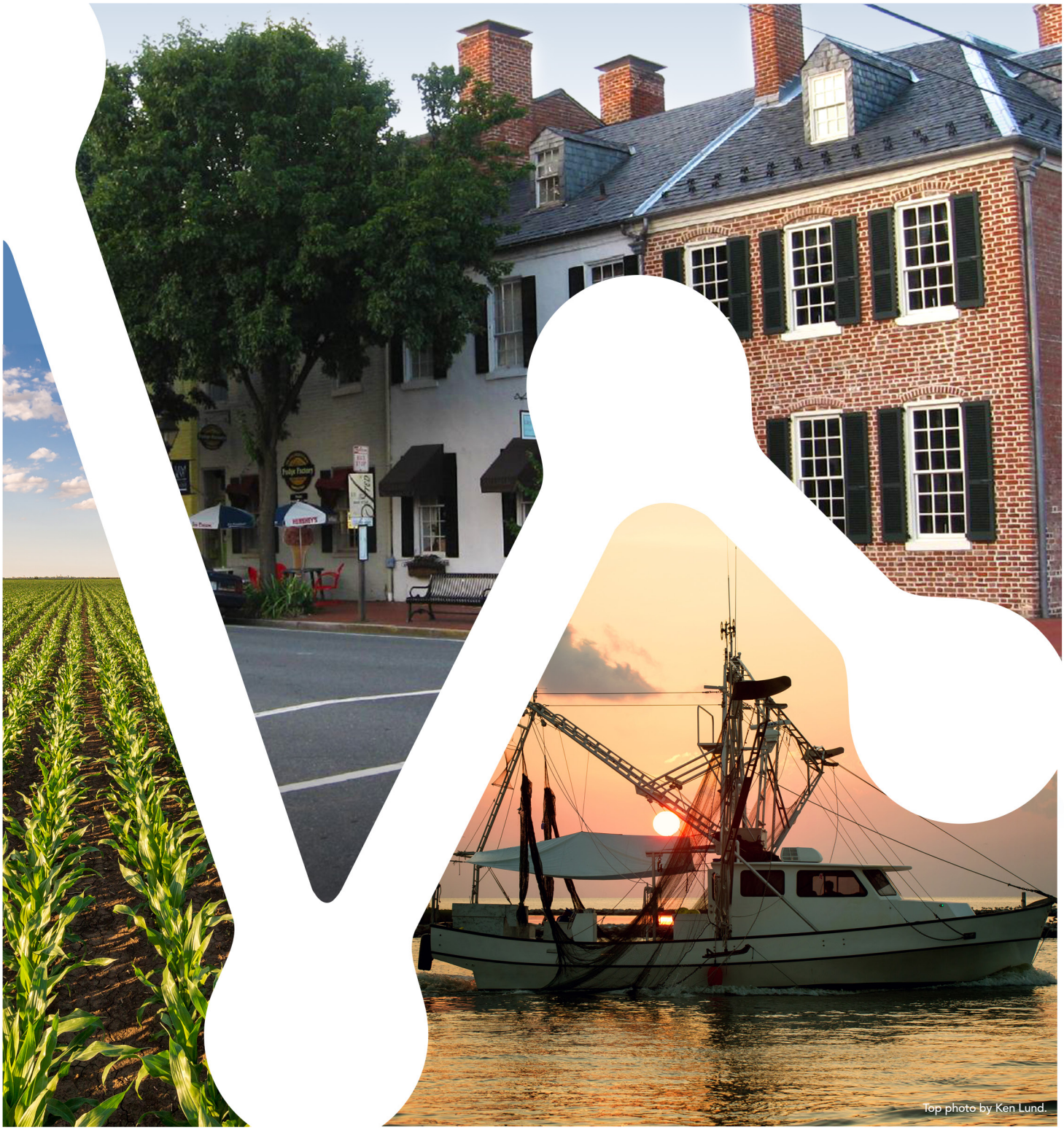
MARY BALL WASHINGTON REGION 6 COUNCIL
ECONOMIC PROFILE AND INDUSTRY CLUSTER ANALYSIS



Top photo by Ken Lund.

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Executive Summary

Consistent with the requirements of the GO Virginia initiative, this report provides an empirical assessment of economic and labor market conditions within Mary Ball Washington GO Virginia Region 6. The principal findings from that assessment are as follows:

1) **<u>Regional economy</u>:**

   Mary Ball Washington GO Virginia Region 6 has generally out-performed the statewide average in terms of employment and wage growth. However, there are significant difference in the performance and composition of the economies of the three Planning Districts that comprise Region 6 – George Washington, Middle Peninsula, and Northern Neck.

   - The private sector accounts for a smaller proportion of total employment in Region 6 than is typical for Virginia – 77 percent in Region 6 as a whole, 76 percent in the George Washington Planning District, 78 percent in the Middle Peninsula Planning District, and 77 percent in the Northern Neck Planning District vs. 82 percent statewide in Virginia.
   - Private employment in Region 6 generally grew faster than the statewide average over the last five years – 6.9 percent in Region 6 as a whole, 8.9 percent in the George Washington Planning District, 6.2 percent in the Middle Peninsula Planning District, and minus 7.2 percent in the Northern Neck Planning District vs. 5.9 percent statewide in Virginia.
   - Private sector average weekly wages in Region 6 grew faster than the statewide average over the last five years – 9.9 percent in Region 6 as a whole, 8.1 percent in the George Washington Planning District, 14.1 percent in the Middle Peninsula Planning District, and 17.1 percent in the Northern Neck Planning District vs. 8.6 percent statewide in Virginia.
   - Private sector average weekly wages in Region 6 in the fourth quarter of 2016 were below the statewide average – $796 in Region 6 as a whole, $827 in the George Washington Planning District, $689 in the Middle Peninsula Planning District, and $711 in the Northern Neck Planning District vs. $1,091 statewide in Virginia.
   - Region 6's *Retail Trade* and *Accommodation and Food Services* sectors, the two sectors that are most closely associated with the tourism industry, are larger than one would expect based on the statewide norm. While, Region 6's

Professional, Scientific, and Technical Services sector is smaller than one would expect.

- At the Planning District level, in the Middle Peninsula and Northern Neck both the *Agriculture* and *Manufacturing* sectors are larger than one would expect based on the statewide norm.
- The largest most recent year-over-year private employment increases in Region 6 occurred in *Transportation and Warehousing* (up 1,147 jobs), *Administrative and Support and Waste Management* (up 438 jobs), and *Construction* (up 261 jobs). While the largest year-over-year declines in private employment occurred in *Retail Trade* (down 716 jobs), *Wholesale Trade* (down 406 jobs), and *Information* (down 186 jobs).
- As of April 2017, unemployment stood at 3.7 percent in Region 6 as a whole, and 3.6 percent in the George Washington Planning District, 3.5 percent in the Middle Peninsula Planning District, and 5.0 percent in the Northern Neck Planning District, as compared to 3.6 percent statewide.

2) Economic drivers:

Mary Ball Washington GO Virginia Region 6 is home to a large and diverse number of high-performing industries. However, that mix of industries varied perceptively across the three Planning Districts that comprise Region 6.

- We assessed the relative economic performance of specific industries within Region 6 and each of its three Planning Districts using a Composite Economic Performance Index that took into account each industry's relative employment footprint, short-term and long-term employment growth, short-term and long-term wage growth, industry wage as a proportion of the average wage for the region, proportion of industry output exported out of Region 6, and employment multiplier.
- That analysis identified 85 industries within Region 6 as a whole, 80 within the George Washington Planning District, 57 within the Middle Peninsula Planning District, and 43 within the Northern Neck Planning District that exhibited a Composite Economic Performance Index that was above the median for its area.

3) **Industry clusters:**

Sixteen high-performance, "traded" industry clusters were identified in Mary Ball Washington GO Virginia Region 6.

- The process we used to identify high-performance industry clusters in Region 6 had three primary characteristics:
  - It was a bottom-up approach that was based exclusively on economic data that was specific to Mary Ball Washington GO Virginia Region 6 and the three Planning Districts that comprise Region 6.
  - Consistent with the objectives of the GO Virginia initiative, it focused on traded industries – industries that export a large proportion of their products or services to customers outside of their region.
  - In addition to identifying the core high-performance industries that comprise each cluster, it also used data on the national supply chains for those core industries to identify their top suppliers, and which of those suppliers are already present in Region 6 and which are not.
- Building on the economic driver analysis, we grouped industries that had been identified as economic drivers in Region 6 or either of the three Planning Districts into clusters based on the classification structure of the Bureau of Labor Statistics NAICS taxonomy.
- That process identified 16 high-performance industry clusters in Region 6:
  - Agriculture (including Aquaculture and Forestry)
  - Education
  - Finance and Insurance
  - Information
  - Manufacturing of Computer and Electronic Equipment
  - Manufacturing of Fabricated Metal and Machinery Products
  - Manufacturing of Food and Beverage Products (including Seafood
  - Manufacturing of Miscellaneous Products
  - Manufacturing of Plastics, Rubber, and Nonmetallic Mineral Products
  - Manufacturing of Wood Products and Paper
  - Mining and Quarrying
  - Professional, Scientific, and Technical Services and Management of Companies

- Tourism
- Transportation and Warehousing
- Utilities
- Wholesale Trade

4) **Workforce:**

In general, Mary Ball Washington GO Virginia Region 6 has a sufficient available regional labor pool to support the identified high-performance industry clusters. However, potential bottle necks exist in some "middle skill" occupations such as Electricians and Industrial Mechanics.

- Our analysis of regional occupational employment, showed that the available regional labor pool exceeded current employment in each of the identified high-performance industry clusters. However, there were two cases where that margin was noticeably narrower.
- In the *Professional, Scientific, Technical Services, and Management of Companies* cluster, there were limitations in the regional labor pool available to certain industries within the cluster. Specifically, the Custom Computers Programming Services, Computer System Design Services, and Other Computer Related Services industries.
- In the narrowed the *Transportation and Warehousing* cluster, there were limitations in the regional labor pool available to certain industries within the cluster. Specifically, the Truck Transportation industry.
- Our "gap analysis" of potential shortfalls in the pipeline of completers graduating from regional post-secondary education programs in Region 6 relative to the occupation-driven demand for trained workers from those programs showed that:
  - Many of the identified gaps pertained to occupations that typically require a baccalaureate degree and this is largely attributable to the fact that there is only one four-year degree granting post-secondary education institution in Region 6 – Mary Washington University.
  - However, in some instances, particularly in "middle-skill" occupations that require a less than two-year post-secondary certificate, there were identified gaps could potentially be problematic:
    - Bus and Truck Mechanics and Diesel Engine Specialists
    - Electrical Power Line Installers and Repairers

- Electricians
- Emergency Medical Technicians
- Heavy and Tractor Trailer Truck Drivers
- Heating, Air Conditioning, and Refrigeration Mechanics
- Industrial Machinery Mechanics
- Mobile Heavy Equipment Mechanics
- Motorboat Mechanics and Service Technicians

5) **Commuting patterns:**

Mary Ball Washington GO Virginia Region 6 and its three Planning Districts all experience a significant net out-flow of workers.

- Our analysis of regional commuting patterns showed that, Region 6 and each of its three Planning Districts experienced a significant net out-flow of workers in 2014. More specifically:
  - Region 6: In 2014, 39,940 workers commuted into Region 6 from localities outside of the region, while 115,352 workers commuted out of Region 6 from localities within the region, for a net out-flow of 75,412 workers.
  - George Washington Planning District: In 2014, 39,326 workers commuted into George Washington Planning District from localities outside of the district, while 78,012 workers commuted out of George Washington Planning District from localities within the district, for a net out-flow of 38,686 workers.
  - Middle Peninsula Planning District: In 2014, 9,928 workers commuted into Middle Peninsula Planning District from localities outside of the district, while 33,902 workers commuted out of Middle Peninsula Planning District from localities within the district, for a net out-flow of 23,974 workers.
  - Northern Neck Planning District: In 2014, 4,655 workers commuted into Northern Neck Planning District from localities outside of the district, while 14,817 workers commuted out of Northern Neck Planning District from localities within the district, for a net out-flow of 10,162 workers.

Introduction

Consistent with the requirements of the GO Virginia initiative, this report provides an empirical assessment of economic and labor market conditions within Mary Ball Washington GO Virginia Region 6. The remainder of the report is divided into six sections. The *Economic Profile* section provides an assessment of recent economic trends in Region 6 and the three Planning Districts that comprise Region 6 – George Washington, Middle Peninsula, and Northern Neck. While the *Economic Drivers* section identifies those industries that make an above average contribution to the economy of Region 6 and its three Planning Districts. The *Cluster Analysis* section builds on the economic driver analysis by grouping economic driver industries into clusters and more fully specifying those clusters by identifying the regional supply chains that support them. This is followed by the *Workforce Analysis* section which quantifies the available regional labor pool associated with each cluster, identifies other industries that draw from that same labor pool, and illuminates potential regional gaps between the demand for, and supply of, the trained workers each cluster requires for continued growth. Then the *Commuting Analysis* section rounds out our analysis by providing an assessment of commuting patterns in Region 6 and its three Planning Districts. Finally, the *Conclusion* section provides concluding remarks.

This report was commissioned by Mary Ball Washington GO Virginia Region 6 and produced by Mangum Economics.

Economic Profile

In this section, we provide a context for the analysis to follow by reviewing recent economic trends within Mary Ball Washington GO Virginia Region 6, and the three Planning Districts that comprise Region 6 (George Washington, Middle Peninsula, and Northern Neck).[1]

[1] The George Washington Regional Planning District is comprised of the counties of Caroline, King George, Spotsylvania, Stafford, and the City of Fredericksburg. The Middle Peninsula Planning District is comprised of the counties of Essex, Gloucester, King and Queen, King William, Mathews, and Middlesex. The Northern Neck Planning District is comprised of the counties of Lancaster, Northumberland, Richmond, and Westmoreland.

Employment by Ownership Category

Figure 1 depicts employment by ownership category in Virginia, Mary Ball Washington GO Virginia Region 6, and the three Planning Districts that are encompassed by Region 6, in the fourth quarter of 2016. As these data depict, where in Virginia as a whole private sector employment accounts for 82 percent of total employment, in Region 6 that figure is only 77 percent. While at a Planning District level, private sector employment accounts for: 1) 76 percent of total employment in George Washington, 2) 78 percent of total employment in Middle Peninsula, and 3) 77 percent of total employment in Northern Neck.

In George Washington, this differential is largely attributable to a larger than average federal government presence (*i.e.*, 11 percent of total employment in George Washington vs. 6 percent statewide). While in Middle Peninsula and Northern Neck, it is largely attributable to a larger than average local government presence (*i.e.*, 18 percent in Middle Peninsula and 16 percent in Northern Neck vs. 10 percent statewide). Although, it should be noted that the latter is not unusual in rural communities where school teachers, who are overwhelmingly local government employees, typically comprise a larger proportion of what is generally a smaller overall employment base.

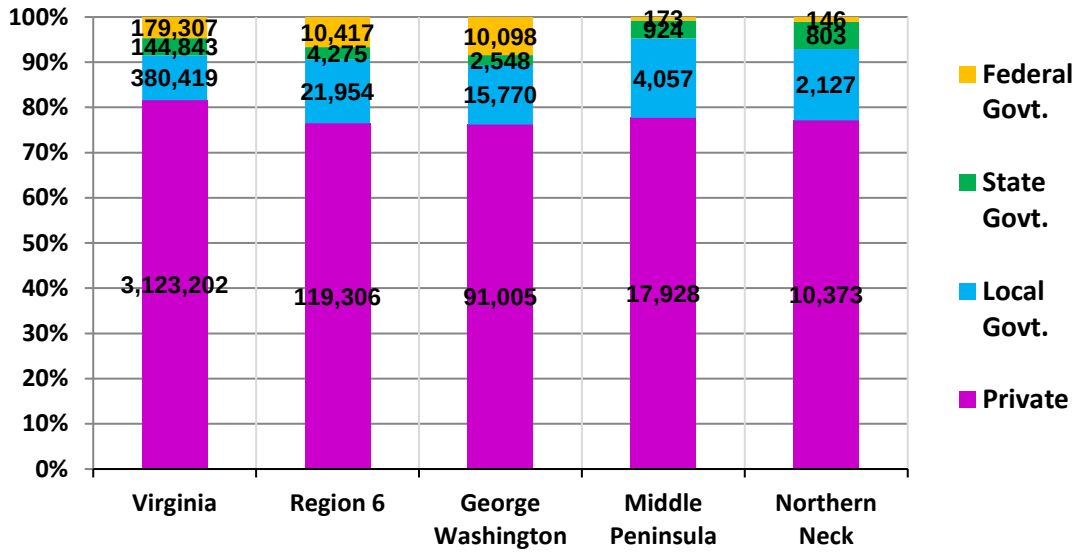

Figure 1: Employment by Ownership Category – 2016:Q4[2]

[2] *Data Source*: Virginia Employment Commission.

Consistent with the GO Virginia initiative's focus on private sector development, in the remainder of this section we will focus exclusively on private sector employment and wages.

Total Private Employment

Figure 2 provides data on total private employment trends in Mary Ball Washington GO Virginia Region 6, and the three Planning Districts that it encompasses for the period from the fourth quarter of 2011 to the fourth quarter of 2016. Overall over this period, Region 6 experienced an increase of 7,657 jobs, or 6.9 percent growth in total private employment. By way of comparison, over the same period the state of Virginia as a whole experienced 5.9 percent growth in total private employment. Breaking that total down by Planning District shows that: 1) George Washington experienced an increase of 7,413 jobs or 8.9 percent growth in private employment, 2) Middle Peninsula experienced an increase of 1,049 jobs or 6.2 percent growth in private employment, and 3) Northern Neck experienced a loss of 805 jobs or a 7.2 percent decline in private employment.

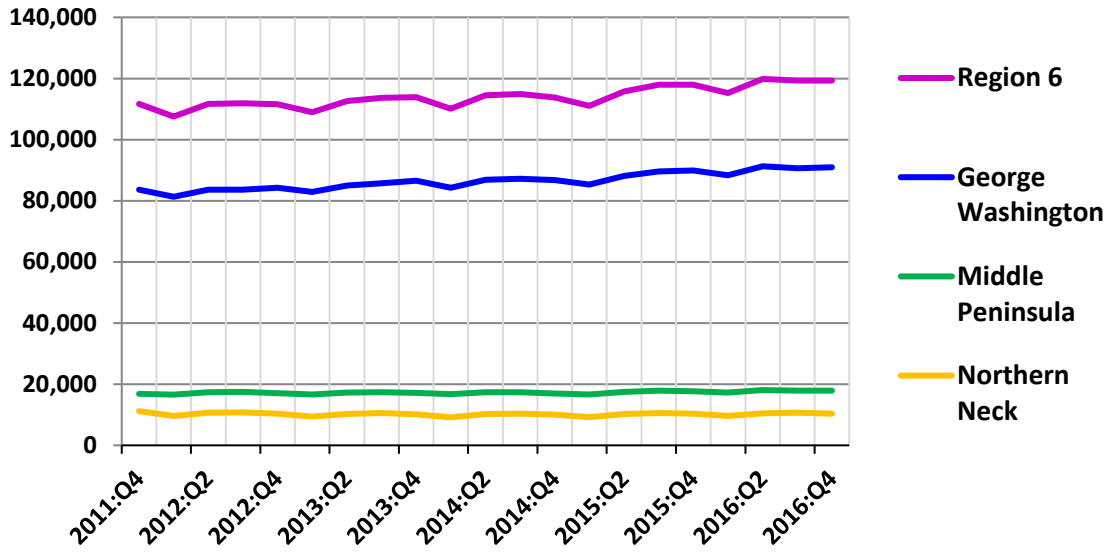

Figure 2: Total Private Employment in Mary Ball Washington GO Virginia Region 6 and Associated Planning Districts – 2011:Q4 to 2016:Q4[3]

To provide a point of reference, Figure 3A compares the year-over-year change in total private employment in Mary Ball Washington GO Virginia Region 6 to that of the state of Virginia as a

[3] *Data Source*: Virginia Employment Commission.

whole over the same five-year period. Any point above the zero line in this graph indicates positive year-over-year employment growth, while any point below the zero line indicates a decline in year-over-year employment. As these data indicate, unlike the state of Virginia as a whole, Region 6 did not experience an immediate negative employment consequence from the 2013 federal sequester, which heavily impacted the Professional and Technical Services sector in Northern Virginia. However, Region 6's year-over-year change in total private employment did dip into negative territory in the third quarter of 2012 and the fourth quarter of 2014. Region 6's private employment growth then accelerated rapidly throughout 2015, but has since retreated back to the statewide norm.

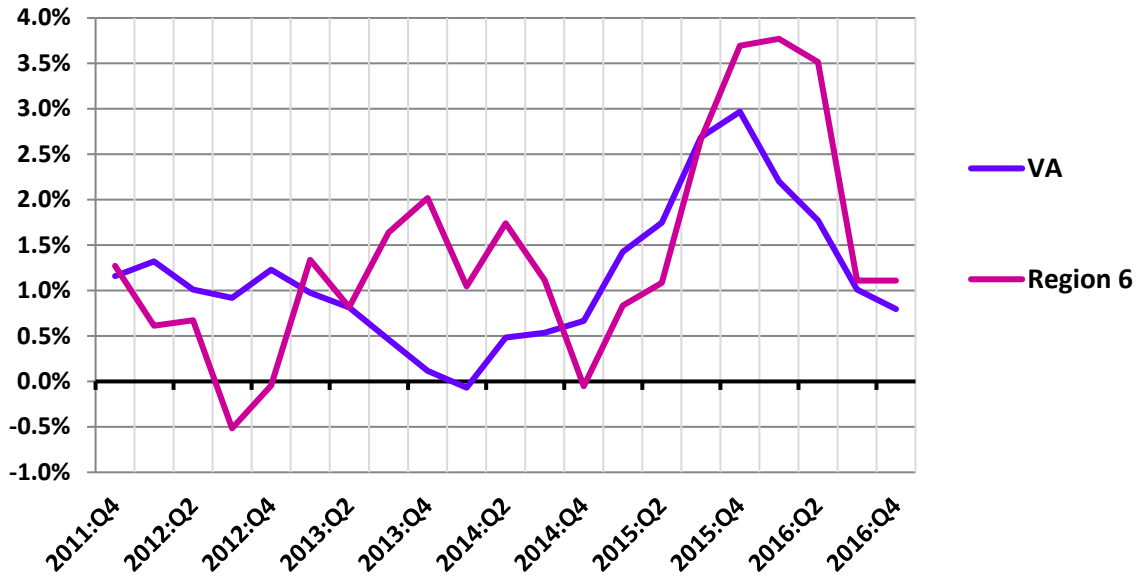

Figure 3A: Year-Over-Year Change in Total Private Employment – 2011:Q4 to 2016:Q4[4]

Figure 3B provides a similar comparison for the three Planning Districts that comprise Mary Ball Washington GO Virginia Region 6. Not surprisingly, given that it accounts for over three-fourths of the total private employment in Region 6, the data for George Washington's year-over-year change in total private employment closely correspond to those for the region as a whole. As these data show, however, both the Middle Peninsula and Northern Neck generally under-performed the state and the region throughout 2013 and 2014, with Northern Neck actually experiencing declining private employment throughout 2012, 2013, and 2014. Starting in 2015, those trends reversed and all three Planning Districts experienced a rapid acceleration in private employment growth as well as a convergence of their employment trends.

[4] *Data Source*: Virginia Employment Commission.

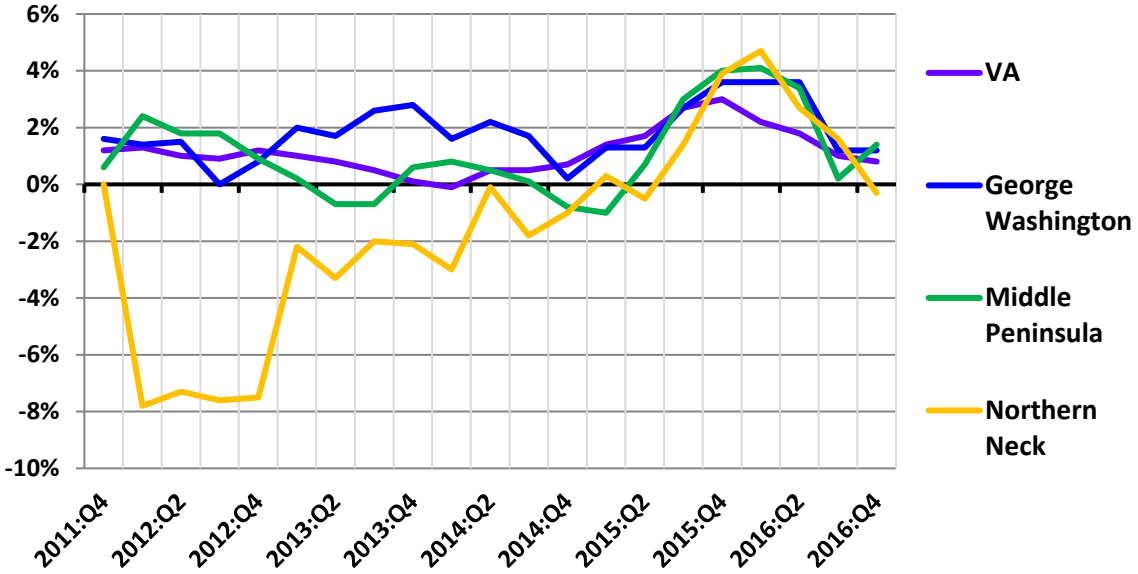

Figure 3B: Year-Over-Year Change in Total Private Employment – 2011:Q4 to 2016:Q4[5]

Private Sector Average Weekly Wages

Figure 4 provides data on trends in private sector nominal average weekly wages in Mary Ball Washington GO Virginia Region 6, and the three Planning Districts that it encompasses for the period from the fourth quarter of 2011 to the fourth quarter of 2016. Over this five-year period as a whole, private sector nominal average weekly wages increased by 9.9 percent in Region 6, as compared to 8.6 percent statewide in Virginia. While at the Planning District level, private sector nominal average weekly wages increased by: 1) 8.1 percent in George Washington, 2) 14.1 percent in Middle Peninsula, and 3) 17.1 percent in Northern Neck.

[5] *Data Source*: Virginia Employment Commission.

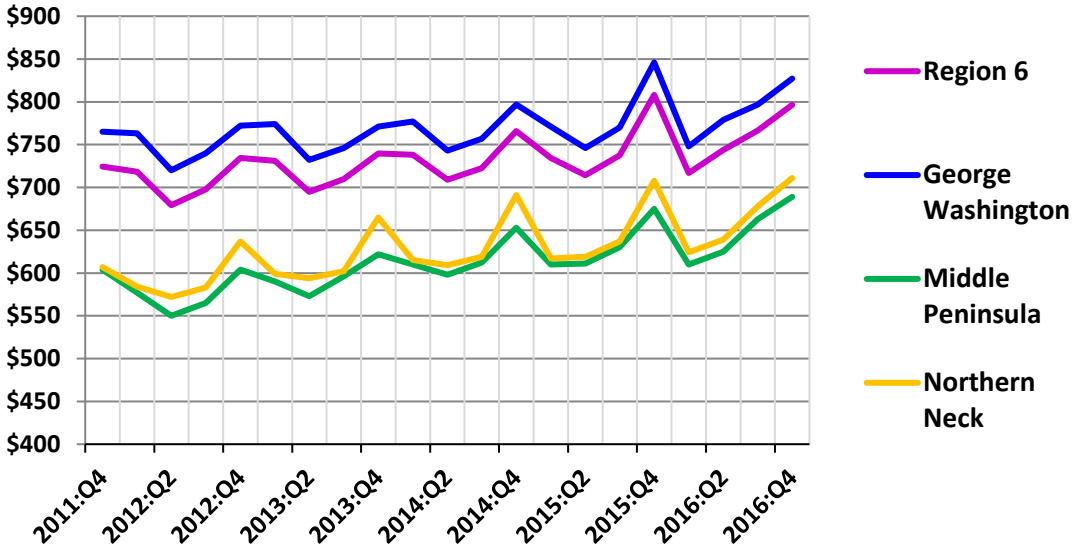

Figure 4: Private Sector Average Weekly Wages in Mary Ball Washington GO Virginia Region 6 and Associated Planning Districts – 2011:Q4 to 2016:Q4[6]

To provide a better visual comparison, Figure 5 compares private sector average weekly wages in the fourth quarter of 2016 in Mary Ball Washington GO Virginia Region 6 and the three Planning Districts it encompasses to the statewide figure for Virginia. As these data show, private sector average weekly wages were $1,091 statewide in Virginia that quarter, as compared to $796 in Region 6, $827 in George Washington, $689 in Middle Peninsula, and $711 in Northern Neck.

[6] *Data Source*: Virginia Employment Commission.

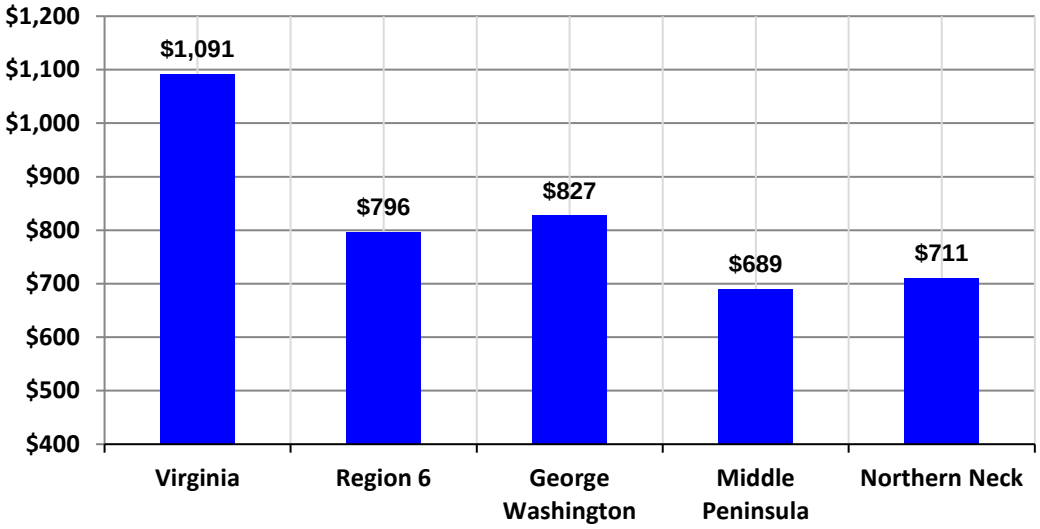

Figure 5: Private Sector Average Weekly Wages in 2016:Q4[7]

Employment by Major Industry

In this portion of the section, we provide a drill-down for employment and wages by major industry sector in Mary Ball Washington GO Virginia Region 6 and the three Planning Districts it encompasses. As the data shown in Figure 6A indicate, in the fourth quarter of 2016 the five largest industry sectors in Region 6 were: 1) *Retail Trade* (22,506 jobs), 2) *Health Care and Social Assistance* (19,088 jobs), 3) *Accommodation and Food Services* (16,189 jobs), 4) *Professional, Scientific, and Technical Services* (9,137 jobs), and 5) *Construction* (8,085 jobs).

Comparing these figures to statewide data that quarter shows that Region 6's *Retail Trade* and *Accommodation and Food Services* sectors, the two sectors that are most closely associated with the tourism industry, are larger than one would expect based on the statewide norm (*Retail Trade* accounts for 19 percent of total private employment in Region 6 vs. 14 percent statewide, and *Accommodation and Food Services* accounts for 14 percent of total private employment in Region 6 vs. 11 percent statewide. In contrast, Region 6's *Professional, Scientific, and Technical Services* sector is smaller than one would expect (accounting for only 8 percent of total private employment in Region 6 vs. 13 percent statewide).

[7] *Data Source*: Virginia Employment Commission.

Figure 6B provides a break-down for the three Planning Districts that comprise Mary Ball Washington GO Virginia Region 6. These data indicate that the *Retail Trade* sector is larger than the statewide norm in all three Planning Districts (*i.e.*, 19 percent of total private employment in George Washington, 21 percent in Middle Peninsula, and 17 percent in Northern Neck, vs. 14 percent statewide), while the employment footprint for *Accommodation and Food Services* only significantly exceeds the statewide norm in George Washington (*i.e.*, 14 percent of total private employment vs. 11 percent statewide).

It is also noteworthy that the *Manufacturing* sector is larger than the statewide norm in both Middle Peninsula and Northern Neck (*i.e.*, 10 percent and 14 percent of total private employment respectively, vs. 7 percent statewide), but below the statewide norm in George Washington (5 percent of total private employment). Similarly, the *Agriculture* sector is larger than the statewide norm in both Middle Peninsula and Northern Neck (*i.e.*, 2 percent and 3 percent of total private employment respectively, relative to < 1 percent statewide), but comparable to the statewide norm in George Washington. While the *Professional, Scientific, and Technical Services* sector is under-represented in all three Planning Districts (*i.e.*, accounting for 9 percent of total private employment in George Washington, and 4 percent in both Middle Peninsula and Northern neck, vs. 13 percent statewide).

Figure 7A provides comparable data for average weekly wages by major industry sector in Mary Ball Washington Region 6. As these data show, the five highest paying industry sectors in Region 6 in the fourth quarter of 2016 were: 1) *Utilities* ($1,600 per week), 2) *Professional, Scientific, and Technical Services* ($1,590 per week), 3) *Mining* ($1,280 per week), 4) *Management of Companies and Enterprises* ($1,268), and 5) *Finance and Insurance* ($1,113 per week). Figure 7B provides a drill-down of these data for each of the three Planning Districts encompassed by Region 6.

Lastly, Figure 8A depicts the most recent year-over-year change in employment by major industry sector in Mary Ball Washington GO Virginia Region 6. As these data indicate, the largest year-over-year employment increases in Region 6 occurred in *Transportation and Warehousing* (up 1,147 jobs), followed by *Administrative and Support and Waste Management* (up 438 jobs), and *Construction* (up 261 jobs). While at the other end of the spectrum, the largest year-over-year declines in employment occurred in *Retail Trade* (down 716 jobs), followed by *Wholesale Trade* (down 406 jobs), and *Information* (down 186 jobs). Figure 8B provides a drill-down of these data for each of Region 6's three Planning Districts.

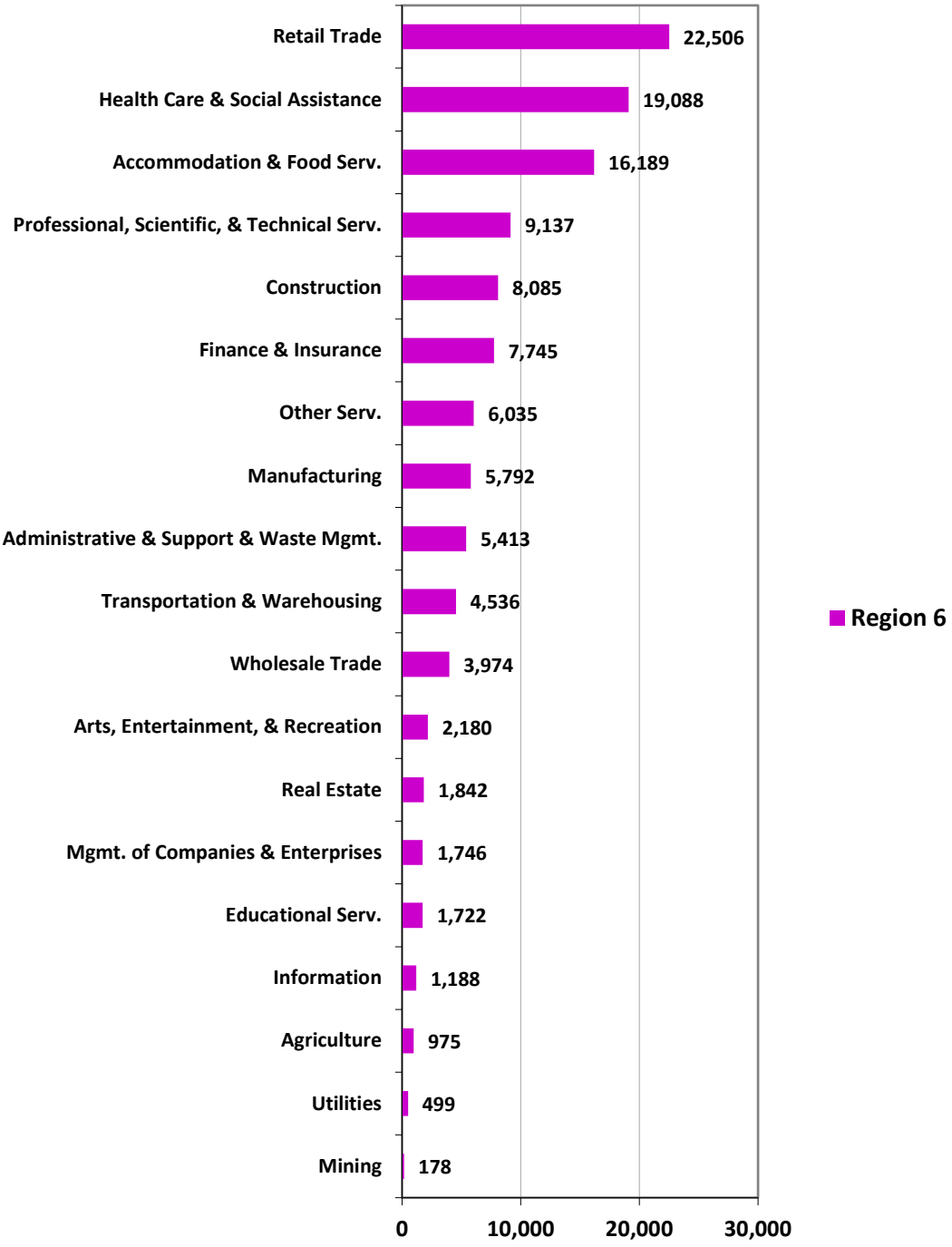

Figure 6A: Private Employment by Major Industry Sector – 2016:Q4[8]

[8] *Data Source*: Virginia Employment Commission.

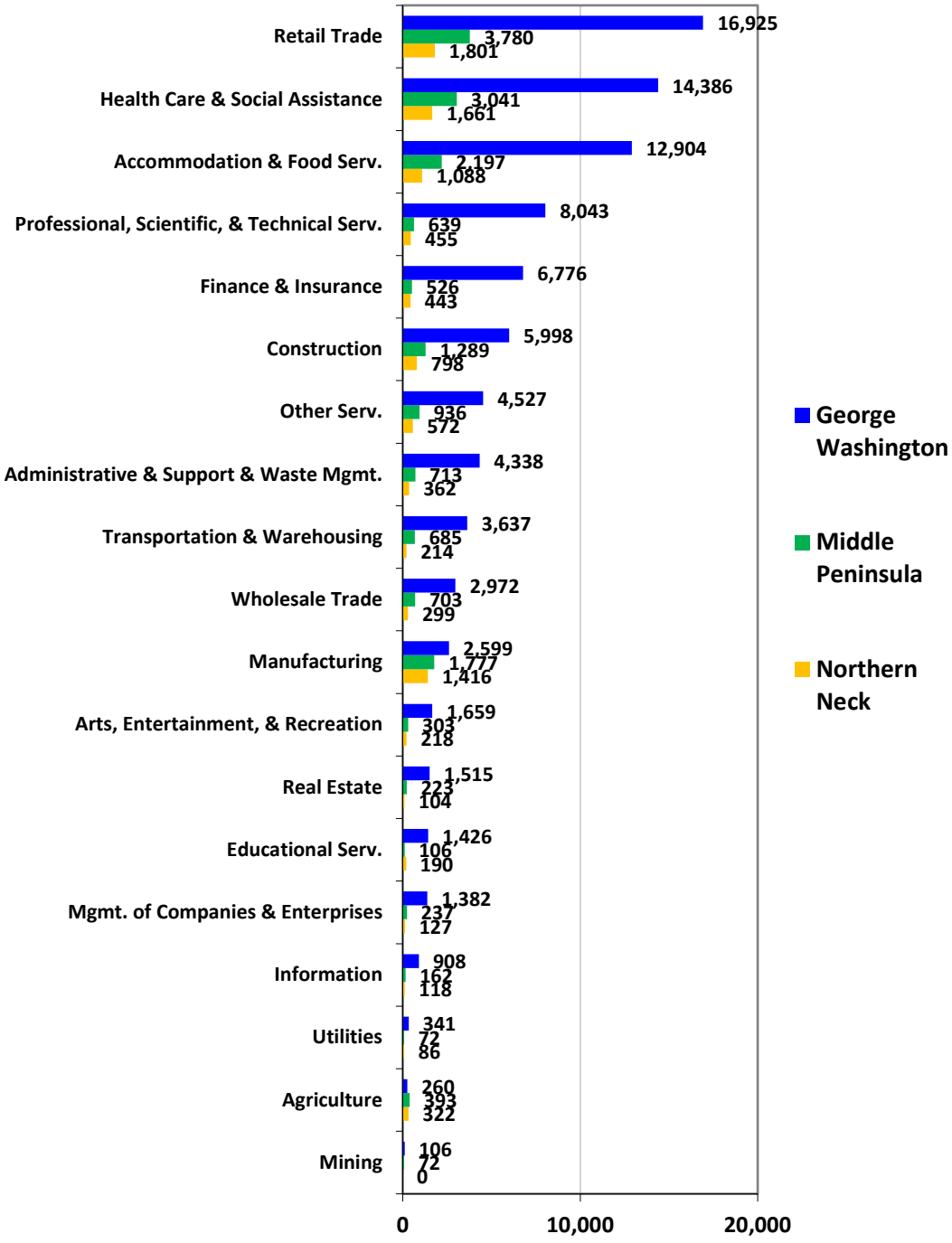

Figure 6B: Private Employment by Major Industry Sector – 2016:Q4[9]

[9] *Data Source*: Virginia Employment Commission.

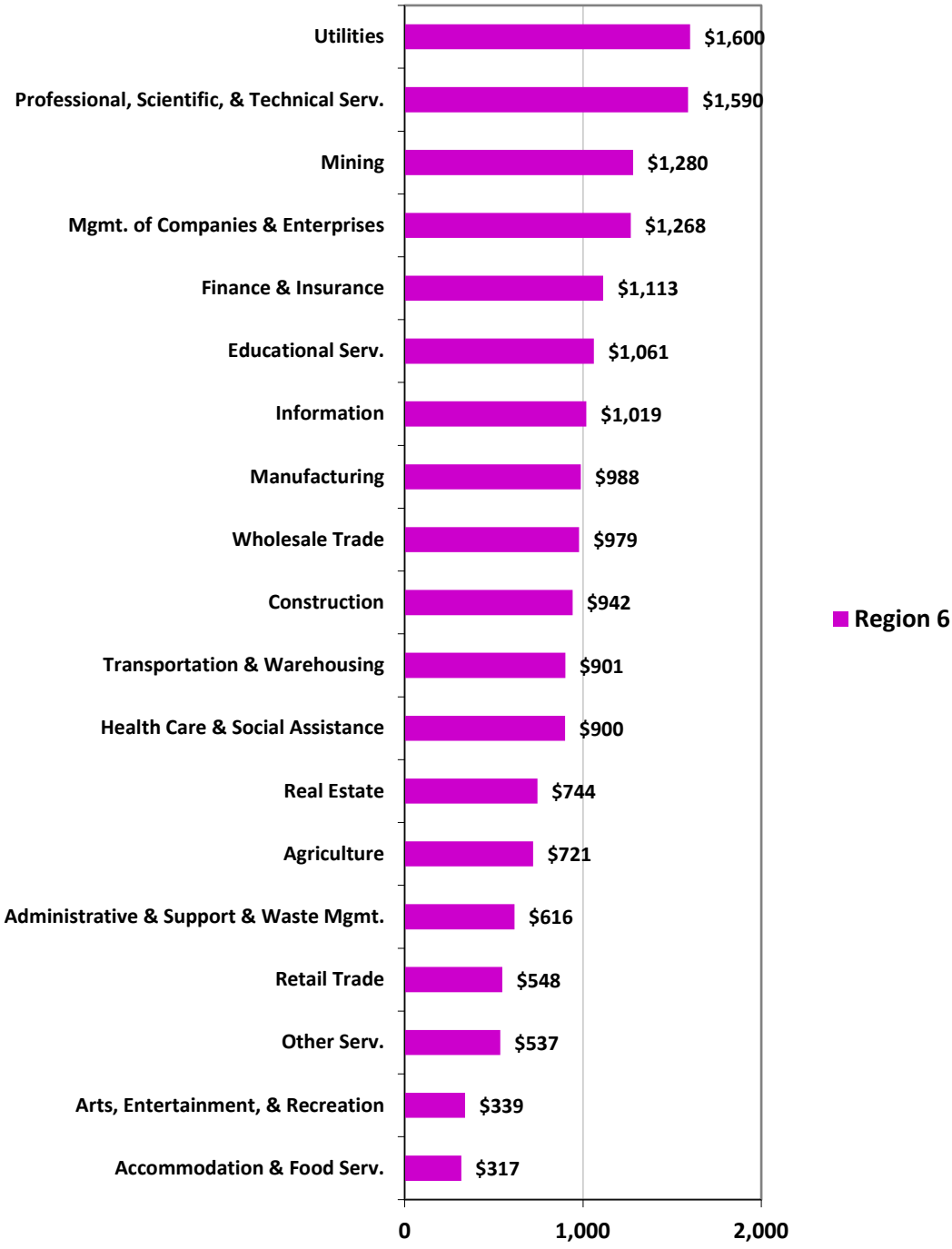

Figure 7A: Private Sector Average Weekly Wages by Major Industry Sector – 2016:Q4[10]

[10] *Data Source*: Virginia Employment Commission.

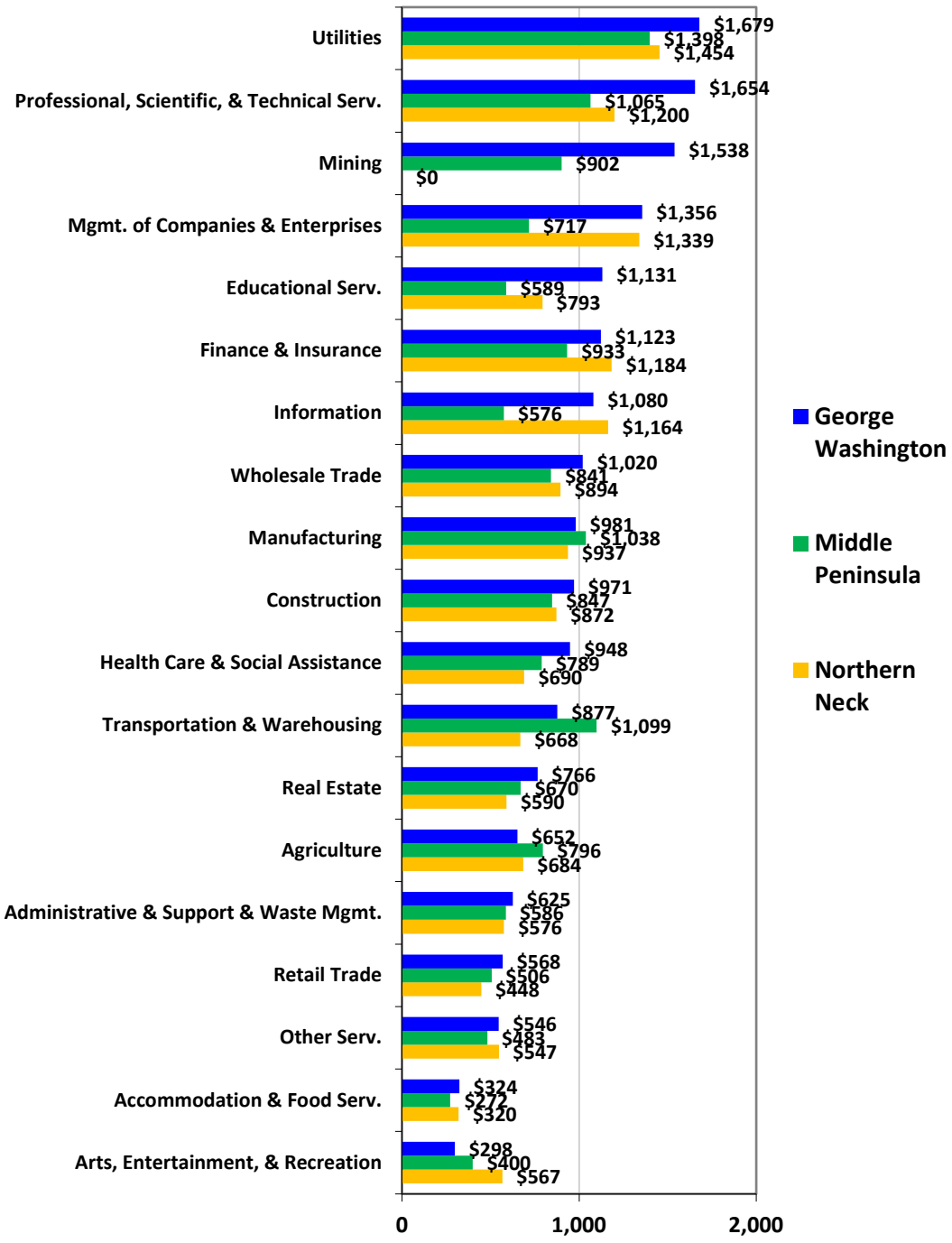

Figure 7B: Private Sector Average Weekly Wages by Major Industry Sector – 2016:Q4[11]

[11] *Data Source*: Virginia Employment Commission.

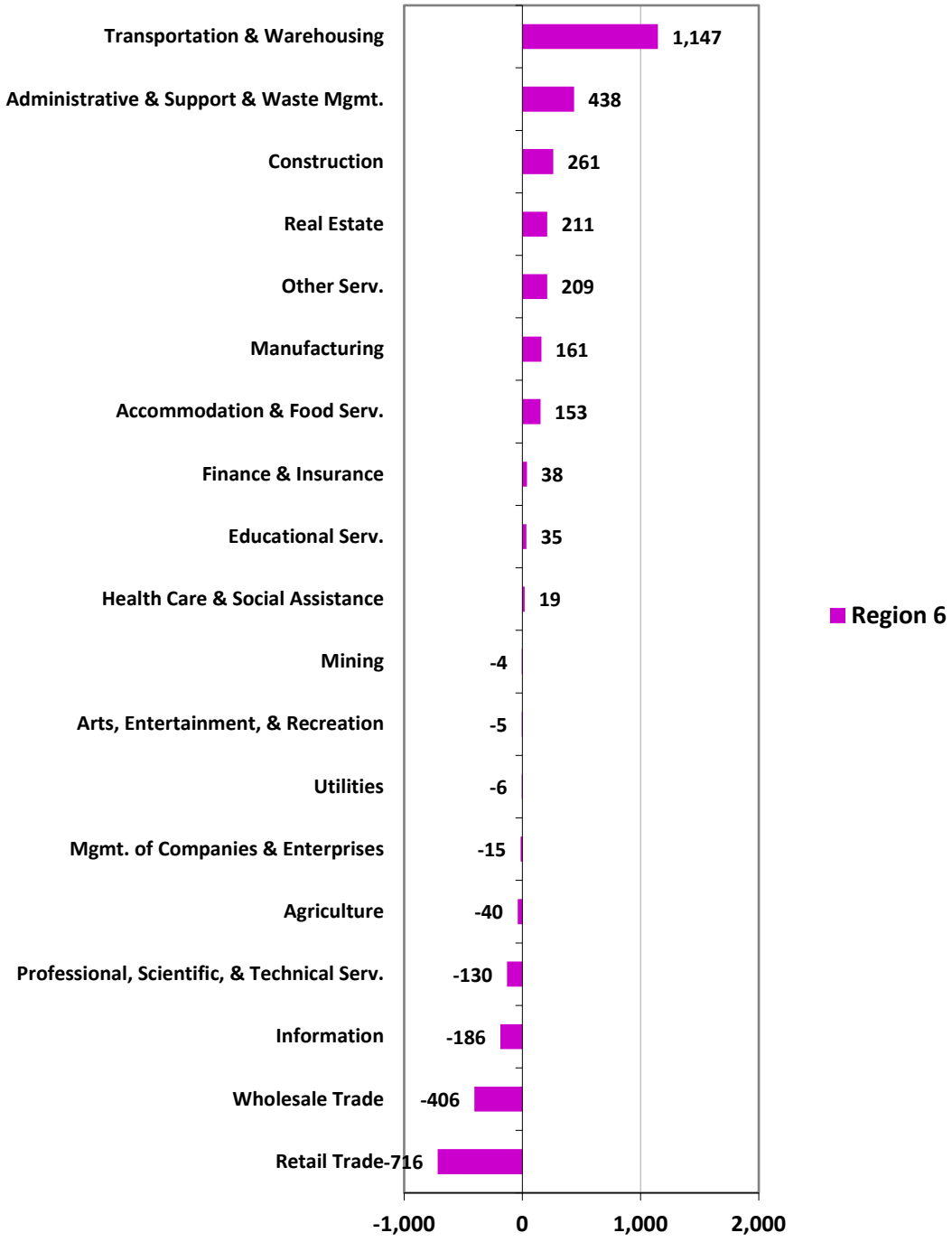

Figure 8A: Change in Private Employment by Major Industry Sector – 2015:Q4 to 2016:Q4[12]

[12] *Data Source*: Virginia Employment Commission.

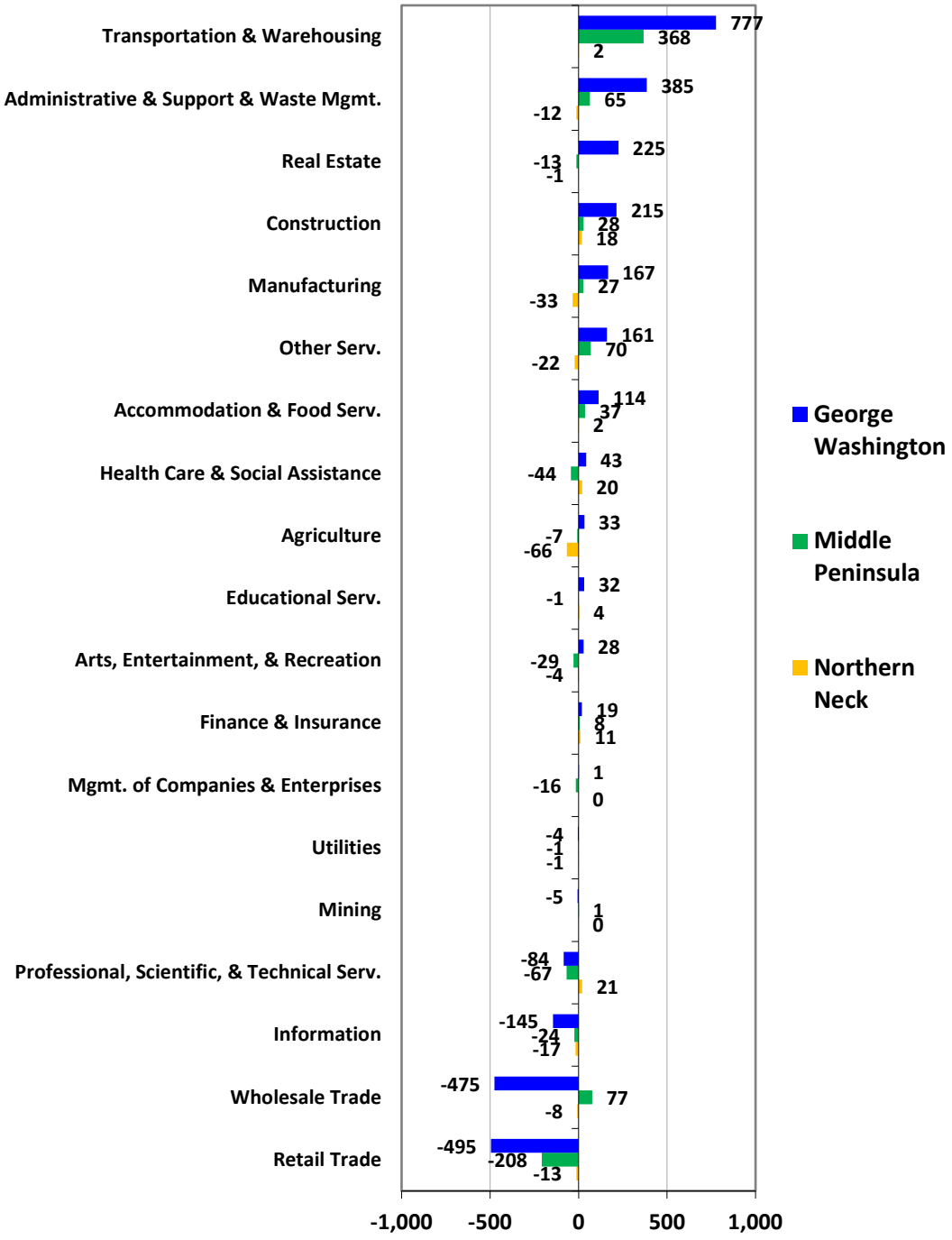

Figure 8B: Change in Private Employment by Major Industry Sector – 2015:Q4 to 2016:Q4[13]

[13] *Data Source*: Virginia Employment Commission.

Unemployment

In this last portion of the section, we briefly review recent unemployment trends in Mary Ball Washington GO Virginia Region 6 and its three Planning Districts and benchmark those data against the state of Virginia as a whole. Figure 9A depicts the unemployment rate in Region 6 and Virginia statewide over the period from April 2013 through April 2017. As these data show, unemployment in Region 6 tracked very closely with the statewide trend over the period, although it was typically slightly above the statewide average. As of April 2017, unemployment stood at 3.7 percent in Region 6 as compared to 3.6 percent statewide.

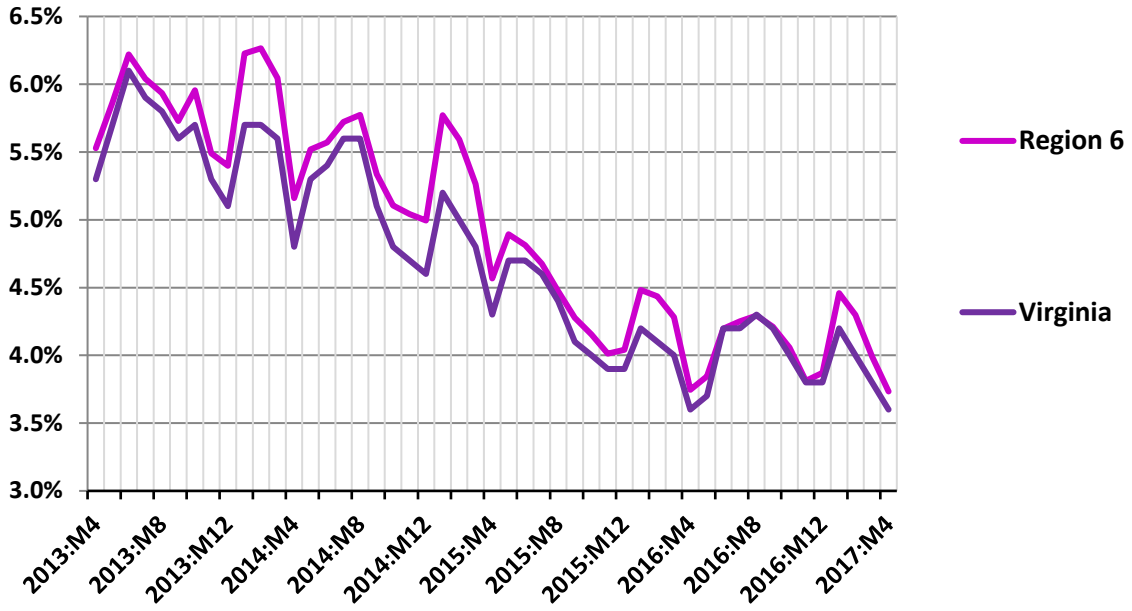

Figure 9A: Unemployment Rate – April of 2013 to April of 2017[14]

[14] *Data Source*: Virginia Employment Commission.

Figure 9B provides similar data for the three Planning Districts within Region 6. As these data demonstrate, unemployment rates in George Washington and Middle Peninsula also tacked very closely with the statewide trend throughout the period. However, unemployment in Northern Neck was sometimes two to three percentage points above the statewide average and also subject to significant seasonal swings. As of April 2017, unemployment stood at 3.6 percent in George Washington, 3.5 percent in Middle Peninsula, and 5.0 percent in Northern Neck, as compared to 3.6 percent statewide.

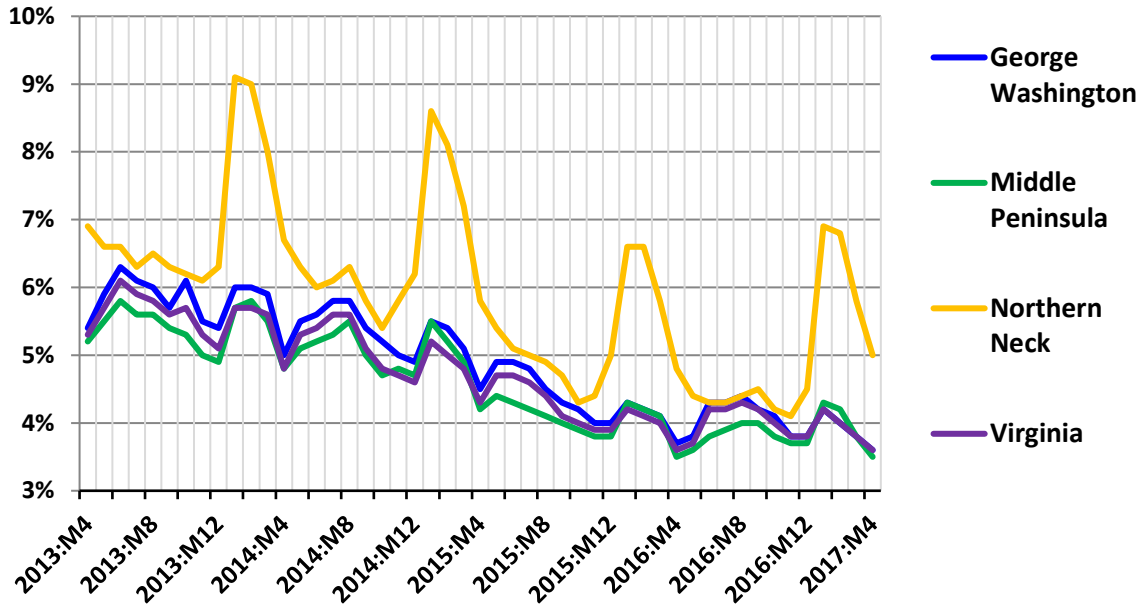

Figure 9B: Unemployment Rate – April of 2013 to April of 2017[15]

[15] *Data Source*: Virginia Employment Commission.

Economic Drivers

In this section, we identify those industries that make an above average contribution to the growth of Mary Ball Washington GO Virginia Region 6's economy and the economies of the three Planning Districts that comprise Region 6.

Method

To identify these economic driver industries, we employ a composite economic performance index that is based on eight individual metrics. These metrics were selected based on GO Virginia's prioritization of fast growing, export industries, that offer high wages, and have a significant economic impact. Each metric, and the weight that it is given in the composite economic performance index, is listed below.

1) Employment Location Quotient or "LQ" (weight = 12.5 percent): This metric measures the relative employment footprint of an industry.[16] If it is greater than one, that indicates that the industry has a larger employment footprint in the area than one would expect based on the statewide norm. If it is less than one, the industry has a smaller employment footprint than one would expect based on the statewide norm.
2) Short-Term Employment Growth or "ST Emp." (weight = 12.5 percent): This metric measures one-year employment growth in an industry.[17]
3) Long-Term Employment Growth or "LT Emp." (weight = 12.5 percent): This metric measures five-year employment growth in an industry.[18]
4) Short-Term Wage Growth or "ST Wage" (weight = 6.5 percent): This metric measures one-year wage growth in an industry.[19]

[16] More specifically, the employment location quotient is calculated as: LQ*e* = ((area private employment in industry i)/(total area private employment))/((statewide private employment in industry i)/(total statewide private employment)). *Data Source*: derived from Virginia Employment Commission data.
[17] More specifically, short-term employment growth is calculated as: ST*e* = ((2016:Q4 area private employment in industry i) – (2015:Q4 area private employment in industry i)). *Data Source*: derived from Virginia Employment Commission data.
[18] More specifically, long-term employment growth is calculated as: LT*e* = ((2016:Q4 area private employment in industry i) – (2011:Q4 area private employment in industry i)). *Data Source*: derived from Virginia Employment Commission data.
[19] More specifically, short-term wage growth is calculated as: ST*w* = ((2016:Q4 area private wages in industry i) – (2015:Q4 area private wages in industry i))/(2015:Q4 area private wages in industry i). *Data Source*: derived from Virginia Employment Commission data.

5) Long-Term Wage Growth or "LT Wage" (weight = 6.5 percent): This metric measures five-year wage growth in an industry.[20]

6) Relative Wage or "Rel. Wage" (weight = 12.5 percent): This metric measures the wage in an industry relative to the average wage across all industries.[21] If it is greater than one, the wage in the industry is higher than the average wage for the area. If it is less than one, the wage in the industry is lower than the average wage for the area.

7) Industry Exports or "Exports" (weight = 18.75 percent): This metric measures the proportion of an industry's out put that is exported outside of Region 6.[22]

8) Type I Multiplier or "Type I Mult." (weight = 18.75 percent): This metric measures the direct and indirect employment impact the industry has on Region 6. It is an indication of the depth and breadth of an industry's economic roots within an area. The larger the metric, the larger the proportion of the industry's operational expenditures that go to suppliers and employees within the area, so the smaller the leakage of dollars outside of the area.[23]

Each metric was produced all industries at a four-digit NAICS level in Mary Ball Washington Region 6, and separately for each of the three Planning Districts.[24] Each industry is ranked on each metric relative to all other industries in the area that is being studied (*i.e.*, Region 6 or the individual Planning Districts). Those rankings are then weighted and summed to produce the composite economic performance index for that industry in each study area. The smaller the index, the higher the economic performance of that industry relative to all other industries within the study area.

[20] More specifically, long-term wage growth is calculated as: LT*w* = ((2016:Q4 area private wages in industry i) – (2011:Q4 area private wages in industry i))/(2011:Q4 area private wages in industry i). *Data Source*: derived from Virginia Employment Commission data.
[21] More specifically, relative wage is calculated as: RW = (2016:Q4 area private wage in industry i)/(2016:Q4 average area private wage across all industries). *Data Source*: derived from Virginia Employment Commission data.
[22] More specifically, industry exports is calculated as: EXP = (2015 industry output exported outside of Region 6)/(2015 total industry output produced in Region 6). *Data Source*: derived from IMPLAN data.
[23] *Data Source*: IMPLAN.
[24] NAICS stands for North American Industry Code System. It is a coding taxonomy that the U.S. Bureau of Labor Statistics uses to classify industries. It is a six-digit code, where the first two digits denote major industry sectors such as *Manufacturing* or *Retail Trade*. Going beyond two digits increases the granularity of the classification.

Caveats

It is important to point out that the employment and wage data used in this section are taken from the Virginia Employment Commission's *Quarterly Census of Employment and Wages*. Although these data provide the most comprehensive look at regional labor market data available, they are subject to limitations. Because these data are based on unemployment insurance reports filed by employers, they only reflect "covered" employment – employment that is covered by unemployment insurance. As a result, certain categories of employment (*e.g.*, self-employed) and employment in certain industries (*e.g.*, agriculture) may be under-reported. In addition, the Virginia Employment Commission is required to suppress data when disclosure of those data could be used to identify employment and wages in a specific firm. This generally occurs when there is only one major employer in that industry within the region (*e.g.*, the RockTenn paper mill in West Point).

Results

In this portion of the section, we provide a listing of the economic drivers in Mary Ball Washington Region 6, and each of the three Planning Districts. Economic drivers are defined as industries that demonstrated a composite economic performance index that was above the median for the study area. Each composite economic performance index was calculated in accordance with the method described above.

MANGUM economics

Table 1: Region 6 – Industries Demonstrating Above Median Economic Performance

Industry	LQ	ST Emp.	LT Emp.	ST Wage	LT Wage	Rel. Wage	Exports	Type I Mult.	P-Index
Paper mills	1.31	NA	NA	NA	NA	0.00	99.1%	2.56	30.75
Grain farming	12.70	9	53	19.9%	81.9%	1.16	94.8%	1.74	32.56
Pump and pumping equipment manufacturing	0.16	13	NA	76.3%	NA	1.42	99.5%	1.77	33.31
Power-driven handtool manufacturing	0.16	13	NA	76.3%	NA	1.42	99.5%	1.55	36.50
Overhead cranes, hoists, and monorail systems manufacturing	0.16	13	NA	76.3%	NA	1.42	99.4%	1.57	36.69
Oilseed farming	12.70	9	53	19.9%	81.9%	1.16	98.3%	1.41	37.63
Other fabricated metal manufacturing	0.91	49	NA	233.5%	NA	1.45	96.3%	1.28	38.38
Packaging machinery manufacturing	0.16	13	NA	76.3%	NA	1.42	99.7%	1.41	41.19
Wood preservation	4.30	23	49	-1.3%	30.2%	0.94	90.1%	2.43	41.94
Sawmills	4.30	23	49	-1.3%	30.2%	0.94	74.1%	2.35	43.81
Motor vehicle gasoline engine and engine parts manufacturing	0.03	1	NA	24.9%	NA	1.00	99.9%	1.92	44.25
Conveyor and conveying equipment manufacturing	0.16	13	NA	76.3%	NA	1.42	98.7%	1.42	44.38
Warehousing and storage	1.90	740	591	149.6%	125.7%	1.20	9.6%	1.29	45.81
Water transportation	13.09	-2	9	-3.9%	8.8%	1.74	64.4%	3.13	46.94
Motor vehicle transmission and power train parts manufacturing	0.03	1	NA	24.9%	NA	1.00	99.4%	1.83	47.06
Breweries	0.78	30	117	19.8%	622.6%	0.46	88.6%	2.40	47.31
Water, sewage and other systems	0.35	NA	NA	NA	NA	0.74	38.8%	1.96	48.00
Ready-mix concrete manufacturing	1.51	10	-5	4.9%	12.0%	1.38	62.7%	1.89	48.81
Other motor vehicle parts manufacturing	0.03	1	NA	24.9%	NA	1.00	99.3%	1.68	48.94
Motor vehicle steering, suspension component (except spring), and brake systems manufacturing	0.03	1	NA	24.9%	NA	1.00	98.9%	1.72	50.06
Wineries	0.78	30	117	19.8%	622.6%	0.46	96.0%	1.58	50.31
Dry pasta, mixes, and dough manufacturing	0.26	NA	16	NA	49.1%	0.59	99.2%	1.82	51.75
Securities and commodity contracts intermediation and brokerage	0.90	15	75	23.9%	322.6%	6.33	11.5%	1.37	51.81

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Table 1: Region 6 – Industries Demonstrating Above Median Economic Performance

Industry	LQ	ST Emp.	LT Emp.	ST Wage	LT Wage	Rel. Wage	Exports	Type I Mult.	P-Index
Fabricated structural metal manufacturing	0.32	12	17	7.5%	44.2%	1.82	96.9%	1.45	53.44
Other concrete product manufacturing	1.51	10	-5	4.9%	12.0%	1.38	58.4%	1.55	53.69
Truck transportation	1.55	41	162	2.8%	10.6%	1.11	15.8%	1.44	54.06
Broadcast and wireless communications equipment manufacturing	0.60	-7	8	14.1%	-2.4%	6.94	99.3%	1.54	56.06
Outpatient care centers	1.83	85	293	16.6%	89.6%	1.30	0.2%	1.43	56.44
Manufactured ice	0.78	30	117	19.8%	622.6%	0.46	78.7%	1.47	56.69
Retail - Motor vehicle and parts dealers	1.70	88	529	4.6%	53.4%	1.30	12.8%	1.17	57.38
Other communications equipment manufacturing	0.60	-7	8	14.1%	-2.4%	6.94	99.2%	1.51	57.75
Electric power generation - Biomass	1.02	-7	-20	2.8%	16.1%	2.14	32.2%	5.74	58.44
Electric power generation - Fossil fuel	1.02	-7	-20	2.8%	16.1%	2.14	32.2%	3.28	59.00
Sand and gravel mining	2.10	-4	9	-14.8%	47.9%	1.61	56.7%	1.44	59.06
Ornamental and architectural metal work manufacturing	0.32	12	17	7.5%	44.2%	1.82	96.0%	1.29	60.38
News syndicates, libraries, archives and all other information services	0.85	-9	9	7.7%	11.6%	1.38	31.3%	3.43	60.56
Sheet metal work manufacturing	0.32	12	17	7.5%	44.2%	1.82	96.8%	1.26	61.50
Concrete block and brick manufacturing	1.51	10	-5	4.9%	12.0%	1.38	5.4%	1.76	61.94
Cut stock, resawing lumber, and planing	0.47	5	1	2.2%	61.0%	1.10	84.2%	1.66	62.00
Electric power transmission and distribution	1.02	-7	-20	2.8%	16.1%	2.14	29.3%	1.84	62.75
Stone mining and quarrying	2.10	-4	9	-14.8%	47.9%	1.61	38.0%	1.35	63.00
Waste management and remediation services	1.62	1	14	2.6%	7.7%	1.15	17.5%	1.52	63.25
Offices of physicians	1.51	26	443	-2.7%	8.8%	2.00	4.9%	1.27	63.50
Other financial investment activities	0.25	2	22	23.1%	132.8%	3.32	8.7%	1.60	63.69
Ophthalmic goods manufacturing	0.19	-3	-1	4.1%	5.8%	1.10	99.6%	1.81	64.31
Performing arts companies	1.73	26	NA	-15.0%	NA	0.31	1.8%	2.07	64.38
All other miscellaneous wood product manufacturing	0.47	5	1	2.2%	61.0%	1.10	90.5%	1.49	65.00

Table 1: Region 6 – Industries Demonstrating Above Median Economic Performance

Industry	LQ	ST Emp.	LT Emp.	ST Wage	LT Wage	Rel. Wage	Exports	Type I Mult.	P-Index
Seafood product preparation and packaging	11.42	-24	-57	-9.5%	-0.2%	1.23	94.1%	1.86	65.31
Automotive equipment rental and leasing	0.91	13	67	8.0%	79.9%	0.78	14.8%	1.46	65.31
Other millwork, including flooring	0.47	5	1	2.2%	61.0%	1.10	79.4%	1.52	65.38
Other educational services	1.06	45	336	36.2%	137.2%	1.93	3.9%	1.09	65.69
Surgical and medical instrument manufacturing	0.19	-3	-1	4.1%	5.8%	1.10	99.1%	1.74	67.13
Couriers and messengers	1.01	39	100	3.6%	28.9%	0.94	22.8%	1.23	67.88
Architectural, engineering, and related services	0.77	131	-107	0.6%	-9.2%	1.99	20.2%	1.49	68.13
Frozen cakes and other pastries manufacturing	0.26	NA	16	NA	49.1%	0.59	98.7%	1.25	68.44
Internet publishing and broadcasting and web search portals	0.85	-9	9	7.7%	11.6%	1.38	6.5%	3.61	68.63
Jewelry and silverware manufacturing	0.60	8	9	2.6%	1.3%	0.87	99.4%	1.30	68.69
Facilities support services	0.67	130	31	22.1%	-45.3%	0.73	24.6%	1.51	69.50
Dental equipment and supplies manufacturing	0.19	-3	-1	4.1%	5.8%	1.10	98.6%	1.65	69.75
Real estate	1.01	219	292	10.1%	30.5%	0.95	0.4%	1.36	70.00
Gasket, packing, and sealing device manufacturing	0.60	8	9	2.6%	1.3%	0.87	96.0%	1.43	70.38
Scientific research and development services	0.19	10	-78	14.5%	14.5%	3.45	8.9%	1.91	70.69
Bread and bakery product, except frozen, manufacturing	0.26	NA	16	NA	49.1%	0.59	96.6%	1.22	72.00
Prefabricated wood building manufacturing	0.47	5	1	2.2%	61.0%	1.10	52.4%	1.37	72.50
Landscape and horticultural services	1.07	224	642	10.9%	62.2%	0.64	23.3%	1.06	73.06
Management consulting services	0.68	-200	457	-13.1%	22.4%	2.28	32.2%	1.32	73.25
Wood container and pallet manufacturing	0.47	5	1	2.2%	61.0%	1.10	90.1%	1.27	73.44
Advertising, public relations, and related services	0.44	-4	11	5.5%	38.8%	1.72	5.6%	1.59	73.69
Semiconductor and related device manufacturing	0.60	-2	-18	-13.4%	-28.3%	1.08	89.2%	2.66	74.00
Car washes	1.89	26	123	-0.9%	13.7%	0.91	28.7%	1.07	75.13
Wholesale trade	0.91	-119	201	-8.8%	17.8%	1.26	14.2%	1.54	75.38

Table 1: Region 6 – Industries Demonstrating Above Median Economic Performance

Industry	LQ	ST Emp.	LT Emp.	ST Wage	LT Wage	Rel. Wage	Exports	Type I Mult.	P-Index
Satellite, telecommunications resellers, and all other telecommunications	0.08	4	NA	55.2%	NA	1.44	8.8%	1.17	75.44
All other miscellaneous manufacturing	0.60	8	9	2.6%	1.3%	0.87	89.0%	1.31	75.81
Musical instrument manufacturing	0.60	8	9	2.6%	1.3%	0.87	97.3%	1.26	76.00
Polystyrene foam product manufacturing	0.46	-6	30	-2.6%	10.4%	0.95	97.7%	1.43	76.06
Wood windows and door manufacturing	0.47	5	1	2.2%	61.0%	1.10	9.8%	1.48	76.25
Wood kitchen cabinet and countertop manufacturing	0.39	2	17	-6.8%	23.2%	0.92	98.5%	1.32	76.75
Other plastics product manufacturing	0.46	-6	30	-2.6%	10.4%	0.95	98.5%	1.39	77.38
Environmental and other technical consulting services	0.68	-200	457	-13.1%	22.4%	2.28	61.4%	1.20	77.94
Commercial logging	2.99	-11	-1	-2.6%	19.8%	1.10	31.9%	1.26	78.75
Scenic and sightseeing transportation and support activities for transportation	0.43	9	14	2.0%	13.5%	1.02	8.8%	1.54	79.44
Upholstered household furniture manufacturing	0.39	2	17	-6.8%	23.2%	0.92	97.6%	1.28	79.56
Printed circuit assembly (electronic assembly) manufacturing	0.60	-2	-18	-13.4%	-28.3%	1.08	99.7%	1.29	80.75
Commercial and industrial machinery and equipment rental and leasing	0.61	9	-18	7.9%	-23.2%	1.44	7.3%	1.37	80.75
Services to buildings	1.07	224	642	10.9%	62.2%	0.64	5.3%	1.07	80.75

Table 2: George Washington – Industries Demonstrating Above Median Economic Performance

Industry	LQ Emp.	ST Emp.	LT Emp.	ST Wage	LT Wage	Rel. Wage	Exports	Type I Mult.	P-Index
Other fabricated metal manufacturing	1.12	45	NA	211.6%	NA	1.44	96.3%	1.28	35.25
Grain farming	4.32	3	8	15.4%	78.4%	1.21	94.8%	1.74	36.81
News syndicates, libraries, archives and all other information services	0.94	16	23	20.4%	23.6%	1.53	31.3%	3.43	39.38
Breweries	0.86	27	NA	23.7%	NA	0.46	88.6%	2.40	41.06
Oilseed farming	4.32	3	8	15.4%	78.4%	1.21	98.3%	1.41	41.88
Motor vehicle gasoline engine and engine parts manufacturing	0.04	1	NA	24.9%	NA	1.00	99.9%	1.92	41.94
Warehousing and storage	2.49	740	601	149.6%	128.8%	1.20	9.6%	1.29	42.13
Wood preservation	1.99	2	29	-0.8%	35.7%	1.06	90.1%	2.43	42.25
Wineries	0.86	27	NA	23.7%	NA	0.46	96.0%	1.58	43.88
Sawmills	1.99	2	29	-0.8%	35.7%	1.06	74.1%	2.35	44.13
Motor vehicle transmission and power train parts manufacturing	0.04	1	NA	24.9%	NA	1.00	99.4%	1.83	44.56
Other motor vehicle parts manufacturing	0.04	1	NA	24.9%	NA	1.00	99.3%	1.68	46.44
Ready-mix concrete manufacturing	1.32	12	-3	4.2%	11.4%	1.29	62.7%	1.89	46.56
Internet publishing and broadcasting and web search portals	0.94	16	23	20.4%	23.6%	1.53	6.5%	3.61	47.25
Motor vehicle steering, suspension component (except spring), and brake systems manufacturing	0.04	1	NA	24.9%	NA	1.00	98.9%	1.72	47.38
Pump and pumping equipment manufacturing	0.01	-1	NA	-55.2%	NA	1.52	99.5%	1.77	47.63
Securities and commodity contracts intermediation and brokerage	0.86	11	79	27.8%	598.0%	7.30	11.5%	1.37	48.63
Dry pasta, mixes, and dough manufacturing	0.34	NA	16	NA	49.1%	0.59	99.2%	1.82	48.81
Fabricated structural metal manufacturing	0.42	12	17	7.5%	44.2%	1.82	96.9%	1.45	49.63
Manufactured ice	0.86	27	NA	23.7%	NA	0.46	78.7%	1.47	49.88
Power-driven handtool manufacturing	0.01	-1	NA	-55.2%	NA	1.52	99.5%	1.55	50.63

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Table 2: George Washington – Industries Demonstrating Above Median Economic Performance

Industry	LQ Emp.	ST Emp.	LT Emp.	ST Wage	LT Wage	Rel. Wage	Exports	Type I Mult.	P-Index
Overhead cranes, hoists, and monorail systems manufacturing	0.01	-1	NA	-55.2%	NA	1.52	99.4%	1.57	50.81
Other concrete product manufacturing	1.32	12	-3	4.2%	11.4%	1.29	58.4%	1.55	51.06
Broadcast and wireless communications equipment manufacturing	0.78	-7	8	14.1%	-2.4%	6.94	99.3%	1.54	51.19
Outpatient care centers	2.03	65	237	15.8%	85.3%	1.34	0.2%	1.43	51.88
Truck transportation	1.67	12	155	-0.6%	8.0%	1.12	15.8%	1.44	52.56
Other communications equipment manufacturing	0.78	-7	8	14.1%	-2.4%	6.94	99.2%	1.51	52.88
Retail - Motor vehicle and parts dealers	1.81	55	435	2.6%	53.3%	1.37	12.8%	1.17	54.06
Electric power generation - Biomass	1.01	-6	-16	4.0%	19.7%	2.23	32.2%	5.74	55.19
Packaging machinery manufacturing	0.01	-1	NA	-55.2%	NA	1.52	99.7%	1.41	55.31
Electric power generation - Fossil fuel	1.01	-6	-16	4.0%	19.7%	2.23	32.2%	3.28	55.75
Cut stock, resawing lumber, and planing	0.62	5	1	2.2%	61.0%	1.10	84.2%	1.66	55.94
Ornamental and architectural metal work manufacturing	0.42	12	17	7.5%	44.2%	1.82	96.0%	1.29	56.56
Sheet metal work manufacturing	0.42	12	17	7.5%	44.2%	1.82	96.8%	1.26	57.69
Conveyor and conveying equipment manufacturing	0.01	-1	NA	-55.2%	NA	1.52	98.7%	1.42	58.31
Electric power transmission and distribution	1.01	-6	-16	4.0%	19.7%	2.23	29.3%	1.84	58.75
All other miscellaneous wood product manufacturing	0.62	5	1	2.2%	61.0%	1.10	90.5%	1.49	58.75
Concrete block and brick manufacturing	1.32	12	-3	4.2%	11.4%	1.29	5.4%	1.76	58.94
Other millwork, including flooring	0.62	5	1	2.2%	61.0%	1.10	79.4%	1.52	59.13
Performing arts companies	2.27	26	NA	-15.0%	NA	0.31	1.8%	2.07	59.25
Automotive equipment rental and leasing	1.06	12	51	6.1%	66.3%	0.80	14.8%	1.46	59.81
Offices of physicians	1.72	21	435	-4.3%	5.8%	2.05	4.9%	1.27	60.06
Facilities support services	0.88	130	31	22.1%	-45.3%	0.73	24.6%	1.51	61.13
Ophthalmic goods manufacturing	0.25	-3	-1	4.1%	5.8%	1.10	99.6%	1.81	61.38
Other financial investment activities	0.26	1	14	24.4%	113.9%	3.70	8.7%	1.60	61.50

Table 2: George Washington – Industries Demonstrating Above Median Economic Performance

Industry	LQ Emp.	ST Emp.	LT Emp.	ST Wage	LT Wage	Rel. Wage	Exports	Type I Mult.	P-Index
Other educational services	1.14	31	241	38.2%	146.7%	2.12	3.9%	1.09	61.63
Architectural, engineering, and related services	0.88	138	-114	2.3%	-9.5%	2.09	20.2%	1.49	61.69
Couriers and messengers	1.31	35	96	2.9%	28.0%	0.94	22.8%	1.23	62.44
Rope, cordage, twine, tire cord and tire fabric mills	0.09	2	NA	29.5%	NA	0.64	99.0%	1.28	63.31
Surgical and medical instrument manufacturing	0.25	-3	-1	4.1%	5.8%	1.10	99.1%	1.74	64.19
Sand and gravel mining	1.64	-5	-32	-9.4%	24.5%	1.93	56.7%	1.44	64.50
Real estate	1.11	213	307	9.6%	34.4%	0.97	0.4%	1.36	64.69
Frozen cakes and other pastries manufacturing	0.34	NA	16	NA	49.1%	0.59	98.7%	1.25	65.13
Prefabricated wood building manufacturing	0.62	5	1	2.2%	61.0%	1.10	52.4%	1.37	65.88
Dental equipment and supplies manufacturing	0.25	-3	-1	4.1%	5.8%	1.10	98.6%	1.65	66.63
Wood container and pallet manufacturing	0.62	5	1	2.2%	61.0%	1.10	90.1%	1.27	67.19
Scientific research and development services	0.24	7	-84	14.9%	12.6%	3.47	8.9%	1.91	67.69
Retail - Gasoline stores	1.64	38	152	3.2%	22.5%	0.52	19.5%	1.17	67.94
Other textile product mills	0.09	2	NA	29.5%	NA	0.64	97.9%	1.21	68.19
Stone mining and quarrying	1.64	-5	-32	-9.4%	24.5%	1.93	38.0%	1.35	68.25
Wood kitchen cabinet and countertop manufacturing	0.39	2	29	-3.5%	76.0%	0.98	98.5%	1.32	68.25
Jewelry and silverware manufacturing	0.66	5	4	-0.6%	-9.2%	0.86	99.4%	1.30	68.56
Bread and bakery product, except frozen, manufacturing	0.34	NA	16	NA	49.1%	0.59	96.6%	1.22	68.69
Management consulting services	0.81	-172	441	-13.1%	22.7%	2.33	32.2%	1.32	68.81
Wood windows and door manufacturing	0.62	5	1	2.2%	61.0%	1.10	9.8%	1.48	69.25
Landscape and horticultural services	1.07	197	553	13.4%	67.2%	0.65	23.3%	1.06	69.31
Gasket, packing, and sealing device manufacturing	0.66	5	4	-0.6%	-9.2%	0.86	96.0%	1.43	70.06
Textile bag and canvas mills	0.09	2	NA	29.5%	NA	0.64	98.6%	1.16	70.25
Semiconductor and related device manufacturing	0.78	-2	-18	-13.4%	-28.3%	1.08	89.2%	2.66	70.38
Car washes	1.93	31	102	-0.8%	12.6%	0.93	28.7%	1.07	70.50

Table 2: George Washington – Industries Demonstrating Above Median Economic Performance

Industry	LQ Emp.	ST Emp.	LT Emp.	ST Wage	LT Wage	Rel. Wage	Exports	Type I Mult.	P-Index
Greenhouse, nursery, and floriculture production	0.88	26	31	6.6%	142.1%	0.82	96.2%	1.03	70.56
Satellite, telecommunications resellers, and all other telecommunications	0.11	4	NA	55.2%	NA	1.44	8.8%	1.17	70.88
Management of companies and enterprises	0.64	1	5	0.1%	-11.0%	1.70	16.3%	1.51	70.94
Upholstered household furniture manufacturing	0.39	2	29	-3.5%	76.0%	0.98	97.6%	1.28	71.06
Other computer related services, including facilities management	0.68	10	-180	-3.5%	-1.3%	2.32	31.0%	1.39	71.50
Polystyrene foam product manufacturing	0.60	-6	30	-2.6%	10.4%	0.95	97.7%	1.43	71.69
Custom computer programming services	0.68	10	-180	-3.5%	-1.3%	2.32	16.8%	1.47	71.69
Scenic and sightseeing transportation and support activities for transportation	0.69	5	6	1.7%	10.3%	1.04	8.8%	1.54	72.06
Other plastics product manufacturing	0.60	-6	30	-2.6%	10.4%	0.95	98.5%	1.39	73.00
Wholesale trade	0.89	-340	121	-14.7%	21.6%	1.32	14.2%	1.54	73.56

Table 3: Middle Peninsula – Industries Demonstrating Above Median Economic Performance

Industry	LQ Emp.	ST Emp.	LT Emp.	ST Wage	LT Wage	Rel. Wage	Exports	Type I Mult.	P-Index
Pump and pumping equipment manufacturing	0.97	14	NA	123.6%	NA	1.41	99.5%	1.77	15.06
Paper mills	8.71	NA	NA	NA	NA	0.00	99.1%	2.56	16.88
Grain farming	47.46	8	29	32.0%	86.6%	1.25	94.8%	1.74	16.94
Power-driven handtool manufacturing	0.97	14	NA	123.6%	NA	1.41	99.5%	1.55	16.94
Overhead cranes, hoists, and monorail systems manufacturing	0.97	14	NA	123.6%	NA	1.41	99.4%	1.57	17.13
Water, sewage and other systems	2.31	NA	NA	NA	NA	0.74	38.8%	1.96	19.31
Packaging machinery manufacturing	0.97	14	NA	123.6%	NA	1.41	99.7%	1.41	19.75
Oilseed farming	47.46	8	29	32.0%	86.6%	1.25	98.3%	1.41	19.94
Conveyor and conveying equipment manufacturing	0.97	14	NA	123.6%	NA	1.41	98.7%	1.42	20.88
Wood preservation	13.98	23	22	0.1%	28.9%	0.75	90.1%	2.43	24.63
Sawmills	13.98	23	22	0.1%	28.9%	0.75	74.1%	2.35	25.19
Waste management and remediation services	4.70	30	88	36.6%	120.9%	0.83	17.5%	1.52	25.56
Water transportation	87.10	-2	9	-3.9%	8.8%	1.74	64.4%	3.13	28.38
Truck transportation	1.48	40	50	34.0%	56.4%	1.09	15.8%	1.44	29.50
Sand and gravel mining	5.69	1	41	-25.8%	177.3%	1.13	56.7%	1.44	30.56
Ready-mix concrete manufacturing	3.35	-2	-2	6.2%	13.1%	1.56	62.7%	1.89	32.63
Stone mining and quarrying	5.69	1	41	-25.8%	177.3%	1.13	38.0%	1.35	33.00
Wholesale trade	1.23	227	40	54.7%	-10.1%	1.01	14.2%	1.54	33.44
Other concrete product manufacturing	3.35	-2	-2	6.2%	13.1%	1.56	58.4%	1.55	35.44
Hospitals	1.34	49	NA	31.0%	NA	1.45	0.2%	1.32	37.50
Seafood product preparation and packaging	9.65	-5	29	-23.1%	36.1%	0.54	94.1%	1.86	38.00
Periodical publishers	1.30	3	10	9.0%	61.7%	0.82	7.5%	1.85	38.69
Book publishers	1.30	3	10	9.0%	61.7%	0.82	12.6%	1.55	39.25
Scientific research and development services	0.06	3	6	7.2%	84.7%	2.94	8.9%	1.91	39.44

MANGUM economics

Table 3: Middle Peninsula – Industries Demonstrating Above Median Economic Performance

Industry	LQ Emp.	ST Emp.	LT Emp.	ST Wage	LT Wage	Rel. Wage	Exports	Type I Mult.	P-Index
Other financial investment activities	0.34	1	8	13.9%	643.5%	1.86	8.7%	1.60	39.88
Commercial logging	12.51	1	6	0.0%	21.6%	1.11	31.9%	1.26	40.31
Insurance carriers	0.35	1	2	0.5%	35.1%	1.49	56.9%	1.59	40.38
Directory, mailing list, and other publishers	1.30	3	10	9.0%	61.7%	0.82	6.0%	1.57	40.94
Retail - Furniture and home furnishings stores	1.19	13	9	6.3%	42.9%	1.16	19.7%	1.23	41.25
Offices of physicians	0.85	9	49	17.7%	67.4%	1.57	4.9%	1.27	41.25
Concrete block and brick manufacturing	3.35	-2	-2	6.2%	13.1%	1.56	5.4%	1.76	41.81
Couriers and messengers	0.06	NA	NA	NA	NA	0.73	22.8%	1.23	41.94
Retail - Motor vehicle and parts dealers	1.65	2	72	12.8%	58.0%	1.06	12.8%	1.17	42.56
Automotive equipment rental and leasing	0.66	1	NA	39.2%	NA	0.54	14.8%	1.46	42.81
Outpatient care centers	1.59	4	40	7.8%	98.9%	1.12	0.2%	1.43	43.19
Advertising, public relations, and related services	0.47	3	-3	20.0%	36.4%	1.40	5.6%	1.59	45.94
Newspaper publishers	1.30	3	10	9.0%	61.7%	0.82	11.1%	1.24	46.56
Scenic and sightseeing transportation and support activities for transportation	0.51	4	8	7.5%	123.5%	0.75	8.8%	1.54	46.69
Management consulting services	0.22	-25	44	-13.9%	116.7%	1.85	32.2%	1.32	47.88
Retail - Building material and garden equipment and supplies stores	3.47	18	38	-5.8%	13.7%	0.63	6.7%	1.22	48.25
Car washes	1.79	9	30	-1.1%	26.6%	0.85	28.7%	1.07	48.94
Architectural, engineering, and related services	0.46	-1	17	-7.0%	15.9%	0.97	20.2%	1.49	49.44
Landscape and horticultural services	1.07	29	100	3.9%	63.0%	0.64	23.3%	1.06	50.25
Environmental and other technical consulting services	0.22	-25	44	-13.9%	116.7%	1.85	61.4%	1.20	50.88
Nondepository credit intermediation and related activities	0.26	2	9	10.7%	19.6%	1.02	9.1%	1.31	51.44
Rope, cordage, twine, tire cord and tire fabric mills	2.87	-7	-10	-21.7%	-25.2%	0.84	99.0%	1.28	51.50
Office administrative services	0.21	3	NA	130.0%	NA	2.74	2.7%	1.09	51.75
Personal and household goods repair and maintenance	5.36	-5	7	14.1%	54.9%	1.07	22.6%	1.06	52.50

Table 3: Middle Peninsula – Industries Demonstrating Above Median Economic Performance

Industry	LQ Emp.	ST Emp.	LT Emp.	ST Wage	LT Wage	Rel. Wage	Exports	Type I Mult.	P-Index
Insurance agencies, brokerages, and related activities	1.03	5	9	2.4%	22.7%	1.22	0.5%	1.29	52.88
Retail - Nonstore retailers	1.56	-2	10	-11.0%	47.3%	1.16	3.7%	1.28	53.13
Wood kitchen cabinet and countertop manufacturing	0.60	0	0	-18.7%	-26.4%	0.74	98.5%	1.32	53.75
Other textile product mills	2.87	-7	-10	-21.7%	-25.2%	0.84	97.9%	1.21	54.69
Automotive repair and maintenance, except car washes	1.79	9	30	-1.1%	26.6%	0.85	3.6%	1.12	54.94
Securities and commodity contracts intermediation and brokerage	0.32	1	-6	-9.1%	-26.3%	3.02	11.5%	1.37	55.38
Upholstered household furniture manufacturing	0.60	0	0	-18.7%	-26.4%	0.74	97.6%	1.28	55.44
Services to buildings	1.07	29	100	3.9%	63.0%	0.64	5.3%	1.07	55.88
Animal production, except cattle and poultry and eggs	17.92	-2	13	0.4%	93.2%	0.77	16.0%	1.04	56.69

Table 4: Northern Neck – Industries Demonstrating Above Median Economic Performance

Industry	LQ Emp.	ST Emp.	LT Emp.	ST Wage	LT Wage	Rel. Wage	Exports	Type I Mult.	P-Index
Gasket, packing, and sealing device manufacturing	0.89	3	7	47.9%	366.3%	1.07	96.0%	1.43	20.31
Insurance carriers	1.19	4	7	3.0%	25.2%	1.32	56.9%	1.59	20.63
Jewelry and silverware manufacturing	0.89	3	7	47.9%	366.3%	1.07	99.4%	1.30	21.06
Grain farming	26.14	-2	16	-11.1%	68.7%	0.84	94.8%	1.74	21.25
Oilseed farming	26.14	-2	16	-11.1%	68.7%	0.84	98.3%	1.41	22.56
Wood preservation	7.82	-2	-2	-4.7%	22.7%	1.21	90.1%	2.43	22.56
Musical instrument manufacturing	0.89	3	7	47.9%	366.3%	1.07	97.3%	1.26	22.56
All other miscellaneous manufacturing	0.89	3	7	47.9%	366.3%	1.07	89.0%	1.31	22.75
Other computer related services, including facilities management	0.23	29	30	41.7%	33.2%	1.45	31.0%	1.39	23.31
Securities and commodity contracts intermediation and brokerage	2.24	3	2	10.3%	61.8%	3.85	11.5%	1.37	23.63
Sawmills	7.82	-2	-2	-4.7%	22.7%	1.21	74.1%	2.35	23.69
Electric power generation - Biomass	2.82	-1	-4	-1.6%	4.3%	1.87	32.2%	5.74	23.81
Custom computer programming services	0.23	29	30	41.7%	33.2%	1.45	16.8%	1.47	24.06
Electric power generation - Fossil fuel	2.82	-1	-4	-1.6%	4.3%	1.87	32.2%	3.28	24.38
Electric power transmission and distribution	2.82	-1	-4	-1.6%	4.3%	1.87	29.3%	1.84	26.44
Wineries	1.45	3	3	2.5%	11.7%	0.44	96.0%	1.58	26.88
Breweries	1.45	3	3	2.5%	11.7%	0.44	88.6%	2.40	27.06
Computer systems design services	0.23	29	30	41.7%	33.2%	1.45	18.0%	1.27	27.06
Sign manufacturing	0.89	3	7	47.9%	366.3%	1.07	73.2%	1.16	27.63
Manufactured ice	1.45	3	3	2.5%	11.7%	0.44	78.7%	1.47	29.88
Other educational services	2.45	17	111	26.6%	474.7%	1.09	3.9%	1.09	29.94
Animal production, except cattle and poultry and eggs	15.49	5	NA	125.6%	NA	0.81	16.0%	1.04	31.06
Wholesale trade	1.10	-6	40	-11.0%	59.2%	1.15	14.2%	1.54	31.81

Table 4: Northern Neck – Industries Demonstrating Above Median Economic Performance

Industry	LQ Emp.	ST Emp.	LT Emp.	ST Wage	LT Wage	Rel. Wage	Exports	Type I Mult.	P-Index
Retail - Motor vehicle and parts dealers	0.85	31	22	45.7%	39.3%	0.91	12.8%	1.17	32.06
Seafood product preparation and packaging	114.64	-19	-86	-8.6%	-1.8%	1.33	94.1%	1.86	32.75
Retail - Nonstore retailers	3.19	2	-2	4.2%	33.3%	1.17	3.7%	1.28	33.00
Hotels and motels, including casino hotels	1.68	-7	18	0.7%	35.9%	0.63	93.0%	1.22	33.81
Legal services	0.89	4	3	10.6%	18.4%	1.35	4.0%	1.31	34.13
Other ambulatory health care services	0.27	NA	NA	NA	NA	0.90	0.5%	1.18	36.31
Retail - Building material and garden equipment and supplies stores	1.87	5	0	0.5%	8.2%	0.71	6.7%	1.22	38.44
Other accommodations	1.74	-15	15	0.2%	30.8%	0.63	98.8%	1.10	38.56
Periodical publishers	1.12	0	-4	5.1%	-6.8%	0.60	7.5%	1.85	38.63
Book publishers	1.12	0	-4	5.1%	-6.8%	0.60	12.6%	1.55	38.63
Commercial fishing	94.94	-11	-7	-9.2%	62.6%	1.22	94.9%	1.06	39.19
Real estate	0.68	2	9	24.2%	76.8%	0.76	0.4%	1.36	39.38
Management of companies and enterprises	0.52	0	-21	0.8%	-18.0%	1.68	16.3%	1.51	40.13
Directory, mailing list, and other publishers	1.12	0	-4	5.1%	-6.8%	0.60	6.0%	1.57	40.50
Monetary authorities and depository credit intermediation	2.26	-3	-49	2.7%	8.4%	1.21	4.8%	1.43	40.81
Other amusement and recreation industries	1.58	-6	-2	6.4%	42.5%	0.72	16.2%	1.15	41.56
Commercial logging	1.19	-9	-3	-35.4%	-3.4%	1.18	31.9%	1.26	41.69
Personal and household goods repair and maintenance	6.13	-3	5	-12.9%	27.9%	0.91	22.6%	1.06	42.06
Retail - Furniture and home furnishings stores	0.73	1	-9	6.8%	-10.7%	0.86	19.7%	1.23	42.81
Insurance agencies, brokerages, and related activities	0.91	7	-17	8.2%	-7.3%	1.27	0.5%	1.29	42.81

Cluster Analysis

In this section, we build on the analysis of economic drivers from the previous section to identify high-performance industry clusters within Mary Ball Washington GO Virginia Region 6.

Method

The process that was used to quantify the clusters identified in this section has three key characteristics. First, it employs a bottom-up approach. That means that all clusters have been identified on the basis of economic data from Mary Ball Washington GO Virginia Region 6 and the three Planning Districts that comprise Region 6. The strength of this approach is that the clusters identified in this section reflect strengths and economic relationships that are specific to Region 6. They have not been identified based on national or statewide data and then superimposed on Region 6.

More specifically, we have used the results from the previous section to identify all industries that have been classified as economic drivers in Mary Ball Washington GO Virginia Region 6 or in either of the three Planning Districts that comprise Region 6, where an economic driver is defined as an industry that demonstrated a composite economic performance index that was above the median for the study area. Those economic drivers were then grouped into clusters based on the classification structure of the Bureau of Labor Statistics NAICS taxonomy.

Second, consistent with the objectives of the GO Virginia initiative, in identifying high-performance clusters we have focused on traded industries. Traded industries are industries that export a large proportion of their products or services to customers outside of their region. For example, most manufacturers primarily sell to customers outside of their region. As other studies have comprehensively demonstrated, the distinction between traded and local industries is important because they make different contributions to the economy.[25] In general, traded industries are associated with higher wages and larger employment multipliers than local industries. For this reason, economic development strategies often focus on traded industries because they offer more "bang for the buck" in terms growing the regional economy.

Third, in addition to identifying the core high-performance industries that comprise each cluster, we have also used data on the national supply chains for those core industries to

[25] *See* Delgado, Bryden, and Zyontz, "Categorization of Traded and Local Industries in the US Economy," undated.

identify their top suppliers, and which of those suppliers are already present in Mary Ball Washington GO Virginia Region 6 and which are not.[26] The purpose of this portion of the analysis is to more fully specify the cluster by detailing its supply chain within the region, and identifying potential recruitment opportunities regarding potential suppliers who are not yet in the region.

Cluster Listing

Based on this approach we identified sixteen high-performance industry clusters within Mary Ball Washington GO Virginia Region 6. Those clusters are listed in Table 5, along with some key economic characteristics of each cluster. Those characteristics include:

- Establishments: The number of establishments reported by the Virginia Employment Commission in Region 6 for the driver industries included in the cluster for the fourth quarter of 2016.
- Employment: The number of jobs reported by the Virginia Employment Commission in Region 6 for the driver industries included in the cluster for the fourth quarter of 2016.
- Average Weekly Wage: The aggregate average weekly wage reported by the Virginia Employment Commission in Region 6 for the driver industries included in the cluster for the fourth quarter of 2016.
- Export$: The dollar figure for exports out of Region 6 reported by IMPLAN for the driver industries included in the cluster for 2015.
- Export%: The percentage of total output exported out of Region 6 reported by IMPLAN for the driver industries included in the cluster for 2015.
- Type I Multiplier: A measure of the direct and indirect employment impact the driver industries included in the cluster have on Region 6.

It is important to once again point out that the employment and wage data used in this section are taken from the Virginia Employment Commission's *Quarterly Census of Employment and Wages*. Although these data provide the most comprehensive look at regional labor market data available, they are subject to limitations. Because these data are based on unemployment insurance reports filed by employers, they only reflect "covered" employment – employment that is covered by unemployment insurance. As a result, certain categories of employment (*e.g.*, self-employed) and employment in certain industries (*e.g.*, agriculture) may be under-

[26] *Data Source*: IMPLAN.

reported. In addition, the Virginia Employment Commission is required to suppress data when public disclosure of those data could be used to identify employment and wages in a specific firm. This generally occurs when there is only one major employer in that industry within the region (*e.g.*, the RockTenn paper mill in West Point).

Table 5: High-Performance Industry Clusters Identified in Mary Ball GO Virginia Region 6

Cluster	Establishments	Employment	Avg. Weekly Wage	Exports$	Exports%	Type I Multiplier
Agriculture	106	740	$754	$173,743,160	80%	1.38
Education	105	912	$1,533	$11,812,453	4%	1.09
Finance and Insurance	449	2,492	$1,286	$1,068,426,488	40%	1.54
Information	59	447	$913	$29,189,820	15%	2.46
Manufacturing: Computer and Electronic Product	11	172	$2,787	$159,601,860	99%	1.59
Manufacturing: Fabricated Metal and Machinery Product	20	195	$1,293	$53,240,478	98%	1.52
Manufacturing: Food and Beverage	34	869	$860	$318,205,571	94%	1.80
Manufacturing: Miscellaneous	10	177	$1,280	$184,248,423	98%	1.63
Manufacturing: Plastics, Rubber, and Nonmetallic Mineral Products	27	464	$965	$123,572,454	73%	2.36

Table 5: High-Performance Industry Clusters Identified in Mary Ball GO Virginia Region 6

Cluster	Establishments	Employment	Avg. Weekly Wage	Exports$	Exports%	Type I Multiplier
Manufacturing: Wood Product and Paper	33	745	$765	$388,145,598	89%	2.29
Mining and Quarrying	52	261	$720	$41,128,275	51%	1.41
Professional, Scientific, Technical Services, and Management of Companies	1,074	9,310	$1,657	$431,239,681	19%	1.49
Tourism	239	3,504	$357	$109,253,697	61%	1.30
Transportation and Warehousing	236	3,765	$891	$155,870,665	16%	1.45
Utilities	14	352	$1,685	$178,757,159	30%	2.17
Wholesale Trade	400	3,758	$999	$2,490,351,562	14%	1.54

Cluster Detail

Tables 6 through 53 provide additional detail on each of the sixteen high-performance clusters that were listed in Table 5. That additional detail includes:

- Cluster Membership: A list of the specific driver industries that are included in each cluster along with the number of establishments, the number of jobs, and the average weekly wage associated with each of those industries in the George Washington Planning District, Middle Peninsula Planning District, Northern Neck Planning District, and Region 6 as a whole.
- Economic Performance: A list of the areas (*i.e.*, George Washington Planning District, Middle Peninsula Planning District, Northern Neck Planning District, and Region 6 as a whole) in which each industry demonstrated a composite economic performance index that exceeded median for that area.
- Top 25 Cluster Suppliers: The top 25 suppliers of the driver industries included in the cluster. Suppliers that are not currently present in Region 6, and therefore represent potential recruitment opportunities, are highlighted in yellow.

Agriculture Cluster

Table 6: Agriculture Cluster – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
Auqaculture				5	32	$611	5	16	$643	10	48	$621
Commercial fishing				6	4	$431	11	35	$973	17	39	$917
Commercial logging	8	68	$859	18	127	$880	3	7	$942	29	202	$875
Grain and oilseed farming	7	42	$961	18	91	$994	9	29	$668	34	162	$927
Greenhouse, nursery, and floriculture production	5	68	$653	7	79	$495	4	142	$576	16	289	$572
TOTAL	**20**	**178**	**$805**	**54**	**333**	**$789**	**32**	**229**	**$664**	**106**	**740**	**$754**

Table 7: Agriculture Cluster – Economic Performance

Industry	George Washington	Middle Peninsula	Northern Neck	Region 6
Aquaculture		X	X	
Commercial fishing			X	
Commercial logging		X	X	X
Grain and oilseed farming	X	X	X	X
Greenhouse, nursery, and floriculture production	X			

"X" indicates above median performance

Table 8: Agriculture Cluster – Top 25 Cluster Suppliers

Industry	Within Region
Support activities for agriculture and forestry	Yes
Pesticide and other agricultural chemical manufacturing	NO
Real estate	Yes
Wholesale trade	Yes
Petroleum refineries	NO
Phosphatic fertilizer manufacturing	NO
Grain farming	Yes
Insurance carriers	Yes
Nitrogenous fertilizer manufacturing	NO

Table 8: Agriculture Cluster – Top 25 Cluster Suppliers

Industry	Within Region
Other animal food manufacturing	NO
Animal production, except cattle and poultry and eggs	Yes
Farm machinery and equipment manufacturing	Yes
Oilseed farming	Yes
Truck transportation	Yes
Maintenance and repair construction of nonresidential structures	Yes
Greenhouse, nursery, and floriculture production	Yes
Monetary authorities and depository credit intermediation	Yes
Beef cattle ranching and farming, including feedlots and dual-purpose ranching and farming	Yes
All other crop farming	Yes
Fertilizer mixing	Yes
Forestry, forest products, and timber tract production	Yes
Commercial and industrial machinery and equipment rental and leasing	Yes
Rail transportation	Yes
Scenic and sightseeing transportation and support activities for transportation	Yes
Automotive equipment rental and leasing	Yes

Education Cluster

Table 9: Education Cluster – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
Other educational services	86	745	$1,685	11	39	$800	8	128	$868	105	912	$1,533
TOTAL	**86**	**745**	**$1,685**	**11**	**39**	**$800**	**8**	**128**	**$868**	**105**	**912**	**$1,533**

Table 10: Education Cluster – Economic Performance

Industry	GW	MP	NN	Region 6
Other educational services	X		X	X

"X" indicates above median performance

Table 11: Education Cluster – Top 25 Cluster Suppliers

Industry	Within Region
Real estate	Yes
Internet publishing and broadcasting and web search portals	Yes
Electronic computer manufacturing	NO

Table 11: Education Cluster – Top 25 Cluster Suppliers

Industry	Within Region
Other educational services	Yes
Management of companies and enterprises	Yes
Management consulting services	Yes
Advertising, public relations, and related services	Yes
Employment services	Yes
Wireless telecommunications carriers (except satellite)	Yes
Monetary authorities and depository credit intermediation	Yes
Other computer related services, including facilities management	Yes
Insurance carriers	Yes
Printing	Yes
Wired telecommunications carriers	Yes
Retail - General merchandise stores	Yes
Insurance agencies, brokerages, and related activities	Yes
Wholesale trade	Yes
Accounting, tax preparation, bookkeeping, and payroll services	Yes
Waste management and remediation services	Yes
Legal services	Yes
Periodical publishers	Yes
Radio and television broadcasting	Yes

Table 11: Education Cluster – Top 25 Cluster Suppliers

Industry	Within Region
Petroleum refineries	NO
Maintenance and repair construction of nonresidential structures	Yes
Business and professional associations	Yes

Finance and Insurance Cluster

Table 12: Finance and Insurance Cluster – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
Monetary authorities and depository credit intermediation	89	873	$938	40	313	$840	29	250	$963	158	1,436	$921
Nondepository credit intermediation and related activities	38	179	$1,100	14	41	$810	4	5	$798	56	225	$1,040
Securities and commodity contracts intermediation and brokerage	22	138	$5,812	6	10	$2,403	3	41	$3,066	31	189	$5,036

Table 12: Finance and Insurance Cluster – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
Other financial investment activities	21	47	$2,942	4	12	$1,484				25	59	$2,645
Insurance carriers	30			14	44	$1,184	8	87	$1,048	52	131	$1,094
Insurance agencies, brokerages, and related activities	91	304	$826	21	98	$973	15	50	$1,011	127	452	$879
TOTAL	**291**	**1,541**	**$1,432**	**99**	**518**	**$937**	**59**	**433**	**$1,183**	**449**	**2,492**	**$1,286**

Table 13: Finance and Insurance Cluster – Economic Performance

Industry	GW	MP	NN	Region 6
Insurance agencies, brokerages, and related activities		X		
Insurance carriers		X	X	
Monetary authorities and depository credit intermediation			X	
Nondepository credit intermediation and related activities		X		
Other financial investment activities	X	X		X
Securities and commodity contracts intermediation and brokerage	X	X	X	X

"X" indicates above median performance

Table 14: Finance and Insurance Cluster – Top 25 Cluster Suppliers

Industry	Within Region
Insurance agencies, brokerages, and related activities	Yes
Other financial investment activities	Yes
Insurance carriers	Yes
Monetary authorities and depository credit intermediation	Yes
Real estate	Yes
Securities and commodity contracts intermediation and brokerage	Yes
Data processing, hosting, and related services	Yes
Management of companies and enterprises	Yes
Nondepository credit intermediation and related activities	Yes
Management consulting services	Yes
Legal services	Yes
Accounting, tax preparation, bookkeeping, and payroll services	Yes
Advertising, public relations, and related services	Yes
Funds, trusts, and other financial vehicles	Yes
Wireless telecommunications carriers (except satellite)	Yes
Employment services	Yes
Printing	Yes
Wired telecommunications carriers	Yes

Table 14: Finance and Insurance Cluster – Top 25 Cluster Suppliers

Industry	Within Region
Internet publishing and broadcasting and web search portals	Yes
Maintenance and repair construction of nonresidential structures	Yes
Full-service restaurants	Yes
Marketing research and all other miscellaneous professional, scientific, and technical services	Yes
Other computer related services, including facilities management	Yes
Air transportation	Yes
Computer systems design services	Yes

Information Cluster

Table 15: Information Cluster – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
Newspaper publishers	11	183	$1,015	10	90	$652	6	45	$479	27	318	$837
Periodical publishers	11	183	$1,015	10	90	$652	6	45	$479	27	318	$837
Book publishers	11	183	$1,015	10	90	$652	6	45	$479	27	318	$837
Directory, mailing list, and other publishers	11	183	$1,015	10	90	$652	6	45	$479	27	318	$837
Satellite, telecommunications resellers, and all other telecomm.	3	12	$1,147							3	12	$1,147
News syndicates, libraries, archives and all other information services	20	99	$1,220	6			3	18	$431	29	117	$1,098
Internet publishing and broadcasting and web search portals	20	99	$1,220	6			3	18	$431	29	117	$1,098
TOTAL	**34**	**294**	**$1,089**	**16**	**90**	**$652**	**9**	**63**	**$465**	**59**	**447**	**$913**

Table 16: Information Cluster – Economic Performance

Industry	GW	MP	NN	Region 6
Book publishers		X	X	
Directory, mailing list, and other publishers		X	X	
Internet publishing and broadcasting and web search portals	X			X
News syndicates, libraries, archives and all other information services	X			X
Newspaper publishers		X		
Periodical publishers		X	X	
Satellite, telecommunications resellers, and all other telecommunications	X			X

"X" indicates above median performance

Table 17: Information Cluster – Top 25 Cluster Suppliers

Industry	Within Region
Internet publishing and broadcasting and web search portals	Yes
Printing	Yes
Advertising, public relations, and related services	Yes
Real estate	Yes
Employment services	Yes
Management consulting services	Yes
Wired telecommunications carriers	Yes

Table 17: Information Cluster – Top 25 Cluster Suppliers

Industry	Within Region
Marketing research and all other miscellaneous professional, scientific, and technical services	Yes
Radio and television broadcasting	Yes
Management of companies and enterprises	Yes
Other computer related services, including facilities management	Yes
Legal services	Yes
Wireless telecommunications carriers (except satellite)	Yes
Wholesale trade	Yes
Lessors of nonfinancial intangible assets	Yes
Couriers and messengers	Yes
Monetary authorities and depository credit intermediation	Yes
Accounting, tax preparation, bookkeeping, and payroll services	Yes
Data processing, hosting, and related services	Yes
Periodical publishers	Yes
Scenic and sightseeing transportation and support activities for transportation	Yes
Computer systems design services	Yes
Commercial and industrial machinery and equipment rental and leasing	Yes
News syndicates, libraries, archives and all other information services	Yes
Office administrative services	Yes

Manufacturing Cluster: Computer and Electronics

Table 18: Manufacturing Cluster, Computer and Electronics – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
Broadcast and wireless comm. equip. manuf.	6	71	$5,526							6	71	$5,526
Other comm. equip. manuf.	6	71	$5,526							6	71	$5,526
Semiconductor and related device manuf	5	101	$861							5	101	$861
Printed circuit assembly (electronic assembly) manuf	5	101	$861							5	101	$861
TOTAL	**11**	**172**	**$2,787**							**11**	**172**	**$2,787**

Table 19: Manufacturing Cluster, Computer and Electronics – Economic Performance

Industry	GW	MP	NN	Region 6
Broadcast and wireless communications equipment manufacturing	X			X
Other communications equipment manufacturing	X			X
Printed circuit assembly (electronic assembly) manufacturing				X
Semiconductor and related device manufacturing	X			X

"X" indicates above median performance

Table 20: Manufacturing Cluster, Computer and Electronics – Top 25 Cluster Suppliers

Industry	Within Region
Semiconductor and related device manufacturing	Yes
Wholesale trade	Yes
Management of companies and enterprises	Yes
Other basic inorganic chemical manufacturing	NO
Industrial gas manufacturing	NO
Electric power transmission and distribution	Yes
Maintenance and repair construction of nonresidential structures	Yes
Other electronic component manufacturing	NO
Printed circuit assembly (electronic assembly) manufacturing	Yes
Truck transportation	Yes

Table 20: Manufacturing Cluster, Computer and Electronics – Top 25 Cluster Suppliers

Industry	Within Region
Plastics packaging materials and unlaminated film and sheet manufacturing	NO
Employment services	Yes
Business support services	Yes
Specialized design services	Yes
Fabricated structural metal manufacturing	Yes
Architectural, engineering, and related services	Yes
Lessors of nonfinancial intangible assets	Yes
Investigation and security services	Yes
Machine shops	Yes
Commercial and industrial machinery and equipment repair and maintenance	Yes
Advertising, public relations, and related services	Yes
Services to buildings	Yes
Legal services	Yes
Management consulting services	Yes
Sheet metal work manufacturing	Yes

Manufacturing Cluster: Fabricated Metal

Table 21: Manufacturing Cluster, Fabricated Metal – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
Fabricated structural metal manufacturing	7	95	$1,449							7	95	$1,449
Sheet metal work manufacturing	7	95	$1,449							7	95	$1,449
Ornamental and architectural metal work manufacturing	7	95	$1,449							7	95	$1,449
Other fabricated metal manufacturing	4	64	$1,143	3	4	$1,284				7	68	$1,151
Pump and pumping equipment manufacturing	3	2	$1,213	3	30	$1,122				6	32	$1,127
Conveyor and conveying equipment manufacturing	3	2	$1,213	3	30	$1,122				6	32	$1,127
Overhead cranes, hoists, and monorail systems manufacturing	3	2	$1,213	3	30	$1,122				6	32	$1,127
Power-driven handtool manufacturing	3	2	$1,213	3	30	$1,122				6	32	$1,127

Table 21: Manufacturing Cluster, Fabricated Metal – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
Packaging machinery manufacturing	3	2	$1,213	3	30	$1,122				6	32	$1,127
TOTAL	**14**	**161**	**$1,325**	**6**	**34**	**$1,141**				**20**	**195**	**$1,293**

Table 22: Manufacturing Cluster, Fabricated Metal – Economic Performance

Industry	GW	MP	NN	Region 6
Conveyor and conveying equipment manufacturing	X	X		X
Fabricated structural metal manufacturing	X			X
Ornamental and architectural metal work manufacturing	X			X
Other fabricated metal manufacturing	X			X
Overhead cranes, hoists, and monorail systems manufacturing	X	X		X
Packaging machinery manufacturing	X	X		X
Power-driven handtool manufacturing	X	X		X
Pump and pumping equipment manufacturing	X	X		X
Sheet metal work manufacturing	X			X

"X" indicates above median performance

Table 23: Manufacturing Cluster, Fabricated Metal – Top 25 Cluster Suppliers

Industry	Within Region
Iron and steel mills and ferroalloy manufacturing	Yes
Wholesale trade	Yes
Management of companies and enterprises	Yes
Machine shops	Yes
Aluminum sheet, plate, and foil manufacturing	NO
Rolled steel shape manufacturing	NO
Fabricated structural metal manufacturing	Yes
Ferrous metal foundries	NO
Iron, steel pipe and tube manufacturing from purchased steel	Yes
Semiconductor and related device manufacturing	Yes
Truck transportation	Yes
Paint and coating manufacturing	NO
Sheet metal work manufacturing	Yes
Turned product and screw, nut, and bolt manufacturing	NO
Other aluminum rolling, drawing and extruding	NO
Motor and generator manufacturing	NO
Lessors of nonfinancial intangible assets	Yes
Marketing research and all other miscellaneous professional, scientific, and technical services	Yes

Table 23: Manufacturing Cluster, Fabricated Metal – Top 25 Cluster Suppliers

Industry	Within Region
Monetary authorities and depository credit intermediation	Yes
Architectural, engineering, and related services	Yes
Other miscellaneous chemical product manufacturing	Yes
Copper rolling, drawing, extruding and alloying	NO
Securities and commodity contracts intermediation and brokerage	Yes
Electric power transmission and distribution	Yes
Data processing, hosting, and related services	Yes

Manufacturing Cluster: Food and Beverage

Table 24: Manufacturing Cluster, Food and Beverage – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
Manufactured ice	8	114	$368				5	22	$349	13	136	$365
Breweries	8	114	$368				5	22	$349	13	136	$365
Wineries	8	114	$368				5	22	$349	13	136	$365
Seafood product preparation and packaging				5	88	$433	12	605	$1,059	17	693	$980
Bread and bakery product, except frozen, manufacturing	4	40	$468							4	40	$468
Frozen cakes and other pastries manufacturing	4	40	$468							4	40	$468
Dry pasta, mixes, and dough manufacturing	4	40	$468							4	40	$468
TOTAL	**12**	**154**	**$394**	**5**	**88**	**$433**	**17**	**627**	**$1,035**	**34**	**869**	**$860**

Table 25: Manufacturing Cluster, Food and Beverage – Economic Performance

Industry	GW	MP	NN	Region 6
Bread and bakery product, except frozen, manufacturing	X			X
Breweries	X		X	X
Dry pasta, mixes, and dough manufacturing	X			X
Frozen cakes and other pastries manufacturing	X			X
Manufactured ice	X		X	X
Seafood product preparation and packaging		X	X	X
Wineries	X		X	X

"X" indicates above median performance

Table 26: Manufacturing Cluster, Food and Beverage – Top 25 Suppliers

Industry	Within Region
Management of companies and enterprises	Yes
Wholesale trade	Yes
Flour milling	NO
Metal cans manufacturing	NO
Paperboard container manufacturing	Yes
Glass container manufacturing	NO
Truck transportation	Yes

Table 26: Manufacturing Cluster, Food and Beverage – Top 25 Suppliers

Industry	Within Region
Grain farming	Yes
Wet corn milling	NO
Animal production, except cattle and poultry and eggs	Yes
Lessors of nonfinancial intangible assets	Yes
Marketing research and all other miscellaneous professional, scientific, and technical services	Yes
Fruit farming	Yes
Electric power transmission and distribution	Yes
Packaging machinery manufacturing	Yes
All other food manufacturing	Yes
Fats and oils refining and blending	NO
Dry pasta, mixes, and dough manufacturing	Yes
Poultry and egg production	Yes
Rail transportation	Yes
Monetary authorities and depository credit intermediation	Yes
Semiconductor and related device manufacturing	Yes
Soybean and other oilseed processing	NO
Sugar cane mills and refining	NO
Wineries	Yes

Manufacturing Cluster: Miscellaneous

Table 27: Manufacturing Cluster, Miscellaneous – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
Textile bag and canvas mills	3	5	$512	5	30	$668				8	35	$645
Rope, cordage, twine, tire cord and tire fabric mills	3	5	$512	5	30	$668				8	35	$645
Other textile product mills	3	5	$512	5	30	$668				8	35	$645
Motor vehicle gasoline engine and engine parts manufacturing	3	6	$799							3	6	$799
Motor vehicle steering, suspension component (except spring), and brake systems manufacturing	3	6	$799							3	6	$799
Motor vehicle transmission and power train parts manufacturing	3	6	$799							3	6	$799
Other motor vehicle parts manufacturing	3	6	$799							3	6	$799

Table 27: Manufacturing Cluster, Miscellaneous – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
Wood kitchen cabinet and countertop manufacturing	7	83	$776	8	25	$591	2			17	108	$733
Upholstered household furniture manufacturing	7	83	$776	8	25	$591	2			17	108	$733
Surgical and medical instrument manufacturing	7	19	$876							7	19	$876
Dental equipment and supplies manufacturing	7	19	$876							7	19	$876
Ophthalmic goods manufacturing	7	19	$876							7	19	$876
Jewelry and silverware manufacturing	9	78	$684	4	3	$325	4	12	$849	17	93	$694
Sign manufacturing	9	78	$684	4	3	$325	4	12	$849	17	93	$694
Gasket, packing, and sealing device manufacturing	9	78	$684	4	3	$325	4	12	$849	17	93	$694
Musical instrument manufacturing	9	78	$684	4	3	$325	4	12	$849	17	93	$694
All other miscellaneous manufacturing	9	78	$684	4	3	$325	4	12	$849	17	93	$694

Table 27: Manufacturing Cluster, Miscellaneous – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
TOTAL	**29**	**191**	**$743**	**17**	**58**	**$617**	**6**	**12**	**$849**	**52**	**261**	**$720**

Table 28: Manufacturing Cluster, Miscellaneous – Economic Performance

Industry	GW	MP	NN	Region 6
All other miscellaneous manufacturing	X			X
Dental equipment and supplies manufacturing	X	X		
Gasket, packing, and sealing device manufacturing	X	X		X
Jewelry and silverware manufacturing	X	X		X
Motor vehicle gasoline engine and engine parts manufacturing	X	X		
Motor vehicle steering, suspension component (except spring), and brake systems manufacturing	X	X		
Motor vehicle transmission and power train parts manufacturing	X	X		
Musical instrument manufacturing	X			X
Ophthalmic goods manufacturing	X	X		
Other motor vehicle parts manufacturing	X	X		
Other textile product mills		X	X	

Table 28: Manufacturing Cluster, Miscellaneous – Economic Performance

Industry	GW	MP	NN	Region 6
Rope, cordage, twine, tire cord and tire fabric mills		X	X	
Sign manufacturing				X
Surgical and medical instrument manufacturing	X	X		
Textile bag and canvas mills		X	X	
Upholstered household furniture manufacturing	X	X	X	
Wood kitchen cabinet and countertop manufacturing	X	X	X	

"X" indicates above median performance

Table 29: Manufacturing Cluster, Miscellaneous – Top 25 Cluster Suppliers

Industry	Within Region
Wholesale trade	Yes
Management of companies and enterprises	Yes
Iron and steel mills and ferroalloy manufacturing	Yes
Nonferrous metal foundries	Yes
Machine shops	Yes
Motor vehicle metal stamping	NO
Ferrous metal foundries	NO
Other motor vehicle parts manufacturing	Yes

Table 29: Manufacturing Cluster, Miscellaneous – Top 25 Cluster Suppliers

Industry	Within Region
Truck transportation	Yes
Other plastics product manufacturing	Yes
Plastics material and resin manufacturing	NO
Turned product and screw, nut, and bolt manufacturing	NO
Surgical and medical instrument manufacturing	Yes
Lessors of nonfinancial intangible assets	Yes
Surgical appliance and supplies manufacturing	NO
Paperboard container manufacturing	Yes
Electric power transmission and distribution	Yes
Other engine equipment manufacturing	NO
Plate work manufacturing	NO
Artificial and synthetic fibers and filaments manufacturing	NO
Plastics packaging materials and unlaminated film and sheet manufacturing	NO
Retail - Motor vehicle and parts dealers	Yes
Semiconductor and related device manufacturing	Yes
Paint and coating manufacturing	NO
Marketing research and all other miscellaneous professional, scientific, and technical services	Yes

Table 30: Manufacturing Cluster, Plastics, Rubber, and Nonmetallic Mineral Products – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
Polystyrene foam product manufacturing	7	185	$760							7	185	$760
Other plastics product manufacturing	7	185	$760							7	185	$760
Ready-mix concrete manufacturing	14	186	$1,030	6	93	$1,242				20	279	$1,101
Concrete block and brick manufacturing	14	186	$1,030	6	93	$1,242				20	279	$1,101
Other concrete product manufacturing	14	186	$1,030	6	93	$1,242				20	279	$1,101
TOTAL	**21**	**371**	**$895**	**6**	**93**	**$1,242**				**27**	**464**	**$965**

Table 31: Manufacturing Cluster, Plastics, Rubber, and Nonmetallic Mineral Products – Economic Performance

Industry	GW	MP	NN	Region 6
Concrete block and brick manufacturing	X	X		X
Other concrete product manufacturing	X	X		X
Other plastics product manufacturing	X			X

Polystyrene foam product manufacturing	X			X
Ready-mix concrete manufacturing	X	X		X

"X" indicates above median performance

Table 32: Manufacturing Cluster, Plastics, Rubber, and Nonmetallic Mineral Products – Top 25 Suppliers

Industry	Within Region
Plastics material and resin manufacturing	NO
Wholesale trade	Yes
Sand and gravel mining	Yes
Cement manufacturing	NO
Management of companies and enterprises	Yes
Petrochemical manufacturing	NO
Truck transportation	Yes
Other basic organic chemical manufacturing	NO
Plastics packaging materials and unlaminated film and sheet manufacturing	NO
Paperboard container manufacturing	Yes
Other plastics product manufacturing	Yes
Electric power transmission and distribution	Yes
Marketing research and all other miscellaneous professional, scientific, and technical services	Yes
Rail transportation	Yes
Monetary authorities and depository credit intermediation	Yes

Table 32: Manufacturing Cluster, Plastics, Rubber, and Nonmetallic Mineral Products – Top 25 Suppliers

Industry	Within Region
Maintenance and repair construction of nonresidential structures	Yes
Machine shops	Yes
Other basic inorganic chemical manufacturing	NO
Synthetic dye and pigment manufacturing	NO
Laminated plastics plate, sheet (except packaging), and shape manufacturing	NO
Unlaminated plastics profile shape manufacturing	NO
Lessors of nonfinancial intangible assets	Yes
Synthetic rubber manufacturing	Yes
Architectural, engineering, and related services	Yes
Stone mining and quarrying	Yes

Manufacturing Cluster: Wood Products and Paper

Table 33: Manufacturing Cluster, Wood Products and Paper – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
Sawmills	9	221	$846	9	306	$600	3	99	$962	21	626	$744

Table 33: Manufacturing Cluster, Wood Products and Paper – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
Wood preservation	9	221	$846	9	306	$600	3	99	$962	21	626	$744
Wood windows and door manufacturing	12	119	$875							12	119	$875
Cut stock, resawing lumber, and planing	12	119	$875							12	119	$875
Other millwork, including flooring	12	119	$875							12	119	$875
Wood container and pallet manufacturing	12	119	$875							12	119	$875
Prefabricated wood building manufacturing	12	119	$875							12	119	$875
All other miscellaneous wood product manufacturing	12	119	$875							12	119	$875
Paper mills												
TOTAL	**21**	**340**	**$856**	**9**	**306**	**$600**	**3**	**99**	**$962**	**33**	**745**	**$765**

Table 34: Manufacturing Cluster, Wood Products and Paper – Economic Performance

Industry	GW	MP	NN	Region 6
All other miscellaneous wood product manufacturing	X			X
Cut stock, resawing lumber, and planing	X			X
Other millwork, including flooring	X			X
Paper mills		X		X
Prefabricated wood building manufacturing	X			X
Sawmills	X	X	X	X
Wood container and pallet manufacturing	X			X
Wood preservation	X	X	X	X
Wood windows and door manufacturing	X			X
All other miscellaneous wood product manufacturing	X			X

"X" indicates above median performance

Table 35: Manufacturing Cluster, Wood Products and Paper – Top 25 Suppliers

Industry	Within Region
Wholesale trade	Yes
Sawmills	Yes
Commercial logging	Yes
Management of companies and enterprises	Yes

Table 35: Manufacturing Cluster, Wood Products and Paper – Top 25 Suppliers

Industry	Within Region
Electric power transmission and distribution	Yes
Truck transportation	Yes
Natural gas distribution	Yes
Rail transportation	Yes
Other basic inorganic chemical manufacturing	NO
Petroleum refineries	NO
Paperboard container manufacturing	Yes
Other basic organic chemical manufacturing	NO
Paper bag and coated and treated paper manufacturing	NO
Architectural, engineering, and related services	Yes
Maintenance and repair construction of nonresidential structures	Yes
Cut stock, resawing lumber, and planing	Yes
Coal mining	Yes
Semiconductor and related device manufacturing	Yes
Pulp mills	NO
Sawmill, woodworking, and paper machinery	Yes
Machine shops	Yes
Wet corn milling	NO
Wood container and pallet manufacturing	Yes

Table 35: Manufacturing Cluster, Wood Products and Paper – Top 25 Suppliers

Industry	Within Region
Wood preservation	Yes
Data processing, hosting, and related services	Yes

Mining and Quarrying Cluster

Table 36: Mining and Quarrying Cluster – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
Stone mining and quarrying	5	105	$1,540	5	72	$902				10	177	$1,280
Sand and gravel mining	5	105	$1,540	5	72	$902				10	177	$1,280
TOTAL	**5**	**105**	**$1,540**	**5**	**72**	**$902**				**10**	**177**	**$1,280**

Table 37: Mining and Quarrying Cluster – Economic Performance

Industry	GW	MP	NN	Region 6
Sand and gravel mining	X	X		X
Stone mining and quarrying	X	X		X

"X" indicates above median performance

Table 38: Mining and Quarrying Cluster – Top 25 Cluster Suppliers

Industry	Within Region
Petroleum refineries	NO
Maintenance and repair construction of nonresidential structures	Yes
Support activities for oil and gas operations	Yes
Wholesale trade	Yes
Architectural, engineering, and related services	Yes
Electric power transmission and distribution	Yes
Management of companies and enterprises	Yes
Commercial and industrial machinery and equipment rental and leasing	Yes
Other nonmetallic minerals services	Yes
Construction machinery manufacturing	Yes
Stone mining and quarrying	Yes
Other financial investment activities	Yes

Table 38: Mining and Quarrying Cluster – Top 25 Cluster Suppliers

Industry	Within Region
Explosives manufacturing	NO
Sand and gravel mining	Yes
Conveyor and conveying equipment manufacturing	Yes
Insurance carriers	Yes
Monetary authorities and depository credit intermediation	Yes
Natural gas distribution	Yes
Legal services	Yes
Oil and gas field machinery and equipment manufacturing	NO
Truck transportation	Yes
Lessors of nonfinancial intangible assets	Yes
Warehousing and storage	Yes
Rail transportation	Yes
Scenic and sightseeing transportation and support activities for transportation	Yes

Professional, Scientific, Technical Services, and Management of Companies Cluster

Table 39: Professional, Scientific, and Technical Services Cluster – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
Legal services	111	381	$1,367	39	79	$1,460	21	76	$1,076	171	536	$1,339
Architectural, engineering, and related services	135	1,494	$1,662	28	155	$771	17	56	$1,845	180	1,705	$1,587
Custom computer programming services	294	2,924	$1,843	22	50	$1,980	18	113	$1,157	334	3,087	$1,820
Computer systems design services	294	2,924	$1,843	22	50	$1,980	18	113	$1,157	334	3,087	$1,820
Other computer related services, including facilities management	294	2,924	$1,843	22	50	$1,980	18	113	$1,157	334	3,087	$1,820
Management consulting services	204	1,680	$1,857	41	92	$1,471	18	81	$1,382	263	1,853	$1,817
Environmental and other technical consulting services	204	1,680	$1,857	41	92	$1,471	18	81	$1,382	263	1,853	$1,817
Scientific research and development services	22	193	$2,766	6	10	$2,339				28	203	$2,745

Table 39: Professional, Scientific, and Technical Services Cluster – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
Advertising, public relations, and related services	29	151	$1,418	5	29	$1,115				34	180	$1,369
Management of companies and enterprises	47	1,382	$1,356	10	237	$717	7	127	$1,339	64	1,746	$1,268
TOTAL	**842**	**8,205**	**$1,723**	**151**	**652**	**$1,066**	**81**	**453**	**$1,320**	**1,074**	**9,310**	**$1,657**

Table 40: Professional, Scientific, and Technical Services Cluster – Economic Performance

Industry	GW	MP	NN	Region 6
Advertising, public relations, and related services		X		X
Architectural, engineering, and related services	X	X		X
Computer systems design services			X	
Custom computer programming services	X		X	
Environmental and other technical consulting services		X		X
Legal services			X	
Management consulting services	X	X		X
Management of companies and enterprises	X		X	

Table 40: Professional, Scientific, and Technical Services Cluster – Economic Performance

Industry	GW	MP	NN	Region 6
Other computer related services, including facilities management	X		X	
Scientific research and development services	X	X		X

"X" indicates above median performance

Table 41: Professional, Scientific, and Technical Services Cluster – Top 25 Cluster Suppliers

Industry	Within Region
Real estate	Yes
Management consulting services	Yes
Employment services	Yes
Legal services	Yes
Architectural, engineering, and related services	Yes
Monetary authorities and depository credit intermediation	Yes
Scientific research and development services	Yes
Marketing research and all other miscellaneous professional, scientific, and technical services	Yes
Advertising, public relations, and related services	Yes
Accounting, tax preparation, bookkeeping, and payroll services	Yes
Lessors of nonfinancial intangible assets	Yes
Management of companies and enterprises	Yes

Table 41: Professional, Scientific, and Technical Services Cluster – Top 25 Cluster Suppliers

Industry	Within Region
Wireless telecommunications carriers (except satellite)	Yes
Office administrative services	Yes
Internet publishing and broadcasting and web search portals	Yes
Other computer related services, including facilities management	Yes
Data processing, hosting, and related services	Yes
Insurance carriers	Yes
Computer systems design services	Yes
Environmental and other technical consulting services	Yes
Wired telecommunications carriers	Yes
Radio and television broadcasting	Yes
Electric power transmission and distribution	Yes
Wholesale trade	Yes
Business support services	Yes

Tourism Cluster

Table 42: Tourism Cluster – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
Performing arts companies	7	147	$246							7	147	$246
Other amusement and recreation industries	65	1,324	$270	33	293	$390	21	147	$575	119	1,764	$315
Hotels and motels, including casino hotels	72	1,174	$399	13	72	$263	13	239	$501	98	1,485	$409
Other accommodations	76	1,224	$404	17	116	$333	20	253	$502	113	1,593	$414
TOTAL	**148**	**2,695**	**$329**	**50**	**409**	**$374**	**41**	**400**	**$529**	**239**	**3,504**	**$357**

Table 43: Tourism Cluster – Economic Performance

Industry	GW	MP	NN	Region 6
Hotels and motels, including casino hotels			X	
Other accommodations			X	
Other amusement and recreation industries			X	
Performing arts companies	X			X

"X" indicates above median performance

Table 44: Tourism Cluster – Top 25 Suppliers

Industry	Within Region
Real estate	Yes
Independent artists, writers, and performers	Yes
Electric power transmission and distribution	Yes
Management of companies and enterprises	Yes
Advertising, public relations, and related services	Yes
Insurance carriers	Yes
Maintenance and repair construction of nonresidential structures	Yes
Wholesale trade	Yes
Management consulting services	Yes
Internet publishing and broadcasting and web search portals	Yes

Table 44: Tourism Cluster – Top 25 Suppliers

Industry	Within Region
Petroleum refineries	NO
All other food and drinking places	Yes
Nondepository credit intermediation and related activities	Yes
Printing	Yes
Employment services	Yes
Radio and television broadcasting	Yes
Accounting, tax preparation, bookkeeping, and payroll services	Yes
Promoters of performing arts and sports and agents for public figures	Yes
Retail - General merchandise stores	Yes
Waste management and remediation services	Yes
Services to buildings	Yes
Wireless telecommunications carriers (except satellite)	Yes
Retail - Nonstore retailers	Yes
Wired telecommunications carriers	Yes
Architectural, engineering, and related services	Yes

Transportation and Warehousing Cluster

Table 45: Transportation and Warehousing Cluster – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
Water transportation				3	26	$1,386				3	26	$1,386
Truck transportation	97	1,415	$893	49	247	$867	28	54	$727	174	1,716	$884
Scenic and sightseeing transportation and support activities for transportation	21	226	$830	6	19	$599				27	245	$812
Couriers and messengers	14	461	$748	3	4	$577				17	465	$747
Warehousing and storage	13	1,313	$957				2			15	1,313	$957
TOTAL	**145**	**3,415**	**$894**	**61**	**296**	**$891**	**30**	**54**	**$727**	**236**	**3,765**	**$891**

Table 46: Transportation and Warehousing Cluster – Economic Performance

Industry	GW	MP	NN	Region 6
Couriers and messengers	X	X		X
Scenic and sightseeing transportation and support activities for transportation	X	X		X
Truck transportation	X	X		X
Warehousing and storage	X			X
Water transportation		X		X

"X" indicates above median performance

Table 47: Transportation and Warehousing Cluster – Top 25 Cluster Suppliers

Industry	Within Region
Petroleum refineries	NO
Scenic and sightseeing transportation and support activities for transportation	Yes
Couriers and messengers	Yes
Wholesale trade	Yes
Real estate	Yes
Insurance carriers	Yes
Warehousing and storage	Yes
Truck transportation	Yes
Management of companies and enterprises	Yes

Table 47: Transportation and Warehousing Cluster – Top 25 Cluster Suppliers

Industry	Within Region
Employment services	Yes
Monetary authorities and depository credit intermediation	Yes
Maintenance and repair construction of nonresidential structures	Yes
Rail transportation	Yes
Retail - Motor vehicle and parts dealers	Yes
Commercial and industrial machinery and equipment rental and leasing	Yes
Waste management and remediation services	Yes
Air transportation	Yes
Electric power transmission and distribution	Yes
Support activities for oil and gas operations	Yes
Wireless telecommunications carriers (except satellite)	Yes
Automotive equipment rental and leasing	Yes
Other motor vehicle parts manufacturing	Yes
Management consulting services	Yes
Nondepository credit intermediation and related activities	Yes
Lessors of nonfinancial intangible assets	Yes

Utilities Cluster

Table 48: Utilities Cluster – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
Electric power generation - Fossil fuel	8	262	$1,775				3	83	$1,490	11	345	$1,707
Electric power generation - Biomass	8	262	$1,775				3	83	$1,490	11	345	$1,707
Electric power transmission and distribution	8	262	$1,775				3	83	$1,490	11	345	$1,707
Water, sewage and other systems				3	7	$591				3	7	$591
TOTAL	**8**	**262**	**$1,775**	**3**	**7**	**$591**	**3**	**83**	**$1,490**	**14**	**352**	**$1,685**

Table 49: Utilities Cluster – Economic Performance

Industry	GW	MP	NN	Region 6
Electric power generation - Biomass	X		X	X
Electric power generation - Fossil fuel	X		X	X
Electric power transmission and distribution	X		X	X
Water, sewage and other systems		X		X

"X" indicates above median performance

Table 50: Utilities Cluster – Top 25 Suppliers

Industry	Within Region
Electric power generation - Fossil fuel	Yes
Electric power generation - Nuclear	NO
Coal mining	Yes
Extraction of natural gas and crude petroleum	Yes
Electric power generation - Wind	NO
Petroleum refineries	NO
Electric power generation - Hydroelectric	NO
Maintenance and repair construction of nonresidential structures	Yes
Electric power generation - Biomass	Yes

Table 50: Utilities Cluster – Top 25 Suppliers

Industry	Within Region
Extraction of natural gas liquids	NO
Pipeline transportation	Yes
Scenic and sightseeing transportation and support activities for transportation	Yes
Marketing research and all other miscellaneous professional, scientific, and technical services	Yes
Monetary authorities and depository credit intermediation	Yes
Rail transportation	Yes
Legal services	Yes
Wholesale trade	Yes
Architectural, engineering, and related services	Yes
Electric power transmission and distribution	Yes
Employment services	Yes
Electric power generation - Solar	NO
Real estate	Yes
Electric power generation - Geothermal	NO
Accounting, tax preparation, bookkeeping, and payroll services	Yes
Electric power generation - Fossil fuel	Yes

Wholesale Trade Cluster

Table 51: Wholesale Trade Cluster – Cluster Membership

Industry	George Washington			Middle Peninsula			Northern Neck			Region 6		
	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage	Est.	Emp.	Avg. Wkly Wage
Wholesale trade	265	2,833	$1,053	81	645	$801	54	280	$912	400	3,758	$999
TOTAL	**265**	**2,833**	**$1,053**	**81**	**645**	**$801**	**54**	**280**	**$912**	**400**	**3,758**	**$999**

Table 52: Wholesale Trade Cluster – Economic Performance

Industry	GW	MP	NN	Region 6
Wholesale trade	X	X	X	X

"X" indicates above median performance

Table 53: Wholesale Trade Cluster – Top 25 Cluster Suppliers

Industry	Within Region
Real estate	Yes
Management of companies and enterprises	Yes
Wholesale trade	Yes
Advertising, public relations, and related services	Yes

Table 53: Wholesale Trade Cluster – Top 25 Cluster Suppliers

Industry	Within Region
Couriers and messengers	Yes
Warehousing and storage	Yes
Insurance carriers	Yes
Management consulting services	Yes
Scenic and sightseeing transportation and support activities for transportation	Yes
Nondepository credit intermediation and related activities	Yes
Employment services	Yes
Wireless telecommunications carriers (except satellite)	Yes
Accounting, tax preparation, bookkeeping, and payroll services	Yes
Business support services	Yes
Internet publishing and broadcasting and web search portals	Yes
Electric power transmission and distribution	Yes
Legal services	Yes
Radio and television broadcasting	Yes
Printing	Yes
Monetary authorities and depository credit intermediation	Yes
Wired telecommunications carriers	Yes
Lessors of nonfinancial intangible assets	Yes
Commercial and industrial machinery and equipment repair and maintenance	Yes

Table 53: Wholesale Trade Cluster – Top 25 Cluster Suppliers

Industry	Within Region
Petroleum refineries	NO
Truck transportation	Yes

Workforce Analysis

In this section, we quantify the regional supply of labor available to support the industry clusters identified in the previous section, and illuminate potential gaps in the pipeline of trained workers needed to fuel the continued growth of those clusters.

Available Regional Labor Pool

To quantify the available regional labor pool associated with each of the sixteen high-performance industry clusters identified in the previous section, we use a staffing matrix from the Virginia Employment Commission (that details the specific occupations employed within given industries in Virginia) to identify the occupations associated with each industry cluster. We then map those occupations into the Virginia Employment Commission's estimates of occupational employment in each of the Planning Districts that comprise Mary Ball Washington GO Virginia Region 6, to identify the overall regional labor pool available for each cluster.

The results of that analysis are provided in Tables 54 through 69. In these tables:

- Regional Employment: Is the total regional employment in the specified industry or cluster.
- Available Labor Pool: Is the total regional employment within the occupations employed within the specified industry or cluster. It should be noted that cluster totals may not be equal to the sum of the industry totals, due to occupational overlap between industries.
- Employment to Labor Pool Ratio: Is equal to the available regional labor pool divided by regional employment within the specified industry or cluster. This ratio provides a measure of the relative availability of labor across industries and clusters.

Although in all instances the available regional labor pool greatly exceeded cluster employment, there were two cases where that margin was noticeably narrower. The first was in the *Professional, Scientific, Technical Services, and Management of Companies* cluster, where limitations in the regional labor pool available to the Custom Computers Programming Services, Computer System Design Services, and Other Computer Related Services narrowed the labor pool for the cluster. While the second was the *Transportation and Warehousing* cluster, where limitations in the regional labor pool available to the Truck Transportation industry narrowed the labor pool for the cluster.

Table 54: Agriculture Cluster – Available Regional Labor Pool

Industry	Regional Employment	Available Regional Labor Pool	Employment to Labor Pool Ratio
Auqaculture	48	N/A	N/A
Commercial fishing	39	14,445	370.4
Commercial logging	202	16,110	79.8
Grain and Oilseed farming	162	N/A	N/A
Greenhouse, nursery, and floriculture production	289	N/A	N/A
TOTAL	**740**	**21,472**	**29.0**

Table 55: Education Cluster – Available Regional Labor Pool

Industry	Regional Employment	Available Regional Labor Pool	Employment to Labor Pool Ratio
Other educational services	912	83,527	91.6
TOTAL	**912**	**83,257**	**91.3**

Table 56: Finance and Insurance Cluster – Available Regional Labor Pool

Industry	Regional Employment	Available Regional Labor Pool	Employment to Labor Pool Ratio
Monetary authorities and depository credit intermediation	1,436	27,342	19.0
Nondepository credit intermediation and related activities	225	27,342	121.5
Securities and commodity contracts intermediation and brokerage	189	12,754	67.5
Other financial investment activities	59	12,754	216.2
Insurance carriers	131	50,169	383.0
Insurance agencies, brokerages, and related activities	452	50,169	111.0
TOTAL	**2,492**	**53,995**	**21.7**

Table 57: Information Cluster – Available Regional Labor Pool

Industry	Regional Employment	Available Regional Labor Pool	Employment to Labor Pool Ratio
Newspaper publishers	318	N/A	N/A
Periodical publishers	318	N/A	N/A
Book publishers	318	N/A	N/A
Directory, mailing list, and other publishers	318	28,556	89.8
Satellite, telecommunications resellers, and all other telecomm.	12	19,789	1649.1
News syndicates, libraries, archives and all other information services	117	17,860	152.6
Internet publishing and broadcasting and web search portals	117	17,860	152.6
TOTAL	**447**	**44,864**	**100.4**

Table 58: Manufacturing, Computer and Electronics Cluster – Available Regional Labor Pool

Industry	Regional Employment	Available Regional Labor Pool	Employment to Labor Pool Ratio
Broadcast and wireless comm. equip. manufacturing	71	30,982	436.4
Other comm. equip. manufacturing	71	30,982	436.4
Semiconductor and related device manufacturing	101	30,982	306.8
Printed circuit assembly (electronic assembly) manufacturing	101	30,982	306.8
TOTAL	**172**	**30,982**	**180.1**

Table 59: Manufacturing, Fabricated Metal Cluster – Available Regional Labor Pool

Industry	Regional Employment	Available Regional Labor Pool	Employment to Labor Pool Ratio
Fabricated structural metal manufacturing	95	19,053	200.6
Sheet metal work manufacturing	95	19,053	200.6
Ornamental and architectural metal work manufacturing	95	19,053	200.6
Other fabricated metal manufacturing	68	19,053	280.2
Pump and pumping equipment manufacturing	32	16,736	523.0
Conveyor and conveying equipment manufacturing	32	16,736	523.0
Overhead cranes, hoists, and monorail systems manufacturing	32	16,736	523.0
Power-driven handtool manufacturing	32	16,736	523.0
Packaging machinery manufacturing	32	16,736	523.0
TOTAL	**195**	**26,219**	**134.5**

Table 60: Manufacturing, Food and Beverage Cluster – Available Regional Labor Pool

Industry	Regional Employment	Available Regional Labor Pool	Employment to Labor Pool Ratio
Manufactured ice	136	7,183	52.8
Breweries	136	7,183	52.8
Wineries	136	7,183	52.8
Seafood product preparation and packaging	693	71,803	103.6
Bread and bakery product, except frozen, manufacturing	40	71,803	1795.1
Frozen cakes and other pastries manufacturing	40	71,803	1795.1
Dry pasta, mixes, and dough manufacturing	40	71,803	1795.1
TOTAL	**869**	**71,980**	**82.8**

Table 61: Manufacturing, Plastics, Rubber, and Nonmetallic Mineral Products Cluster – Available Regional Labor Pool

Industry	Regional Employment	Available Regional Labor Pool	Employment to Labor Pool Ratio
Polystyrene foam product manufacturing	185	21,234	114.8
Other plastics product manufacturing	185	21,234	114.8
Ready-mix concrete manufacturing	279	54,309	194.7
Concrete block and brick manufacturing	279	54,309	194.7
Other concrete product manufacturing	279	54,309	194.7
TOTAL	**464**	**55,197**	**119.0**

Table 62: Manufacturing, Miscellaneous Cluster – Available Regional Labor Pool

Industry	Regional Employment	Available Regional Labor Pool	Employment to Labor Pool Ratio
Textile bag and canvas mills	35	56,240	1606.9
Rope, cordage, twine, tire cord and tire fabric mills	35	56,240	1606.9
Other textile product mills	35	56,240	1606.9
Motor vehicle gasoline engine and engine parts manufacturing	6	6,576	1096.0
Motor vehicle steering, suspension component (except spring), and brake systems manufacturing	6	6,576	1096.0
Motor vehicle transmission and power train parts manufacturing	6	6,576	1096.0
Other motor vehicle parts manufacturing	6	6,576	1096.0
Wood kitchen cabinet and countertop manufacturing	108	17,678	163.7
Upholstered household furniture manufacturing	108	17,678	163.7
Surgical and medical instrument manufacturing	19	20,487	1078.3
Dental equipment and supplies manufacturing	19	20,487	1078.3
Ophthalmic goods manufacturing	19	20,487	1078.3

Table 62: Manufacturing, Miscellaneous Cluster – Available Regional Labor Pool

Industry	Regional Employment	Available Regional Labor Pool	Employment to Labor Pool Ratio
Jewelry and silverware manufacturing	93	20,487	220.3
Sign manufacturing	93	20,487	220.3
Gasket, packing, and sealing device manufacturing	93	20,487	220.3
Musical instrument manufacturing	93	20,487	220.3
All other miscellaneous manufacturing	93	20,487	220.3
TOTAL	**261**	**21,519**	**82.4**

Table 63: Manufacturing, Wood Product Cluster – Available Regional Labor Pool

Industry	Regional Employment	Available Regional Labor Pool	Employment to Labor Pool Ratio
Sawmills	626	45,315	72.4
Wood preservation	626	45,315	72.4
Wood windows and door manufacturing	119	45,315	380.8
Cut stock, resawing lumber, and planing	119	45,315	380.8
Other millwork, including flooring	119	45,315	380.8
Wood container and pallet manufacturing	119	45,315	380.8
Prefabricated wood building manufacturing	119	45,315	380.8
All other miscellaneous wood product manufacturing	119	45,315	380.8
Paper mills		25,029	N/A
TOTAL	**745**	**49,835**	**66.9**

Table 64: Mining and Quarrying Cluster – Available Regional Labor Pool

Industry	Regional Employment	Available Regional Labor Pool	Employment to Labor Pool Ratio
Stone mining and quarrying	177	22,909	129.4
Sand and gravel mining	177	22,909	129.4
TOTAL	**177**	**22,909**	**129.4**

Table 65: Professional, Scientific, Technical Services, and Management of Companies Cluster – Available Regional Labor Pool

Industry	Regional Employment	Available Regional Labor Pool	Employment to Labor Pool Ratio
Legal services	536	10,727	20.0
Architectural, engineering, and related services	1,705	46,427	27.2
Custom computer programming services	3,087	36,314	11.8
Computer systems design services	3,087	36,314	11.8
Other computer related services, including facilities management	3,087	36,314	11.8
Management consulting services	1,853	34,926	18.8
Environmental and other technical consulting services	1,853	34,926	18.8
Scientific research and development services	203	25,359	124.9
Advertising, public relations, and related services	180	12,505	69.5
Management of companies and enterprises	1,746	67,784	38.8
TOTAL	**9,310**	**79,309**	**8.5**

Table 66: Tourism Cluster – Available Regional Labor Pool

Industry	Regional Employment	Available Regional Labor Pool	Employment to Labor Pool Ratio
Performing arts companies	147	4,457	30.3
Other amusement and recreation industries	1,764	69,250	39.3
Hotels and motels, including casino hotels	1,485	57,347	38.6
Other accommodations	1,593	57,347	36.0
TOTAL	**3,504**	**72,437**	**20.7**

Table 67: Transportation and Warehousing Cluster – Available Regional Labor Pool

Industry	Regional Employment	Available Regional Labor Pool	Employment to Labor Pool Ratio
Water transportation	26	4,365	167.9
Truck transportation	1,716	25,195	14.7
Scenic and sightseeing transportation and support activities for transportation	245	17,605	71.9
Couriers and messengers	465	14,754	31.7
Warehousing and storage	1,313	33,069	25.2
TOTAL	**3,765**	**46,352**	**12.3**

Table 68: Utilities Cluster – Available Regional Labor Pool

Industry	Regional Employment	Available Regional Labor Pool	Employment to Labor Pool Ratio
Electric power generation - Fossil fuel	345	44,207	128.1
Electric power generation - Biomass	345	44,207	128.1
Electric power transmission and distribution	345	44,207	128.1
Water, sewage and other systems	7	44,207	6315.3
TOTAL	**352**	**44,207**	**125.6**

Table 69: Wholesale Trade Cluster – Available Regional Labor Pool

Industry	Regional Employment	Available Regional Labor Pool	Employment to Labor Pool Ratio
Wholesale trade	3,758	73,625	19.6
TOTAL	**3,758**	**73,625**	**19.6**

Shared Labor Pools

In this portion of the section, we build on our analysis of the overall regional labor pool available for each cluster by identifying industries outside of those clusters that draw heavily from the same labor pool, and are therefore linked to the cluster through shared skill requirements workforce needs. A listing of the top 25 industries that draw from each cluster's labor pool is provided in Tables 70 through 85.

Table 70: Agriculture Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Transportation Equipment Manufacturing	Yes	
Merchant Wholesalers, Durable Goods	Yes	
Management of Companies and Enterprises	Yes	Professional, Scientific, Technical Services, and Management of Companies
Construction of Buildings	Yes	
Heavy and Civil Engineering Construction	Yes	
Employment Services	Yes	
Specialty Trade Contractors	Yes	
Wholesale Electronic Markets and Agents and Brokers	Yes	
Utilities	Yes	
Architectural, Engineering, and Related Services	Yes	Professional, Scientific, Technical Services, and Management of Companies
Nonmetallic Mineral Product Manufacturing	Yes	

Table 70: Agriculture Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Support Activities for Transportation	Yes	
Management, Scientific, and Technical Consulting Services	Yes	
Truck Transportation	Yes	Transportation and Warehousing
Merchant Wholesalers, Nondurable Goods	Yes	
Mining (except Oil and Gas)	Yes	
Machinery Manufacturing	Yes	
Wood Product Manufacturing	Yes	
Beverage and Tobacco Product Manufacturing	Yes	
Facilities Support Services	Yes	
Rental and Leasing Services	Yes	
Food Manufacturing	Yes	
Chemical Manufacturing	Yes	
Plastics and Rubber Products Manufacturing	Yes	
Warehousing and Storage	Yes	Transportation and Warehousing

Table 71: Education Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Food Manufacturing	Yes	
Chemical Manufacturing	Yes	
Machinery Manufacturing	Yes	
Transportation Equipment Manufacturing	Yes	
Merchant Wholesalers, Durable Goods	Yes	

Table 71: Education Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Architectural, Engineering, and Related Services	Yes	Professional, Scientific, Technical Services, and Management of Companies
Management, Scientific, and Technical Consulting Services	Yes	
Management of Companies and Enterprises	Yes	Professional, Scientific, Technical Services, and Management of Companies
Educational Services	Yes	
Repair and Maintenance	Yes	
Heavy and Civil Engineering Construction	Yes	
Employment Services	Yes	
Computer Systems Design and Related Services	Yes	
Specialty Trade Contractors	Yes	
Paper Manufacturing	Yes	
Plastics and Rubber Products Manufacturing	Yes	
Fabricated Metal Product Manufacturing	Yes	
Electrical Equipment, Appliance, and Component Manufacturing	Yes	
Wholesale Electronic Markets and Agents and Brokers	Yes	
Utilities	Yes	
Telecommunications	Yes	
Data Processing, Hosting and Related Services	Yes	
Primary Metal Manufacturing	Yes	
Miscellaneous Manufacturing	Yes	
Construction of Buildings	Yes	

Table 72: Finance and Insurance Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Management of Companies and Enterprises	Yes	Professional, Scientific, Technical Services, and Management of Companies
Employment Services	Yes	
Educational Services	Yes	
Hospitals	Yes	
Utilities	Yes	
Merchant Wholesalers, Durable Goods	Yes	
Nursing and Residential Care Facilities	Yes	
Computer Systems Design and Related Services	Yes	
Merchant Wholesalers, Nondurable Goods	Yes	
Food Manufacturing	Yes	
Religious, Grantmaking, Civic, Professional, and Similar Org	Yes	
Individual and Family Services	Yes	
Business Support Services	Yes	
Offices of Physicians	Yes	
Specialty Trade Contractors	Yes	
Real Estate	Yes	
Vocational Rehabilitation Services	Yes	
Legal Services	Yes	Professional, Scientific, Technical Services, and Management of Companies
Rental and Leasing Services	Yes	
Nonstore Retailers	Yes	
Telecommunications	Yes	
Repair and Maintenance	Yes	

Table 72: Finance and Insurance Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Community Food and Housing, and Emergency and Other Relief	Yes	
Museums, Historical Sites, and Similar Institution	Yes	
Support Activities for Transportation	Yes	

Table 73: Information Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Management of Companies and Enterprises	Yes	Professional, Scientific, Technical Services, and Management of Companies
Employment Services	Yes	
Merchant Wholesalers, Durable Goods	Yes	
Specialty Trade Contractors	Yes	
Computer Systems Design and Related Services	Yes	
Educational Services	Yes	
Merchant Wholesalers, Nondurable Goods	Yes	
Hospitals	Yes	
Food Manufacturing	Yes	
Support Activities for Transportation	Yes	
Motor Vehicle and Parts Dealers	Yes	
Rental and Leasing Services	Yes	
Truck Transportation	Yes	Transportation and Warehousing
Utilities	Yes	
Museums, Historical Sites, and Similar Institution	Yes	
Business Support Services	Yes	

Table 73: Information Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Repair and Maintenance	Yes	
Religious, Grantmaking, Civic, Professional, and Similar Org	Yes	
Nonstore Retailers	Yes	
Real Estate	Yes	
Wholesale Electronic Markets and Agents and Brokers	Yes	
Vocational Rehabilitation Services	Yes	
Accommodation, including Hotels and Motels	Yes	
Individual and Family Services	Yes	
Beverage and Tobacco Product Manufacturing	Yes	

Table 74: Manufacturing, Computer and Electronics Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Food Manufacturing	Yes	
Chemical Manufacturing	Yes	
Machinery Manufacturing	Yes	
Transportation Equipment Manufacturing	Yes	
Merchant Wholesalers, Durable Goods	Yes	
Architectural, Engineering, and Related Services	Yes	Professional, Scientific, Technical Services, and Management of Companies
Management, Scientific, and Technical Consulting Services	Yes	
Management of Companies and Enterprises	Yes	Professional, Scientific, Technical Services, and Management of Companies
Educational Services	Yes	
Repair and Maintenance	Yes	

Table 74: Manufacturing, Computer and Electronics Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Heavy and Civil Engineering Construction	Yes	
Employment Services	Yes	
Computer Systems Design and Related Services	Yes	
Specialty Trade Contractors	Yes	
Paper Manufacturing	Yes	
Plastics and Rubber Products Manufacturing	Yes	
Fabricated Metal Product Manufacturing	Yes	
Electrical Equipment, Appliance, and Component Manufacturing	Yes	
Wholesale Electronic Markets and Agents and Brokers	Yes	
Utilities	Yes	
Telecommunications	Yes	
Data Processing, Hosting and Related Services	Yes	
Primary Metal Manufacturing	Yes	
Miscellaneous Manufacturing	Yes	
Construction of Buildings	Yes	

Table 75: Manufacturing, Fabricated Metal Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Mining (except Oil and Gas)	Yes	
Utilities	Yes	
Heavy and Civil Engineering Construction	Yes	
Specialty Trade Contractors	Yes	
Food Manufacturing	Yes	

Table 75: Manufacturing, Fabricated Metal Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Textile Product Mills	Yes	
Wood Product Manufacturing	Yes	
Paper Manufacturing	Yes	
Chemical Manufacturing	Yes	
Plastics and Rubber Products Manufacturing	Yes	
Nonmetallic Mineral Product Manufacturing	Yes	
Primary Metal Manufacturing	Yes	
Electrical Equipment, Appliance, and Component Manufacturing	Yes	
Transportation Equipment Manufacturing	Yes	
Furniture and Related Product Manufacturing	Yes	
Miscellaneous Manufacturing	Yes	
Merchant Wholesalers, Durable Goods	Yes	
Warehousing and Storage	Yes	Transportation and Warehousing
Architectural, Engineering, and Related Services	Yes	Professional, Scientific, Technical Services, and Management of Companies
Employment Services	Yes	
Repair and Maintenance	Yes	
Beverage and Tobacco Product Manufacturing	Yes	
Printing and Related Support Activities	Yes	
Newspaper, Periodical, Book, and Directory Publishers	Yes	
Management of Companies and Enterprises	Yes	Professional, Scientific, Technical Services, and Management of Companies

Table 76: Manufacturing, Food and Beverage Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Employment Services	Yes	
Hospitals	Yes	
Management of Companies and Enterprises	Yes	Professional, Scientific, Technical Services, and Management of Companies
Educational Services	Yes	
Nonstore Retailers	Yes	
Repair and Maintenance	Yes	
Vocational Rehabilitation Services	Yes	
Nursing and Residential Care Facilities	Yes	
Merchant Wholesalers, Durable Goods	Yes	
Merchant Wholesalers, Nondurable Goods	Yes	
Religious, Grantmaking, Civic, Professional, and Similar Organizations	Yes	
Amusement, Gambling, and Recreation Industries	Yes	
Accommodation, including Hotels and Motels	Yes	
Community Food and Housing, and Emergency and Other Relief S	Yes	
Health and Personal Care Stores	Yes	
Specialty Trade Contractors	Yes	
General Merchandise Stores	Yes	
Furniture and Home Furnishings Stores	Yes	
Support Activities for Transportation	Yes	
Individual and Family Services	Yes	
Performing Arts, Spectator Sports, and Related Industries	Yes	
Museums, Historical Sites, and Similar Institution	Yes	
Rental and Leasing Services	Yes	

Table 76: Manufacturing, Food and Beverage Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Motor Vehicle and Parts Dealers	Yes	
Chemical Manufacturing	Yes	

Table 77: Manufacturing, Plastics, Rubber, and Nonmetallic Mineral Products Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Merchant Wholesalers, Durable Goods	Yes	
Employment Services	Yes	
Specialty Trade Contractors	Yes	
Wood Product Manufacturing	Yes	
Management of Companies and Enterprises	Yes	Professional, Scientific, Technical Services, and Management of Companies
Architectural, Engineering, and Related Services	Yes	Professional, Scientific, Technical Services, and Management of Companies
Repair and Maintenance	Yes	
Construction of Buildings	Yes	
Food Manufacturing	Yes	
Chemical Manufacturing	Yes	
Support Activities for Transportation	Yes	
Services to Buildings and Dwellings	Yes	
Fabricated Metal Product Manufacturing	Yes	
Furniture and Related Product Manufacturing	Yes	
Building Material and Garden Equipment and Supplies Dealers	Yes	
Other Support Services	Yes	

Table 77: Manufacturing, Plastics, Rubber, and Nonmetallic Mineral Products Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Educational Services	Yes	
Mining (except Oil and Gas)	Yes	
Transportation Equipment Manufacturing	Yes	
Merchant Wholesalers, Nondurable Goods	Yes	
Management, Scientific, and Technical Consulting Services	Yes	
Textile Product Mills	Yes	
Truck Transportation	Yes	Transportation and Warehousing
Miscellaneous Store Retailers	Yes	
Miscellaneous Manufacturing	Yes	

Table 78: Manufacturing, Miscellaneous Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Food Manufacturing	Yes	
Educational Services	Yes	
Management of Companies and Enterprises	Yes	Professional, Scientific, Technical Services, and Management of Companies
Employment Services	Yes	
Chemical Manufacturing	Yes	
Merchant Wholesalers, Durable Goods	Yes	
Specialty Trade Contractors	Yes	
Architectural, Engineering, and Related Services	Yes	Professional, Scientific, Technical Services, and Management of Companies
Hospitals	Yes	

Table 78: Manufacturing, Miscellaneous Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Management, Scientific, and Technical Consulting Services	Yes	
Religious, Grantmaking, Civic, Professional, and Similar Org	Yes	
Repair and Maintenance	Yes	
Merchant Wholesalers, Nondurable Goods	Yes	
Support Activities for Transportation	Yes	
Accommodation, including Hotels and Motels	Yes	
Fabricated Metal Product Manufacturing	Yes	
Nursing and Residential Care Facilities	Yes	
Museums, Historical Sites, and Similar Institution	Yes	
Building Material and Garden Equipment and Supplies Dealers	Yes	
Services to Buildings and Dwellings	Yes	
Other Support Services	Yes	
Performing Arts, Spectator Sports, and Related Industries	Yes	
Miscellaneous Store Retailers	Yes	
Warehousing and Storage	Yes	Transportation and Warehousing
Nonmetallic Mineral Product Manufacturing	Yes	

Table 79: Manufacturing, Wood Products Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Merchant Wholesalers, Durable Goods	Yes	
Employment Services	Yes	

Table 79: Manufacturing, Wood Products Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Management of Companies and Enterprises	Yes	Professional, Scientific, Technical Services, and Management of Companies
Architectural, Engineering, and Related Services	Yes	Professional, Scientific, Technical Services, and Management of Companies
Food Manufacturing	Yes	
Chemical Manufacturing	Yes	
Fabricated Metal Product Manufacturing	Yes	
Utilities	Yes	
Specialty Trade Contractors	Yes	
Merchant Wholesalers, Nondurable Goods	Yes	
Educational Services	Yes	
Heavy and Civil Engineering Construction	Yes	
Transportation Equipment Manufacturing	Yes	
Repair and Maintenance	Yes	
Nonmetallic Mineral Product Manufacturing	Yes	
Plastics and Rubber Products Manufacturing	Yes	
Construction of Buildings	Yes	
Management, Scientific, and Technical Consulting Services	Yes	
Hospitals	Yes	
Primary Metal Manufacturing	Yes	
Waste Management and Remediation Service	Yes	
Facilities Support Services	Yes	
Building Material and Garden Equipment and Supplies Dealers	Yes	
Warehousing and Storage	Yes	Transportation and Warehousing

Table 79: Manufacturing, Wood Products Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Support Activities for Transportation	Yes	

Table 80: Mining and Quarrying Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Construction of Buildings	Yes	
Wood Product Manufacturing	Yes	
Nonmetallic Mineral Product Manufacturing	Yes	
Transportation Equipment Manufacturing	Yes	
Merchant Wholesalers, Durable Goods	Yes	
Support Activities for Transportation	Yes	
Management of Companies and Enterprises	Yes	Professional, Scientific, Technical Services, and Management of Companies
Employment Services	Yes	
Management, Scientific, and Technical Consulting Services	Yes	
Specialty Trade Contractors	Yes	
Other Support Services	Yes	
Architectural, Engineering, and Related Services	Yes	Professional, Scientific, Technical Services, and Management of Companies
Services to Buildings and Dwellings	Yes	
Food Manufacturing	Yes	
Repair and Maintenance	Yes	
Chemical Manufacturing	Yes	
Machinery Manufacturing	Yes	

Table 80: Mining and Quarrying Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Truck Transportation	Yes	
Building Material and Garden Equipment and Supplies Dealers	Yes	
Rental and Leasing Services	Yes	
Wholesale Electronic Markets and Agents and Brokers	Yes	
Fabricated Metal Product Manufacturing	Yes	
Furniture and Related Product Manufacturing	Yes	
Warehousing and Storage	Yes	Transportation and Warehousing
Miscellaneous Manufacturing	Yes	

Table 81: Professional, Scientific, Technical Services, and Management of Companies Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Employment Services	Yes	
Educational Services	Yes	
Merchant Wholesalers, Durable Goods	Yes	
Hospitals	Yes	
Utilities	Yes	
Religious, Grantmaking, Civic, Professional, and Similar Org	Yes	
Transportation Equipment Manufacturing	Yes	
Specialty Trade Contractors	Yes	
Food Manufacturing	Yes	
Chemical Manufacturing	Yes	
Fabricated Metal Product Manufacturing	Yes	

Table 81: Professional, Scientific, Technical Services, and Management of Companies Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Heavy and Civil Engineering Construction	Yes	
Construction of Buildings	Yes	
Warehousing and Storage	Yes	Transportation and Warehousing
Facilities Support Services	Yes	
Merchant Wholesalers, Nondurable Goods	Yes	
Machinery Manufacturing	Yes	
Repair and Maintenance	Yes	
Individual and Family Services	Yes	
Vocational Rehabilitation Services	Yes	
Support Activities for Transportation	Yes	
Plastics and Rubber Products Manufacturing	Yes	
Rental and Leasing Services	Yes	
Business Support Services	Yes	
Nursing and Residential Care Facilities	Yes	

Table 82: Tourism Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Religious, Grantmaking, Civic, Professional, and Similar Org	Yes	
Educational Services	Yes	
Employment Services	Yes	
Nursing and Residential Care Facilities	Yes	
Management of Companies and Enterprises	Yes	Professional, Scientific, Technical Services, and Management of Companies

Table 82: Tourism Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Museums, Historical Sites, and Similar Institution	Yes	
Food Services and Drinking Places	Yes	
Real Estate	Yes	
Food Manufacturing	Yes	
Hospitals	Yes	
Individual and Family Services	Yes	
Community Food and Housing, and Emergency and Other Relief S	Yes	
Nonstore Retailers	Yes	
Building Material and Garden Equipment and Supplies Dealers	Yes	
General Merchandise Stores	Yes	
Gasoline Stations	Yes	
Furniture and Home Furnishings Stores	Yes	
Sporting Goods, Hobby, Book, and Music Stores	Yes	
Vocational Rehabilitation Services	Yes	
Repair and Maintenance	Yes	
Beverage and Tobacco Product Manufacturing	Yes	
Personal and Laundry Services	Yes	
Support Activities for Transportation	Yes	
Merchant Wholesalers, Durable Goods	Yes	
Food and Beverage Stores	Yes	

Table 83: Transportation and Warehousing Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Merchant Wholesalers, Durable Goods	Yes	
Employment Services	Yes	
Merchant Wholesalers, Nondurable Goods	Yes	
Motor Vehicle and Parts Dealers	Yes	
Food Manufacturing	Yes	
Specialty Trade Contractors	Yes	
Management of Companies and Enterprises	Yes	Professional, Scientific, Technical Services, and Management of Companies
Repair and Maintenance	Yes	
Transportation Equipment Manufacturing	Yes	
Plastics and Rubber Products Manufacturing	Yes	
Rental and Leasing Services	Yes	
Architectural, Engineering, and Related Services	Yes	Professional, Scientific, Technical Services, and Management of Companies
Heavy and Civil Engineering Construction	Yes	
Waste Management and Remediation Service	Yes	
Chemical Manufacturing	Yes	
Nonstore Retailers	Yes	
Utilities	Yes	
Vocational Rehabilitation Services	Yes	
Newspaper, Periodical, Book, and Directory Publishers	Yes	
Wholesale Electronic Markets and Agents and Brokers	Yes	
Machinery Manufacturing	Yes	
Personal and Laundry Services	Yes	
Fabricated Metal Product Manufacturing	Yes	

Table 83: Transportation and Warehousing Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Management, Scientific, and Technical Consulting Services	Yes	
Paper Manufacturing	Yes	

Table 84: Utilities Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Educational Services	Yes	
Management of Companies and Enterprises	Yes	Professional, Scientific, Technical Services, and Management of Companies
Specialty Trade Contractors	Yes	
Employment Services	Yes	
Support Activities for Transportation	Yes	
Merchant Wholesalers, Durable Goods	Yes	
Computer Systems Design and Related Services	Yes	
Food Manufacturing	Yes	
Hospitals	Yes	
Telecommunications	Yes	
Repair and Maintenance	Yes	
Real Estate	Yes	
Merchant Wholesalers, Nondurable Goods	Yes	
Religious, Grantmaking, Civic, Professional, and Similar Organizations	Yes	
Truck Transportation	Yes	Transportation and Warehousing
Rental and Leasing Services	Yes	
Other Support Services	Yes	

Table 84: Utilities Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Nonstore Retailers	Yes	
Building Material and Garden Equipment and Supplies Dealers	Yes	
Museums, Historical Sites, and Similar Institution	Yes	
Wholesale Electronic Markets and Agents and Brokers	Yes	
Vocational Rehabilitation Services	Yes	
Nursing and Residential Care Facilities	Yes	
Accommodation, including Hotels and Motels	Yes	
Newspaper, Periodical, Book, and Directory Publishers	Yes	

Table 85: Wholesale Trade Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Employment Services	Yes	
Management of Companies and Enterprises	Yes	Professional, Scientific, Technical Services, and Management of Companies
Specialty Trade Contractors	Yes	
Repair and Maintenance	Yes	
Support Activities for Transportation	Yes	
Rental and Leasing Services	Yes	
Food Manufacturing	Yes	
Educational Services	Yes	
Motor Vehicle and Parts Dealers	Yes	
Hospitals	Yes	
Nonstore Retailers	Yes	

Table 85: Wholesale Trade Cluster – Top 25 Industries that Draw from Same Labor Pool

Industry	Within Region	Link to Another Cluster
Architectural, Engineering, and Related Services	Yes	Professional, Scientific, Technical Services, and Management of Companies
Building Material and Garden Equipment and Supplies Dealers	Yes	
Other Support Services	Yes	
Religious, Grantmaking, Civic, Professional, and Similar Org	Yes	
Warehousing and Storage	Yes	Transportation and Warehousing
Business Support Services	Yes	
Miscellaneous Store Retailers	Yes	
Telecommunications	Yes	
Truck Transportation	Yes	Transportation and Warehousing
Personal and Laundry Services	Yes	
Nonmetallic Mineral Product Manufacturing	Yes	
Community Food and Housing, and Emergency and Other Relief S	Yes	
Chemical Manufacturing	Yes	
Management, Scientific, and Technical Consulting Services	Yes	

Gap Analysis

In this portion of the section, we compare the occupation-driven demand for trained workers in Mary Ball Washington GO Virginia region 6 to the pipeline of completers graduating from regional post-secondary education programs, to identify potential gaps between the two.

Regional Demand for Trained Workers

To estimate the occupation-driven demand for trained workers in Region 6, we start with the most recent sub-state occupational employment projections from the Virginia Employment

Commission. According to those projections, between 2012 and 2022 Region 6 will experience approximately 6,785 job openings each year.[27] Figure 10 provides a breakdown of these annual openings by major occupation category.

[27] *Data Source*: Virginia Employment Commission, "2012 to 2022 Sub-state Occupational Employment Projections." It should be noted that the Virginia Employment Commission produces sub-state employment projections for Workforce Development Areas only. The Workforce Development Area most closely associated with Mary Ball Washington Region 6 is the Bay Consortium. The Bay Consortium encompasses the Region 6 localities of the City of Fredericksburg, and the counties of Caroline, Essex, King and Queen, King George, King William, Lancaster, Mathews, Middlesex, Northumberland, Richmond, Spotsylvania, Stafford, and Westmoreland. However, the Bay Consortium does not include the Region 6 locality of Gloucester County, and it does include the counties of Accomack and Northampton, which are not part of Region 6.

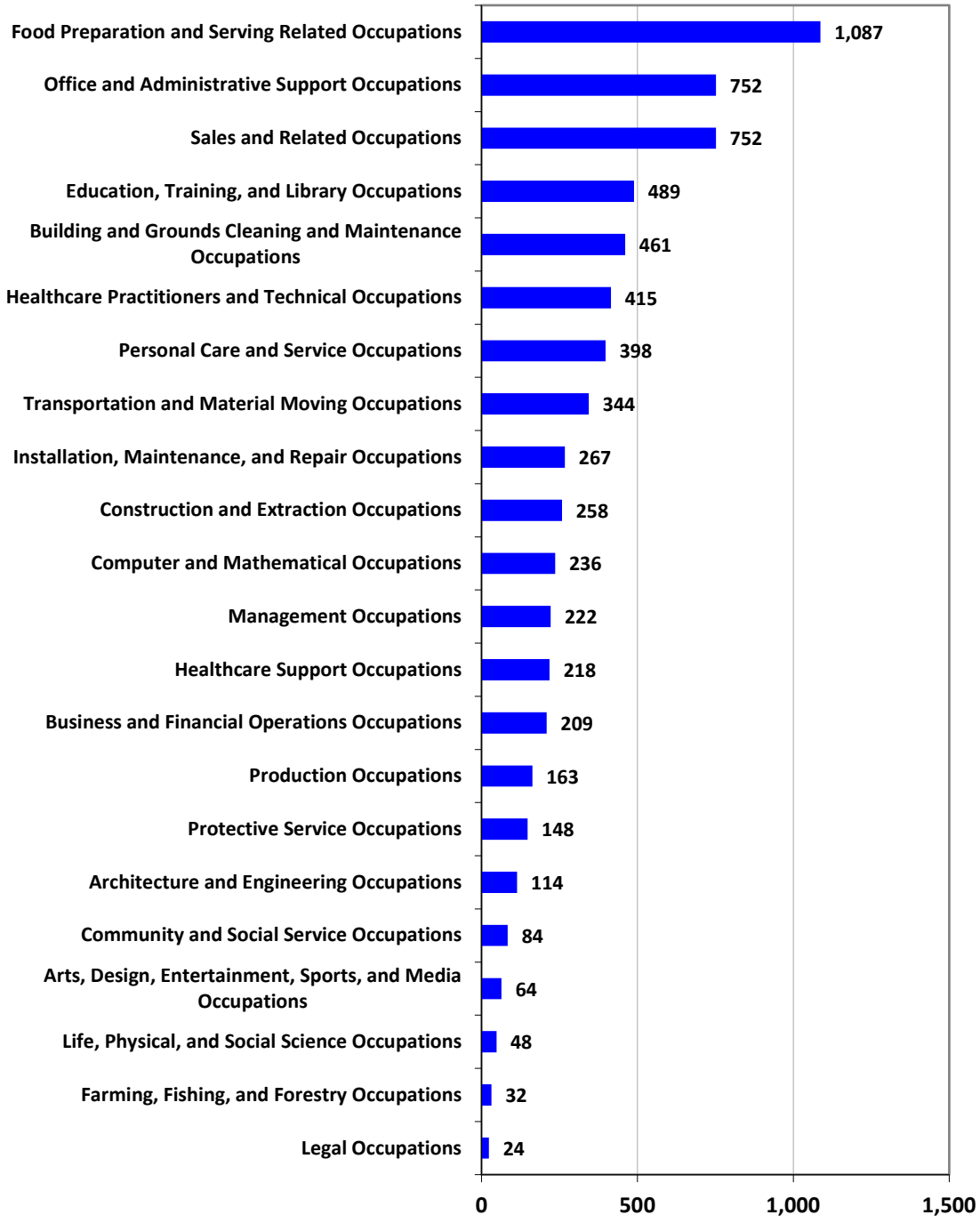

Figure 10: Average Annual Openings in Region 6 by Major Occupation Category – 2012 to 2022[28]

[28] *Data Source*: Virginia Employment Commission.

Regional Supply of Completers

To estimate the regional supply of completers from those education and training programs identified in the demand analysis, we use 2014-15 completions data from the U.S. Department of Education's IPEDS Data Center for all post-secondary institutions within Region 6.[29]

Comparing Demand and Supply

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 entrance into that occupation.[30] It is important to realize that these relationships are often many-to-many (one occupation maps into multiple programs, or one program maps into multiple occupations). Our approach specifically takes this into account by "allocating" completers across occupations based on the number of annual openings associated with each occupation. Through this process, we are able to use the occupational employment projections for Region 6 to estimate the occupation-driven demand for trained workers in Region 6.

Caveats

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

- Some multi-campus institutions report enrollment and completion data to the IPEDS Data Center through their main campus only. As a practical matter, this means that all enrollment and completions are reported "as if" they occurred at the main campus.
- Post-secondary institutions do not report completions for non-credit or specialized workforce training classes to the IPEDS Data center. As a result, completers from these programs may not be captured in the pipeline of completers graduating from regional post-secondary education programs.
- For these reasons, the training "gaps" identified in this section are correctly viewed as "potential" gaps in the regional pipeline of trained workers. They identify areas where there may be an insufficient supply of programs or program graduates within the region, and where further conversations with employers and educators/training providers may be advisable.

Percentage of Regional Need Met

[29] More specifically, those data capture degree and certificate completions in 2014-15 from the University of Mary Washington, Virginia Baptist College, Germanna Community College, and Rappahannock Community College.
[30] The National Crosswalk Service Center is funded by the U.S. Department of Labor, Employment and Training Administration.

Complete detail on the results obtained from a comparison of the occupation-driven demand for trained workers in Mary Ball Washington GO Virginia Region 6, to the pipeline of completers graduating from regional post-secondary education programs, is provided in the Appendix to this report. In the interest of brevity and clarity, Tables 86 through 101 draw from those data to provide a listing of only those occupations associated with each of the previously identified sixteen high-performance industry clusters where a potential gap exists – where our analysis indicates there may be an insufficient supply of programs or program graduates within the region to meet the demand for trained workers in that occupation.

In these tables:

- Occupation: Is an occupation within the specified cluster.
- Avg. Annual Openings: Is the projected number of average annual openings for the given occupation over the period from 2012 to 2022.
- Typical Educ. Level: Is the level of educational attainment typically associated with the given occupation.
- Cert <1: Is the number of 2014-15 completers from education and training programs in Region 6 associated with the given occupation that received a less than one year certificate.
- Cert >1 <2: Is the number of 2014-15 completers from education and training programs in Region 6 associated with the given occupation that received a more than one year, but less than two year certificate.
- Assoc: Is the number of 2014-15 completers from education and training programs in Region 6 associated with the given occupation that received an Associates degree.
- BA: Is the number of 2014-15 completers from education and training programs in Region 6 associated with the given occupation that received a Baccalaureate degree.
- MA: Is the number of 2014-15 completers from education and training programs in Region 6 associated with the given occupation that received a Masters degree.
- Total Comp.: Is the total number of 2014-15 completions from education and training programs in Region 6 associated with the given occupation.
- % of Need Met: Is the percentage of demand for trained workers in the given occupation that was met through regional education and training programs.

Many of the gaps identified in Table 86 through Table 101 pertain to occupations that typically require a baccalaureate degree. The primary reason for this is that there is only one four-year

degree granting post-secondary education institution in Region 6 – the University of Mary Washington in the City of Fredericksburg. In all likelihood, many of these shortfalls would actually be filled by graduates from institutions that are outside of the region.

However, there are some instances, particularly in "middle-skill" occupations that require a less than two-year post-secondary certificate, where the identified gaps could potentially be problematic. Those occupations are:

- Bus and Truck Mechanics and Diesel Engine Specialists
- Electrical Power Line Installers and Repairers
- Electricians
- Emergency Medical Technicians
- Heavy and Tractor Trailer Truck Drivers
- Heating, Air Conditioning, and Refrigeration Mechanics
- Industrial Machinery Mechanics
- Mobile Heavy Equipment Mechanics
- Motorboat Mechanics and Service Technicians

Table 86: Agriculture Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Heavy and Tractor-Trailer Truck Drivers	64	HS						0	0%
Computer User Support Specialists	19	BA						0	0%
Industrial Machinery Mechanics	14	Cert						0	0%
Bus and Truck Mechanics and Diesel Engine Specialists	11	HS						0	0%

Table 87: Education Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Childcare Workers	94	HS	11	10	9			30	32%
Middle School Teachers, Except Special and Career/Technical	51	BA						0	0%
Heating, Air Conditioning, and Refrigeration Mechanics and I	33		4					4	12%
Physical Therapists	25	MA						0	0%
Information Security Analysts	22	BA						0	0%
Computer User Support Specialists	19	BA						0	0%

Table 87: Education Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Market Research Analysts and Marketing Specialists	15	BA						0	0%
Child, Family, and School Social Workers	15	BA						0	0%
Medical and Health Services Managers	14	BA						0	0%
Education Administrators, Elementary and Secondary School	13	MA						0	0%
Bus and Truck Mechanics and Diesel Engine Specialists	11	HS						0	0%
Human Resources Specialists	10	BA						0	0%
Educational, Guidance, School, and Vocational Counselors	10	MA						0	0%
Social and Human Service Assistants	10	BA						0	0%
Kindergarten Teachers, Except Special Education	10	BA						0	0%
Occupational Therapists	10	MA						0	0%
Purchasing Agents, Except Wholesale, Retail, and Farm Produc	9	BA						0	0%
Training and Development Specialists	9	BA						0	0%
Civil Engineers	9	BA						0	0%
Electricians	9	Cert						0	0%
Career/Technical Education Teachers, Secondary School	8	BA						0	0%

Table 87: Education Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Special Education Teachers, Secondary School	8	BA						0	0%
Librarians	8	MA						0	0%
Budget Analysts	6	BA						0	0%
Operations Research Analysts	6	MA						0	0%
Library Technicians	6	BA						0	0%
Coaches and Scouts	6	BA						0	0%
Special Education Teachers, Middle School	5	BA						0	0%
Public Relations Specialists	4	BA						0	0%
Instructional Coordinators	3	MA						0	0%
Occupational Health and Safety Specialists	3	BA						0	0%
Data Entry Keyers	2	HS						0	0%

Table 88: Finance and Insurance Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Information Security Analysts	22	BA						0	0%
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	33		4					4	12%

Table 88: Finance and Insurance Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Computer User Support Specialists	19	BA						0	0%
Market Research Analysts and Marketing Specialists	15	BA						0	0%
Human Resources Specialists	10	BA						0	0%
Training and Development Specialists	9	BA						0	0%
Insurance Sales Agents	9	BA						0	0%
Securities, Commodities, and Financial Services Sales Agents	8							0	0%
Loan Officers	7	BA						0	0%
Budget Analysts	6	BA						0	0%
Operations Research Analysts	6	MA						0	0%
Meeting, Convention, and Event Planners	5	BA						0	0%
Public Relations Specialists	4	BA						0	0%
Financial Analysts	3	BA						0	0%
First-Line Supervisors of Non-Retail Sales Workers	3	BA						0	0%
Loan Interviewers and Clerks	2	Assoc						0	0%

Table 89: Information Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Computer User Support Specialists	19	BA						0	0%
Market Research Analysts and Marketing Specialists	15	BA						0	0%
Human Resources Specialists	10	BA						0	0%
Librarians	8	MA						0	0%
Library Technicians	6	BA						0	0%
Meeting, Convention, and Event Planners	5	BA						0	0%
Editors	5	BA						0	0%
Technical Writers	5	Assoc						0	0%
Advertising Sales Agents	4	BA						0	0%
First-Line Supervisors of Non-Retail Sales Workers	3	BA						0	0%

Table 90: Manufacturing, Computer and Electronics Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Information Security Analysts	22	BA						0	0%
Computer User Support Specialists	19	BA						0	0%
Mechanical Engineers	19	BA						0	0%
Electronics Engineers, Except Computer	13	BA						0	0%

Table 90: Manufacturing, Computer and Electronics Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Electrical Engineers	12	BA						0	0%
Purchasing Agents, Except Wholesale, Retail, and Farm Products	9	BA						0	0%
Sales Representatives, Wholesale and Manufacturing, Technical	5	BA						0	0%

Table 91: Manufacturing, Fabricated Metal Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Sales Representatives, Wholesale and Manufacturing, Except T	27	BA						0	0%
Industrial Machinery Mechanics	14	Cert						0	0%
Purchasing Agents, Except Wholesale, Retail, and Farm Products	9	BA						0	0%

Table 92: Manufacturing, Food and Beverage Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Heavy and Tractor-Trailer Truck Drivers	64	HS						0	0%
Heating, Air Conditioning, and Refrigeration Mechanics and I	33		4					4	12%
Medical and Health Services Managers	14	BA						0	0%
Industrial Machinery Mechanics	14	Cert						0	0%
Human Resources Specialists	10	BA						0	0%
Purchasing Agents, Except Wholesale, Retail, and Farm Produc	9	BA						0	0%
Electricians	9	Cert						0	0%
Industrial Engineers	7	BA						0	0%
Occupational Health and Safety Specialists	3	BA						0	0%

Table 93: Manufacturing, Plastics, Rubber, and Nonmetallic Mineral Products Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Heavy and Tractor-Trailer Truck Drivers	64	HS						0	0%

Table 93: Manufacturing, Plastics, Rubber, and Nonmetallic Mineral Products Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Sales Representatives, Wholesale and Manufacturing, Except T	27	BA						0	0%
Mechanical Engineers	19	BA						0	0%
Market Research Analysts and Marketing Specialists	15	BA						0	0%
Industrial Machinery Mechanics	14	Cert						0	0%
Bus and Truck Mechanics and Diesel Engine Specialists	11	HS						0	0%
Human Resources Specialists	10	BA						0	0%
Purchasing Agents, Except Wholesale, Retail, and Farm Produc	9	BA						0	0%
Electricians	9	Cert						0	0%
Industrial Engineers	7	BA						0	0%
Occupational Health and Safety Specialists	3	BA						0	0%
First-Line Supervisors of Non-Retail Sales Workers	3	BA						0	0%

Table 94: Manufacturing, Miscellaneous Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Mechanical Engineers	19	BA						0	0%

Table 94: Manufacturing, Miscellaneous Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Market Research Analysts and Marketing Specialists	15	BA						0	0%
Industrial Machinery Mechanics	14	Cert						0	0%
Purchasing Agents, Except Wholesale, Retail, and Farm Produc	9	BA						0	0%
Training and Development Specialists	9	BA						0	0%
Industrial Engineers	7	BA						0	0%
Sales Representatives, Wholesale and Manufacturing, Technica	5	BA						0	0%
Occupational Health and Safety Specialists	3	BA						0	0%
First-Line Supervisors of Non-Retail Sales Workers	3	BA						0	0%

Table 95: Manufacturing, Wood Products Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Sales Representatives, Wholesale and Manufacturing, Except T	27	BA						0	0%
Computer User Support Specialists	19	BA						0	0%
Mechanical Engineers	19	BA						0	0%

Table 95: Manufacturing, Wood Products Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Industrial Machinery Mechanics	14	Cert						0	0%
Electrical Engineers	12	BA						0	0%
Human Resources Specialists	10	BA						0	0%
Purchasing Agents, Except Wholesale, Retail, and Farm Produc	9	BA						0	0%
Industrial Engineers	7	BA						0	0%
First-Line Supervisors of Non-Retail Sales Workers	3	BA						0	0%

Table 96: Mining and Quarrying Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Heavy and Tractor-Trailer Truck Drivers	64	HS						0	0%
Industrial Machinery Mechanics	14	Cert						0	0%
Bus and Truck Mechanics and Diesel Engine Specialists	11	HS						0	0%
Mobile Heavy Equipment Mechanics, Except Engines	4	Cert						0	0%

Table 97: Professional, Scientific, Technical Services, and Management of Companies Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Heavy and Tractor-Trailer Truck Drivers	64	HS						0	0%
Software Developers, Systems Software	32	BA						0	0%
Sales Representatives, Wholesale and Manufacturing, Except T	27	BA						0	0%
Information Security Analysts	22	BA						0	0%
Computer User Support Specialists	19	BA						0	0%
Mechanical Engineers	19	BA						0	0%
Market Research Analysts and Marketing Specialists	15	BA						0	0%
Medical and Health Services Managers	14	BA						0	0%
Industrial Machinery Mechanics	14	Cert						0	0%
Electronics Engineers, Except Computer	13	BA						0	0%
Electrical Engineers	12	BA						0	0%
Bus and Truck Mechanics and Diesel Engine Specialists	11	HS						0	0%
Human Resources Specialists	10	BA						0	0%
Educational, Guidance, School, and Vocational Counselors	10	MA						0	0%
Social and Human Service Assistants	10	BA						0	0%

Table 97: Professional, Scientific, Technical Services, and Management of Companies Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Purchasing Agents, Except Wholesale, Retail, and Farm Produc	9	BA						0	0%
Training and Development Specialists	9	BA						0	0%
Civil Engineers	9	BA						0	0%
Mental Health Counselors	9	MA						0	0%
Lawyers	9	Doc						0	0%
Electricians	9	Cert						0	0%
Librarians	8	MA						0	0%
Logisticians	7	BA						0	0%
Loan Officers	7	BA						0	0%
Industrial Engineers	7	BA						0	0%
Budget Analysts	6	BA						0	0%
Operations Research Analysts	6	MA						0	0%
Meeting, Convention, and Event Planners	5	BA						0	0%
Aerospace Engineers	5	BA						0	0%
Editors	5	BA						0	0%
Technical Writers	5	Assoc						0	0%
Sales Representatives, Wholesale and Manufacturing, Technica	5	BA						0	0%
Construction and Building Inspectors	5	Cert						0	0%

Table 97: Professional, Scientific, Technical Services, and Management of Companies Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Computer Hardware Engineers	4	BA						0	0%
Public Relations Specialists	4	BA						0	0%
Financial Analysts	3	BA						0	0%
Occupational Health and Safety Specialists	3	BA						0	0%
First-Line Supervisors of Non-Retail Sales Workers	3	BA						0	0%
Loan Interviewers and Clerks	2	Assoc						0	0%

Table 98: Tourism Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Emergency Medical Technicians and Paramedics	45	Cert	15					15	33%
Market Research Analysts and Marketing Specialists	15	BA						0	0%
First-Line Supervisors of Personal Service Workers	13	BA						0	0%
Fitness Trainers and Aerobics Instructors	12	BA						0	0%
Human Resources Specialists	10	BA						0	0%
Motorboat Mechanics and Service Technicians	9	Cert						0	0%
Coaches and Scouts	6	BA						0	0%

Table 98: Tourism Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Meeting, Convention, and Event Planners	5	BA						0	0%

Table 99: Transportation and Warehousing Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Heavy and Tractor-Trailer Truck Drivers	64	HS						0	0%
Heating, Air Conditioning, and Refrigeration Mechanics and I	33		4					4	12%
Sales Representatives, Wholesale and Manufacturing, Except T	27	BA						0	0%
Bus and Truck Mechanics and Diesel Engine Specialists	11	HS						0	0%
Human Resources Specialists	10	BA						0	0%
Electricians	9	Cert						0	0%
Motorboat Mechanics and Service Technicians	9	Cert						0	0%
Logisticians	7	BA						0	0%

Table 100: Utilities Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Budget Analysts	6	BA						0	0%
Financial Analysts	3	BA						0	0%
Civil Engineers	9	BA						0	0%
Electrical Engineers	12	BA						0	0%
Occupational Health and Safety Specialists	3	BA						0	0%
Electricians	9	Cert						0	0%
Electrical Power-Line Installers and Repairers	5	Cert						0	0%

Table 101: Wholesale Trade Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Heavy and Tractor-Trailer Truck Drivers	64	HS						0	0%
Heating, Air Conditioning, and Refrigeration Mechanics and I	33		4					4	12%
Software Developers, Systems Software	32	BA						0	0%
Sales Representatives, Wholesale and Manufacturing, Except T	27	BA						0	0%
Computer User Support Specialists	19	BA						0	0%

Table 101: Wholesale Trade Cluster – Potential Regional Gaps in Pipeline of Trained Workers

Occupation	Occupational Demand		Supply of Completers						% of Need Met
	Avg. Annual Openings	Typical Educ. Level	Cert <1	Cert >1 <2	Assoc	BA	MA	Total Comp.	
Market Research Analysts and Marketing Specialists	15	BA						0	0%
Electrical Engineers	12	BA						0	0%
Bus and Truck Mechanics and Diesel Engine Specialists	11	HS						0	0%
Human Resources Specialists	10	BA						0	0%
Training and Development Specialists	9	BA						0	0%
Logisticians	7	BA						0	0%
Technical Writers	5	Assoc						0	0%
Sales Representatives, Wholesale and Manufacturing, Technica	5	BA						0	0%
Public Relations Specialists	4	BA						0	0%
Mobile Heavy Equipment Mechanics, Except Engines	4	Cert						0	0%
First-Line Supervisors of Non-Retail Sales Workers	3	BA						0	0%

Commuting Analysis

Tables 102 through 117 provide detailed data on the commuting patterns in Mary Ball Washington GO Virginia Region 6 and the three Planning Districts that comprise Region 6 in 2014. As these data show, Region 6 and each of its three Planning Districts experienced a significant net out-flow of workers in 2014. More specifically:

- Region 6: In 2014, 39,940 workers commuted into Region 6 from localities outside of the region, while 115,352 workers commuted out of Region 6 from localities within the region, for a net out-flow of 75,412 workers.
- George Washington Planning District: In 2014, 39,326 workers commuted into George Washington Planning District from localities outside of the district, while 78,012 workers commuted out of George Washington Planning District from localities within the district, for a net out-flow of 38,686 workers.
- Middle Peninsula Planning District: In 2014, 9,928 workers commuted into Middle Peninsula Planning District from localities outside of the district, while 33,902 workers commuted out of Middle Peninsula Planning District from localities within the district, for a net out-flow of 23,974 workers.
- Northern Neck Planning District: In 2014, 4,655 workers commuted into Northern Neck Planning District from localities outside of the district, while 14,817 workers commuted out of Northern Neck Planning District from localities within the district, for a net out-flow of 10,162 workers.

Out-Commute

Table 102: Individuals that Out-Commute from a Region 6 Locality to Another Locality[31]

Out-Commute to Another Locality	Out-Commute to a Locality Within Region 6	Out-Commute to a Locality Outside of Region 6
198,160	82,808	115,352

Table 103: Top 10 Destinations Localities for Out-Commuters from Region 6 [32]

Out-Commute to	Out-Commute from Region 6	% of Total Out-Commuters from Region 6
Fairfax County, VA	19,240	16.7%
Prince William County, VA	11,427	9.9%
District of Columbia, DC	7,263	6.3%
Henrico County, VA	6,956	6.0%
Newport News city, VA	6,173	5.4%
Hanover County, VA	4,963	4.3%
Richmond city, VA	4,480	3.9%
Arlington County, VA	3,455	3.0%
Chesterfield County, VA	3,152	2.7%
Loudoun County, VA	3,091	2.7%

[31] *Data Source*: U.S. Census Bureau, Center for Economic Studies, Longitudinal Employer-Household Dynamics (LEHD) program, 2014 data.
[32] *Data Source*: U.S. Census Bureau, Center for Economic Studies, Longitudinal Employer-Household Dynamics (LEHD) program, 2014 data.

In-Commute

Table 104: Individuals that In-Commute to a Region 6 Locality[33]

In-Commute to a Locality Within Region 6	In-Commute from a Locality Within Region 6	In-Commute from a Locality Outside of Region 6
113,402	73,462	39,940

Table 105: Top 10 Origination Localities for In-Commuters to Region 6[34]

In-Commute from	In-Commute to Region 6	% of Total In-Commuters to Region 6
Prince William County, VA	4,449	11.1%
Fairfax County, VA	2,898	7.3%
Loudoun County, VA	1,795	4.5%
Henrico County, VA	1,694	4.2%
Hanover County, VA	1,525	3.8%
Orange County, VA	1,517	3.8%
Chesterfield County, VA	1,421	3.6%
Virginia Beach city, VA	1,291	3.2%
Newport News city, VA	1,281	3.2%
Culpeper County, VA	1,011	2.5%

[33] *Data Source*: U.S. Census Bureau, Center for Economic Studies, Longitudinal Employer-Household Dynamics (LEHD) program, 2014 data.
[34] *Data Source*: U.S. Census Bureau, Center for Economic Studies, Longitudinal Employer-Household Dynamics (LEHD) program, 2014 data.

Out-Commute

Table 106: Individuals that Out-Commute from a George Washington Planning District Locality to Another Locality[35]

Out-Commute to Another Locality	Out-Commute to a Locality Within George Washington	Out-Commute to a Locality Outside of George Washington
140,213	62,201	78,012

Table 107: Top 10 Destinations Localities for Out-Commuters from George Washington Planning District [36]

Out-Commute to	Out-Commute from George Washington	% of Total Out-Commuters from George Washington
Fairfax County, VA	17,927	23.0%
Prince William County, VA	11,205	14.4%
District of Columbia, DC	6,520	8.4%
Henrico County, VA	3,305	4.2%
Arlington County, VA	3,073	3.9%
Loudoun County, VA	2,859	3.7%
Alexandria city, VA	2,576	3.3%
Hanover County, VA	2,451	3.1%
Richmond city, VA	1,863	2.4%
Chesterfield County, VA	1,409	1.8%

[35] *Data Source*: U.S. Census Bureau, Center for Economic Studies, Longitudinal Employer-Household Dynamics (LEHD) program, 2014 data.
[36] *Data Source*: U.S. Census Bureau, Center for Economic Studies, Longitudinal Employer-Household Dynamics (LEHD) program, 2014 data.

In-Commute

Table 108: Individuals that In-Commute to a George Washington Planning District Locality[37]

In-Commute to a Locality Within George Washington	In-Commute from a Locality Within George Washington	In-Commute from a Locality Outside of George Washington
101,527	62,201	39,326

Table 109: Top 10 Origination Localities for In-Commuters to George Washington Planning District [38]

In-Commute from	In-Commute to George Washington	% of Total In-Commuters to George Washington
Prince William County, VA	4,916	12.5%
Fairfax County, VA	3,398	8.6%
Loudoun County, VA	2,158	5.5%
Orange County, VA	1,994	5.1%
Henrico County, VA	1,405	3.6%
Westmoreland County, VA	1,370	3.5%
Hanover County, VA	1,241	3.2%
Chesterfield County, VA	1,231	3.1%
Fauquier County, VA	1,210	3.1%
Culpeper County, VA	1,195	3.0%

[37] *Data Source*: U.S. Census Bureau, Center for Economic Studies, Longitudinal Employer-Household Dynamics (LEHD) program, 2014 data.
[38] *Data Source*: U.S. Census Bureau, Center for Economic Studies, Longitudinal Employer-Household Dynamics (LEHD) program, 2014 data.

Out-Commute

Table 110: Individuals that Out-Commute from a Middle Peninsula Planning District Locality to Another Locality[39]

Out-Commute to Another Locality	Out-Commute to a Locality Within Middle Peninsula	Out-Commute to a Locality Outside of Middle Peninsula
45,727	11,825	33,902

Table 111: Top 10 Destinations Localities for Out-Commuters from Middle Peninsula Planning District [40]

Out-Commute to	Out-Commute from Middle Peninsula	% of Total Out-Commuters from Middle Peninsula
Newport News city, VA	5,006	14.8%
Henrico County, VA	3,083	9.1%
Hanover County, VA	2,187	6.5%
Richmond city, VA	2,127	6.3%
James City County, VA	2,084	6.1%
York County, VA	1,652	4.9%
Hampton city, VA	1,443	4.3%
Fairfax County, VA	1,330	3.9%
Chesterfield County, VA	1,283	3.8%
Virginia Beach city, VA	1,235	3.6%

[39] *Data Source*: U.S. Census Bureau, Center for Economic Studies, Longitudinal Employer-Household Dynamics (LEHD) program, 2014 data.
[40] *Data Source*: U.S. Census Bureau, Center for Economic Studies, Longitudinal Employer-Household Dynamics (LEHD) program, 2014 data.

In-Commute

Table 112: Individuals that In-Commute to a Middle Peninsula Planning District Locality[41]

In-Commute to a Locality Within Middle Peninsula	In-Commute from a Locality Within Middle Peninsula	In-Commute from a Locality Outside of Middle Peninsula
21,753	11,825	9,928

Table 113: Top 10 Origination Localities for In-Commuters to Middle Peninsula Planning District [42]

In-Commute from	In-Commute to Middle Peninsula	% of Total In-Commuters to Middle Peninsula
Newport News city, VA	848	8.5%
James City County, VA	525	5.3%
York County, VA	501	5.0%
Henrico County, VA	445	4.5%
Hanover County, VA	418	4.2%
Richmond County, VA	388	3.9%
Lancaster County, VA	374	3.8%
Chesterfield County, VA	371	3.7%
Northumberland County, VA	371	3.7%
Hampton city, VA	359	3.6%

[41] *Data Source*: U.S. Census Bureau, Center for Economic Studies, Longitudinal Employer-Household Dynamics (LEHD) program, 2014 data.
[42] *Data Source*: U.S. Census Bureau, Center for Economic Studies, Longitudinal Employer-Household Dynamics (LEHD) program, 2014 data.

Out-Commute

Table 114: Individuals that Out-Commute from a Northern Neck Planning District Locality to Another Locality[43]

Out-Commute to Another Locality	Out-Commute to a Locality Within Northern Neck	Out-Commute to a Locality Outside of Northern Neck
22,535	7,718	14,817

Table 115: Top 10 Destinations Localities for Out-Commuters from Northern Neck Planning District [44]

Out-Commute to	Out-Commute from Northern Neck	% of Total Out-Commuters from Northern Neck
Lancaster County, VA	2,676	18.1%
Westmoreland County, VA	1,991	13.4%
Northumberland County, VA	1,633	11.0%
Richmond County, VA	1,418	9.6%
Fairfax County, VA	978	6.6%
Henrico County, VA	769	5.2%
Newport News city, VA	698	4.7%
District of Columbia, DC	665	4.5%
Essex County, VA	620	4.2%
King George County, VA	601	4.1%

[43] *Data Source*: U.S. Census Bureau, Center for Economic Studies, Longitudinal Employer-Household Dynamics (LEHD) program, 2014 data.
[44] *Data Source*: U.S. Census Bureau, Center for Economic Studies, Longitudinal Employer-Household Dynamics (LEHD) program, 2014 data.

In-Commute

Table 116: Individuals that In-Commute to a Northern Neck Planning District Locality[45]

In-Commute to a Locality Within Region 6	In-Commute from a Locality Within Northern Neck	In-Commute from a Locality Outside of Northern Neck
12,373	7,718	4,655

Table 117: Top 10 Origination Localities for In-Commuters to Northern Neck Planning District [46]

In-Commute from	In-Commute to Northern Neck	% of Total In-Commuters to Northern Neck
Essex County, VA	413	8.9%
Middlesex County, VA	309	6.6%
Stafford County, VA	189	4.1%
Gloucester County, VA	182	3.9%
Caroline County, VA	154	3.3%
Prince William County, VA	145	3.1%
Henrico County, VA	135	2.9%
King George County, VA	124	2.7%
Fairfax County, VA	121	2.6%
Accomack County, VA	109	2.3%

[45] *Data Source*: U.S. Census Bureau, Center for Economic Studies, Longitudinal Employer-Household Dynamics (LEHD) program, 2014 data.
[46] *Data Source*: U.S. Census Bureau, Center for Economic Studies, Longitudinal Employer-Household Dynamics (LEHD) program, 2014 data.

Conclusion

Consistent with the requirements of the GO Virginia initiative, this report has provided an empirical assessment of economic and labor market conditions within Mary Ball Washington GO Virginia Region 6. What that assessment has shown is that Region 6 has a diverse and growing economy, but that there are significant differences and disparities among the three Planning Districts that comprise Region 6 – George Washington, Middle Peninsula, and Northern Neck.

For example, where George Washington and Middle Peninsula out-performed the state in employment growth over the last five years, Northern Neck suffered declines in employment. Similarly, where Middle Peninsula and Northern Neck out-performed the state in wage growth over the last five years, George Washington did not. There are also significant differences in the make-up and relative importance of each Planning District's industry base. For example, where the biggest wage drivers in George Washington are the *Professional, Scientific, and Technical Services* and *Finance and Insurance* sectors, in Middle Peninsula and Northern Neck they are the *Manufacturing* and *Construction* sectors.

Similarly, where *Aquaculture*; *Commercial Logging*; *Seafood Preparation and Packaging*; *Paper Mills*; and *Tourism* are high performance industries in either or both the Middle Peninsula and Northern Neck, in George Washington they are not. While *Telecommunications*; *Computer and Electronics Products Manufacturing*; *Fabricated Metal Manufacturing*; *Plastics, Rubber, and Nonmetallic Mineral Products Manufacturing*; *Millwork*; *Prefabricated Wood Building Products Manufacturing*; and *Wood Windows and Doors Manufacturing* are high performance industries in George Washington, but not in Middle Peninsula or Northern Neck.

Collectively, however, Mary Ball Washington GO Virginia Region 6 exhibits a diverse economy with a broad range of high-performing industries. Using a Composite Economic Performance Index that took into account relative employment footprint, short-term and long-term employment growth, short-term and long-term wage growth, industry wage as a proportion of the average wage for the region, proportion of industry output exported out of Region 6, and industry employment multiplier, our analysis identified 85 economic driver industries in Region 6 (and 80 in George Washington, 57 in Middle Peninsula, and 43 in Northern Neck). And building on that analysis of regional and sub-regional economic drivers, we were able to identify sixteen high-performance industry clusters within Region 6 that are comprised of "traded" or export oriented industries.

Our analysis also showed that, in general, Region 6 has a sufficient available incumbent labor pool to support each of the sixteen identified high-performance industry clusters. Moreover, because Region 6 as a whole, and each of its three Planning Districts individually, currently experience a significant out-flow residents who commute to localities outside of the region to work, it is highly likely that the region's potentially available labor pool greatly exceeds its current occupational employment. However, our analysis also showed that potential bottle necks exist in some "middle skill" occupations such as Electricians and Industrial Mechanics.

In sum, our analysis has shown that Mary Ball Washington GO Virginia Region 6 enjoys a growing and diverse economy, with a substantially untapped pool of resident labor that currently commutes to work in neighboring localities.