



GROWTH & DIVERSIFICATION PLAN

AUGUST
2019



Region One Vision

Southwest Virginia is a vibrant and robust region with a diversified and growing population and economy.

Region One Mission

We make investments in our assets: human, community, natural, and structural. Our diversification plan guides our investments to grow new clusters and strengthen emerging and existing industries.

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EXECUTIVE SUMMARY

In the summer of 2017, the GO Virginia Region One Council published the first Growth and Diversification Plan for the thirteen counties and three cities which comprise Region One. This release represents an update to the original plan providing adjusted priorities in some areas as well as an evaluation of progress and challenges encountered over the past two years.

The Virginia Initiative for Growth and Opportunity otherwise known as GO Virginia (GO VA) was created by the passage of legislation during the 2016 General Assembly session. The effort exists to promote private sector job growth and diversification throughout the Commonwealth, emphasizing high wage careers and regional collaboration across all segments of the job market. Recognizing the vast differences of the economic landscape across the Commonwealth, the 2016 legislation required each region to develop its own diversification plan and update it at least every two years.

Region One Overview

Home to an estimated population of 389,173, Region One is located in the southwest corner of the Commonwealth. Impacted heavily by the sharp decline in the energy sector since 2012, the region



has the weakest economic growth of all of the nine GO Virginia regions in the Commonwealth with a 0.2% employment decline in the four quarters ending with December 2018. This is compared to 1.6% employment growth in the state and 1.5% in the nation over the same period.

Adjacent to four other states (Kentucky, North Carolina, Tennessee and West Virginia), Region One has access to a labor shed with a population of almost 1.3 million people. Population in the broader labor shed is projected to grow by .1% per year through 2029. Unfortunately, the same cannot be said about Region One. The population decline in far Southwest Virginia is accelerating and is projected to lose 17,942 people through 2029. This is compared to 8,119 when the plan was completed two years ago. *This metric alone underscores the significance of GO Virginia Region One's work, which must include reversing the accelerating decline.*

Growth and Diversification Plan

The GO Virginia Region One Growth and Diversification Plan identifies and prioritizes economic opportunities, needs and challenges facing the region and is designed to assist the regional council in evaluating which potential projects best address the identified priorities. It outlines the needed enhancements where GO Virginia grant funds may support collaborative programs between at least two or more localities that will lead to the creation of higher paying jobs. This plan guides the regional council's work to develop talent pipelines, grow existing businesses, encourage the entrepreneurial activity of the region and advance joint site and infrastructure development.

The Region One Growth and Diversification Plan **is not a strategic economic development plan for SWVA** nor is it envisioned to be comprehensive in addressing all the challenges that face the region. This plan

highlights priority areas that accomplish GO Virginia's goals, while still being flexible as the region's circumstances change or new ideas and opportunities arise.

Methodology

Incorporating input from a broad range of stakeholders in the updating of this Growth and Diversification Plan was a priority for the GO Virginia Region One Council. Sources of data, which informed the development of this plan, included a community online survey, regional stakeholder conversations including workgroup input, stakeholder interviews, and quantitative analysis of economic and demographic metrics provided by Chmura Economics and Analytics. Additionally, statewide initiatives such as TEconomy Partners and Virginia Research Investment Commission (VRIC) reports provided helpful data on which strategies related to scaling up business and developing an entrepreneurship ecosystem were designed.

In an attempt not to duplicate the various regional initiatives, which have developed since 2017, the Region One Council leveraged the input of regional stakeholders who have updated their strategic plans over the past two years.

The Region One Council considers the Growth and Diversification Plan to be a living document that will be updated on an ongoing basis as additional action plans, feasibility studies and stakeholder conversations evolve. As an example, results of the site selection characterization and community competitiveness reports conducted by the Virginia Economic Development Partnership will be incorporated into the plan as appropriate once those reports are available.

Highlights of Progress

Since the organization of GO Virginia Region One, seven projects have been funded totaling \$833,844.20. Region One has also participated in one competitive project in conjunction with Region Three. (See the Region One Implementation Overview section for a complete list of funded projects.)

After only two years of operations, it is unlikely that any change in regional metrics can be attributed to the work of GO Virginia. However, progress has been made as it relates to regional collaboration and project participation, which have set the stage for future initiatives.

Regional Collaboration

Incentivizing collaboration across jurisdictions is a priority of GO Virginia. Since the organization of the Region One Council and the development of the first Growth and Diversification Plan in 2017, two new Regional Industrial Facilities Authorities (RIFAs) have been formed. These include:

- Lonesome Pine RIFA (Counties of Dickenson, Lee, Scott, Wise, and the City of Norton)
- Cumberland Plateau RIFA (Counties of Buchanan, Tazewell, and Russell)

The effort to organize a RIFA is significant, but the benefits to members can be powerful. The creation of these two new RIFAs provides an excellent foundation on which regional collaboration is encouraged through the revenue sharing opportunities. The Blue Ridge Crossroads Economic Development Authority (BRCEDA) and the Smyth-Washington County Industrial Facilities Authority (SWIFA) were the only two RIFAs in Region One prior to the launch of GO Virginia.

Regional Participation

All of the thirteen counties and three cities in Region One are impacted by at least one of the approved projects and 100% of the counties and cities are actively participating in at least one project, including one local town.

Targeted Industries & Underpinning Strategies

The original Growth and Diversification Plan for Region One identified four targeted industries which had the best potential to grow and create higher paying employment opportunities. These include **agriculture and food/beverage manufacturing, information and emerging technologies, advanced manufacturing and energy and minerals**. After review of the quantitative data associated with these industry sectors and their significance to the region's economy, they remain the priorities of the Region One Council.

As the Region One Council canvassed the area for input on the update of the plan, the foundational strategies originally identified were affirmed and therefore will remain relatively the same. Additionally, the plan development benefitted from two years of experience with what projects were prioritized and funded at the state level. Thus, the 2019 regional strategy framework is in alignment with GO Virginia priorities and includes the following:

- Talent Development
- Sites and Infrastructure
- Innovation and Scale Up Support

This framework represents a practical yet aspirational approach to diversifying the region's economy and provides guidance to stakeholders as to the priorities of the Region One Council. These underpin all of the industry sectors operating in the region, supporting both existing and new employers. The chart below provides an overview of the priority strategies of Region One.

Talent Development Strategies
Strategy 1: Align education and training programs with needs and expectations of target industries; strengthen communication between educational providers and target industries
Strategy 2: Build a strong pipeline of participants for programs (certifications, associates, bachelors or above) valued by the target market employers; promote career pathways
Strategy 3: Increase awareness of occupational, educational, and workforce opportunities available in the region
Strategy 4: Increase industry recognized certifications, credentials and degrees related to the target industries

Sites and Infrastructure Strategies

Strategy 1: Ensure existing and new sites are certified for targeted industries; advance existing sites based upon the VEDP characterization study and fully leverage the Virginia Business Site Readiness Program (VBRSP)

Strategy 2: Assess and upgrade utilities and broadband to remain competitive

Strategy 3: Leverage newly created and existing Regional Industrial Facility Authorities (RIFAs) to establish larger, regional industrial sites attractive to the target industries

Innovation & Scale Up Support Strategies

Strategy 1: Develop approach to address recommendations in the Spring 2019 TEconomy Report (See appendix for select slides and priority actions.)

Strategy 2: Determine the region's approach to identifying a regional entrepreneurship and innovation "coordinating entity" to focus on high-growth company development and support

Strategy 3: Develop programming at all levels of the educational infrastructure supporting innovation and entrepreneurship

INTRODUCTION

Think Again – A challenge to reimagine Southwest Virginia.

SWVA: A different side of Virginia

As the current brand for the western counties of Virginia indicates, Southwest Virginia is a different side of Virginia. In fact, the eastern part of Virginia, the golden crescent, which encompasses Northern Virginia, Richmond and the Tidewater/Hampton Roads area of Virginia could not be more different than the thirteen counties and three cities, which comprise GO Virginia Region One. The vast differences of the Commonwealth are what make Virginia so unique.

However, one could also say that there are many different “sides” of SWVA itself. Slice the region and its metrics any way you want and you will find multiple sides of Southwest Virginia. There is the stunningly beautiful side of the region, which attracts thousands of visitors every year to experience the outdoor recreation, appreciate the artisanship and music as well as indulge in the local food. Guests to the region have come to love it for the authentic experiences and tourism, which Southwest Virginia has increased substantially over the past two decades with projections for this industry continuing to look bright.

Another side of the region is the quality of life experienced in small rural communities with their own distinct personalities and charm. Many of these communities are stops along the internationally recognized Crooked Road with family-friendly music venues meeting multiple times weekly.

For many, the region is home. Whether they are current residents or if they are among the thousands who have left to find employment, the mountains of Southwest Virginia are cherished. Many long to stay in the region they love or seek opportunities of returning home.

Although there are many sides of SWVA which are bright and prosperous, there are also sides of the region that cause concern and even alarm.

Health metrics related to heart disease, cancer, diabetes and substance abuse disorder provide an endless sea of obstacles for healthcare providers and coalitions across the broader region to join forces and combat. Employers will describe their workforce as loyal, hardworking and talented. However, the continued population decline negatively impacts access to qualified talent pools.

Regional educational attainment rates overshadow the tremendous successes of the region's high schools in achieving exceptional scores on the state's standards of learning and excellent graduate rates. The area's high schools have excelled in academic and technical fields of robotics, forensics, and drama. Yet, the loss of the region's young adults have skewed the educational attainment metrics so that if one does not *look beyond the numbers*, one would never know what exceptionally talented and bright students grow up in Southwest Virginia.

This growth and diversification plan for Southwest Virginia seeks to provide an *honest* look at the region's opportunities and challenges, offering a *realistic* view of the region. For it is only through truly identifying the region's challenges will the people of SWVA be able to address complex issues and realize true opportunities.

The advice offered to the readers of this plan is to *set aside preconceived notions* or understandings of the region. Read the pages to follow with an open mind. Your understanding of Virginia's Great Southwest may be right on target, but it may also be inaccurate. If there is a chance that you do not have the full story of SWVA, *you may not even know what you do not know*. Approaching this growth and diversification plan with an open mind may give you a new perspective of a region that has as many tremendous opportunities as it does complex challenges.

Think again about Southwest Virginia. Think of what it could be. Think of what its people have to offer if true potential is realized. Think of the assets and resources already present as well as those that the region may not be leveraging. Please do not think of the region as one you see in the rear-view mirror, but rather, as one that is in front of you. In front of us. One that is reimagined and leveraging every single asset and resource at its disposal.

When you think of Southwest Virginia, think again.



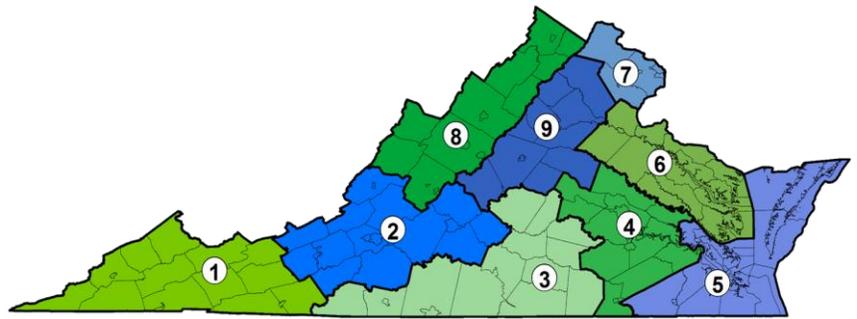
A different side of Virginia

GO VA: Virginia Initiative for Growth and Opportunity

GO Virginia is a bipartisan, business-led economic development initiative that is changing the way Virginia's diverse regions collaborate on economic and workforce development activities.

The Virginia Initiative for Growth and Opportunity (GO VA) was created by the passage of legislation during the 2016 General Assembly session with the

primary objectives to promote private sector job growth and diversification across the Commonwealth, emphasizing high wage careers, utilizing targeted incentives and encouraging regional collaboration across all segments of the job market.



Recognizing the vastness and variances of the economic landscape across Virginia, the Commonwealth is divided into nine regions, with each region having its own Regional Council. These councils, much like the statewide Board, are comprised of leaders across many sectors of the economic and workforce development landscape, with the majority of the council mandated to be private business leaders.

Region One Overview

Region One (GO VA 1) comprises thirteen counties and three cities in far Southwest Virginia with an estimated population of just over 389,000 at the time of this publication, making Region One among the least populated of the GO VA regions. While it would not be accurate to portray all of GO VA 1 as rural, it is generally characterized by mountainous terrain with many small towns and communities dotting the landscape and transportation challenges in many locales.

Much of GO VA 1 has been dependent upon natural resources – such as coal, timber, and natural gas – as its economic base for many generations, enjoying economic growth during boom times but enduring extreme economic difficulties during primary industry contractions. ***Echoing one of the forces behind the formation of GO Virginia, the economic leaders of the region have identified the volatility of relying upon a single source economy – regardless of what industry it may be – and are embracing the creation of a varied and robust economic base for its citizenry.***

What the Growth and Diversification Plan is, and what it is not...

GO Virginia is intended to facilitate regional collaboration to grow and diversify the economy through supporting projects leading to the creation of more higher paying jobs and addressing gaps in workforce and other factors that impact the success of growth and diversification programs at the regional level.

The GO Virginia Region One Growth and Diversification Plan identifies economic opportunities, needs and challenges facing the westernmost counties of Virginia. The plan establishes priorities among these opportunities and outlines the needed enhancements where GO Virginia Grant funds may support collaborative programs between at least two or more localities that will lead to the creation of higher

paying jobs. This plan guides the regional council, which is primarily employer and business led in supporting efforts to:

- a) develop, recruit and/or retain the talent needed in the region;
- b) grow existing businesses, develop existing clusters, scale up small and mid-sized companies;
- c) establish start-ups from commercializing research and supporting entrepreneurs; and
- d) advance joint site and infrastructure development needs towards business-readiness.

The plan is designed to assist the regional council in evaluating which potential projects best address the identified needs and opportunities but it is also flexible to incorporate new ideas and opportunities that may arise.

The Region One Growth and Diversification Plan is not a strategic economic development plan for SWVA nor is it envisioned to be comprehensive in addressing all the challenges that face the region. This plan highlights priority areas that accomplish GO Virginia's goals while still being flexible as the region's circumstances change.

Methodology of Region One's Updated Plan

In updating this Growth and Diversification Plan, the GO Virginia Region One Council emphasized the importance of seeking broad regional input through a variety of means. Sources of data, which informed the development of this plan, included an online community survey, regional stakeholder conversations including workgroup input, stakeholder interviews, and quantitative analysis of economic and demographic data provided by Chmura Economics and Analytics. Additionally, statewide initiatives such as the TEconomy Partners report provided helpful data on which strategies related to scaling up business and developing an entrepreneurship ecosystem were involved.

Since the development of the 2017 plan, which included regional conversations in each of the three planning districts comprising Region One, a number of strategic plans and initiatives have taken place which engaged stakeholders from various industry sectors from across the region.

The Region One Council leveraged the results of those efforts in the development of this plan in an attempt to not duplicate efforts and establish cohesion among key strategic partners or stakeholders. The data from these regional conversations are included in the appendix.

Similar to the development of the 2017 Growth and Diversification Plan, an online community survey was distributed in summer 2019 in order to gather input on the state of the region's economy and identify what stakeholders view as regional strengths, challenges, and opportunities. Over a three week period, 144 stakeholders responded to the survey, which included on average 25 questions depending on responses. The majority of respondents are full-time employed residents of Region One, aged between 55-64 and 35-44. More than 81% of respondents have lived in the region for ten years or more. When those who live in Region One were asked if they are considering leaving the region, 23% indicated yes for job opportunities and improved quality of life. The majority of respondents rated the economic situation poor as it related to employment growth, high wage job opportunities, and opportunities to utilize skills for which they were trained.

Aligning with Region One's industry targets, respondents indicated that economic developers should be attracting information technology and manufacturing industries to the region. Throughout the survey, the importance of attracting tourism and recreation, healthcare, and agriculture/agribusiness industries to the region was noted as well. Key regional challenges pointed to population decline, health concerns, and lack of industry growth. When asked what the Region One Council should consider when addressing the region's challenges, responses varied widely, but specified a large focus on jobs and workforce development including education opportunities, small business and entrepreneurship including manufacturing, and local and regional collaboration. Summarized survey results can be found in the appendix.

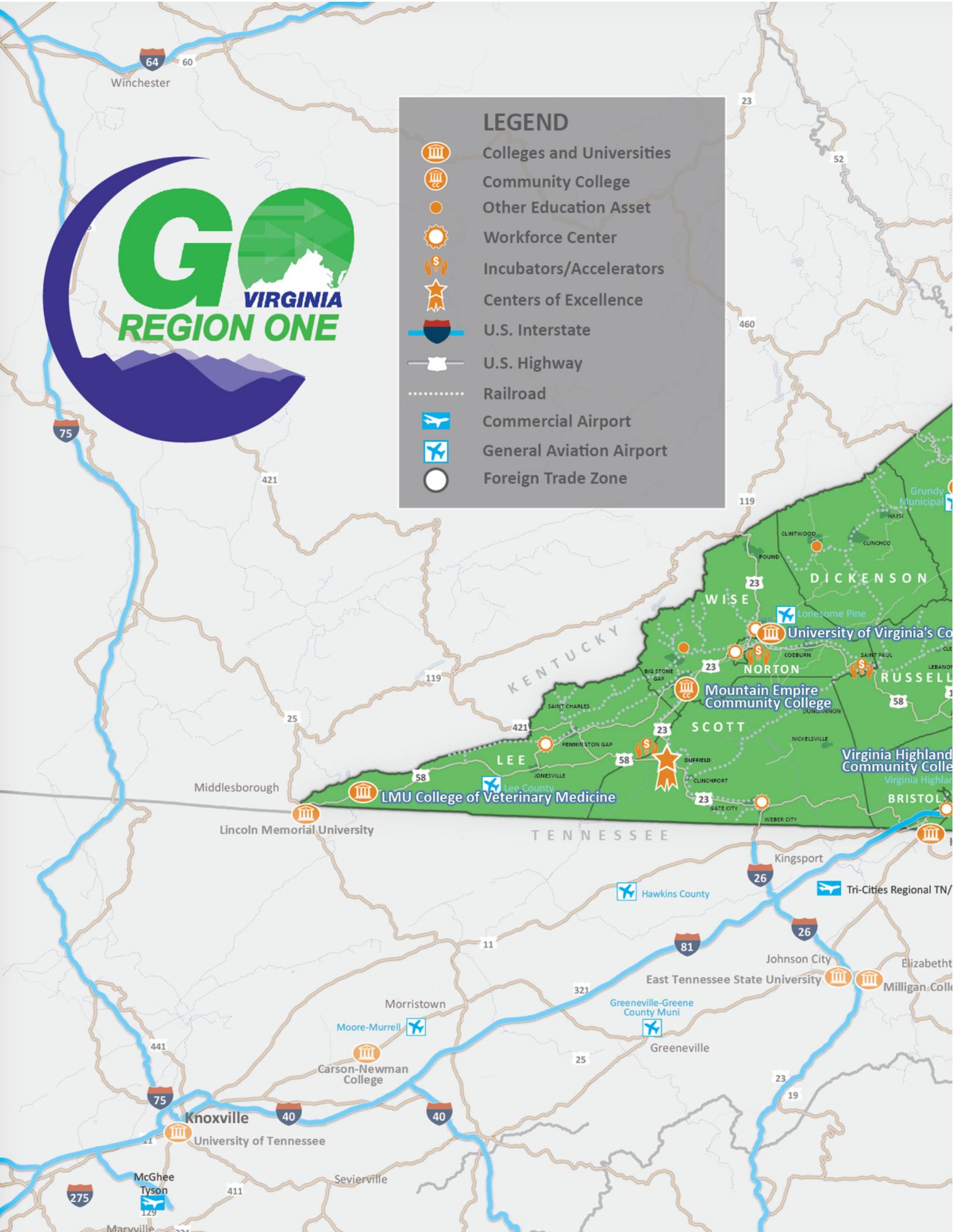
Additionally, numerous strategic plans from across the region were reviewed, analyzed and incorporated within the strategies of the updated Growth and Diversification Plan. Statewide reports and studies were also evaluated as the Region One plan was updated. The Virginia Research Investment Committee (VRIC) and State Council for Higher Education of Virginia (SCHEV) report titled *Assessment of Virginia's Research Assets: Strategic Directions to Advance Innovation-Led Growth and high Quality Job Creation across the Commonwealth* provided insights into supporting the growth of the targeted industries identified as priorities in Region One, specifically, the information and emerging technology sector related to cybersecurity.

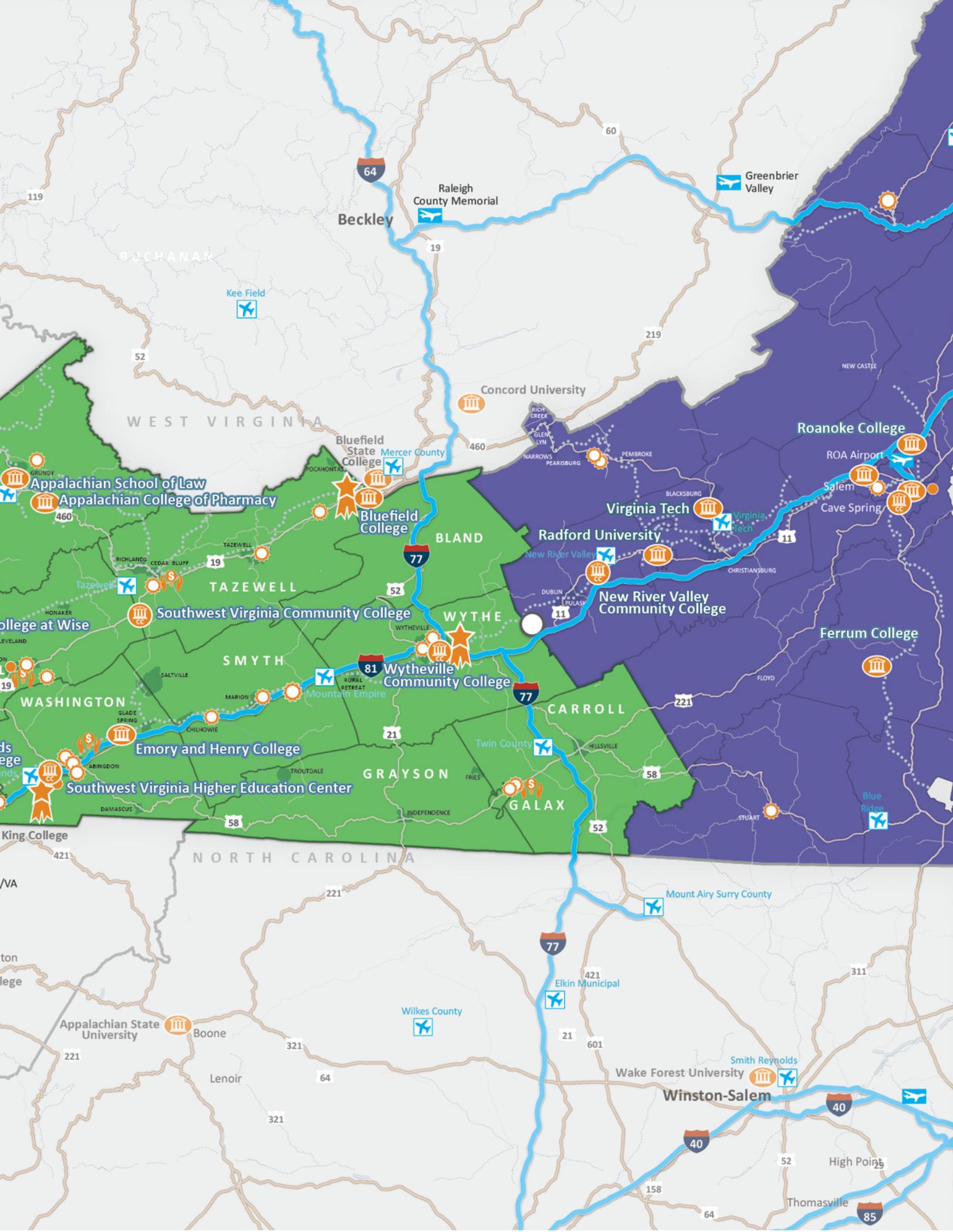
The Region One Council considers the Growth and Diversification Plan to be a living document, which will be updated on an ongoing basis as additional action plans, feasibility studies and stakeholder conversations evolve. As an example, results of the site selection characterization and community competitiveness reports conducted by the Virginia Economic Development Partnership will be incorporated into the plan as appropriate once those reports are available.



LEGEND

-  Colleges and Universities
-  Community College
-  Other Education Asset
-  Workforce Center
-  Incubators/Accelerators
-  Centers of Excellence
-  U.S. Interstate
-  U.S. Highway
-  Railroad
-  Commercial Airport
-  General Aviation Airport
-  Foreign Trade Zone





Beckley

Raleigh County Memorial

Greenbrier Valley

BUCHANAN

Kee Field

WEST VIRGINIA

Concord University

Roanoke College

Appalachian School of Law
Appalachian College of Pharmacy

Bluefield State College
Mercer County

Bluefield College

Radford University

Virginia Tech

ROA Airport

Tazewell

Southwest Virginia Community College

New River Valley Community College

College at Wise

TAZEWELL

WYTHE

Wytheville Community College

Ferrum College

College of Arts and Sciences

SMYTH

Emory and Henry College

Southwest Virginia Higher Education Center

King College

WASHINGTON

GRAYSON

GALAX

NORTH CAROLINA

Mount Airy Surry County

VA

Appalachian State University

Wilkes County

Wake Forest University

Smith Reynolds

Winston-Salem

Boone

Lenoir

High Point

Thomasville

SWVA BY THE NUMBERS

GO Virginia Region One contracted with Chmura Economics and Analytics to conduct a thorough analysis of the region's economic and workforce data. Chmura's analysis is an update to the baseline metrics in the 2017 Growth and Diversification Plan. The report analyzes the demographic trends, economic landscape, growth of key employment sectors, and gaps in occupations and skills critical to economic growth in GO Virginia Region One and the labor shed. An in-depth analysis of the coal decline impact in Region One is also considered in the update. This section includes an overview of the Region One economic and workforce data and the changes in data since the 2017 Growth and Diversification Plan, as well as an explanation of the labor shed. The full economic and workforce analysis can be found in the appendix.

Region One Background and Labor Shed



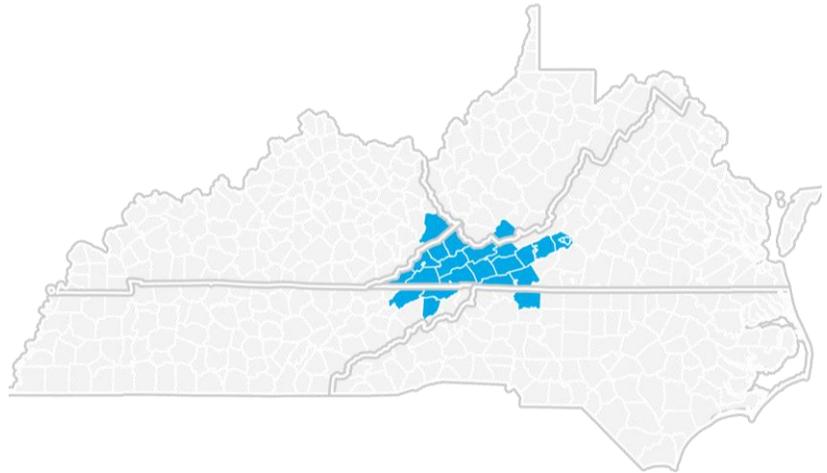
GO VA 1, located in the most southwest corner of the state, is mainly rural and has the weakest economic growth of all the GO VA regions in the state, based on its -0.2% employment decline in the four quarters ending with the fourth quarter of 2018. By comparison, employment grew 1.6% in the state and 1.5% in the nation over the same period.

The Appalachian Mountains run through many of the 13 counties and 3 cities that comprise the region. The beauty of the mountains along with the rural amenities of the region also bring the challenges of a sparsely populated area where mountains can make navigation difficult to connect residents with jobs.

The GO VA 1 region borders on four states that provide job opportunities for residents of GO VA 1. From an economic development perspective, the adjoining counties are home to firms that GO VA 1 should consider as cluster and supply chain assets. For example, EASTMAN Chemical Company and Domtar paper mill in Kingsport, Tennessee (Sullivan County) should be highlighted with prospect firms that are considering locating to the southwest portion of GO VA 1. Likewise, Pike County, Kentucky, should be included in discussions with prospects in energy-related businesses.

As shown in the accompanying map, commuting patterns indicate that three counties in Tennessee, and one each in Kentucky, West Virginia, and North Carolina have enough migration in and out of the GO VA 1 region to warrant inclusion in the GO VA 1 labor shed. The presence of Interstate 81, Interstate 26, and Highway 23 running through the region also provides easy access for some residents to commute. Consequently, the GO VA 1 labor shed includes six additional Virginia localities. Including Virginia and other states, the twelve additional localities are:

- City of Roanoke, Virginia
- City of Salem, Virginia
- Hawkins County, Tennessee
- Mercer County, West Virginia
- Montgomery County, Virginia
- Pike County, Kentucky
- Pulaski County, Virginia
- Radford City, Virginia
- Roanoke County, Virginia
- Sullivan County, Tennessee
- Surry County, North Carolina
- Washington County, Tennessee



All the localities except the City of Salem were added because they have at least a combination of 600 people commuting to or from the GO VA 1 region. The City of Salem was added because it is in the center of Roanoke County, which met the 600-commuter threshold.¹

Employment in the GO VA 1 labor shed fared better than the GO VA 1 region in the last year, growing 0.7% over the four quarters ending with the fourth quarter of 2018. The labor shed is slightly less dependent on coal mining (0.6% percent versus 1.8% in GO VA 1) and manufacturing (11.5% vs 12.0% in GO VA 1).

Economic and Workforce Data Analysis 2019 Overview

While employment in GO Virginia Region One has contracted recently, wage growth has remained strong. Employment in GO Virginia Region One declined to 139,075 as of 2018Q4. The region's average annual wage has increased over the past two years to \$34,678. The region's population decreased to 389,000 as of 2017, and projections estimate the population will contract annually by 0.4% through 2029. The labor force participation rate stands at 50.3% in the GO VA 1 region and 54.7% in the labor shed, compared to 63.3% in the nation. The unemployment rate stands at 3.9% in the region as of March 2019 compared with 3.7% in the nation. Per capita income increased to \$22,535 in the region and \$24,889 in the labor shed compared to \$31,177 in the nation. Poverty levels decreased to 18.3% in both the GO VA 1 region and labor shed, and 14.6% in the nation.

¹ A detailed explanation of the methodology used to create the GO VA 1 labor shed is in Appendix 1.1.

Region One Economic & Workforce Data 2019		
	2019 Report	Source; Date
Population	389,000	Census Bureau, 2017
Employment	139,075	Chmura's JobsEQ, 2018Q4
Unemployment Rate	3.9%	BLS, March 2019
Average Annual Wage	\$34,678	Chmura's JobsEQ, 2018Q4
Per capita income	\$22,535	ACS, 2013-17
Labor Force Participation Rate	50.33%	ACS, 2013-17
Post-secondary degree awards (Labor Shed)	27,143	Chmura's JobsEQ, 2016-17

Region One's industry targets remain poised for future growth. In advanced manufacturing, the average annual wage was \$43,828 for 17,134 people employed. The 1,413 workers employed in food and beverage manufacturing earned an average annual wage of \$42,831. The 4,023 energy workers earned \$77,591, due in large part to the high wages in coal mining. While coal mining employment has generally remained flat over the past two years, wages in this industry have continued to grow. The 2,041 information technology workers in the region earned \$64,700. The region is well-equipped for expansion in data centers, computer systems design, food and beverage manufacturing, animal slaughtering and transportation equipment industries.

Target Sectors	Employment	Average Annual Wage
Advanced Manufacturing	17,134	\$43,828
Food and Beverage Manufacturing	1,413	\$42,831
Energy & Minerals	4,023	\$77,591
Coal Mining	2,514	\$85,197
Information Technology*	2,041	\$64,700

Source: Chmura's JobsEQ, 2018Q4

*Note: Wage as of 2017

While Region One's key sectors pay above-average wages for the region, they generally pay an average annual wage lower than other GO Virginia regions. Advanced manufacturing and information technology pay a lower average wage than all eight other regions. Food and beverage manufacturing pays a lower average annual wage than Regions 2, 3, 4, and 5, and a higher average wage than Regions 6, 7, 8, and 9. The energy sector pays a higher wage in Region One compared to Regions 2, 3, 6,

and 8, and a lower wage than Regions 4, 5, 7, and 9. Over 99% of Virginia's coal mining employment is in Region One, so it is not surprising that the wage is the highest in this region.

Average Annual Wages for Key Sectors by GO Virginia Region						
	All Industries	Advanced Manufacturing	Food and Beverage Manufacturing	Energy	Coal Mining	Information Technology
Region 1	\$34,864	\$44,222	\$42,898	\$77,203	\$85,339	\$68,100
Region 2	\$41,948	\$57,133	\$48,009	\$72,709	\$64,625	\$80,800
Region 3	\$34,569	\$47,424	\$47,189	\$71,848	n/a	\$72,700
Region 4	\$51,914	\$64,527	\$52,601	\$121,561	n/a	\$89,500
Region 5	\$46,192	\$63,583	\$43,817	\$84,663	\$66,135	\$86,500
Region 6	\$45,143	\$49,268	\$32,836	\$70,204	n/a	\$87,700
Region 7	\$75,839	\$81,967	\$28,814	\$147,141	n/a	\$106,200
Region 8	\$41,052	\$53,847	\$41,049	\$72,989	n/a	\$77,800
Region 9	\$48,394	\$54,349	\$28,564	\$104,940	\$51,216	\$89,100

Source: Chmura's JobsEQ

Note: Wages as of 2019Q1. Information Technology wages as of 2018.

Economic & Workforce Development Trends, 2017-2019

Employment in GO Virginia Region One declined from 139,464 for the four quarters ending in 2017Q1 to 139,075 as of 2018Q4. This change represents an average annual decline of 0.2% compared to an increase of 1.4% in the nation over the same period. The region's average annual wage increased over the same period from \$33,865 to \$34,678, or 1.4% annually, compared to 2.5% annual wage growth nationally (\$53,198 to \$55,594). As shown in the following table, per capita income increased 2.8% over the past two years (+4.4% nationally from \$28,930 to \$31,177), the labor force participation rate decreased 1.0 percentage points (-0.2 percentage points nationally from 63.5% to 63.3%), and the region's unemployment rate also declined 1.7 percentage points (-0.7 percentage points in the nation from 4.4% to 3.7%).

Region One Economic & Workforce Data, 2017-2019			
	2017 Report	2019 Report	Source; Dates
Employment	139,464	139,075	Chmura's JobsEQ; 2017Q1, 2018Q4
Unemployment rate	5.6% (May 2017)	3.9% (March 2019)	BLS; May 2017, March 2019
Average Annual Wages	\$33,865	\$34,678	Chmura's JobsEQ; 2017Q1, 2018Q4
Per capita income	\$21,473	\$22,535	ACS; 2011-15, 2013-17
Labor Force Participation Rate	51.30%	50.33%	ACS; 2011-15, 2013-17
Poverty Level (of all people)	19.2%	18.3%	ACS; 2011-15, 2013-17
Post-secondary degree awards (Labor Shed)	26,637	27,143	Chmura's JobsEQ; 2015-16, 2016-17

The educational attainment of residents in GO Virginia Region One has increased over the past two years. The proportion of residents aged 25 to 64 in the GO VA 1 region with a bachelor's degree or higher increased from 16.4% in 2015 to 17.0% as of 2017. All GO Virginia regions experienced increases between 0.2 and 1.6 percentage points in bachelor's degree attainment over the same time period. The proportion of residents whose highest education level is an associate's degree increased from 9.5% to 10.0%, among the highest percentage point increases for GO Virginia regions. The proportion of residents without a high school diploma declined from 15.9% to 14.9% over the same period, the largest drop for all GO Virginia regions. As shown in the table above, the number of post-secondary degree awards in the labor shed also increased by about 500 awards from the 2016 academic year to the 2017 academic year.

Educational Attainment by GO Virginia Region									
	No High School Diploma			Associate's Degree			Bachelor's Degree or Higher		
	2015	2017	Change	2015	2017	Change	2015	2017	Change
Region 1	15.9%	14.9%	-1.0%	9.5%	10.0%	0.5%	16.4%	17.0%	0.6%
Region 2	9.8%	9.2%	-0.6%	9.5%	10.1%	0.6%	29.2%	29.9%	0.8%
Region 3	16.2%	15.2%	-0.9%	10.1%	10.0%	0.0%	16.0%	16.4%	0.4%
Region 4	10.1%	9.4%	-0.8%	7.4%	7.8%	0.4%	36.0%	37.5%	1.5%
Region 5	8.3%	7.8%	-0.5%	10.0%	10.2%	0.3%	30.2%	31.4%	1.2%
Region 6	8.2%	7.9%	-0.3%	8.3%	8.8%	0.5%	29.5%	31.1%	1.6%
Region 7	7.7%	7.9%	0.2%	5.8%	5.7%	-0.1%	58.2%	59.1%	0.9%
Region 8	12.5%	12.3%	-0.2%	7.3%	7.9%	0.6%	26.2%	26.4%	0.2%
Region 9	9.8%	9.3%	-0.5%	7.0%	7.0%	0.0%	36.3%	37.5%	1.3%

Source: Chmura's JobsEQ, ACS

Innovation and industry trends have remained largely constant over the past two years. Jobs created by young companies (5 years old or less) contributed 20.0% of total job creation in GO VA 1 in 2017. This represents a slight decrease from 22.2% in 2016. There have not been any major changes in top industries by employment share or GDP share by 2-digit NAICS codes in the GO VA 1 region.

The following table shows the changes in employment and average annual wages in the key target industries; advanced manufacturing, food and beverage manufacturing, energy and minerals, and information technology. Average annual wages increased in all key targets over the past two years. Employment rose modestly in advanced manufacturing, food and beverage manufacturing, and energy, but slightly declined in information technology.

Key Targets for GO VA Region One

	Advanced Manufacturing		Food and Beverage Manufacturing		Energy and Minerals		Information Technology	
	2017Q1	2018Q4	2017Q1	2018Q4	2017Q1	2018Q4	2017Q1	2018Q4
Year	2017Q1	2018Q4	2017Q1	2018Q4	2017Q1	2018Q4	2017Q1	2018Q4
Average Annual Wage	\$43,514	\$43,828	\$41,710	\$42,831	\$71,666	\$77,591	\$64,000	\$64,700
Employment	17,025	17,134	1,353	1,413	3,912	4,023	2,146	2,041

Source: JobsEQ & Chmura

*Note: information technology wages as of 2016 and 2017

The largest projected potential occupation shortfalls in GO VA 1 are concentrated in lower-skill jobs. Cashiers, food service workers, retail salespersons, and customer service representatives are among the top occupations with potential supply gaps in both 2017 and 2019. Registered nurses, nursing assistants, and general and operations managers typically require post-secondary education and all have potential supply gaps both in the 2017 and 2019 reports.

The most in-demand occupations by online job postings were heavily concentrated in retail services for 2017 and 2019. The top in-demand occupations for both years were retail salespersons, heavy truck drivers, and retail supervisors. Nurses and speech-language pathologists were the top occupations in online job postings requiring at least a bachelor's degree in both 2017 and 2019. Medical and health services managers, typically requiring a bachelor's degree, joined this list of top occupations in 2019.

EXISTING REGIONAL PLANS, PROJECTS, & PARTNERS

GO VA's Purpose

Create additional higher paying jobs through incentivized collaboration primarily through out-of-state revenue, which diversifies and strengthens the economy in every region.

Region One Vision

Southwest Virginia is a vibrant and robust region with a diversified and growing population and economy.

Region One Mission

We make investments in our assets: human, community, natural, and structural. Our diversification plan guides our investments to grow new clusters and strengthen emerging and existing industries.

GO Virginia Region One has one simple goal:

Repurpose the SWVA economy to grow high wage jobs

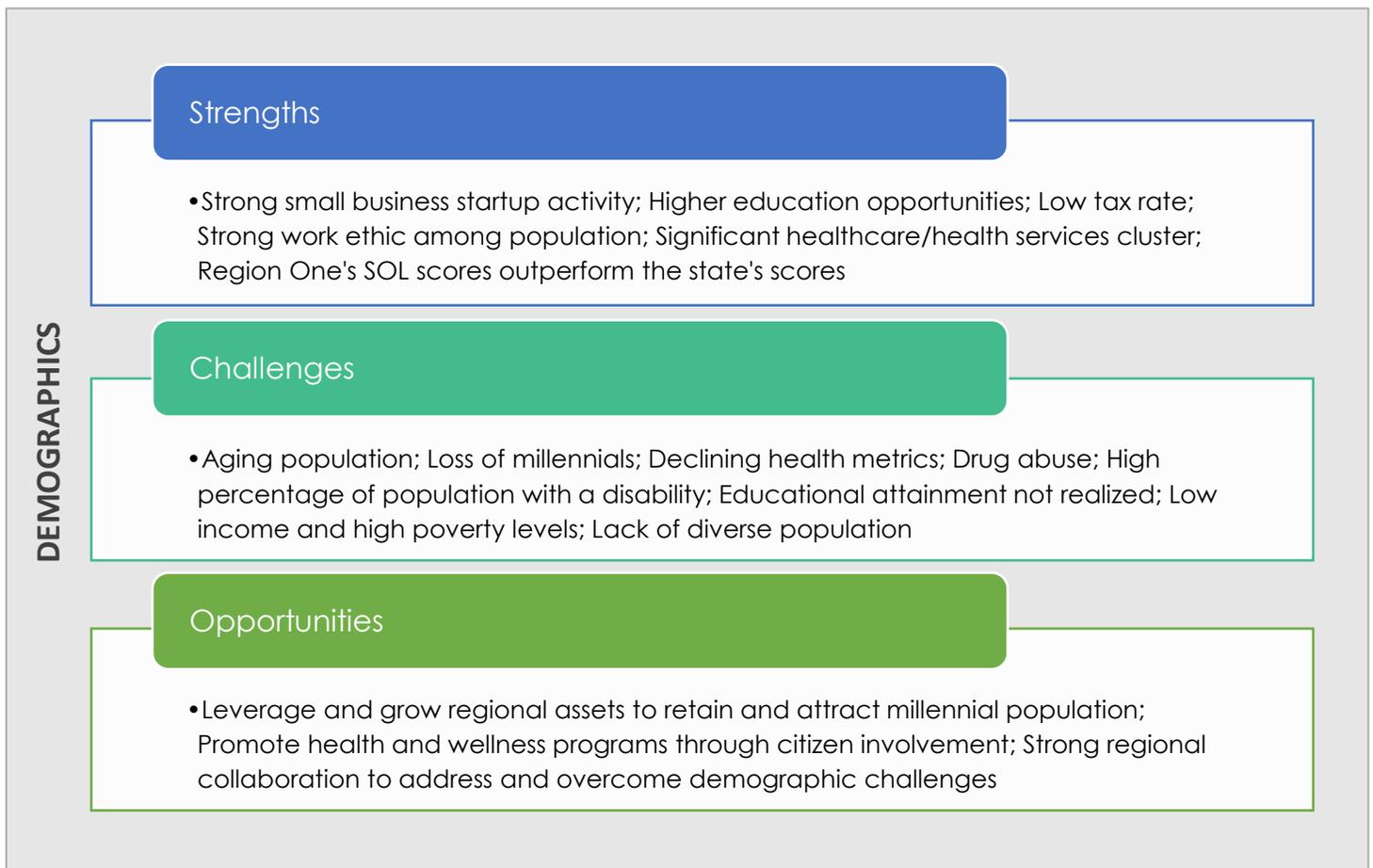
In accomplishing this goal, GO VA Region One is focusing on strategies which will transition the region's economy away from a single-industry dominated economy to a more sustainable and diversified economic base. Region One aligned regional priorities with that of the GO Virginia State Board. These priorities are mapped between the region and state in the following chart:

GO Virginia Priorities		Region One Priorities
Support Collaboration	✓	Implementation Infrastructure & Coordinating Strategies Defined
Increase Higher Paying Jobs	✓	Targeting Basic Employers with Wages Above Regional Median Wage
Grow Industry Clusters	✓	Targeting Existing Industry Clusters Where SWVA has a Competitive Advantage
Talent Development	✓	Focused on Educational & Industry Alignment
Site Development	✓	Enhancing the Availability of Development-ready Sites
Scale Up Businesses	✓	Supporting Existing Businesses to Develop New Products and/or New Markets
Support Entrepreneurs	✓	Enhancing Regional Ecosystem with Increased Access to Capital & Mentoring Opportunities
Support Economic Development	✓	Focused on Product Development & Information/Data Capacity Critical to Industry Recruitment

Existing Regional Strategic Plans

In the course of developing the Region One 2017 Growth and Diversification Plan, twenty strategic plans were reviewed and evaluated including plans from neighboring states as well as documents related to regional initiatives promoting the creative economy. The analysis for the 2019 updated Growth and Diversification Plan included a review of eleven additional regional strategic plans or annual reports. The full list of plans reviewed in 2017 and 2019 may be found in the appendix.

As noted during the initial review, many of the strategies outlined in the regional strategic plans directly correlate with GO VA 1's growth strategies. The chart below was outlined in the initial Plan to demonstrate how the region shares many commonalities when looking at strengths, challenges, and opportunities. The chart is shared again with updates from recently reviewed plans to draw importance to the need of collaborating as a region to build upon regional strengths, address challenges, and take advantage of the opportunities.



Strengths

- Sizable middle-skill STEM training; Trainable workforce with ability to transition from coal to manufacturing filling workforce gaps; High quality of training resources; Strong higher education opportunities and support; Existing technical training capacity; Veteran workforce (existing & retired military); Creative and talented millennial population; Workforce receptive to new skills and job opportunities; Workforce development infrastructure; Strong regional work ethic

Challenges

- Aging workforce; Loss of millennials/brain drain; Losing workforce to disabilities; Unemployed and underemployed workforce; Lack of training programs specific for target industry sectors and markets; Few employment opportunities with competitive wages; Lack of apprenticeship opportunities; Workforce isn't always ready- skills and mentality; Lack of employment opportunities for newly trained workforce; Substance abuse; Workforce submissive to "way things are" status quo mentality; Difficult to attract talent; Lack of access to educational funds/programs/awareness; Large company closures

Opportunities

- Coordinate and focus workforce programs to align with industry and economic development targets; Market higher education and specialty schools on a regional, state, and national level; Match job training to skilled workers; Identify workforce talents of the existing workforce and provide opportunities for training advancement to aid in retention of employees; Develop industry clusters that can cross county and regulatory boundaries to provide support for specific industries such as equipment manufacturing, electrical equipment, and IT and cyber (engage economic development professionals); Leverage the Virginia Economic Development Partnership (VEDP) strategic plan by targeting industry clusters; Develop partnerships to work with industrial recruitment and coordinate with educational opportunities creating a hand-in-hand pipeline for job recruitment; Build credentials and certifications that are transferable between industries and geographic areas; Focus on youth in education and establish a pathway from kindergarten to career for workforce development; Focus on opportunities to educate the parents of children – combine school efforts with family support opportunities; Develop funding sources for K-12 grades in schools to hire a dedicated technology teacher (computer science); Promote IT job openings that are available today and emphasize the available salaries; Dispel the mindset that to be successful in the workforce requires a four year college degree

Strengths

- Jobs created by small companies outpaced the Commonwealth as well as nationally; Minimal cost of doing business (labor); Strong and growing retail; Local business success stories; Availability of support services and supplier networks; Availability of good and trainable workforce; Local incentive programs; Downtown revitalization

Challenges

- New business formation has declined in the region; Lack of funding, grants, investment capital, incubator space for entrepreneurs; Limited mentoring programs to connect successful business leaders and entrepreneurs wanting to enter start up space; Limited access to high speed internet connections is a challenge; Difficult to obtain information and understand requirements and regulations to start a business; Access to suppliers and markets is inadequate resulting in lost sales opportunities; Community environment supporting an entrepreneurial culture is a challenge; Regional economic climate with limited, fixed incomes and competitive pricing driving consumers to big box retailers; Shop local programs are a challenge

Opportunities

- Cultivate entrepreneurs and support and diversify existing businesses; Identify what is currently being done and who is doing it; Develop a prepared workforce; Assess market trends and identify where existing businesses could expand and new businesses emerge, taking advantage of the technical skillset of unemployed or underemployed miners; create an entrepreneur ecosystem – create an environment with resources for new entrepreneurs and emerging businesses, including access to capital; Explore new ways of growing things and niche markets like hydroponics, maple syrup, heritage breeds, and tilapia; Create apprenticeship and mentor opportunities for startups; Encourage downtown revitalization; Organize global marketing branding initiatives; Create funding opportunities for startups- revolving loan programs, micro lending, grants, etc.; Research thriving rural communities - successful and innovative programs/startups; Support cultural heritage and tourism; Develop regional entrepreneurial culture of communities to support/encourage startups and small business; Provide guidance and coordinated problem solving for value added ag businesses; Manufacture outdoor recreation products for outfitters; Develop youth entrepreneur programs; Improve business culture to retain staff

Strengths

- Developed industrial parks; Low energy costs compared to national average; Network of small general aviation airports; Interstate system; Rail; Strong broadband and telecommunications infrastructure; Strong utility infrastructure; Educational institutions; Strong small business development centers; Enterprise zones; 3D printing; Appalachian Electric Power (AEP) \$100M investment in eliminating operational blips; Opportunity Zones

Challenges

- Abrupt decline in energy sector; Limited funding and resources for infrastructure; Aging water and sewer systems; Limited natural gas infrastructure; Broadband last mile and cellular coverage; Need for site readiness and shell buildings; Maintenance of roads and bridges; Limited rail (passenger and freight); Topography and geography of regional areas create disparity of expense in infrastructure; Limited public transportation; Distance from major interstate highways for some regional areas; Transportation – freight return trips – empty

Opportunities

- Leverage broadband infrastructure to promote the ability to work remotely, and introduce youth to technology operations early; Grow information technology (IT) hubs to attract and support millennials; Develop energy research centers; Include renewal energy opportunities to attract large companies; Promote and support downtown revitalization; Regional coordination and collaboration for project funding to create utility authorities seeking grants and bonds; Seek state and federal funding for broadband expansion for last mile and cellular; Creative housing opportunities such as cluster housing

Strengths

- Strong cultural heritage; SWVA home to eight major natural recreation anchors; Quality of life and quality of place are attracting new residents to communities, thus creating new business which further enhance the quality of life; Rapidly growing health education landscape; Scenic beauty of region; Low cost of living; Low crime rate; Moderate climate conditions; Millennials appreciate the “Appalachian” brand; Resilient population with strong work ethic; Open to outside views and opportunities

Challenges

- Regional branding- unified message; Perceived Appalachia culture (negative stereotypes of region, region is second rate); Tourism seen to some as not an economic development priority; Lack of quality child care; Visual impression of houses and schools in the region; Lack of entertainment to entice young entrepreneurs

Opportunities

- Promote, grow and market a high quality of life in SWVA; Tell and share the story of SWVA's culture in a positive way; Promote regional outdoor recreation assets; Develop an inventory of “things to do” that would be attractive to young professionals; Grow health and wellness as economic drivers (market high quality of life in SWVA, tell and share the story of SWVA's culture in a positive way, promote the strength of SWVA culture to people and employers); Create an identity for the region as a “culture of wellness”; Foster agricultural and natural resources growth, as well as healthcare development; Create a digital ambassador program that creates a positive regional image; Educate community members in general of the region's assets such as outdoor recreation, broadband, water, energy, land and labor; Leverage our location; Address internal self-perception problem-increase pride within region; Assist local and regional partners in connecting industrial recruitment and the creative economy; Develop an agri-tourism stakeholder group; Expand and develop craft beverage tourism opportunities; Develop collaborative relationships with state and federal permitting and landowning agencies for outdoor recreation

Strengths

- Collaborative regional planning and coordinated economic and workforce development efforts "Planning Blueprints"; Technology broadband-4G regional collaboration; Existing technical capital; Integrated network of education- K-12 >Community College>Universities; Chambers provide opportunity for regional networking; 10 county region of Southwest Virginia pilot project of downtown development; Cooperation of businesses in the region; Increased collaboration/communication between organizations; Establishment of two new Rural Industrial Facilities Authorities; Increased collaborative discussions across state and regional lines

Challenges

- Regional branding (unified approach and message); Competition between county economic development organizations; Absence of regional entrepreneurship center; Lack of coordinated advertising effort to attract people; No collaboration with land owners to encourage investment in agriculture commodities that would produce the greatest yield

Opportunities

- Foster regional collaboration for workforce and education for all ages and stages, including workforce rehabilitation; Develop a business-to business network to identify input or support needs that can be sourced locally to build the regional economy; Develop opportunities for smaller companies to partner with larger companies to meet and address the needs of one another; Connect farmers markets to grocers, school systems, hotels, hospitals, and food banks (gleaning "seconds" or produce that is still viable but cannot be sold); Convene stakeholders regionally to develop a regional workforce strategy beyond the local level; Lead state discussion on collaborating across state lines and within labor shed; Emphasize or expand trade and soft skills (such as communication and collaboration) in education; Align local and regional economic development strategies; Regional collaboration for Opportunity Zones; Increase entrepreneurship opportunities and promote collaboration; More aggressive and expansive marketing effort of the region

Strengths

- Strong SWVA legislative delegation; Committed support from regional planning district commissions, community economic boards and developers; Strong support from leadership in higher education, and K-12, as well as local government and civic organizations; Passionate leadership

Challenges

- Lack of understanding/experience among elected officials; Regional leadership; Citizen frustration/distrust of government – limited resources for communication between the two; Need for trained leaders pool; Young/future leaders leaving area and do not return; Resistance to change among leaders; Lack of “depth on bench”- same people doing all the work; Need for “non-polarizing” language to discuss issues; Lack of leadership succession

Opportunities

- Strengthen existing leaders and foster opportunities for leaders to create and communicate compelling vision for the future of the region with community members; Cultivate leadership and mentoring opportunities with community members and local business leaders and students in elementary school through college, and engage them in the community; Focus on opportunities to develop student leaders; Develop training and resources such as regional leadership academy and celebrating success;

Significant similarities exist among the three planning districts as it relates to industry targets. The chart below exhibits the overlap of the primary target industries of regional EDOs (Economic Development Offices), Planning District Commissions (PDCs) and Workforce Development Boards (WDBs). Overall target sectors are listed in blue text with sub-sectors displayed in black text.

Target Sectors	Planning Districts 1 & 2				Planning District 3		
	LENOWISCO PDC	Cumberland Plateau PDC	VCEDA*	Workforce Dev. Board Area 1	Mount Rogers PDC	VIAA**	Workforce Dev. Board Area 2
Tourism	X	X	X	X	X		
Healthcare				X			X
Information Technology	X	X	X	X	X	X	
Data Centers	X	X	X	X		X	
Call Centers		X	X	X	X		
Software Engineering/ Development	X	X	X	X			X
Cyber Security	X		X	X			
Agriculture	X	X		X	X		
Aquaculture	X	X	X		X		
Industrial Hemp	X	X			X		
Manufacturing	X	X	X	X	X	X	
Food and Beverage	X		X	X	X	X	X
Plastics		X	X	X	X	X	
Advanced Material	X		X	X	X	X	
Wood Products	X		X	X	X	X	
Fabricated Materials	X	X	X	X		X	X
Machinery	X	X	X	X			
Transportation Equipment	X		X	X		X	X
Distribution and Logistics					X	X	
Energy		X	X				
Clean Coal		X	X				
Entrepreneurship	X	X	X	X			
Unmanned Systems	X		X				
Existing Businesses	X		X	X		X	
Federal Contracting	X		X				

*VCEDA - Virginia Coalfield Economic Development Authority

**VIAA - Virginia's Industrial Advancement Alliance

Advanced manufacturing, specifically focusing on food and beverage processing and fabricated materials, information technology targeting data centers and software engineering/development, and tourism were among the common targets.

The commonalities, in addition to the quantitative analysis of business trends, labor market data and skills gap analysis helped inform the targeted industries of GO VA Region One. Although one of the primary initiatives of all three planning districts was the development and promotion of outdoor, cultural and tourism assets, it was not chosen as a primary targeted industry of GO VA due to the relatively low wages compared to the region's average.

In examining the industry trend analysis and also participating in conversations with business, community and government leaders, it is clear that the most significant difference from the westernmost end of Region One to the eastern most area is the impact the decline in the coal and energy sector has had on demographics, employment levels and quality of life. In addition to avoiding the negative economic impacts of the natural resource industry decline, the presence of Interstates 81 and 77 also offer unique advantages for PDC 3, the eastern part of the region, where logistics and distribution, warehousing and storage are primary targets.

All regions indicated the importance of regional collaboration and working across county lines, as well as taking a unified approach to marketing the region. Similar challenges pointed to declining or stagnant population numbers including the loss of millennials, an aging workforce and filling existing job openings. Existing educational programs are challenged in recruiting adequate numbers of participants even for positions in demand occupations such as those in the skilled trades. This is due in part to a lack of awareness of the job occupations available in the region, the basic lack of understanding of manufacturing in today's world and the limited communication between educational partners and employers with vacancies. These challenges sparked opportunities to improve k-12 educational pathways for workforce development that align with industry and private sector needs, in which progress is being made by recently funded GO Virginia projects.

Given the advantages of doing business in Region One, entrepreneurship and existing business support is a large focus for all planning districts. Although entrepreneurship trends have decreased slightly in the region, jobs created by small companies outpaced the Commonwealth, as well as nationally. Limited funding and infrastructure availability for entrepreneurs, point to several opportunities to create an entrepreneurial environment rich in resources for new entrepreneurs and emerging businesses, including access to capital, accelerator programs and incubator space.

Partners & Initiatives

The Region One landscape is rich with existing regional organizations that are implementing dozens of strategic initiatives and projects to improve the economy in Southwest Virginia. These organizations play multiple roles within the region as many are focused on various strategies and partner on a wide array of projects across the region. As identified through various regional conversations and the community survey, a lack of coordination among many regional efforts still exists, which limits the potential impact of initiatives. Across the region, however, there are many organizations that understand the value of collaboration and that the greatest impact and return on investment is to be achieved through regional collaboration across multiple sectors, which allows for leveraging and targeting of resources.

In order to demonstrate the region's supply of partners, organizations, and correlating initiatives, as well as to identify those with capacity to partner for potential GO Virginia project implementation, a list is included in this section of efforts that are operating on a regional level. The efforts are categorized by focus of specific strategies or industry targets for sake of organization. However, as mentioned earlier, many organizations are working on multiple strategies and across multiple industry sectors. It is important to note that this is not an exhaustive list of the region's organizations, rather it includes those focusing on Region One's target industries or growth strategies, and are working at a regional level with bandwidth to partner on projects which may align with their missions. In addition, many of the organizations listed are active partners on current GO Virginia funded projects and have been engaged in the Region One targeted industries working groups focused on project pipeline development.

Education and Workforce

Higher Education

As indicated in the regional strategic plan analysis, a regional strength pointed to the strong infrastructure of institutions of higher education located within Region One and the labor shed. Fifteen, four-year colleges and universities and six community colleges are operating in the Region One labor shed, contributing much needed human and educational capital to efforts to improve economic conditions in the area. When assessing currently funded GO Virginia projects throughout Virginia, one would find that the majority of projects include strong partnerships with the regional higher education institutions and many projects are being led by them. Given their expertise and relationships across the region with industry partners, as well as their focus on building a strong pipeline of skilled workers, the higher education institutions are an ideal partner for regional projects.

Four-year Colleges and/or Universities in the Labor Shed (* denotes those located within Region One)

1. The University of Virginia's College at Wise *
2. Bluefield College *
3. Appalachian School of Law*
4. Appalachian College of Pharmacy*
5. Southwest Higher Ed Center *
6. Emory & Henry College*
7. LMU – College of Veterinary Medicine*
8. King College
9. East Tennessee State University

10. Pikeville College
11. Lincoln Memorial University
12. Radford University
13. Virginia Polytechnic Institute
14. Concord University
15. Alice Lloyd College

Community Colleges within the Labor Shed (* denotes those located within Region One)

1. Mountain Empire Community College *
2. Southwest Virginia Community College *
3. Virginia Highlands Community College *
4. Wytheville Community College *
5. Northeast State Technical Community College
6. New River Community College

Over the past decade, many of the colleges have collaborated on workforce development initiatives designed to build a technology and manufacturing workforce. Presently, several of the colleges are collaborating on federally grant-funded initiatives supporting the development of industry recognized credentials for the manufacturing and information technology sectors. Some examples include:

- Regional Cyber Security Initiative: The University of Virginia's College at Wise along with Mountain Empire Community College and Southwest Virginia Community College partnered to build capacity at each higher education institution to create cybersecurity programs and courses. Funded by the Appalachian Regional Commission and the Virginia Tobacco Regional Revitalization Commission, the colleges added cyber expertise to faculty, established cybersecurity labs, and partnered to design and host the region's first cyber competition and cyber symposium. Additionally, the effort involves introducing emerging cybersecurity companies to Southwest Virginia resulting in the creation of virtual full-time positions and internships.
- Wytheville Community College (WCC) is an active partner in the Greater Opportunities in Technology and Engineering Careers (GO-TEC) Phase II project in Region Three. The project is designed to increase capacity for training high demand, high income workers and to increase the pipeline of students entering five regional training areas of need: precision machining, welding, IT/cybersecurity, robotics/mechatronics, and advanced materials. WCC has engaged its service areas partners to explore the potential development of Career Connection labs in Region One's middle schools.
- Virginia Highlands Community College received significant amount of funding to develop the Advanced Technology and Workforce Development Center on their campus that will provide technical training and industry credentials in a number of fields, including manufacturing.

In addition, several of the college systems are putting more of a focus on agricultural development. Lincoln Memorial University College of Veterinary Medicine, located in Lee County, is a major asset for the region with small and large animal teaching and research facilities. Some specific agricultural efforts underway by Region One colleges and involving partnership from the private sector include:

- Launch of the Smart Farming program by Mountain Empire Community College (MECC), which is focused on using drone technology for agricultural purposes. The program enabled MECC to

introduce the first Unmanned Aerial Systems Associate Degree program in the Virginia Community College System.

- Southwest Virginia Community College (SWCC) was awarded a grant from the Virginia Coalfield Economic Development Authority (VCEDA) to conduct a feasibility study for a proposed regional agricultural education and events center to be located in Tazewell and Russell counties near SWCC.

Southwest Virginia Higher Education Center

Located in Abingdon, Virginia, the Southwest Virginia Higher Education Center is a partnership of top-ranked Universities and is the first multi-college and university institution of higher education in the Commonwealth. Having nine colleges represented at the facility, the Higher Education Center partners with public and private colleges and universities to provide degree programs, certificates, and professional development courses. The Higher Education Center also holds an Energy Center that invests in and recruits early-stage, growth-oriented, investment-worthy technology companies to the region.

Southwest Virginia Workforce Development Board

Serving the counties of Buchanan, Dickenson, Lee, Russell, Scott, Tazewell, and Wise and the City of Norton, the Southwest Virginia Workforce Development Board offers re-employment and training programs designed to assist adults, dislocated workers, and youth to enter into high-demand occupations and to gain livable wages. The Board also offers local businesses various services to include technical assistance in maintaining a successful business. Funding can also be provided to assist individuals with technical program fees associated with training an employment.

The New River/Mount Rogers Workforce Development Board

The New River/Mount Rogers Workforce Development Board supports the region's economy through a collaborative approach to meeting needs of businesses and job seekers that is flexible and adaptable to the changing economic ecosystem. Servicing the Mount Rogers and New River areas, the Board offers training and credential attainment for unemployed, underemployed and incumbent workers. In addition, they are partners in the SWVA Work Ready Community initiative to certify work readiness skills throughout the region, providing a tool to assist in economic development efforts.

United Way of Southwest Virginia

Servicing the entire Region One footprint, United Way of Southwest Virginia is a non-profit organization that is focused on initiatives to improve the region's health, education, and financial stability. Through an initiative-based cradle-to-career approach, United Way of Southwest Virginia is creating sustainable solutions to address the challenges facing tomorrow's workforce. One key goal of United Way is to develop a talent pipeline that prepares the next generation for the jobs of tomorrow, supplies businesses with skilled workers, and builds a robust, competitive economy. One of their more recent and popular programs, Ignite Internships, has been expanded throughout Region One, as well as the labor shed with support from GO Virginia. The program is focused on working with schools and employers to collaboratively align school curriculums with employer needs, providing activities to encourage post-

secondary education, streamline work credentialing, provide work-based learning opportunities and match new graduates with local employers.

Entrepreneurship and Innovation

Opportunity SWVA

Opportunity SWVA is a network of entrepreneurship and business support organizations operating in SWVA since 2012 and charged with the implementation of the Blueprint for Entrepreneurial Growth and Economic Prosperity in Southwest Virginia. The coalition is piloting the way for the region to align resources, highlighting opportunities for entrepreneurs, supporting their efforts, and expanding the spirit they bring to communities within the region. Through collaborative partnerships, the initiative is working to rally existing and emerging economic and community development efforts to create thriving entrepreneurial communities that will accelerate progress for both new and established ventures. This thirty-member network covers the Region One footprint and expands into planning district four as well. The group has been responsible for the significant growth in entrepreneurship challenge competitions, educational programs and training for emerging entrepreneurs and connecting them to regional strategies. Since its inception, Opportunity SWVA has been coordinated by UVa-Wise with leadership and support from the Department of Housing and Community Development and Virginia Tourism Corporation.

Opportunity SWVA has helped spark a movement of downtown revitalizations throughout Region One through the Rally SWVA initiatives, which 19 communities have engaged in. The program provides mini-grants and builds leadership capacity, while reinforcing collaborative, entrepreneurial communities. A related effort, SWVA Rise is an emerging leadership program where participants learn various leadership skills that are useful with their involvement in Southwest Virginia. Rally SWVA and SWVA tie nicely together in the sense leadership capacity is being built yielding growth in the region.

The entrepreneurial ecosystem is improving in the region, but gaps remain in providing access to capital for attracting high growth companies to the region. Opportunity SWVA and its extensive network are ideal partners to engage in projects related to entrepreneurship and innovation.

Infrastructure

Rural Industrial Facilities Authorities

It is evident across the region that a primary focus for infrastructure development is to increase the “product,” the term economic development professionals refer to industrial and technology sites and buildings. Existing sites are in place, but each have different levels of infrastructure, capacity and opportunities. At the time of publication for the Region One 2017 Growth and Diversification Plan, there were nine existing industrial sites in the Region One area and a few new industrial/technology sites were on the radar screen for development. The formation of the Lonesome Pine Rural Industrial Development Authority (RIFA) in 2017 brought one of these new sites online, Project Intersection. Another new RIFA in the Cumberland Plateau was formed in spring 2018. Prior to the Region One 2017 Growth and Diversification Plan, only two RIFAs existed. These included the Blue Ridge Crossroads Economic Development Authority (BRCEDA) and the Smyth-Washington County Industrial Facilities Authority (SWIFA). All four RIFAs in the region are listed below with their participating localities.

- Lonesome Pine RIFA (Counties of Dickenson, Lee, Scott, Wise, and the City of Norton)
- Cumberland Plateau RIFA (Counties of Buchanan, Tazewell, and Russell)
- BRCEDA (Counties of Carroll and Grayson, and the City of Galax)
- SWIFA (Counties of Smyth and Washington)

The RIFAs play a key role in providing a mechanism for localities to cooperate on economic development projects to assist the region in overcoming geographic and financial barriers to economic growth. The partnership enables revenue sharing opportunities between the localities and facilitates regional collaboration to ensure current and new sites are ready for prospects. The Lonesome Pine RIFA recently received GO Virginia Region One funds to support a coordinator positions tasked with furthering the organizational structure and establishing the self-sustainability of the RIFA. In addition, the position is focused on coordination with all grants, loans, or funding opportunities related to site development in Region One.

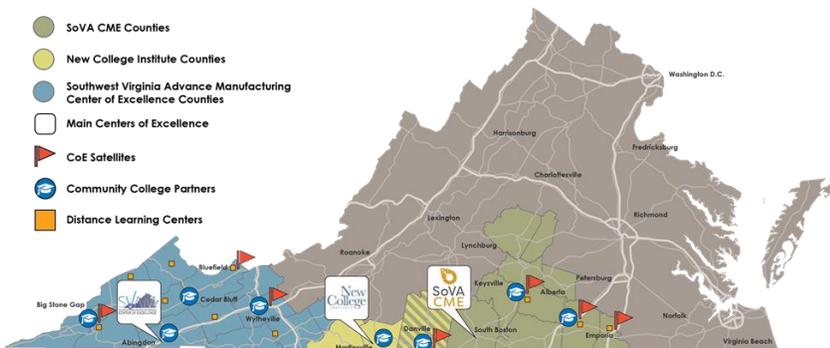
In addition to the infrastructure and revenue sharing activities of BRCEDA, the organization is focused on promoting the Virginia General Assembly's designation of the Twin County area as "Virginia's Entrepreneurial Region". Their Small Business Development Center has assisted 137 local businesses in securing over \$40 million in capital, leading to the creation of 600 jobs.

Advanced Manufacturing

Southwest Virginia Alliance for Manufacturing, Inc.

The Southwest Virginia Alliance for Manufacturing, Inc. (SVAM) is a manufacturer led, 501(c)3 non-profit organization that serves the Region One footprint. SVAM supports the sustainment and advancement of manufacturing in Southwest Virginia through regional collaboration, redefining the image of manufacturing, and closing the skills gap for manufacturers by aligning educational and workforce training resources with the demands of area industry. Services including offering training opportunities, networking opportunities, connecting manufacturers with resources, and employment support. SVAM also plays a lead role in chairing the Region One Advanced Manufacturing Working Group focused on opportunities and project development in this sector.

Southwest Virginia Advanced Manufacturing Center of Excellence



In order to increase capacity to produce a ready regional workforce and to become an advanced manufacturing hub, the Southwest Virginia Advanced Manufacturing Center of Excellence (COE) was established with the recommendation to open three COEs in the region. The COE's are a dynamic network of advanced manufacturing resources

that support industry by developing a skilled workforce. Their goals include increasing the number of

manufacturing career seekers, strengthening existing training for advanced manufacturing partnering with regional educational systems, and developing new, fast-tracked advanced level training.

Appalachian Regional Commission funded a recent project of the COE, named The Heart Project. The goal of the project is to connect businesses and manufacturers, impacted by the fluctuations in the coal industry, with new opportunities. The project, covering the entire Region One footprint, leverages existing resources in the region through partnerships with workforce development organizations and GENEDGE. The Heart Project provides business outreach, network analysis, business service plans for growth and expansion, and targeted technical assistance for local businesses. A major component of the project involved the coordination of 35 business roundtable discussions that convened stakeholders to discuss the region's strengths, problems, opportunities, and threats and a plan for moving bold steps forward. Related to GO Virginia growth strategies, the Heart Project revealed specific bold steps to include developing and implementing apprenticeship and mentoring programs, funding mechanisms to support expansion of existing business and new businesses development, establishing innovation centers focused on industry clusters, and developing solar opportunities. The results of these conversations helped to inform the development of this Growth and Diversification Plan.

GENEDGE

Committed to the long-term success of Virginia enterprises, GENEDGE offers highly personalized services tailored to the specific needs of client companies. Serving all of Region One, GENEDGE is a public resource to help manufacturing and industry innovate, compete, and grow. The organization delivers consulting based expertise and technology transfer to companies and helps clients expand, diversify, improve top & bottom line results, create jobs and sustain employment. GENEDGE has served numerous businesses in Region One over the last several years. While GENEDGE specializes in manufacturing businesses, their work and expertise go beyond this industry to serve multiple industry sectors. An example is their lead partnership in The Heart Project mentioned above.

Agriculture

Region One's rich history in agriculture coupled with the region's immense agricultural assets make it an important industry. Over the years, the region has been focusing efforts on increasing agricultural opportunities to grow this sector. Some examples include the establishment of the Appalachian Regional Exposition Center (APEX) at the intersection of interstates 81 and 77 in Wytheville and the Southwest Virginia Livestock Educational Center currently under construction in Carroll County. Blue Ridge Plateau Initiative, a regional non-profit, has been working for over a decade to establish a regional meat processing facility in Carroll County. The project has undergone a feasibility study and has received significant financial support to date, although additional funding is still needed in order to begin construction. There are similar efforts in Lee and Russell Counties to build agricultural capacity in this part of the region as well. Along with several other initiatives, a feasibility study is underway in Russell County to look at establishing a meat processing facility.

Given the various agricultural efforts occurring in the region, the GO Virginia Region One Council is partnering with the Department of Mines, Minerals, and Energy to develop an Agriculture Action Plan to identify specific opportunities and strategic steps for agricultural development. The Action Plan will build

upon existing strategic plans developed for the region and will help to advance the core strategies identified in those plans, focusing mainly on cattle and grain opportunities.

Appalachian Sustainable Development

Appalachian Sustainable Development (ASD) is a nonprofit organization working to build sustainable local food and forest based economies in Southwest Virginia and Northeast Tennessee. ASD's mission is to transition Appalachia to a more resilient economy and a healthier population by supporting local agriculture, exploring new economic opportunities and connecting people to healthy food. ASD offers numerous programs to the region including the Central Appalachian Food Corridor and Farmer and Rancher Mentoring.

Virginia Cooperative Extension

Virginia Cooperative Extension is an educational outreach program of Virginia's land-grant universities: Virginia Tech and Virginia State University, and a part of the National Institute for Food and Agriculture, an agency of the United States Department of Agriculture. Extension agents and specialists form a network of educators whose classrooms are the communities, homes, and businesses of Virginia, where they bring research-based solutions to the problems facing Virginians today. Each county in Region One is staffed with an extension agent that offers a variety of resources including programs in agriculture, community and leadership, food and health, lawn and garden, natural resources, and 4-H for youth.

Information Technology

Southwest Virginia Technology Council

Servicing the Region One footprint, the Southwest Virginia Technology Council (SWVTC) is a membership organization focused on addressing technology issues for business, education and government with the purpose of enhancing the vitality and social well-being of Southwest Virginia. SWVTC membership includes businesses, institutions and individuals from the Wytheville region to the far western corner of Virginia. The council serves as technology advocates to local, state and national government and agencies to promote and facilitate the development and growth of technology in the region. Their work involves collaborating with other organizations to foster coordinated technology development programs in the areas of education, commerce and economic development. A recently funded GO Virginia project of the SWVTC is the development of the SWVA Hub Link, a talent connection initiative. The goal of the SWVA Hub Link is to serve as an online jobs platform connecting job-seekers to job and training opportunities in the technology industry.

Energy and Minerals

Department of Mines, Minerals, and Energy

The Virginia Department of Mines, Minerals and Energy (DMME) was established in 1985 to enhance the development and conservation of energy and mineral resources in a safe and environmentally sound manner in order to support a more productive economy in Virginia. Region One is home to DMME's Divisions of Mines, Mined Land Reclamation, and Gas and Oil. With locations in Big Stone Gap and Lebanon, DMME offers services and expertise to the region including regulatory services, permitting,

inspections, training activities, and reclamation of abandoned mine lands which includes management of the Abandon Mine Lands (AML) Program focused on reclaiming high priority AML sites.

Solar Workgroup of Southwest Virginia

The Solar Workgroup of Southwest Virginia is convening the region's leaders to advance the goal of leveraging solar development as an economic catalyst. The Workgroup is co-convened by Appalachian Voices, People Incorporated of Southwest Virginia, and The University of Virginia's College at Wise Office of Economic Development and Engagement, with professional facilitation from Dialogue + Design Associates. Participating entities include county and county governments, school districts, community colleges, planning district commissions, industry, nonprofits and interested citizens. The Workgroup released The Solar Roadmap for Southwest Virginia, which identified goal areas and provided preliminary data to include a high-level analysis of the market and demand potential of solar in the region, while identifying specific commercial-scale ambassador projects. The Workgroup was recently awarded GO Virginia funding to develop The Solar Playbook, which will expand on those concepts and provide in-depth and detailed resources to support and lead to implementation of solar investment in the region.

Economic Development

Virginia Coalfield Economic Development Authority

Virginia Coalfield Economic Development Authority (VCED) is a regional economic development organization created by Virginia's General Assembly in 1988 to enhance and diversify the economic base of the coalfields in Southwest Virginia. Their service area includes the counties of Lee, Scott, Wise, Dickenson, Buchanan, Russell, Tazewell, and the City of Norton. VCEDA has helped bring over 20,000 jobs and more than \$204 million in approved funding for 303 projects throughout the coalfield region. To encourage diversification and create new jobs, VCEDA manages financing programs funded by taxes paid by the coal and natural gas industries in the region. VCEDA also offers a Seed Capital Matching Fund for businesses under three years old with less than 10 employees.

Virginia's Industrial Advancement Alliance

Virginia's Industrial Advancement Alliance (VIAA) is a non-profit multi-jurisdictional economic development partnership, to conduct outreach marketing and work with its six localities to support and enhance their economic development efforts. Stretching from Carroll County to Bland County along Interstates 81 and 77, the organization includes membership of Smyth, Wythe, Grayson, Carroll and Bland counties, and the City of Galax. The organization is served by a board of directors with representatives from local governments, private sector, and community colleges. VIAA is focused on targeting sectors including plastics and advanced materials, food and beverage processing, automotive and transportation equipment, information technology, and warehousing and distribution.

Planning District Commissions

The regional Planning District Commissions play a vital role in economic development and regional collaboration in Southwest Virginia. The three planning district commissions (PDC) encompassing the Region One geography were established in the late 1960s and include the LENOWISCO PDC, Cumberland Plateau PDC, and Mount Rogers PDC. The PDCs were formed to promote economic

development activities and have strong relationships with the region's localities, as they provide technical assistance in addressing local issues and planning for infrastructure and development. The PDCs are heavily involved in many aspects of development in the region and are a key partner in implementation of regional projects. Region One's counties and cities encompassed in each PDC are listed below:

- LENOWISCO: Counties of Lee, Scott, Wise, and the City of Norton
- Cumberland Plateau: Counties of Buchanan, Dickenson, Russell, and Tazewell
- Mount Rogers: Counties of Bland, Carroll, Grayson, Smyth, Washington, Wythe, and the Cities of Bristol and Galax

GO Virginia projects in Region One should engage the planning district commission in the respective area to ensure alignment with other regional efforts and to utilize their expertise in project development and management.

Creative Economy

In the early 2000's, a strategy for a creative economy based on Southwest Virginia's assets in music, arts, and crafts, local food and drink, and outdoor recreation was put forth by the Southwest Virginia Cultural Heritage Foundation. Asset based economic development initiatives including The Crooked Road, 'Round the Mountain, Appalachian Spring, and others were launched as a result. Building on this strategy, efforts in community development and marketing and branding were also initiated to enhance and promote the region's unique assets and quality of life.

The numerous downtown and main street revitalization efforts underway are creating business friendly environments that connect to and leverage these regional strategies. As Region One strives to recruit millennials and retain young adults, building communities which are attractive to this demographic require different approaches than the communities have undertaken in the past. Clustering activities and amenities in community downtown spaces are attractive to both millennials and the aging baby boomer population. Creating a "sense of place" with dense environment within the SWVA communities will help strengthen the draw for populations seeking to live, work, play and learn all within walking distance.

Although GO Virginia funding cannot be used for quality of life projects, these efforts are vital to the overall regional strategies to recruit and retain the younger population.

Friends of Southwest Virginia

The Friends of Southwest Virginia, a 501 (c)3 non-profit, works in tandem with the Southwest Virginia Cultural Heritage Foundation with a joint mission to develop the creative economy in Southwest Virginia. From the arts and music of the region to cultural goods and services capitalized through tourism to research and development, their joint work is revolutionizing the rural economic development system of Southwest Virginia and providing thousands of new jobs to the people of this region. Specific initiatives include developing and sustaining the Southwest Virginia Cultural Center and Marketplace, formerly Heartwood, expanding outdoor recreation development initiatives, and planning and implementation of downtown revitalization. Friends of SWVA led the Southwest Virginia branding process and works with regional partners to market the 19 counties and four cities of Southwest Virginia.

Other Regional Initiatives

Southwest Virginia/Northeast Tennessee Collaboration

Over the last year the Bristol, Kingsport, and Johnson City Chambers of Commerce and their board leadership have been jointly engaged in meetings to promote the business case and anecdotal evidence for the impact and value of greater regional efforts across both Northeast Tennessee (NETN) and Southwest Virginia (SWVA). The effort has gained significant momentum, growing the database and representation to approximately 70 business leaders, including locality partners across both regions. The work of GO Virginia Region 1 has been presented to the group as an example of positive collaboration and a strong model for cooperation. Most recently, the group has initiated a naming effort to be used to market the greater SWVA and NETN region to recruit businesses and visitors to the region.

American Electric Power Workforce Study

An available and skilled workforce is the primary driver when businesses consider establishing a new location or expanding an additional one. The Virginia Tech Office of Economic Development is working with Boyette Strategic Advisors (Boyette) to conduct a workforce assessment and skills analysis for a 55-county region in Virginia that is being called the Virginia SkillsBelt. This includes the geography of Region One. The project is being completed with the funding from the Virginia Tobacco Region Revitalization Commission and in partnership with AEP – Appalachian Power.

The Assessment will evaluate the regional workforce, specifically as it relates to transferable skills and compatible occupations for the unemployed and underemployed workforce, many of whom previously worked in the mining, tobacco, and textile and furniture sectors. An in-depth analysis of the regional workforce, its assets and challenges, available training opportunities, and future employment trends will lead to strategic recommendations for enhancing the area's workforce and better preparing workers to meeting the challenges of the future. The results are expected in late 2019.

Invest SWVA / Coalfield Strategies

InvestSWVA is the newly-created Southwest Virginia Regional Marketing Initiative. The initiative is a public-private partnership focused on driving economic sustainability efforts in Region One around the four targeted industry clusters. The advisory board that oversees this regional marketing initiative includes members of the region's General Assembly delegation and representatives from Point Broadband, the Tobacco Regional Revitalization Commission, as well as from the LENOWISCO, Cumberland Plateau and Mount Rogers planning district commissions. Coalfield Strategies, LLC. is the firm that was selected to manage InvestSWVA. The targeted areas of GO Virginia align well with InvestSWVA's marketing strategy.

Regional Funding Partners

Beginning in 2018, a broad range of grant funders throughout the region began meeting to align strategies and gain a better understanding of regional projects and priorities. The group, consisting of representatives from GO Virginia Region One, Tobacco Region Revitalization Commission, Appalachian Regional Commission, Department of Mines, Minerals, and Energy, and Department of Housing and Community Development, meet quarterly to look for ways to work together to support projects that build

the economy in Region One. The group collaborated to develop a document that lists sources of regional funding and their main funding priorities in order to direct interested applicants to appropriate funding and offer potential matching fund sources. Not all funding sources are eligible for GO Virginia match, but the list is meant to assist applicants with other potential sources of funding to support their efforts. This list is located in the appendix.

Of the Region One projects that have received GO Virginia funding and used other grant funding as match, the majority have utilized Appalachian Regional Commission funding as match due to its origination from federal dollars. Specific projects include the Southwest Virginia Technology Council's SWVA Hub Link and Mountain Empire Community College's Smart Farming at the Center for Workforce & Innovation of Appalachia. Other sources of match for Region One projects were obtained from localities, non-profits, and the private sector.

Region One Approved Projects

In addition to the partners and initiatives referenced above, GO Virginia Region One has funded seven regional projects, many of which are connected to previously mentioned efforts. Region One has also participated in a Competitive project with Region Three, in which funding was awarded for the GO-TEC Phase II project. Summaries of the funded projects are included in this section.

Collaborative/Implementation Projects

United Way of Southwest Virginia: Ignite Internships

United Way of Southwest Virginia (UWSWVA) is expanding their Ignite Internships program throughout the region's high schools, working with schools and employers to collaboratively align school curriculums with employer needs. The two-year project includes a capacity-building platform that provides activities to encourage post-secondary education, streamlines work credentialing, provides work-based learning opportunities and matches new graduates with local employers through a web-based platform. Ignite Internships is expected to work with at least 40 new employers and provide internships to 120 students.

UWSWVA was awarded \$250,000 in GO Virginia Per Capita funding for salaries and contract services for software licensing. A total match of \$618,482 over two years is committed to the project by various sources, including a local match of \$50,000 from the Region VII School District Superintendents, which includes 17 school districts in Southwest Virginia.

UWSWVA was recently funded \$99,406 in GO Virginia Region Two Per Capita funding to expand the program into Giles and Pulaski Counties and the City of Radford, which are also part of the Region VII school district.

Mountain Empire Community College: Smart Farming at the Center for Workforce & Innovation of Appalachia

Located in the Town of Appalachia in the former Appalachia Elementary School, the Center for Workforce & Innovation of Appalachia will be a satellite training facility to enable Mountain Empire Community College (MECC) to expand many of its existing programs, as well as launch several new programs. GO Virginia funds will support MECC and its partners to establish the Smart Farming program,

focused on using drone technology for agricultural purposes, which will allow the College to expand their Unmanned Systems program. The concept of "Smart Farming" involves the use of technology to improve farming techniques, increase yields, and maximize profits. The program will involve a two-step process of data collection using drone technology and data analysis using the new Agricultural Science Laboratory. The addition of the Smart Farming courses will enable MECC to develop the first Unmanned Aerial Systems Associate Degree program in the Virginia Community College System and the only such program in Region One. As part of the Smart Farming program, the College will establish the first Agricultural Science Lab in the region to provide space and resources to analyze data collected by the UMS program. MECC is expecting to award at least 45 employable credentials to participating students within two years.

MECC was awarded \$310,372 in GO Virginia Per Capita funding for drone technology and Agricultural Science Lab equipment, renovations, and utilities. A total match of \$380,500 over two years is committed to the project, including a local match of \$62,500 provided by the Wise County Board of Supervisors.

Carroll County Industrial Development Authority: Southwest Virginia Livestock & Educational Center

The Southwest Virginia Livestock & Educational Center is a joint effort of the Agricultural Education Departments of the City of Galax, Carroll County and Grayson County schools, a consortium of local cattle producers and the Virginia Cooperative Extension. The project will establish an educational and working facility to be located on a 42 acre location, with proximity to interstates I-77 and I-81 and the wholesale Southwest Virginia Farmers Market.

In its initial phase, the Southwest Virginia Livestock Educational Center will serve multiple purposes as a hands-on educational facility for local agriculture students and 4H programs and a safe, controlled working facility where both students and local livestock producers can work their herds, receive veterinary services, and grade and sell livestock locally. The project is expected to provide students with increased awareness and opportunities for scholarships to continue their education and local employment in the agriculture sector through internship opportunities. In addition, benefits for the producers can include improved health and genetics of herds, higher certified weights at time of sale and significantly higher sale prices for herds.

The Carroll County Industrial Development Authority (IDA) was awarded \$100,000 in GO Virginia funding to cover costs associated with equipment for the facility. A total match of \$167,200 over two years is committed to the project, including a local match of \$66,000 provided by the Carroll County IDA.

Enhanced Capacity Building Projects

Southwest Virginia Technology Council: SWVA Hub Link

The Southwest Virginia Technology Council (SWVTC) will complete initial work on the SWVA Hub Link platform, an online jobs platform and talent connection initiative, where job-seekers will be able to access job and training opportunities in the technology industry. Prior to the build-out of the platform, SWVTC will solicit input from regional stakeholders, including workforce training providers, community colleges, private industry partners, student and job-seekers, etc. in order to determine the most valuable

features for the online platform. In addition, SWVTC will establish an inventory of existing training opportunities to be featured on the platform.

The SWVTC was awarded \$27,547.19 in GO Virginia funds for this enhanced capacity building project. GO Virginia funding will be used to hire a contractor to conduct the planning and stakeholder engagement work. A total match of \$27,637.20 is committed to the project.

Virginia Polytechnic Institute and State University: Coal to Graphene Market Study

Virginia Polytechnic Institute and State University (Virginia Tech) will conduct a market study, initial environmental impact analysis, and cost projections for the development of a graphene economy in Southwest Virginia. Virginia Tech's Institute of Critical Technology and Applied Science has developed a method of manufacturing graphene from coal at a significantly reduced cost from what is currently available. Virginia Tech will partner with EnviraCarbon on scaling up this production process for industrial applications, which align with several targeted clusters.

Virginia Tech was awarded \$25,000 in GO Virginia funds to be used to procure a consultant to complete the study. The project has a total match of \$25,000 in local funds provided by the Wise County Industrial Development Authority.

LENOWISCO Planning District Commission: Lonesome Pine RIFA Coordinator

The LENOWISCO Planning District Commission, on behalf of the Lonesome Pine Rural Industrial Facilities Authority (LPRIFA), will establish a 24-month coordinator position to manage two federally funded projects of the LPRIFA; Project Intersection and Project Homestead. Consisting of the counties of Lee, Scott, Wise, Dickenson, and the City of Norton, the LPRIFA is a collaborative entity formed to provide a mechanism for the localities to cooperate on economic development projects to assist the region in overcoming geographic and financial barriers to economic growth. Overall, the proposed position will further the LPRIFA organizational structure and establish the self-sustainability of the LPRIFA by facilitating increased economic development opportunities, which will create more prospects for regional revenue sharing.

LENOWISCO was awarded \$50,000 in GO Virginia funding to support the position. The project has a total match of \$50,000, provided by LENOWISCO Planning District Commission and derived from local funds.

Appalachian Voices: The Solar Jobs, Manufacturing and Utility-Scale Investment Playbook for Far Southwest Virginia

Appalachian Voices on behalf of the Solar Workgroup of Southwest Virginia, will develop The Solar Jobs, Manufacturing and Utility-Scale Investment Playbook for Far Southwest Virginia. Building on the Southwest Virginia SolSmart designation and 2017 Solar Roadmap for SWVA, the Playbook will be a highly actionable, data-based analysis that identifies specific pathways for large-scale solar-related investment and employment opportunities in Southwest Virginia. The Playbook will include a detailed market analysis and local asset-leveraging resources to attract and retain significant investments in the solar supply chain related to manufacturing and utility-scale solar developments. The market analysis will inform a workforce training and credential gap assessment, which will identify current and future credentialing needs, and how those needs may be addressed either through existing or new training and certification pathways.

Once released, the Solar Workgroup of Southwest Virginia will partner with localities and the solar industry to ensure implementation of the Playbook.

The project was awarded \$70,947 in GO Virginia funds, which will cover expenses associated with personnel and contract services. A total match of \$70,947 has been committed to the project by various sources.

Competitive Projects

Region 1/Region 3: GO-TEC Phase II

Region One collaborated with Region Three on the Great Opportunities in Technology and Engineering Careers (GO-TEC) Phase II project that includes participation from Wytheville Community College (WCC) and the counties of Bland, Carroll, Grayson, Wythe and Smyth as well as the city of Galax. Led by Danville Community College, GO-TEC Phase II is designed to increase capacity for training high demand, high income workers and to increase the pipeline of students entering five regional training areas of need: precision machining, welding, IT/cybersecurity, robotics/mechatronics, and advanced materials. The project includes a “hub and spoke” model, which has students from “spoke” institutions coming to a “hub” for specialized training. In WCC's case, once completing WCC's machining program, students would complete a year of advanced training in machining in Danville.

The GO-TEC Phase II project was awarded full funding with a contingency that a scaled approach be initially funded at \$1.3 million and validated after a year prior to receiving the full \$4.8 million. The award includes \$65,536 in funding for WCC to strengthen its precision machining program and begin exploration of and support for Career Connection labs in Region One's middle schools. WCC has committed a total match of \$65,536 in local funds to the project.

SWVA BEYOND THE NUMBERS

Region One Industry Targets

Based on the analysis of industries in GO VA Region One and identification of the regional strengths raised by regional stakeholders, **the following industries and clusters are presented as industry targets that can provide above-average wages for residents in the region. These targeted industries remain the same as the original Growth and Diversification Plan.**

Key Targets for GO VA Region One				
	Advanced Manufacturing	Food and Beverage Manufacturing	Energy and Minerals	Information Technology
Location Quotient	1.49	0.89	3.22	0.50
Average Annual Wage	\$43,828	\$42,831	\$77,591	\$64,700
Employment	17,134	1,413	4,023	2,041
Export Sector	✓	✓	✓	✓
	The region possesses above-average wages and competitive advantages in many manufacturing industries.	Prominence of agriculture in the region creates a fertile environment to attract food and beverage manufacturers to the area.	High wages and competitive advantages showcase the importance of energy to the region.	Defined at an occupation level due to their importance across many industries. CGI, DP Facilities South, and Northrop Grumman are examples of this emerging cluster.

Source: JobsEQ & Chmura

Given the significant natural, recreational and cultural assets of the region, Southwest Virginia has invested heavily in building the tourism industry. According to the Virginia Tourism Corporation Economic Impact of Domestic Travel in Virginia report, travelers spent a total of \$1,043.37 million in Southwest Virginia, an increase of \$394 million since 2004, which makes this industry one of the significant revenue generators in the region. Tourism and healthcare are critically important to the region's economy. As part of a comprehensive economic development strategy, these two industries are often part of a prospective employer's decision to locate or expand in a region. Assets in tourism and healthcare add to the quality of life equation, which have become an important part of the site selection formula.

However, due to the relatively low wages of the tourism industry when compared to the region's average, the tourism industry is not included in the target industries of GO Virginia Region One. Similarly, health care was not selected as a potential target as it generally grows with the region's population and is not targeted by economic developers for expansion into a region.

GO Virginia continues to stress the importance of these two industries in SWVA but projects involving these two industries will not be eligible for GO Virginia funding.

In reference to the chart above, the analysis in this section considers whether a sufficient number of workers are in Region One or the labor shed with the skills needed to attract the target industries. The threshold for an ample supply of workers varies across industries and occupations, but a general threshold of a ratio of at least 50:1 of potential candidates (employed plus unemployed) to the new employer demand is used. If gaps exist for occupations that the new firms would require, the number of individuals in an alternative occupation that could be trained for the occupation in demand is considered (referred to below as extended employment) along with new graduates in the region that possess the required skills.

- Advanced manufacturing experienced an increase in employment by 2.6% from 16,696 to 17,134 and an increase in average annual wages from \$42,617 to \$43,828.
- Food and beverage manufacturing, average annual wages increased by 2.5 % from \$41,797 to \$42,831, while employment decreased by -0.3% from 1,418 to 1,413.
- Energy and minerals industry in the GO VA 1 region, employment increased by 0.4% from 4,008 to 4,023 and employment increased by 4.4% from \$74,286 to \$77,591.
- For those working in IT in the GO VA 1 region, employment decreased by 2.9% down to 2,041.

Given the general increase in employment and average annual wages in these four sectors, along with their fairly high location quotients and exporting capabilities, they remain as targets.

A closer look at the traded and local sectors within the GO VA 1 regions showed that while employment had decreased across both type of sectors (-0.06% and -0.75% respectively), total wages had increased in the traded sectors by 3.09% and by 1.47% in local sectors. This increase in wages might be due to expansion in some industries within manufacturing, as the aggregate manufacturing industry grew employment by 2.6% to 17,134 in the last year.

Similarly, the energy and minerals industry had also experienced an increase in employment; increasing by 0.4% to 4,023. The industries that added in the most jobs were:

- Bituminous Coal underground mining (+42 employees)
- Electric Power generation (39)
- Drilling Oil and Gas Wells (10)

Detailed analyses for each of the target industries may be found in the appendix.

Advanced Manufacturing

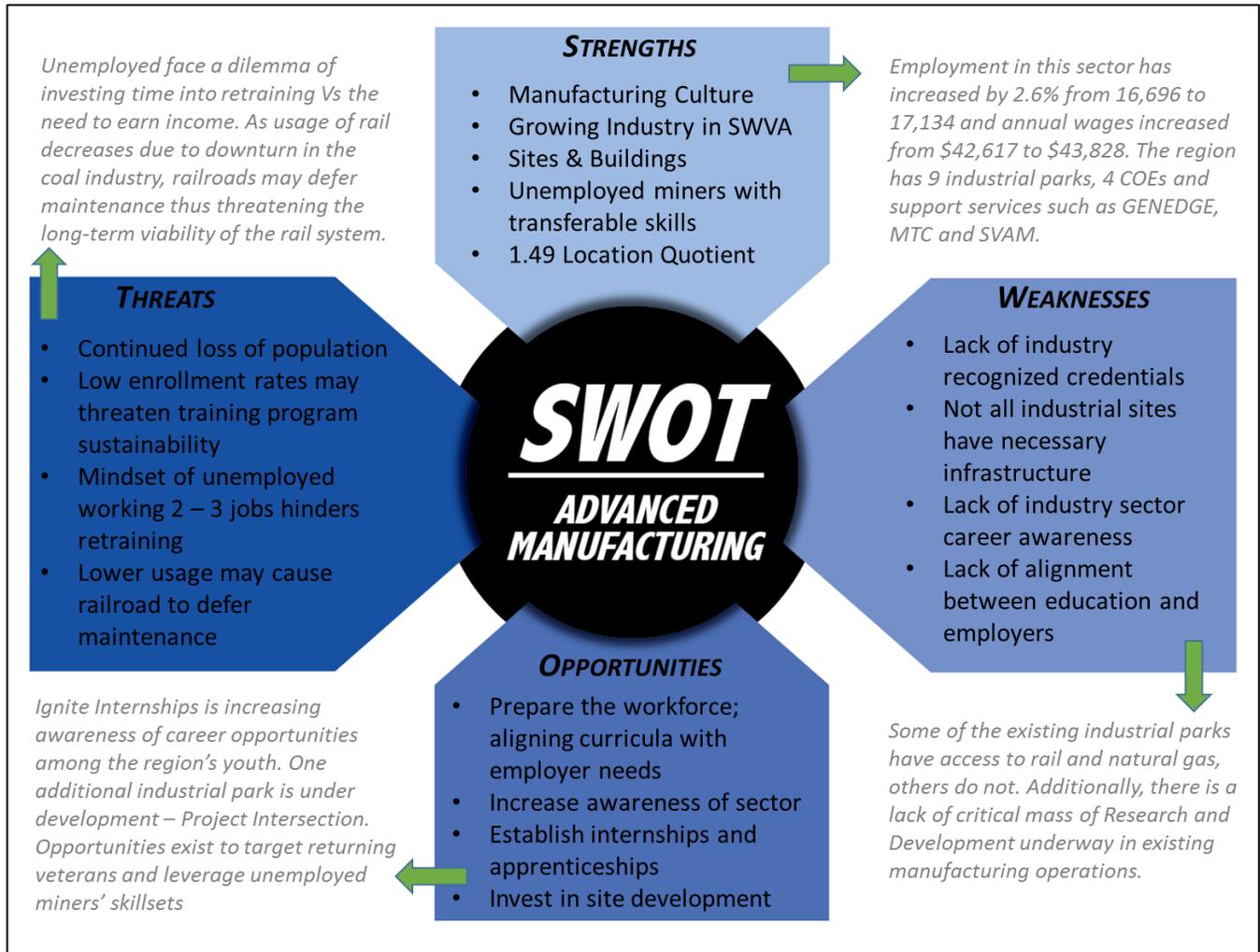
As noted earlier, manufacturing employment across Region One is growing and the location quotient for this sector in SWVA is 1.49 which is greater than the national average. The following industries, which had more than 50 employees last year, added in 100 employees in the last 12 months.

- Truck Trailer manufacturing (+126 employees)
- Mining Machinery and Manufacturing (122)
- Motor vehicle body manufacturing (100)

Specifically, four industries within the advanced manufacturing cluster are examined to illustrate potential regional labor pool and supply chain capacity and gaps with the advanced manufacturing cluster. The details of these analyses may be found in the appendix. The four industries—transportation equipment manufacturing; plastics and rubber products manufacturing; chemical manufacturing; and electrical

equipment, appliance, and component manufacturing—were chosen because they pay above-average wages and account for a significant share of regional employment (as indicated by the location quotients).

Advancing the manufacturing sector is a priority for Region One and as illustrated in the graphic below, the industry represents significant strengths, challenges, opportunities and threats for the region.



Detailed SWOT analysis may be found in the appendix.

Agriculture/Food & Beverage Manufacturing

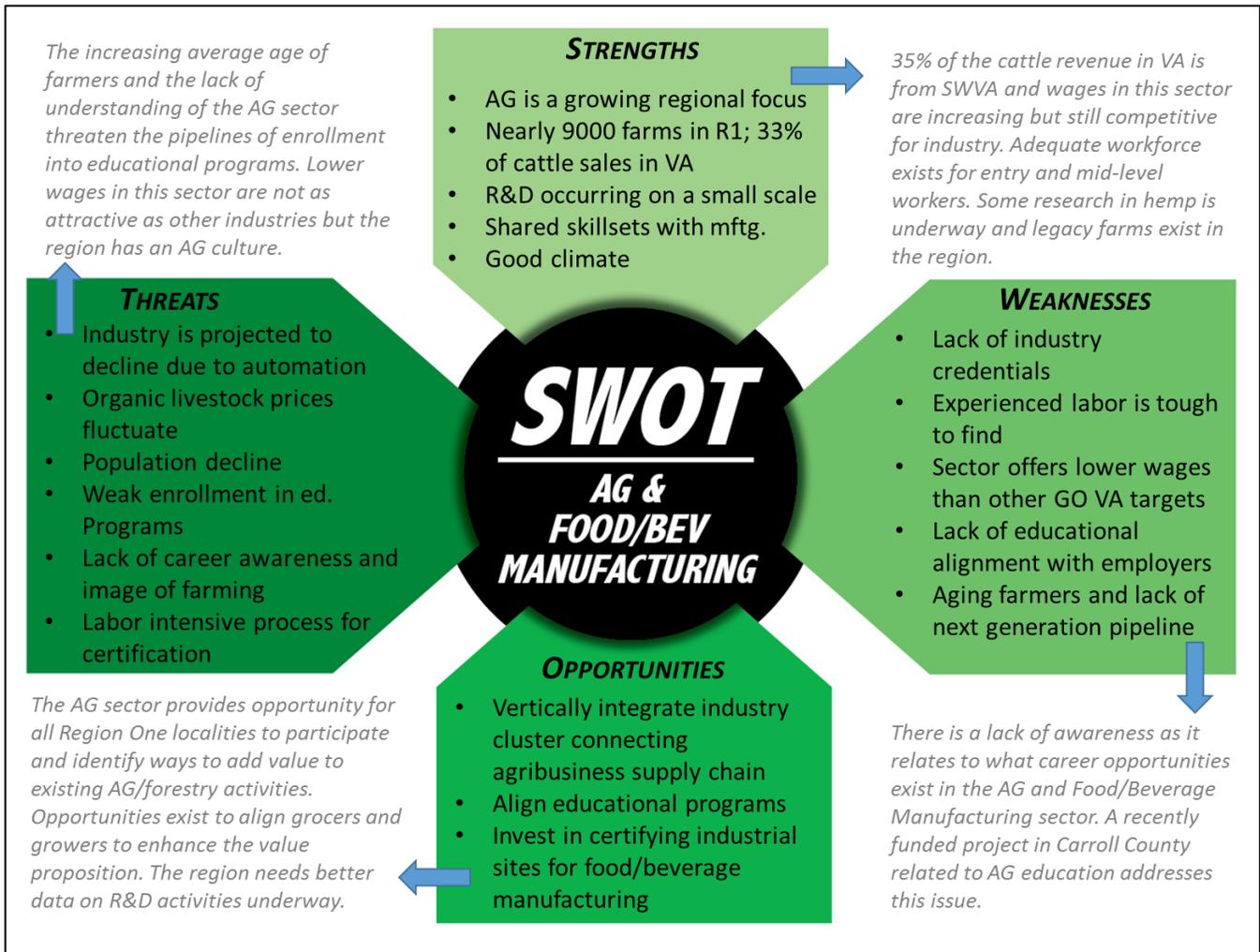
Agriculture is an important industry in the GO VA 1 region. Twenty percent of the state's farms are in the GO VA 1 region, with cattle and calve sales exceeding \$240 million and total crop sales at \$57.4 million.

Both the number of farms and the total farmland acreage decreased in GO VA One and across the state. The number of farms decreased from 2012 to 2017 in the state of Virginia (-6.1%) and the GO VA One region (-10.7%), while total farmland acreage decreased 6.1% in Virginia and 13.6% in the GO VA One region. Total livestock sales in GO VA Region One declined 8% over this period; however, total crop

sales rose 15%. At the national level, the number of farms declined by 3.2% while farmland decreased 1.5% over the same five-year period.

Food and beverage manufacturing is a natural extension to the agriculture industry that would bring jobs at various skill levels. One specific industry within food and beverage manufacturing, animal slaughtering and processing, is of specific interest because of the stated need of local farmers for such a facility since they currently ship cattle to the Midwest for slaughtering and processing. Food and beverage manufacturing, in general, is a significant target industry.

Expanding the agriculture and food/beverage processing sectors in Region One builds upon the strengths of the region as outlined in the SWOT analysis below.



Detailed SWOT analysis may be found in the appendix.

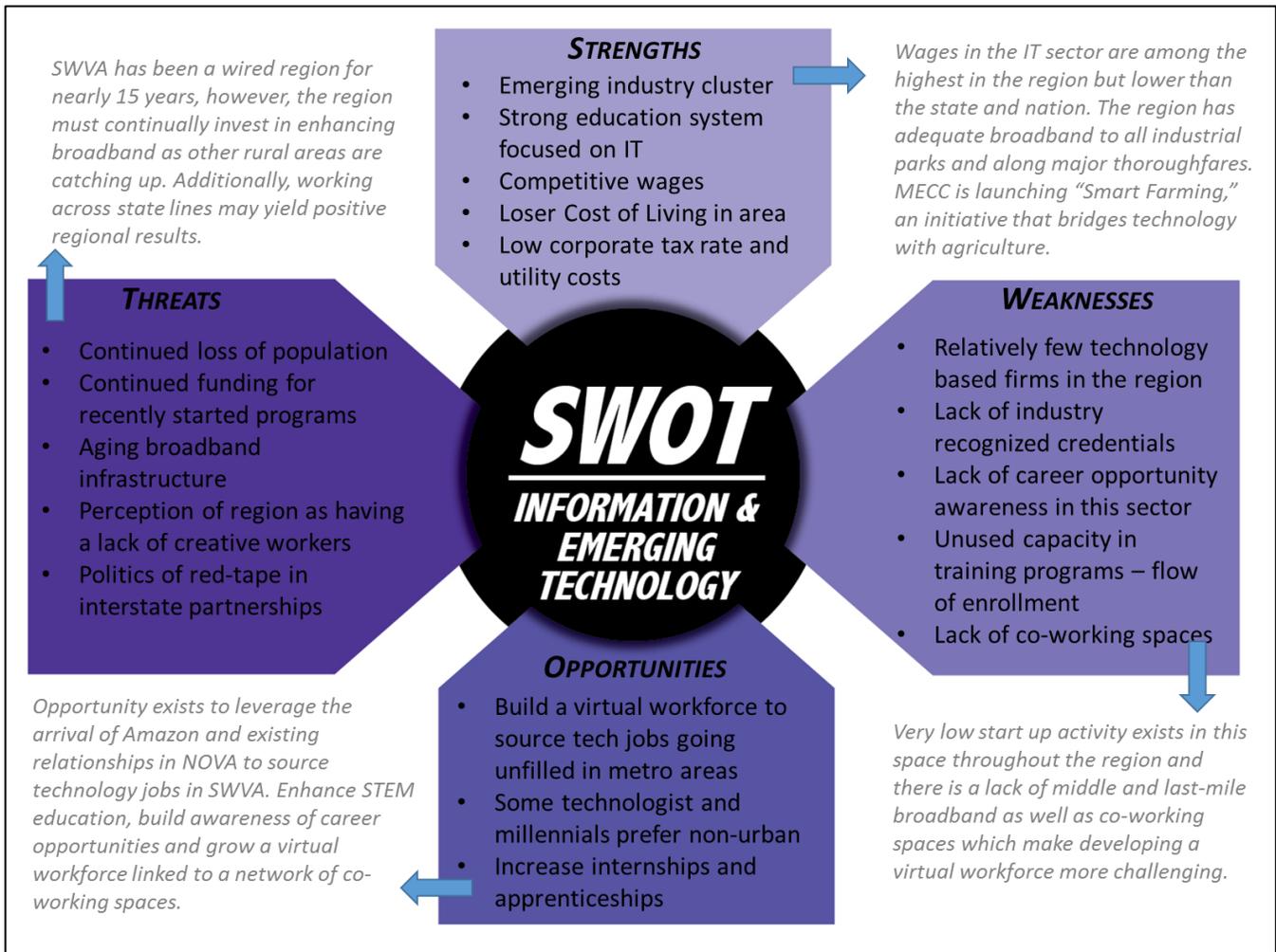
Information & Emerging Technology

Growth in the Information Technology industry offers the greatest opportunity to replace the lost wages suffered by the decline in the energy sector in Region One. With the large investment of broadband in the region and expansion of technology companies such as CGI, Northrop Grumman, DP Facilities – Mineral Gap data center and Wize Solutions over the last decade, information technology occupations are an emerging driver of growth in the region, though not necessarily tied to a particular sector. Technology skills are increasingly needed in every industry to stay competitive. However, the growing concentration of information technology skills in the region points to an opportunity to attract firms that need such skills.

Computer and math occupations pay a much higher average wage than that of the GO VA 1 region—\$64,700 compared to \$38,200. With 2,041 people in the region working in computer and math occupations, the location quotient (LQ) for the occupation is 0.5., meaning that workers with these skills have a concentration half that found in the nation, on average. The LQ for the labor shed is a bit higher at 0.59. Consequently, attracting firms that need computer and math talent is an aspirational strategy.

The region's educational providers at all levels of the educational infrastructure are offering programs designed to increase the tech talent pool. These programs have unrealized capacity and efforts such as the United Way of SWVA's Ignite Program are introducing career opportunities to the area's youth not only in the field of IT, but advanced manufacturing, agriculture and other industries. However, the opportunity exists to strengthen the pipeline of talent into the existing training programs throughout the region and to continue to align curricula to meet the needs of employers.

Growing the information and emerging technology industry in SWVA leverages the assets referenced in the following graphic.



Detailed SWOT analysis may be found in the appendix.

Energy and Minerals

The energy cluster has a location quotient of 3.22 indicating that employment in the GO VA 1 region is more than three times as concentrated in the region as it is in the nation. Moreover, the annual average wage in the cluster was \$77,591 in the first quarter of 2018—more than double the \$34,678 average wage in the GO VA 1 region.

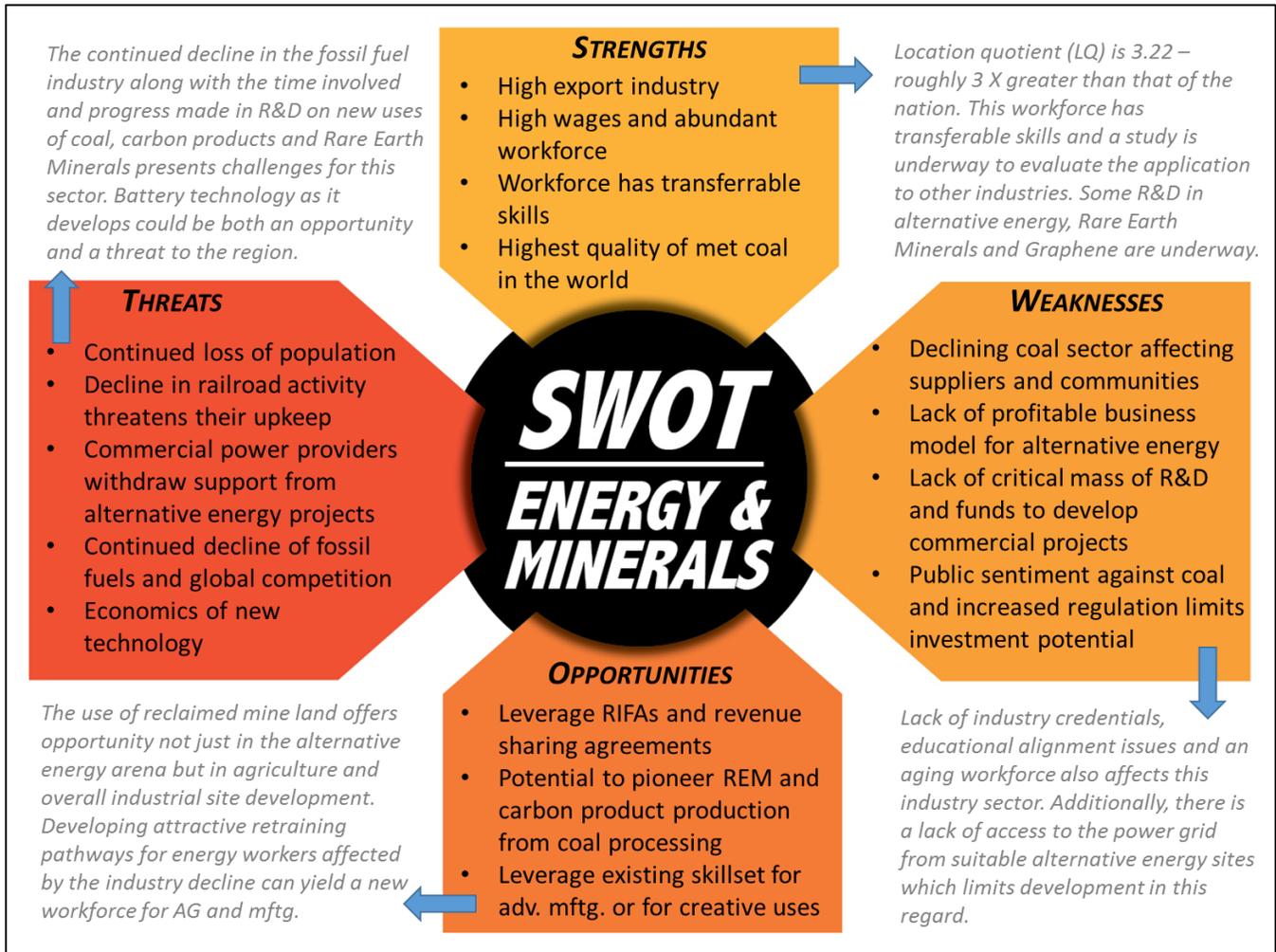
Unfortunately, 62.5% of the employment in this strong regional asset is tied to coal mining, which is in decline. Alternative uses for coal may revive the industry at some future date. However, these technologies are still in the research phase and therefore should be considered aspirational.

Additional electric power generation and alternative energy sources may also be a source of employment growth for the energy cluster in GO VA 1.

Wind and solar projects have also been considered in the GO VA 1 region that would diversify the energy cluster away from its dependence on the coal industry. Both industries pay well in the nation. During the

fourth quarter of 2018, the national annual average wage in solar electric power generation was \$100,170 and wind electric power generation employees earned an annual average \$106,735.

The energy sector remains a Region One targeted industry and the opportunity to continue evaluation of rare earth minerals, carbon-based products and alternative sources of energy may offer growth opportunities in the region and capitalize on the assets as outlined in the SWOT graphic below.



Detailed SWOT analysis may be found in the appendix.

Project Sustainability and Potential Match

The GO Virginia Region One Council is sensitive to the sustainability of projects when funding decisions are made. GO Virginia resources can be used as a catalyst to start conversations amongst regional stakeholders, but to also support viable projects already on the radar screen of partners. However, sustainability of projects as well as gathering the local match required for a project are chronic challenges for the jurisdictions of the region. The GO Virginia Region One Council is engaged in conversations with regional planning districts to explore opportunities for addressing these challenges.

The four target industries of the GO Virginia Region One Council align well with the strategic funders who support the region of SWVA. As mentioned earlier, GO Virginia meets regularly with these stakeholders to explore opportunities to build regional capacity to promote economic development. These funders can use GO Virginia funds as matching dollars when required. However, none of the state dollars offered through these funders can be used as match for GO Virginia projects. Whereas funding for feasibility studies is often more challenging to get funded, GO Virginia offers opportunity to assist with capacity building funds to evaluate the feasibility of attractive regional projects. The value of meeting regularly with the funding stakeholders is to work collaboratively to leverage funding, which can address broad regional projects capable of having a large impact and move the dial on metrics for the region.

Region One Growth Strategies

As the Region One Council canvassed the region for input on the update of the plan, the foundational strategies of the growth plan were affirmed and therefore will remain relatively the same. Additionally, the plan development benefitted from two years of experience with what projects were prioritized and funded at the state level. Thus, the 2019 regional strategy framework includes:

- Talent Development
- Sites and Infrastructure
- Innovation and Scale Up Support

This framework is in alignment with the goals of GO Virginia at the state level. It represents a practical yet aspirational approach to diversifying the region's economy and provides guidance to stakeholders as to the priorities of the Region One Council. These underpin all of the industry sectors operating in the region, supporting both the existing and new employers in the region.

As with the development of the initial Growth and Diversification Plan in the summer of 2017, it is still evident that the region faces steep challenges. Population decline permeates most aspects of the region's economy and the educational attainment and health metrics have not changed significantly in the past two years. The update to the original plan continues to be grounded in a realistic assessment of the possibilities with existing assets and seeks to underpin emerging opportunities in SWVA as well.

While this plan is not a regional strategic economic development plan, nor is it a comprehensive approach to address all the challenges facing Southwest Virginia, it does present a blueprint specifically designed to diversify the region's economy and guide the Region One Council on funding decisions.

The framework remains foundationally the same, however, there are a few updates.

Talent Development

Alignment at all levels; coordinate programs across the educational spectrum, from Pre-K to post-graduate degree levels, as well as workforce initiatives; align with industry needs/expectations and economic development targets

Access to quality workforce is fundamental to industry growth. Aligning educational programming with industry needs is a common theme of every regional economic development conversation. Improvement in this area will support existing and new regional employers.

Region One seeks to invest in the continued alignment at all levels of the educational infrastructure with the articulated needs of business and industry and strengthen the talent pipeline through the following strategies.

2019 Strategies for Talent Development

- Strategy 1: Align education and training programs with needs and expectations of target industries; strengthen communication between educational providers and target industries
- Strategy 2: Build a strong pipeline of participants for programs (certifications, associates, bachelors or above) valued by the target market employers; promote career pathways
- Strategy 3: Increase awareness of occupational, educational, and workforce opportunities available in the region
- Strategy 4: Increase industry recognized certifications, credentials and degrees related to the target industries

Focused attention to the strategies mentioned above will directly underpin growth in the GO Virginia Region One targeted industries. As of the updating of this plan, a number of initiatives are underway which address one or more of the strategies above. Most notably, is the Ignite Internships initiative implemented by strategic partner, United Way of Southwest Virginia. For more details on the Ignite project and others addressing the talent pipeline, please see Region One Approved Projects.

Additionally, working groups aligned with the target industries and pipeline development activities generated by the Region One Council are beginning to yield broad regional projects, which include developing an action plan for use of reclaimed mine land for agricultural purposes, inventorying the technical education and training programs available throughout the region and exploring opportunities to build a virtual workforce skilled to address information technology needs of employers within the GO Virginia Region One geography and beyond.

Although not an exhaustive list of potential GO Virginia fundable projects, the following chart contains examples of projects which support the increase of the talent pipeline in Region One.

Potential Funding Opportunities

- Activities which strengthen relationships and communication channels between educational entities and each target industry
- Activities which facilitate easy access to various programs such as establishing primary points of contact for coordinating workforce and economic development projects and assist businesses in navigating different programs – a champion to advocate for continuous alignment of programs with expressed needs
- Efforts to ensure pathways from various levels of educational programs to careers are clearly outlined and promoted
- Efforts which support innovative and flexible avenues for assisting existing training programs to recruit registrants helping to broaden mindsets to a variety of new employment cluster opportunities
- Initiatives which incentivize enrollment into programs identified as critical to the growth of existing businesses
- Activities which assist with designations as a Work Ready Community (WRC) to improve the region's ratings as it relates to industry recognized credentials; build credentials and certifications that are transferable between industries and geographic areas
- Activities which create and promote meaningful internship and apprenticeship programs engaging youth from high school to college in target industries
- Initiatives which introduce the region's youth to occupational career opportunities early – preferably in middle school
- Initiatives which educate career coaches, guidance counselors, parents and grandparents of occupational opportunities

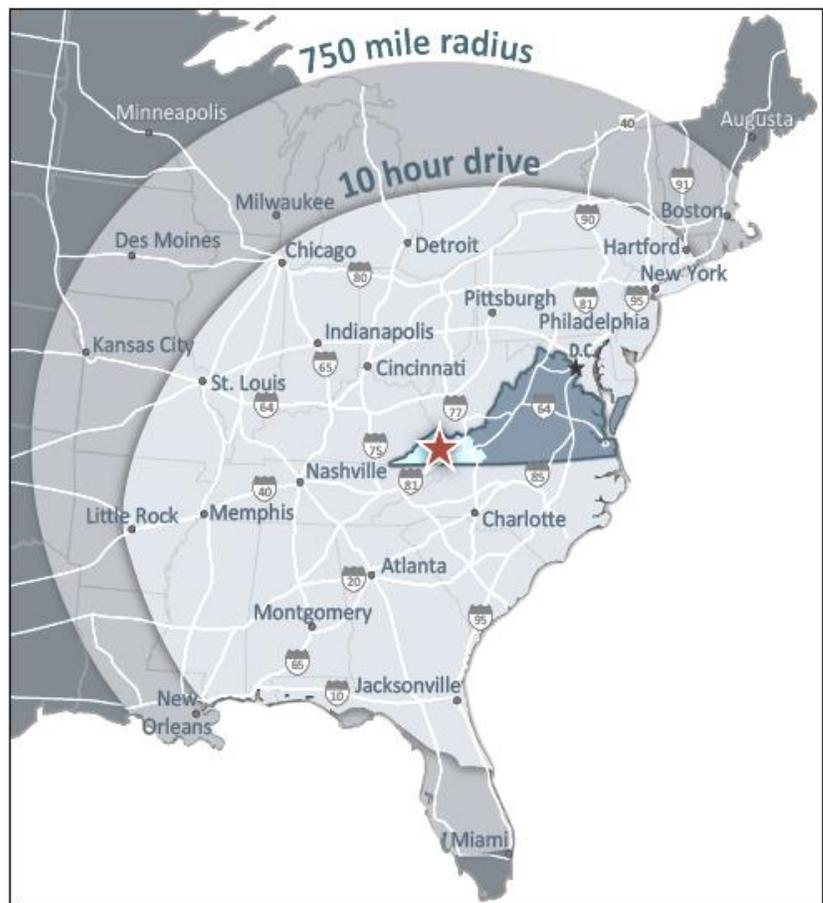
Projects that are eligible for GO Virginia funding will be measured using the Talent Development metrics listed below.

Talent Development Potential Metrics	
# of students trained	# of credentials awarded
# of upskilled employees	% of students receiving credentials
# of new jobs created	# of students enrolled in dual enrollment programs
# of existing jobs retained	Average wages of jobs created
# of businesses served	Average increase in wages for trainees/graduates
# of internships completed	Leveraged private investment
# of apprenticeships completed	Leveraged public investment
# of new programs/credentials implemented	

Sites & Infrastructure

Invest in “ready-to-go” industrial sites which are certified for target industries

A priority of GO VA Region One is to enhance the availability of development-ready sites across the three planning districts. The size and characterization (tier rating) of industrial and technology sites vary across GO VA Region One and since the development of the original Growth and Development Plan, progress has been made within this area of focus. The result of the VEDP Site Characterization Study will be used to make investment decisions in the existing and potential sites across Region One. Second only to an adequately trained and abundant workforce, development-ready sites are the most critical factor in site selection decisions.



Southwest Virginia's location offers access to 14 state capitals within 500 miles and is strategically positioned to reach half of the U.S. population within a day's drive. The region, which borders North Carolina, Tennessee, Kentucky and West Virginia, has market access to the eastern and Midwest United States and a robust transportation network that connects with major North-South and East-West roadways.

2019 Strategies for Sites and Infrastructure

- Strategy 1: Ensure existing and new sites are certified for targeted industries; advance existing sites based upon the VEDP characterization study and fully leverage the Virginia Business Site Readiness Program (VBRSP)
- Strategy 2: Assess and upgrade utilities and broadband to remain competitive
- Strategy 3: Leverage newly created and existing Regional Industrial Facility Authorities (RIFAs) to establish larger, regional industrial sites attractive to target industries

Leveraging resources to address the underpinning strategies referenced above create a foundation on which all four of the GO Virginia Region One targeted industries may grow. The region has numerous ongoing efforts which address one or more of the strategies above. Most notably, work is underway to assess the best and highest uses of reclaim mine land for industrial and agricultural purposes. An action plan is being developed to specifically support the region's opportunities to expand in the cattle and grain industry and a solar playbook is under construction. Once completed, the playbook will inform

decisions made in the advancement of various industrial and technology sites across the region.

The following chart highlights a few examples of potential GO Virginia fundable projects which will aid in the effort to enhance the supply of industrial and technology sites available for economic development purposes.

Potential Funding Opportunities
<ul style="list-style-type: none"> • Efforts to inventory and assess industrial and technology parks and identify needed infrastructure benchmarking against industry target needs (for sites not included in the VEDP Characterization Study); maintain inventory • Initiatives supporting certification of industrial parks for specific industry targets • Activities encouraging collaboration for joint site development for shared revenue opportunities • Activities which leverage tools such as Opportunity Zones, Enterprise Zones, HB222 and the Collaborative Jobs Act • Efforts to upgrade/maintain utilities including broadband to industrial and technology sites • Strengthen the existing and newly formed Regional Industrial Facility Authorities to enable the development of revenue sharing opportunities for regional parks; encourage collaboration between the RIFAs

Projects that are eligible for GO Virginia funding will be measured using the following Sites and Infrastructure metrics.

Sites & Infrastructure Potential Metrics	
# of jobs created	Investment in marketing site
# of existing jobs retained	# of projects (active company recruitment files)
# of businesses served	# of prospects (active company visits)
# of acres advanced to higher tier per VBRSP	# of businesses attracted
Total square footage of new space developed	Average wages of jobs created
# of linear feet of water infrastructure constructed	Leveraged private investment
# of linear feet of sewer infrastructure constructed	Leveraged public investment
Water capacity – million gallons per day (MGD)	Revenues increased from export-sales
Sewer capacity – million gallons per day (MGD)	

VEDP Site Characterization Study

Virginia Economic Development Partnership (VEDP) is undertaking a site characterization study to include all 25+ acre sites in VEDP's Virginia SCAN. This work is part of the Virginia Business Ready Site Program (VBRSP) that will characterize sites into a tier system and make recommendations and cost estimates of what is needed to advance sites to a Tier 4 status. The final report is expected to be available fall 2019.

Working with localities and economic development organizations within Region One, VEDP has identified 23 sites in the region that are still available and meet the criteria to be included in the study. Of the 23 sites, 21 sites have opted in to be included in the study. Three of the 21 sites contain parcels that will be studied to determine if they qualify for a different tier than the overall industrial or technology park they reside in.

Two parks in Region One are graded Business Ready Site Program Tier 4, which include Wildwood Commerce Park and Bluestone Regional Business and Technology Center. Wythe County Progress Park's main park is graded Tier 3, while two of its parcels are each Tier 4. Two additional sites in Region One have been previously graded to include Leatherwood and Wildwood II, which are both Tier 1. The total acreage of sites in Region One that have been graded is over 4,000. The remaining sites in Region One have not been graded.

The characterization will produce a report for each site that will include the following:

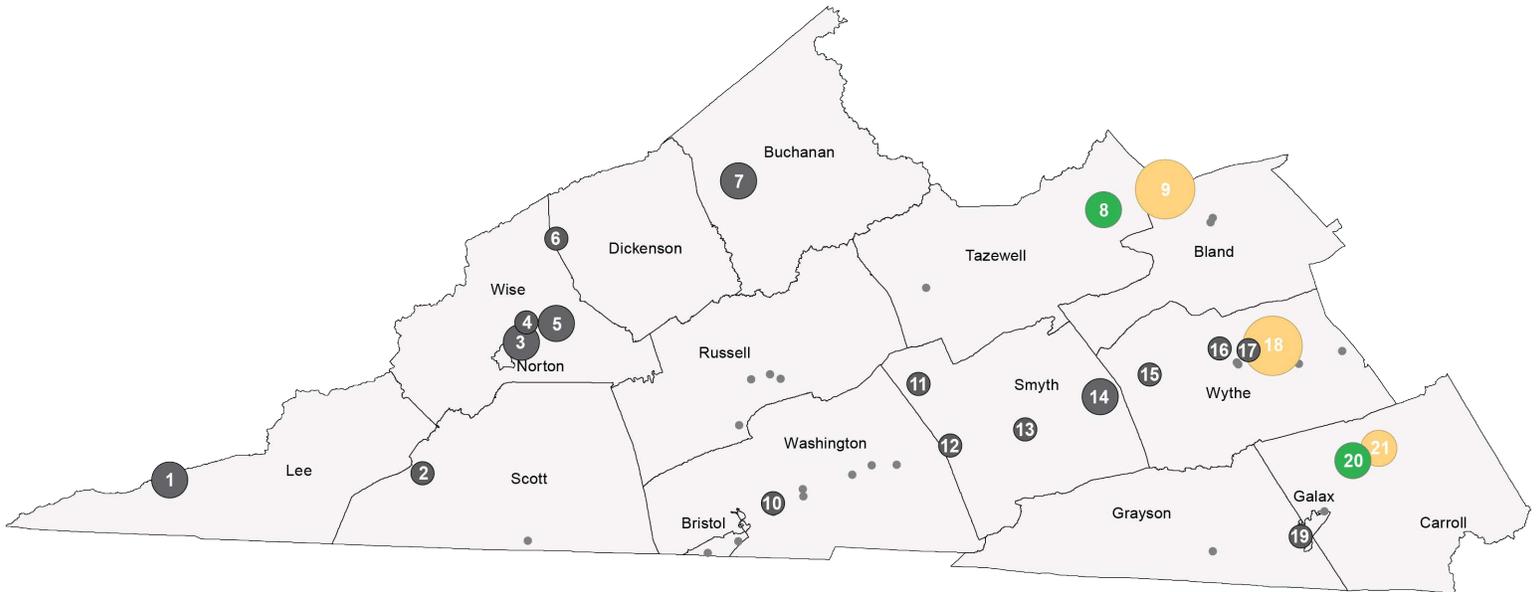
- Summary of the site including site attributes integral to development and selection
- Current Tier Level (1-5) to provide a rating for site readiness
- List of items and next steps to advance tier levels and cost estimates for each step
- Site diagram with the potential build-out of the site

The following map displays the 21 sites in Region One that qualify for the characterization study, including their current Tier Level. The map also includes the Region One sites that are available and marketed, but did not qualify for the characterization study.

VEDP Site Characterization Map

25+ acre industrial sites involved in current batch characterization process

- Business Ready Site (previously certified)
 - Previously characterized site (Tier 1-3)
 - No previous assessment
 - 25-99 contiguous acres
 - 100-499 contiguous acres
 - 500 or more contiguous acres
- Other available sites not involved in current characterization project



- | | |
|---|---|
| <p>1 Constitutional Oaks Industrial Park</p> <p>2 Scott County Regional Business and Technology Park</p> <p>3 Project Intersection</p> <p>4 U.S. 23 Site</p> <p>5 Lonesome Pine Business and Technology Park</p> <p>6 Coalfield Regional Industrial Park</p> <p>7 Southern Gap Business Park</p> <p>8 Bluestone Regional Business & Technology Center</p> <p>9 Leatherwood Site</p> <p>10 Oak Park Center For Business and Industry (full park and 5 parcels)</p> <p>11 North Fork Site</p> | <p>12 Pathway Park</p> <p>13 Hull Property</p> <p>14 Former Brick Plant</p> <p>15 I- 81 Smyth Holdings Group Site</p> <p>16 Fairview Park Commerce Centre</p> <p>17 I-81 Campbell Site</p> <p>18 Wythe County Progress Park (full park and 3 parcels) (two interior parcels were previously certified)</p> <p>19 Blue Ridge Crossroads Commerce Park</p> <p>20 Wildwood Commerce Park (full park and one parcel) (interior parcel was previously certified)</p> <p>21 Wildwood II</p> |
|---|---|

Innovation & Scale Up Support

Build an ecosystem to encourage innovation and to support the creation and expansion of new, emerging and existing businesses

Rural regions are often characterized by having low entrepreneurial and innovation activities. However, most measures used include number of patents, research dollars spent and R&D activities. A recent study conducted by the Economic Research Services and the Northeast Regional Center for Rural Development indicates that innovative companies in rural areas actually increase hourly wages and expand markets. Small business start-ups are an important source of job creation in a region, spurring innovation and competition and driving productivity growth.

In 2017, jobs created by small businesses in SWVA contributed to 41.6% of the job growth in GO VA Region One, above their average contributions in Virginia (36.1%). This is an increase from 36.9% in 2010. The region has placed an emphasis on entrepreneurial support since the creation of the Blueprint for Entrepreneurial Growth and Economic Prosperity in 2012 and the establishment of Opportunity SWVA, a network of small business support organizations. The next step for the region is to invest in supporting scale up activities and build a culture of entrepreneurship and innovation, which leads to the creation of high-growth companies.

TEconomy Partners' assessment of growth and scalability of entrepreneurship in Region One pointed to the region's strength of entrepreneurial development in industry target growth.

Industry Cluster	Economic Development Position in Region	Contribution of Entrepreneurship
Agriculture & Food Processing	Emerging Strength	Very Significant
Energy, Natural Resources, & Finished Products	Specialized/Declining	Very Significant
Information Technology & Communications Services	Emerging Strength	Significant
Manufacturing	Specialized/Declining	Very Significant



GO VA Region One is focused on supporting existing employers, encouraging innovation through research and development, new market/product development as well as encouraging entrepreneurial ventures.

2019 Strategies for Innovation and Scale Up Support

- Strategy 1: Develop approach to addressing recommendations in the Spring 2019 TEconomy Partners Report listed below. Select slides from the full report are included in the appendix.
- Promote and develop stronger ideation programming, resources targeting traded sector opportunities.
 - Establish intensive accelerator programming and domain-specific resources to advance, scale promising early-stage startups.
 - Address need for more startup risk capital for early-stage market entry by traded sector companies in the region.
- Strategy 2: Determine the region's approach to identifying a regional entrepreneurship and innovation "coordinating entity" to focus on high-growth company development
- Strategy 3: Develop programming at all levels of the educational infrastructure supporting innovation and entrepreneurship

The region has made strides in coming together around the support of entrepreneurs and small businesses through Opportunity SWVA, a network of entrepreneurial support organizations operating in the region. The work of this group has yielded growth in the lifestyle businesses formed in the region, however, little activity in the scalable and innovative business sectors has taken place. This underscores the importance of access to capital and the need to establish a "coordinating entity". Numerous business challenge competitions take place in the region annually and most are associated with training related to small business startup needs.

The development of The Oxbow Center accelerator will address recommendations made by TEconomy in that no accelerator program exists in GO Virginia Region One.

The innovation and scale up strategies support all four GO Virginia Region One target industries. Opportunities exist for individuals to start their own businesses in the region, but there is a need for existing industry to increase R&D activities leading to new products and new markets.

Examples of activities and initiatives which support the development of the innovation and entrepreneurial ecosystem in Region One are included in the following chart.

Potential Funding Opportunities

- Programs designed to assist existing companies with evolving their business focusing on accelerated product, service, market and operational initiatives leading to new profitable growth opportunities
- Activities analyzing supply chains serving existing industry and new outlets for local agricultural assets
- Efforts to leverage HUB Zones and Opportunity Zones, educating existing businesses of the benefits and emphasize their presence in economic development outreach/marketing
- Activities to increase Research and Development activity including SBIR/STTR grants
- Encouraging the development of programs supporting intrapreneurship – innovation within existing and growing businesses
- Establishing accelerator programs
- Programs encouraging mentorship and peer-to-peer networks among entrepreneurs
- Activities encouraging GO VA 1 business-to-business relationships
- Enhancing K12 entrepreneurship education
- Activities leveraging opportunities for tech transfer and commercialization of university and college discoveries

Projects that are eligible for GO Virginia funding will be measured using the Innovation & Scale Up Support metrics listed below.

Innovation & Scale Up Support Potential Metrics

# of jobs created	Total capital deployed
# of existing jobs retained	Research and development funding deployed
Average wages of jobs created	New products completed/released to production
Increase in average employee wages	Total patents filed
# of new programs/credentials implemented	Total patents pending
# of credentials awarded	Total patents awarded
# of businesses attracted	# of fund investments
# of businesses retained	Average deal size
# of existing businesses expanded	# of businesses applying for fund investments
# of new businesses created	# of businesses interviewed for fund investments
# of businesses served	# of businesses evaluated for fund investments
Leveraged private investment	Return on Investment (ROI) for deployed funds
Leveraged public investment	Internal Rate of Return (IRR) for deployed funds
Total capital raised	Revenues increased from export-sales

Other Regional Strategies

GO Virginia Region One priorities are directly tied to supporting four industry sectors through developing a talent pipeline, ensuring sites and infrastructure are adequate and building an ecosystem which supports innovation and entrepreneurship. GO Virginia funds may be used for activities which accomplish these goals. However, other initiatives are important to the ongoing development of SWVA. The 2017 Growth and Diversification Plan contained initiatives related to leadership capacity building as well as recruitment of millennials and creative talent. GO Virginia Region One supports these efforts, although grant funds may not be used for such purposes.

REGION ONE IMPLEMENTATION OVERVIEW

GO Virginia Region One Implementation Activity

Since the Region One Growth & Diversification Plan was released in August 2017, the Region One Council has received twelve application submissions from various organizations across the region. Due to grant eligibility requirements, ten applications were sent forward to be evaluated by the Region One Council. Nine projects have been approved and recommended by the Region One Council to the GO Virginia State Board for approval with seven projects receiving approval by the State Board. To date, Region One has awarded seven GO Virginia Per Capita grants, totaling \$833,866.20. Of the seven projects, three collaborative implementation projects have been awarded \$660,372.00 and four enhanced capacity building projects have been awarded \$173,494.20. These projects have leveraged over \$1.3 million in non-state investment, including a total of \$253,500 in local match provided by local governments in Region One. The remainder of the match has been sourced from the private sector, non-profits, and federal funds.

In addition to Per Capita grant awards, Region One collaborated with Region Three on a GO Virginia Competitive grant awarded \$4.8 million, with \$1.3 million in initial funding. The GO-TEC Phase II project specifically involves participation from Wytheville Community College (WCC) and the counties of Bland, Carroll, Grayson, Wythe and Smyth as well as the city of Galax.

All of the thirteen counties and three cities in Region One are impacted by at least one approved project and 100% of the counties and cities are actively participating in at least one project, including one local town. Furthermore, 81% of the localities in Region One are participating in more than one project and 62.5% are engaged in three or more regional projects.

All of the higher education institutions in Region One, including the universities and community colleges, are supporting or participating in at least one approved grant project. In addition, over 65 regional businesses are engaged in at least one approved grant project.

The following charts list the Competitive and Per Capita grant awards for Region One projects. Complete summaries for each project may be found in the Existing Plans, Partners, and Projects section of this document.

Region One Competitive Grant Awards					
Collaborating Regions	Project	Industry Target	GO Virginia Funds	Leveraged Funds	Local Funds
Region 3 / Region 1	GO-TEC Phase II Danville Community College	Advanced Manufacturing Information & Emerging Technologies	\$4,896,528	4,915,962,	\$2,945,981

Region One Per Capita Grant Awards					
Project	Description	Industry Target	GO Virginia Funds	Leveraged Funds	Local Funds
Ignite Internships United Way of Southwest Virginia	Collaborative/Implementation: Workforce Development	Advanced Manufacturing Information & Emerging Technologies Energy & Minerals Food/Beverage Manufacturing	\$250,000	\$618,482	\$50,000
SWVA Hub Link Southwest Virginia Technology Council	Enhanced Capacity Building: Workforce Development	Information & Emerging Technologies	\$27,547.20	\$27,637.20	\$0
Coal to Graphene Market Study Virginia Tech	Enhanced Capacity Building: Workforce Development, Entrepreneurship/Innovation	Information & Emerging Technologies Energy & Minerals	\$25,000	\$25,000	\$25,000
Smart Farming at the Center for Workforce and Innovation of Appalachia Mountain Empire Community College	Collaborative/Implementation: Workforce Development	Information & Emerging Technologies Food/Beverage Manufacturing	\$310,372	\$380,500	\$62,500
Lonesome Pine RIFA Coordinator LENOWISCO Planning District Commission on behalf of the Lonesome Pine Rural Industrial Facilities Authority	Enhanced Capacity Building: Infrastructure/Site Development	Advanced Manufacturing Information & Emerging Technologies Energy & Minerals Food/Beverage Manufacturing	\$50,000	\$50,000	\$50,000
The Solar Jobs, Manufacturing and Utility-Scale Investment Playbook for Far Southwest Virginia Appalachian Voices on behalf of the Solar Workgroup of SWVA	Enhanced Capacity Building: Workforce Development, Infrastructure/Site Development, Entrepreneurship/Innovation	Energy & Minerals Advanced Manufacturing Information & Emerging Technologies	\$70,947	\$70,947	\$0
Southwest Virginia Livestock and Educational Center Carroll County Industrial Development Authority	Collaborative/Implementation: Workforce Development	Food/Beverage Manufacturing	\$100,000	\$167,200	\$66,000
		TOTAL	\$ 833,866.20	\$ 1,339,766.20	\$ 253,500.00

Project Pipeline Development Process

Since organizing in 2017, the Region One Council has focused on building a strong project pipeline through a variety of means. Stakeholder relationship building and outreach has been a cornerstone of the strategy and initial focus was placed on designing and conducting How to Apply Workshops as well as communication tools to educate the region about GO Virginia. A website and social media presence were established. Industry specific working groups were organized for information technology, advanced manufacturing and agriculture and food/beverage processing. Each of these workgroups are led by industry experts with staff support provided by the Region One support organization, UVA-Wise. These workgroups have served as an excellent communications infrastructure bringing like-minded individuals throughout the region together to discuss opportunities to address challenges faced within their respective industries.

One of the primary challenges faced by Region One has been the flow of larger scale projects, those that cover a larger geographic territory, involve more project partners, and even more importantly, are significant enough to truly move the needle on the dial of the region's metrics. Project flow in Region One has been adequate, but the nature of the project applications have been much smaller in scale than originally anticipated. It is for this reason that Region One will work to generate project ideas and help facilitate their development, incubating them to the point of application.

The GO Virginia Region One Council convenes three sub-committees on a regular basis centered on Chambers of Commerce, Economic Development, and Education. It is the goal of the Council to continue to organize these groups and engage their expertise in project development and implementation.

Recently, Region One engaged consulting services with subject matter expertise to assist two of the working groups in identifying high-potential projects. Region One will continue incubating these projects until they yield applications. This mode of operating will become part of the standard procedure for the Council going forward.

How to Apply Workshops proved to be an effective way to communicate the types of funding opportunities which exist with GO Virginia, as well as the application and review process. These sessions provided applicants the opportunity to ask questions, pitch their project and tap into the technical assistance provided by the Region One Council. These workshops will continue to be offered at least twice annually.

Additionally, the Region One Council has developed a list of project pipeline development activities. These activities are at different stages of implementation with the purpose of building regional capacity and incubating project ideas.

Engage Stakeholders

- Engage the Region One Council to generate project ideas and strategies to build the project pipeline. Determine what the Council's priorities are for regional projects.
- Utilize the various groups that GO VA is convening to determine priorities and generate project ideas. These groups include the working groups, sub-committees, how to apply workshop participants, etc.
 - Convene the non-profits in the region to provide a GO VA overview and discuss priorities and ideas.
- Leverage the Rally SWVA community meetings hosted by Opportunity SWVA to generate project ideas at the local level that could have regional impacts.
- Engage the PDC's, RIFA's, VCEDA, VIAA, etc. to discuss priorities, project ideas, and how GO VA Region One can support their efforts.
- Engage in conversations with support organization and region's across Virginia to share best practices and strategies for project development.
- Pursue competitive grant opportunities with regions across the state and encourage RIFA participation.
- Engage all of the higher education institutions, including the community colleges in the region to identify similarities, gaps, and opportunities to collaborate.

Build Regional Capacity

- Develop a list of regional organizations who have the capacity to write and manage grants and call upon them to help generate project ideas and carry them forward to application and implementation, if awarded.
- Help to build capacity of the organizations within Region One to submit proposals and manage grants.
 - Offer a grant writing training session for communities and organizations in the region.
- Host an information session on Opportunity Zones for the Region One Council and stakeholders to learn more about the revitalization tool including best practices and strategies.
- Host an information session on HUB zones to outline on how the incentives can be applied and work for businesses.

Solicit Regional Projects

- Ensure feasibility studies or enhanced capacity building projects are aligned with Region One strategies and target industries which have potential to lead to an implementation grant application.
- Continue to offer how to apply workshops.

Strengthen Working Groups

- Assist working groups in moving projects forward by using Building Capacity funds to:
 - Develop an Agriculture Action Plan to unlock projects in the Food & Beverage Manufacturing industry.
- Encourage cross working group projects for Enhanced Capacity Building applications.
- Explore creating additional working groups focused on sectors that support the industry targets such as a Housing Working Group.

Gather & Distribute Information

- Analyze the funded GO VA projects across the state and pick the ones best suited for Region One. Identify potential applicants and how the project can be restructured to align with Region One priorities.
- Identify the organizations partnering on the funded projects that are most relevant to our region. Develop a list of the “equivalent” organizations in Region One who could lead the charge.
- Analyze the Growth & Diversification Plan and identify the low hanging fruit and generate projects.
- Compile a list of “potential, fundable regional projects” to inspire the region and provide insight as to what types of projects can be funded through GO VA.
- Research what the industry subsector clusters are in Region One.

Process for Applying for Funding

The Region One Council established an application review process which helps guide the applicants through project concept to project application. The earlier an applicant engages the Region One Council with a project, the earlier they can access the technical assistance needed to help strengthen their application.

Region One has an open application window where projects received 30 days prior to a GO Virginia Region One Council meeting (held 4 times per year), will be reviewed and submitted for council consideration. During the review process, the Region One support staff conducts an internal review providing feedback to the applicants to further develop the application submission. As additional information is added to the application, the support staff engages a review committee comprised of

Region One Council Members as well as subject matter experts (SME) related to the industry or field relevant to the application in order to assist with the review process. Support staff also begins the process of review with the DHCD support staff to identify any issues, red flags or opportunities with each application before the full Region One Council considers the project.

Once feedback has been received from SMEs, regional council review team members and DHCD, the Region One support staff provides a recommendation to the Region One Council. The Council makes decisions to recommend the project for State Board approval, continue refining the project, or decline the project. If recommended for funding, the Region One support staff will submit the project to DHCD via an online portal and work with the DHCD staff and the applicant to address additional questions or concerns that may arise during the state's review process.

Applications for competitive funds (those projects involving two or more regions) must be approved by both regional councils prior to consideration at the state board.

The GO Virginia State Board meets four times per year and has the approval authority for all GO Virginia grant funded projects.

Guidelines for applying for GO Virginia funding from both the per capita and competitive funds may be found at www.goswva.org. These guidelines are updated routinely as the GO Virginia State Board makes adjustments. Eligible projects must align with the goals and strategies of GO Virginia, involve broad regional collaboration and focus on the target industries included in this growth and diversification plan.

Additional guidance documents from the state board may be found on www.govirginia.org and may also be found in the appendix of this document.

Project Monitoring, Data Tracking and Benchmarking

The goals of GO Virginia are to create high-wage jobs and promote/encourage regional collaboration. In monitoring the progress made toward achieving these goals, each funded project will be evaluated according to the proposed deliverables, timelines and outcomes. Grantees provide quarterly reports, reimbursement requests based upon project expenses and documentation of spending of matching funding dollars as well.

The GO Virginia Region One support staff provides technical assistance to grantees to help ensure projects stay on track and challenges are addressed as early as possible.

One of the challenges faced by GO Virginia during the first two years of operation, is accessing data and benchmarking regional progress against comparable regions. Region One has engaged the assistance of the Weldon Cooper Center to identify peer and aspirational regions, which may serve as a measuring tool for evaluating regional progress. Along with the Weldon Cooper's Center's assistance, the Region One Council will develop a data dashboard to include metrics that may be used for analysis and comparison. This work is expected to be completed in fall 2019.

APPENDIX

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Appendix 1: Quantitative data analysis: CHMURA ECONOMICS & ANALYTICS

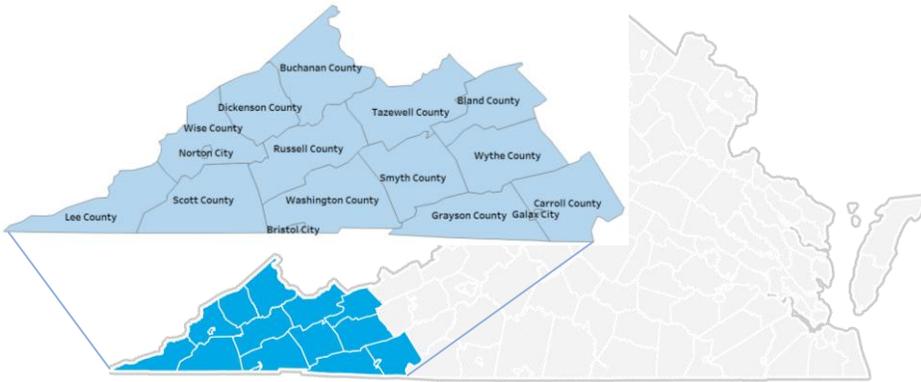
About Chmura Economics & Analytics

We have a data-driven culture. We are a group of published scientists contributing to innovations with big data analytics on the forefront of applied economics and technology solutions. We have a very diverse team of people with backgrounds such as PhD economists, statisticians, computer scientists, and transformation strategists. We serve a cross section of decision makers from the defense, government, public, and private sectors.

As data scientists, we help our clients quickly answer big data questions. We provide a reliable picture of economic trends on both a macro and micro level. Our clients rely on the historical, current, and predictive market reports we provide to cut through the confusing information they receive daily from the media, politicians, and industry resources.

Our clients view us as trusted economic advisors because we help them mitigate risk and prepare for growth by understanding the why, the how, and the what about their local economy. As the nation's preferred provider of labor market data, we help our clients understand both the demand for and the supply of available data. Our clients benefit from our expertise by better understanding their own bottom line costs, sustainability issues, and associated risks.

Background



GO VA 1, located in the most southwest corner of the state, is mainly rural and has **the weakest economic growth of all the GO VA regions in the state** based on its -0.2% employment decline in the four quarters ending with the fourth quarter of 2018. By comparison, employment grew 1.6% in the state and 1.5% in the nation over the same period.

The Appalachian Mountains run through many of the 13 counties and 3 cities that comprise the region. The beauty of the mountains along with the rural amenities of the region also bring the challenges of a sparsely populated area where mountains can make navigation difficult to connect residents with jobs.

The natural resources of the mountains have historically made coal mining one of the highest paying industries in the region. At an annual wage of \$85,197 in the four quarters ending with the fourth quarter of 2018, coal mining pays more than double the regional average wage of \$34,678. Regulatory and environmental concerns as well as cheaper alternatives such as natural gas have led to a loss of 1,591 coal mining jobs in the region since there were 4,105 coal mining jobs in the fourth quarter of 2013. However, the region's coal mining industry has seen a modest employment gain of 192 jobs in the eight quarters since the 2016 presidential election. An estimated 2,514 people worked in the coal mining industry in GO VA 1 in the fourth quarter of 2018.

Manufacturing, another high-paying sector at \$43,828 for the fourth quarter of 2018, has struggled over the last few decades as productivity gains and offshoring have reduced the number of jobs, but employment has stabilized since the Great Recession ended. Sixteen years ago, manufacturers employed more than 26,000 people in the GO VA 1 region, but employment in the sector steadily declined through the first quarter of 2010 (two quarters after the end of the Great Recession), shedding more than 8,300 jobs. Since then, employment has leveled off around 17,000; manufacturing employment has risen as high as 18,221 in 2012 and now stands at 17,134 in the fourth quarter of 2018.

No other major industry sectors have added enough jobs to replace both those lost over the past year and decade in GO VA 1. Like many rural areas across the nation where the relatively small number of firms leads to the lack of alternative opportunities, workers displaced due to firm relocations, closings, or layoffs often must take lower-paying jobs that do not fully utilize their skills.

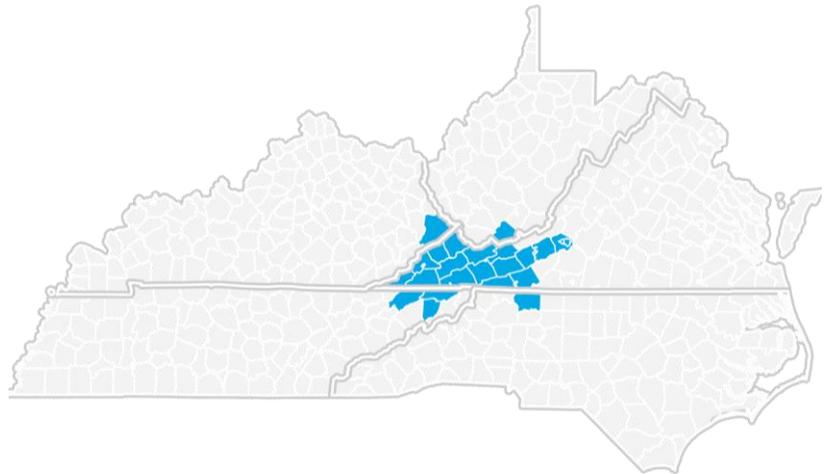
From an economic well-being perspective, the loss of coal mining and manufacturing jobs is particularly hard on this region's economy. Mining and manufacturing are exporting industries that bring new dollars into the region when products are sold to consumers and businesses that are outside the region. These new dollars provide profits and wages to owners and workers in the region who spend some of that money in the region, thereby increasing the demand for products and services provided by local service industries (or "non-export" industries) such as retail stores, restaurants, and real estate.

Labor Shed

The GO VA 1 region borders on four states that provide job opportunities for residents of GO VA 1. From an economic development perspective, the adjoining counties are home to firms that GO VA 1 should consider as cluster and supply chain assets. For example, EASTMAN Chemical Company and Domtar paper mill in Kingsport, Tennessee (Sullivan County) should be highlighted with prospect firms that are considering locating to the southwest portion of GO VA 1. Likewise, Pike County, Kentucky, should be included in discussions with prospects in energy-related businesses.

As shown in the accompanying map, commuting patterns indicate that three counties in Tennessee, and one each in Kentucky, West Virginia, and North Carolina have enough migration in and out of the GO VA 1 region to warrant inclusion in the GO VA 1 labor shed. The presence of Interstate 81, Interstate 26, and Highway 23 running through the region also provides easy access for some residents to commute northeast. Consequently, the GO VA 1 labor shed includes six additional Virginia localities. Including Virginia and other states, the twelve additional localities are:

- City of Roanoke, Virginia
- City of Salem, Virginia
- Hawkins County, Tennessee
- Mercer County, West Virginia
- Montgomery County, Virginia
- Pike County, Kentucky
- Pulaski County, Virginia
- Radford City, Virginia
- Roanoke County, Virginia
- Sullivan County, Tennessee
- Surry County, North Carolina
- Washington County, Tennessee



All the localities except the City of Salem were added because they have at least a combination of 600 people commuting to or from the GO VA 1 region. The City of Salem was added because it is in the center of Roanoke County, which met the 600-commuter threshold.²

Employment in the GO VA 1 labor shed fared better than the GO VA 1 region in the last year, growing 0.7% over the four quarters ending with the fourth quarter of 2018. The labor shed is slightly less dependent on coal mining (0.6% percent versus 1.8% in GO VA 1) and manufacturing (11.5% vs 12.0% in GO VA 1).

The remainder of this report analyzes the demographics, industry and occupation structure, and education and training alignment in the GO VA 1 region and labor shed with emphasis on strengths, weaknesses, opportunities, and threats that can lead to employment growth, economic and workforce diversification, and higher paying jobs for the region.

² A detailed explanation of the methodology used to create the GO VA 1 labor shed is in Appendix 1.

Economic Landscape

Employment in the GO VA 1 region has been almost continuously declining since the Great Recession. Manufacturing, an important driver in the region, has shed jobs nationally since the 1990s and locally since at least 2002; however, in an encouraging sign, employment in manufacturing has stabilized over the last few years. Employment in another important driver in the region—the energy cluster (particularly coal mining)—has lost more than 3,200 jobs since 2012.

Both the manufacturing sector and energy cluster pay a higher average wage in the GO VA 1 region than the average for all industries in the region. Unfortunately, displaced workers from these sectors are unlikely to find alternative employment in the region that pays comparable or higher wages. The result is that some people have left the region, leading to population and labor force declines as well as the loss of talent and skills.

Demographics

The demographics of GO VA 1 depict a rural area that is struggling to grow. The GO VA 1 labor shed's population is more than 3 times larger than GO VA 1 and has a growing population with generally higher educational attainment.

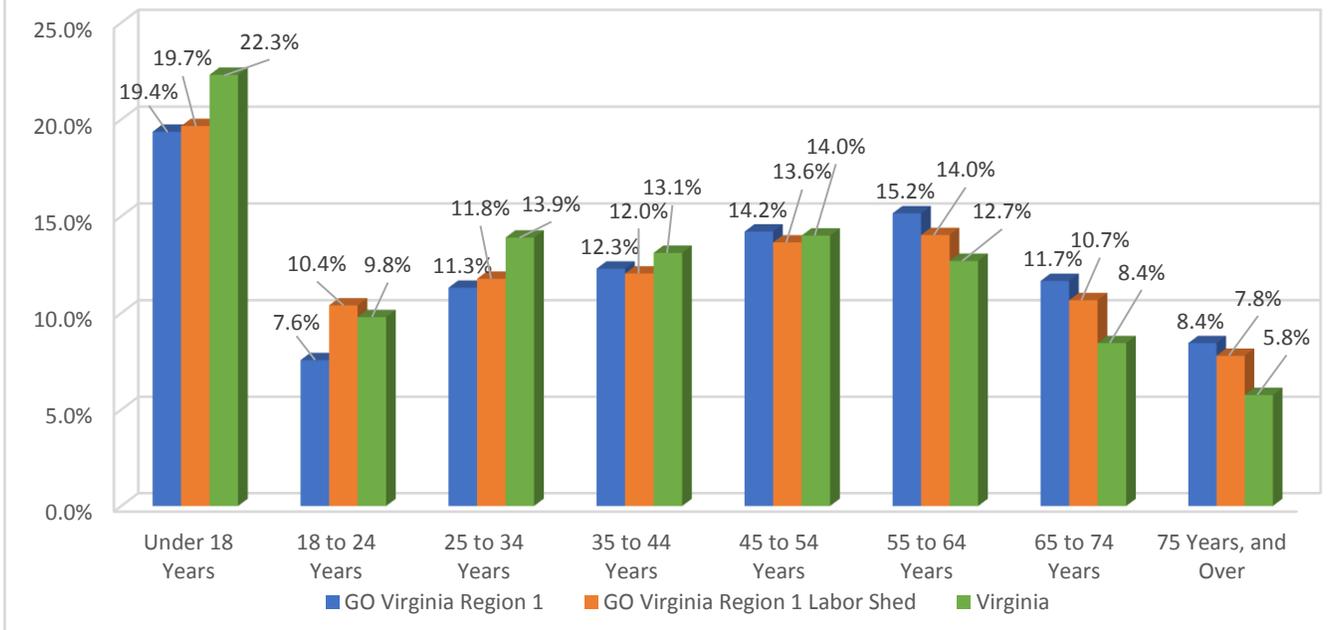
Population

A total of 389,173 people lived in the GO VA 1 region in 2017 according to the Census Bureau—an annual average decrease of 0.5% since 2007. Looking ahead, **projections in JobsEQ anticipate the region will contract an annual average 0.40% a year through 2029—a loss of 17,942 people.** This projected population loss has increased from previous reports because county-level population projections are partially based on historical trends. As the region's population loss has recently accelerated (-1.1% from 2015 to 2016 and -1.0% from 2016 to 2017), the projected future population loss has also increased.

The larger GO VA 1 labor shed was home to almost 1.3 million people in 2017, an average annual growth of 0.0% since 2007. Population in the labor shed is projected to grow an average 0.1% per year through 2029 for an addition of 14,314 residents. Population growth in the state of Virginia and the nation are both expected to increase an annual average of 0.8% and 0.7%, respectively, over the same period.

The age cohorts in GO VA 1 are skewed toward a lower percentage of younger individuals when compared to the region's labor shed and the state, to some extent due to the presence of Virginia Tech, East Tennessee State University, Radford, and other schools in the labor shed but also presumably because some of the younger residents leave the region for better job opportunities. In the GO VA 1 region, 18.9% of the population is aged 18 to 34 years, compared with 22.2% in the labor shed and 23.7% in the state. In contrast, 20.1% of the population in GO VA 1 is 65 years and older compared with 18.5% in the labor shed and 14.2% in Virginia. As the region's population continues aging, there will be a higher demand for healthcare occupations.

Population by Age Cohort, 2013-2017



The population in GO VA 1 lacks diversity by race, which may be a concern to some larger firms that strive for a diversified workforce. Ninety-five percent of the population in GO VA 1 is white according to the 2013-2017 American Community Survey (ACS), compared with 90.5% in the labor shed and 68.4% in the state.

Demographic Summary ¹						
	Percent			Value		
	GO VA Region 1	GO VA Region 1 Labor Shed	Virginia	GO VA Region 1	GO VA Region 1 Labor Shed	Virginia
Demographics						
Population (ACS)	—	—	—	389,173	1,291,309	8,365,952
Population Annual Average Growth ³	-0.50%	0.00%	0.90%	-1,893	7	71,902
Median Age ²	—	—	—	44.5	41.7	38.0
Under 18 Years	19.4%	19.7%	22.3%	75,369	253,921	1,866,274
18 to 24 Years	7.6%	10.4%	9.8%	29,434	134,238	818,913
25 to 34 Years	11.3%	11.8%	13.9%	44,009	151,970	1,162,784
35 to 44 Years	12.3%	12.0%	13.1%	47,838	155,516	1,096,763
45 to 54 Years	14.2%	13.6%	14.0%	55,306	176,246	1,171,473
55 to 64 Years	15.2%	14.0%	12.7%	58,977	181,168	1,061,878
65 to 74 Years	11.7%	10.7%	8.4%	45,371	137,680	706,482

Demographic Summary ¹						
	Percent			Value		
	GO VA Region 1	GO VA Region 1 Labor Shed	Virginia	GO VA Region 1	GO VA Region 1 Labor Shed	Virginia
75 Years, and Over	8.4%	7.8%	5.8%	32,869	100,570	481,385
Race: White	95.0%	90.5%	68.4%	369,768	1,168,209	5,720,209
Race: Black or African American	2.9%	5.4%	19.2%	11,134	70,124	1,605,447
Race: American Indian and Alaska Native	0.2%	0.2%	0.3%	652	2,588	22,499
Race: Asian	0.4%	1.5%	6.2%	1,538	18,836	520,119
Race: Native Hawaiian and Other Pacific Islander	0.0%	0.0%	0.1%	71	452	5,469
Race: Some Other Race	0.4%	0.7%	2.4%	1,482	8,644	200,265
Race: Two or More Races	1.2%	1.7%	3.5%	4,528	22,456	291,944
Hispanic or Latino (of any race)	1.7%	2.8%	9.0%	6,501	36,270	749,458

Source: [JobsEQ®](#)

1. ACS 2013-2017, unless noted otherwise

2. Median values for certain aggregate regions (such as MSAs) may be estimated as the weighted averages of the median values from the composing counties.

3. Census 2017, annual average growth rate since 2007

Labor Force Participation

The labor force participation rate in GO VA 1 is relatively low when compared to the state, perhaps in part because job opportunities are not as plentiful but also because a higher percentage of the population has disabilities, and a lower percentage of those with disabilities are working. The labor force participation rate of the civilian population 16 years and over in GO VA 1 was 50.3% according to the American Community Survey (ACS), 2013-2017 compared with 54.7% in the labor shed and 65.5% in the state.

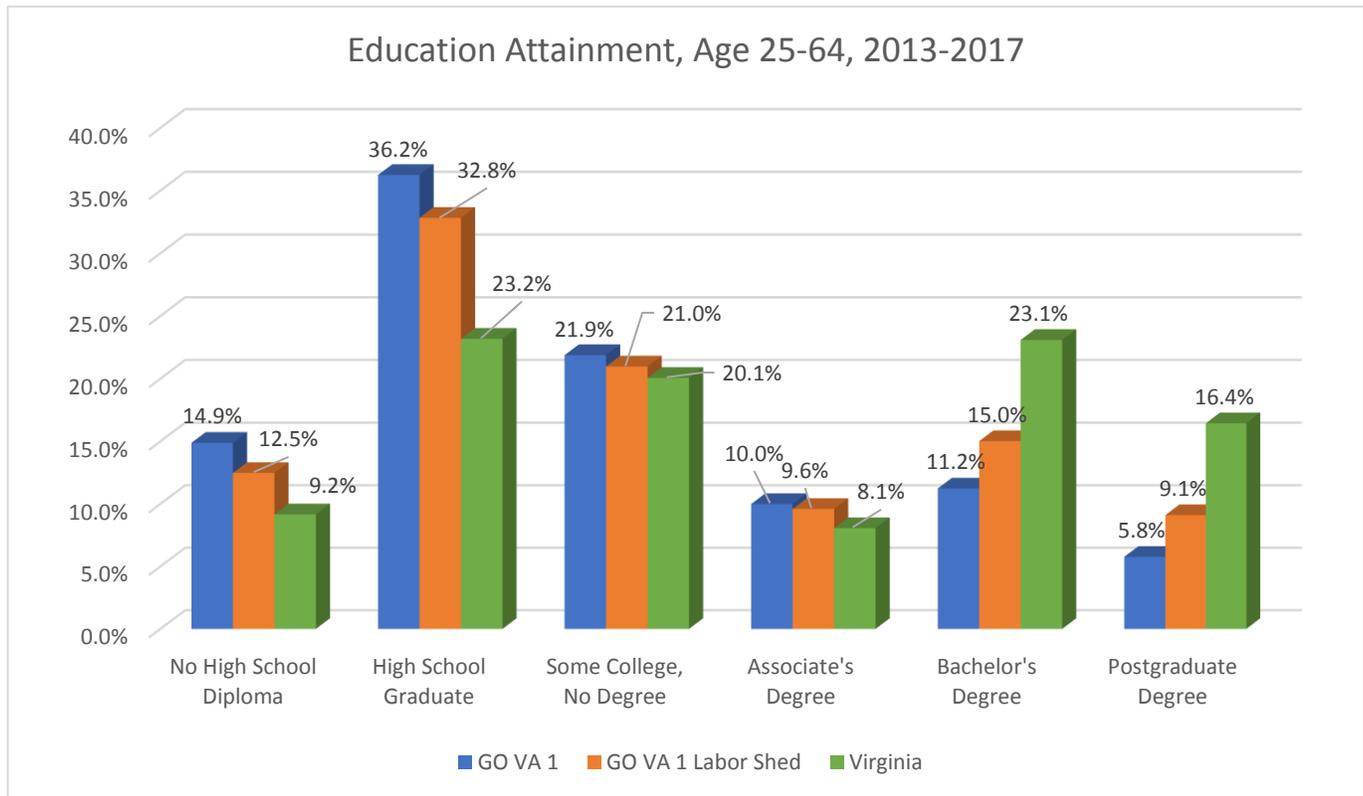
The percentage of the population with a disability in GO VA 1 is more than double that of the state at 19.8% for individuals age 18-64 according to the ACS, 2013-2017. Additionally, only 26.3% of individuals with disabilities in GO VA 1 participate in the labor force compared to 44.0% in the state.

Demographic Summary ¹						
	Percent			Value		
	GO VA Region 1	GO VA Region 1 Labor Shed	Virginia	GO VA Region 1	GO VA Region 1 Labor Shed	Virginia
Economic						
Labor Force Participation Rate and Size (civilian population 16 years and over)	50.3%	54.7%	65.5%	162,208	583,452	4,320,683
Armed Forces Labor Force	0.1%	0.1%	1.7%	242	901	110,817
Veterans, Age 18-64	4.3%	5.1%	8.3%	10,100	40,784	433,158
Mean Commute Time (minutes)	—	—	—	24.9	22.5	28.2
Commute via Public Transportation	0.3%	1.1%	4.4%	513	5,856	182,233
Union Membership ³	4.4%	4.8%	4.5%	—	—	—
Social						
Enrolled in Grade 12 (% of total population)	1.2%	1.2%	1.3%	4,780	15,167	110,440
Disconnected Youth ²	1.8%	1.7%	1.9%	317	1,181	8,220
Children in Single Parent Families (% of all children)	32.6%	34.3%	31.1%	22,212	80,118	552,474
With a Disability, Age 18-64	19.8%	16.8%	9.4%	45,045	132,129	480,446
With a Disability, Age 18-64, Labor Force Participation Rate and Size	26.3%	31.2%	44.0%	11,842	41,252	211,217
Foreign Born	1.4%	3.1%	12.1%	5,491	40,663	1,014,966
Speak English Less Than Very Well (population 5 yrs and over)	0.7%	1.5%	5.8%	2,669	18,543	455,009
1. ACS 2013-2017, unless noted otherwise						
2. Disconnected Youth are 16-19 year olds who are (1) not in school, (2) not high school graduates, and (3) either unemployed or not in the labor force						

Educational Attainment

Educational attainment in the GO VA 1 region falls short of that in the labor shed and state. Just under 15% of the population in GO VA 1 does not have a high school diploma compared with 12.5% in the labor shed and 9.2% in the state. Similarly, a high school diploma is the highest educational attainment level for 36.2% of GO VA 1 residents compared with 32.8% in the labor shed and 23.2% in Virginia. At the other end of the spectrum, only 11.2% of GO VA 1 residents possess a bachelor's degree and another 5.8% have postgraduate degrees compared with 15.0% and 9.1%, respectively, in the labor shed and 23.1% and 16.4%, respectively, in the state. The region has a higher proportion of residents with their highest educational attainment being an associate's degree (10.0%) than the labor shed (9.6%) and

state (8.1%). This is not surprising as the region awarded more associate's degrees and certifications per thousand residents in 2017 (6.8) than the labor shed (6.1) and the state (5.3).



Schools across the GO VA 1 region have outperformed the state average for Standards of Learning (SOL) pass rates. Nearly all school divisions in the region have higher pass rates in the reading, history, math, and science subject areas, as shown in the table below. Green shading represents a pass rate higher than the state average while red shading shows a pass rate lower than the state average. The GO VA 1 region exceeds the state average pass rate for all subjects except for English writing.

Standards of Learning Pass Rates by School Division and Subject, 2017-2018 School Year

School Division	Reading	Writing	History & Social Science	Math	Science
Bland County	85%	77%	92%	80%	87%
Bristol City	73%	68%	82%	71%	77%
Buchanan County	74%	71%	78%	73%	73%
Carroll County	80%	71%	81%	77%	79%
Dickenson County	81%	81%	88%	83%	87%
Galax City	77%	79%	81%	80%	78%
Grayson County	82%	75%	82%	81%	84%
Lee County	79%	72%	84%	80%	81%
Norton City	81%	64%	88%	83%	87%
Russell County	83%	78%	87%	84%	86%
Scott County	86%	76%	91%	89%	88%
Smyth County	80%	67%	84%	79%	82%
Tazewell County	84%	84%	89%	87%	86%
Washington County	86%	81%	85%	86%	87%

Wise County	85%	85%	93%	90%	89%
Wythe County	86%	85%	88%	88%	88%
Region 1 Average	81.4%	75.9%	85.8%	81.9%	83.7%
Virginia Average	79%	78%	84%	77%	81%

Source: Virginia Department of Education

Income and Poverty

The relatively low per capita income and higher poverty level in GO VA 1 reflects a lack of employment opportunities in the region relative to other areas in the state. Per capita income is \$22,535 in GO VA 1 according to ACS, 2013-2017 compared to \$24,889 in the labor shed and \$36,268 in Virginia. During the same period, 18.3% of all people in GO VA 1 were below the poverty level compared with 18.3% in the labor shed and 11.2% in the state. Similarly, 17.2% of households in the GO VA 1 region received food stamps compared with 16.0% in the labor shed and 9.1% in the state.

Demographic Summary ¹						
	Percent			Value		
	GO VA Region 1	GO VA Region 1 Labor Shed	Virginia	GO VA Region 1	GO VA Region 1 Labor Shed	Virginia
Economic						
Median Household Income ²	—	—	—	\$39,106	\$43,008	\$68,766
Per Capita Income	—	—	—	\$22,535	\$24,889	\$36,268
Poverty Level (of all people)	18.3%	18.3%	11.2%	68,583	227,679	906,838
Households Receiving Food Stamps	17.2%	16.0%	9.1%	27,072	84,030	282,296

1. ACS 2013-2017, unless noted otherwise
2. Median values for certain aggregate regions may be estimated as the weighted averages of the median values from the composing counties.

Entrepreneurship Trends

Small business start-ups are an important source of job creation in a regional economy, spurring innovation and competition and driving productivity growth. Research from the National Bureau of Economic Research³ indicates that the age of a business matters more than the size for job creation— young firms are more volatile, showing higher rates of both job creation due to rapid growth as well as higher rates of job destruction due to failures and exit.

While new business formation has declined in the region, the associated job creation has increased. While the new business formation rate (the proportion of startups relative to all active firms) tracked in-line with the state formation rate from 2007 to 2012, it has since declined to a little more than half of the state average as of 2017.⁴ Jobs created by small companies contributed to 41.6% of job creation in GO VA 1 in 2017, above their average contributions in Virginia (36.1%). The 2017 percentage contribution is an increase from 36.9% in 2010. Localities with the highest contributions from small companies are Grayson

³ Source: Who Creates Jobs? Small vs. Large vs. Young, <http://www.nber.org/papers/w16300.pdf>

⁴ Source: Regional Entrepreneurial Assessment Project, Teconomy Partners LLC, December 2018

(64.4%) and Dickenson (62.1%). Localities with the lowest contributions from small companies include Bland (29.7%), Norton (25.9%), and Bristol (25.2%).

While there are many factors that could influence these data, including volatility due to statistical noise, a number of efforts are underway in GO Virginia 1 aimed at encouraging small business start-ups. These include, for example, Mountain Empire Community College's Small Business Development Center; Virginia Highlands Small Business Development Center; Mount Rogers Planning District Commission Loan Funds Program; Blue Ridge Crossroads Small Business Development Center; Virginia Highlands Small Business Incubator; Opportunity SWVA; and the Southwest Virginia Community College Small Business Development Center. In addition, Carroll County, the City of Galax, and Grayson County are designated as "Virginia's Entrepreneurial Region."

Between 2007 and 2017, there were hundreds of startups formed in the GO VA 1 region. There were 107 manufacturing startups over these 10 years, 62 of which survived by 2017. The survival rate was similar for information technology and communication services firms, with 33 of the 65 firms still in existence in 2017. The energy, natural resources, and finished products cluster had 108 of 195 firms survive by 2017, and the agriculture and food processing cluster had 108 of 195 firms alive in 2017. Of the 165 GO VA 1 traded sector startups founded in 2012, 88 firms (53%) were still in existence in 2017.⁵

GO VA 1: Average Quarterly Small Firm (0-19 Employees) Job Creation								
	2000 Average	2010 Average	2016 Average	2017 Average	2000 as a % of Total	2010 as a % of Total	2016 as a % of Total	2017 as a % of Total
US	2,736,015	2,152,248	2,260,292	--	34.5%	36.0%	36.0%	--
Virginia	59,611	50,943	54,113	53,749	33.9%	35.1%	36.3%	36.1%
Region 1	2,726	2,042	1,863	1,838	45.0%	36.9%	40.1%	41.6%
Bland	35	21	16	17	54.3%	43.8%	25.4%	29.7%
Buchanan	201	121	105	104	52.1%	38.3%	32.4%	37.5%
Carroll	173	142	169	148	55.0%	53.4%	57.9%	48.6%
Dickenson	84	72	66	71	48.8%	57.4%	55.2%	62.1%
Grayson	78	81	75	65	63.1%	73.7%	62.4%	64.4%
Lee	125	83	73	79	54.1%	41.2%	48.3%	57.6%
Russell	157	105	120	121	44.2%	36.5%	48.8%	50.1%
Scott	96	64	57	60	40.4%	34.3%	25.9%	30.4%
Smyth	212	175	138	139	37.9%	45.7%	35.8%	42.4%
Tazewell	326	247	198	222	44.5%	36.5%	42.7%	44.4%
Washington	427	342	308	316	44.7%	41.9%	41.4%	39.6%
Wise	271	187	134	139	43.9%	28.8%	29.4%	34.0%
Wythe	235	182	181	157	50.0%	39.6%	40.7%	38.2%
Bristol city	158	113	102	111	21.7%	17.1%	21.7%	25.2%

⁵ Source: Regional Entrepreneurial Assessment Project, Teconomy Partners LLC, December 2018

Galax city	98	63	72	60	36.8%	31.7%	36.5%	37.8%
Norton city	52	47	50	31	26.3%	29.7%	36.1%	25.9%

Source: US Census Bureau, LEHD, QWI

Jobs created by young companies (5 years old or less) contributed 20.0% of total job creation in GO VA 1 in 2017. This represents a slight decrease from 22.2% in 2016, and from 2010 (24.3%). In comparison, the percent contribution of job creation for young firms in Virginia slightly increased from 26.0% in 2016 to 26.5% in 2017. The areas with the highest percentage contributions to job creation from young companies are Dickenson (34.7%), Lee (33.8%), and Smyth (28.7%).

GO VA 1: Average Quarterly Young Firm (5 Years Young or Less) Job Creation								
	2000 Average	2010 Average	2016 Average	2017 Average	2000 as a % of Total	2010 as a % of Total	2016 as a % of Total	2017 as a % of Total
US	2,393,167	1,585,367	1,644,151	-	30.2%	26.5%	26.2%	-
Virginia	54,709	38,167	38,830	39,466	31.1%	26.3%	26.0%	26.5%
Region 1	2,207	1,346	1,074	880	34.2%	24.3%	22.2%	20.0%
Bland	20	14	26	9	31.0%	27.2%	42.6%	16%
Buchanan	122	54	70	54	31.7%	17.3%	21.5%	19.4%
Carroll	111	108	110	68	34.9%	40.5%	37.7%	22.4%
Dickenson	82	50	52	40	48.1%	39.5%	43.0%	34.7%
Grayson	74	47	40	28	54.3%	42.6%	33.4%	27.2%
Lee	93	61	40	46	39.8%	30.3%	26.4%	33.8%
Russell	114	58	64	60	32.1%	20.5%	25.8%	25.1%
Scott	70	39	26	38	29.7%	20.6%	11.7%	19.1%
Smyth	264	116	86	95	46.7%	30.2%	22.2%	28.7%
Tazewell	224	154	107	135	30.4%	22.7%	23.1%	27.0%
Washington	315	184	154	172	32.6%	22.5%	20.5%	21.4%
Wise	228	118	66	82	36.8%	18.0%	14.4%	20.1%
Wythe	182	97	115	94	38.3%	21.2%	25.8%	22.7%
Bristol city	186	160	57	72	25.5%	24.5%	12.1%	16.3%
Galax city	57	37	40	34.5	21.2%	18.6%	20.5%	21.8%
Norton city	67	50	23	28	33.6%	31.4%	16.8%	23.3%

Source: US Census Bureau, LEHD, QWI

Wage Differentials by Cluster and Region

The annual average wage in GO VA 1 was \$38,200 for all occupations in 2017 for the 139,075 people employed in the region. Thirty-six percent of the workers—or 49,578 people—in GO VA 1 are employed in occupations that paid above-average wages in 2017.

There are significant differences within the target sectors of the percentage of people earning above-average wages. For example, about 27.0% of workers in food and beverage manufacturing are employed in occupations that pay wages above the regional average, compared with about 61.8% of workers in the energy cluster. These preliminary baseline measures are summarized in the table below.

Cluster Employment for 4 Quarters Ending 2018 Quarter 4			
Cluster	Occupations with above-average wages	Total -- All Occupations	Percent Paying Above-Average Wages
Energy	2,486	4,023	61.8%
Food and Beverage Manufacturing ⁶	390	1,447	27.0%
Advanced Manufacturing	6,238	17,134	36.4%
Information Technology	2,041	2,041	100%
Total--All Occupations	53,311	139,075	38.3%
Source: JobsEQ Note: wages are as of 2017			

The three cities and 13 counties in the GO VA One region have a wide range of employment and wages. The largest county—Washington County— has nearly ten times the employment (23,134) as the smallest locality—Bland County (2,479), highlighting the wide range of employment within the region. Buchanan County has the highest average annual wage (\$44,249) in the region, mostly due to its high concentration of mining. The lowest wage is \$27,020 in Grayson County. The annual average wage in nine of the counties and cities in GO VA 1 is less than that of the region (shaded red in the table below).

Four Quarters Ending with 2018Q4		
Region	Employment	Average Annual Wages per Worker
Washington County, Virginia	23,134	\$35,208
Tazewell County, Virginia	15,969	\$36,165
Smyth County, Virginia	13,097	\$33,273
Wythe County, Virginia	12,450	\$33,607
Wise County, Virginia	12,214	\$33,872
Bristol City, Virginia	9,635	\$34,551
Russell County, Virginia	7,764	\$38,236
Carroll County, Virginia	7,652	\$30,346

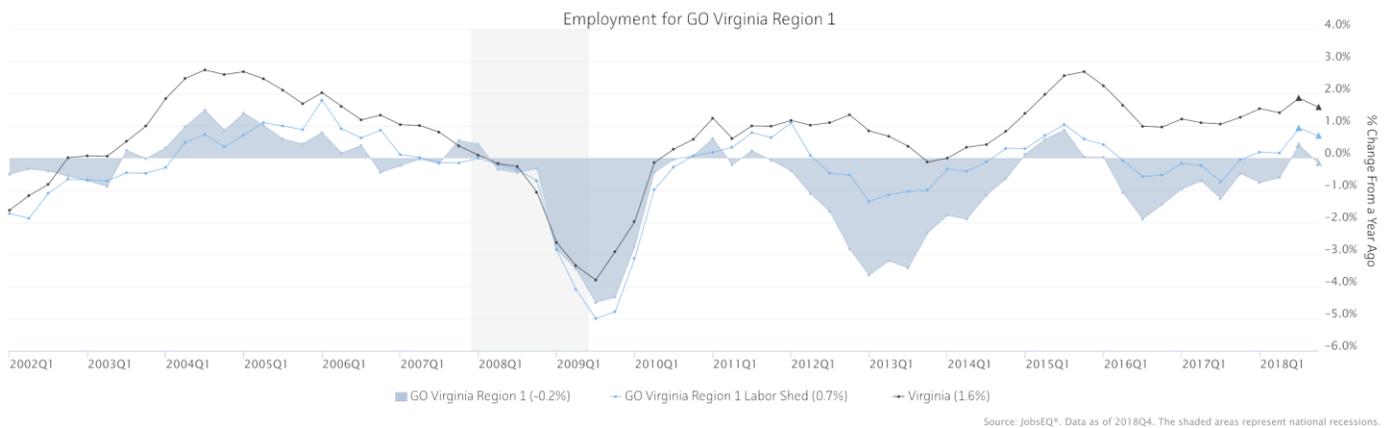
⁶ Figures for food and beverage manufacturing in this table are based on 2019Q1 numbers due to data revisions. These numbers do not significantly differ from 2018Q4 numbers.

Four Quarters Ending with 2018Q4		
Region	Employment	Average Annual Wages per Worker
Buchanan County, Virginia	7,036	\$44,249
Galax City, Virginia	6,091	\$31,909
Scott County, Virginia	5,567	\$30,449
Lee County, Virginia	5,164	\$30,159
Grayson County, Virginia	3,776	\$27,020
Norton City, Virginia	3,549	\$36,827
Dickenson County, Virginia	3,497	\$38,310
Bland County, Virginia	2,479	\$41,641
GO VA Region 1	139,075	\$38,200
Source: JobsEQ		

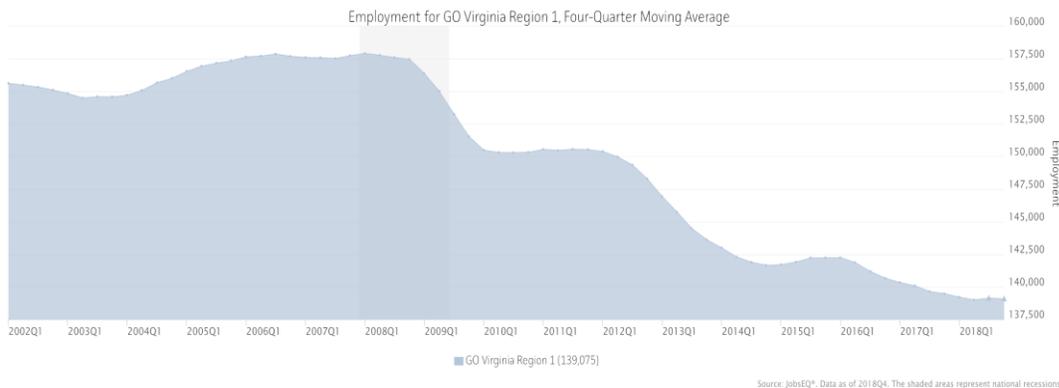
Drivers of Growth: Industry Structure

Employment

Similar to the nation, GO VA 1 experienced a sharp decline in employment during the Great Recession. In the four quarters ending with the third quarter of 2009, employment was down 4.5% from a year earlier in GO VA 1 compared with a 5.0% loss in the labor shed and 3.8% in the state over the same period.



Unlike the state and nation where employment has risen beyond pre-recession peak levels, employment in GO VA 1 has continued to contract. In the first quarter of 2008, at the start of the recession, 157,922 people were employed in the GO VA 1 region. Employment has since dropped by 18,847 workers (or 11.9%) to a total of 139,075 employed in the fourth quarter of 2018. During the four quarters ending in 2018Q4, employment decreased by 395 workers in the region. While still falling, the rate of employment decline slowed in 2018 compared to 2016 and 2017.



Since the start of GO Virginia in spring of 2017, there have been several closings resulting in lost jobs in Region One. The following

four closures reported by the Virginia Economic Development Partnership combine for a loss of 717 jobs in the region:

- Titan Wheel Corp in Smyth County closed in December 2017, eliminating 40 jobs
- Bristol Compressors International closed in September 2018, eliminating 470 jobs in Washington County
- Coca-Cola Bottling Co. closed a facility in Bristol, eliminating 10 jobs in October 2018
- Sykes Enterprises will lay off 197 Buchanan County workers in September 2019

Employment in the GO VA 1 labor shed also remains below its previous peak level prior to the Great Recession. Employment peaked at 599,999 in the second quarter of 2007 in the labor shed, dropping by 33,941 jobs (or 5.66%) to 566,058 in the fourth quarter of 2018. The labor shed's auto manufacturing industry is poised to expand over the next decade as Volvo announced an expansion of their existing plant in Dublin (Pulaski County), including a \$400 million investment in a new 350,000 square foot building, creating 777 new jobs over the next six years.⁷

Industry Mix

The job decline in GO VA 1 over the last decade is mainly driven by a secular decline in manufacturing employment due largely to productivity growth and offshoring. Manufacturers shed 9,212 employees between 2002 and 2018. The construction sector and coal mining industry have shed over 3,400 and 2,600 jobs, respectively, during the same period. The loss in construction jobs is partially caused by the ripple effect from a contraction in manufacturing as well as coal mining, which has been a more recent phenomenon caused by increased regulation over environmental concerns.

Smaller employment losses occurred in most of the other major sectors such as retail trade and finance and insurance that were adversely impacted when manufacturers and coal mines reduced employment. Employment contracted in all the major sectors in GO VA 1 since 2002 except for the following: health care and social assistance; administrative and support and waste management and

⁷ Source: <https://augustafreepress.com/volvo-group-to-create-777-new-jobs-in-pulaski-county-expansion/>

remediation services; public administration; accommodation and food services; professional, scientific, and technical services; and arts, entertainment, and recreation.

The decline in manufacturing is particularly bad for the region's economy because manufacturing provides jobs for a large share of the economy. As shown in the industry mix table, manufacturing in GO VA 1 provided 12.3% of all employment in the region in the four quarters ending in 2018Q4 compared with 11.5% in the labor shed and 6.1% in the state. However, the value added by manufacturing is so large that this sector makes up 20.3% of GO VA 1's gross domestic product (GDP).

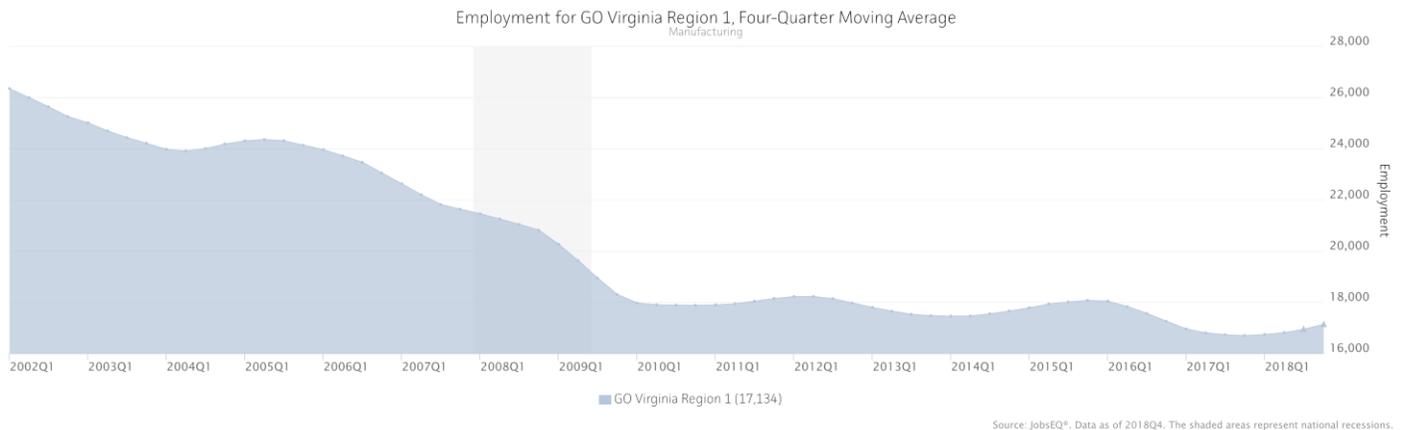
Industry Mix, 2018							
NAICS	Industry	Region One		Labor Shed		Virginia	
		Employment	GDP ¹	Employment	GDP ¹	Employment	GDP ¹
11	Agriculture, Forestry, Fishing and Hunting	3.3%	0.8%	1.4%	0.4%	0.8%	0.3%
21	Mining, Quarrying, and Oil and Gas Extraction	2.6%	8.5%	1.0%	2.6%	0.1%	0.3%
22	Utilities	0.6%	1.4%	0.5%	1.5%	0.4%	1.4%
23	Construction	5.2%	4.9%	5.4%	4.8%	5.9%	4.5%
31	Manufacturing	12.3%	20.3%	11.5%	19.6%	6.1%	9.2%
42	Wholesale Trade	2.3%	3.2%	2.7%	4.5%	2.7%	4.1%
44	Retail Trade	14.0%	9.4%	12.7%	8.1%	10.5%	5.3%
48	Transportation and Warehousing	3.5%	4.0%	3.8%	3.9%	3.9%	3.2%
51	Information	1.2%	1.5%	1.1%	1.8%	1.8%	3.3%
52	Finance and Insurance	2.0%	2.2%	2.8%	3.4%	3.5%	5.4%
53	Real Estate and Rental and Leasing	0.7%	6.9%	1.1%	9.7%	1.6%	14.6%
54	Professional, Scientific, and Technical Services	3.0%	2.9%	3.8%	3.6%	11.2%	12.6%
55	Management of Companies and Enterprises	1.0%	1.2%	1.6%	1.7%	1.8%	2.5%
56	Administrative and Support and Waste Management and Remediation Services	4.6%	2.9%	5.4%	2.8%	6.4%	3.6%
61	Educational Services	7.8%	5.9%	9.2%	7.2%	8.8%	5.6%
62	Health Care and Social Assistance	14.7%	10.5%	16.4%	13.9%	12.4%	7.3%
71	Arts, Entertainment, and Recreation	1.3%	0.6%	1.3%	0.6%	2.0%	0.8%
72	Accommodation and Food Services	8.2%	2.9%	9.0%	3.1%	8.6%	2.6%
81	Other Services (except Public Administration)	4.5%	2.5%	4.6%	2.3%	5.1%	2.4%
92	Public Administration	7.0%	6.9%	4.5%	4.0%	6.0%	7.1%

Source: JobsEQ
¹ Data for GDP are from 2017

Manufacturing Sector

More detailed information is provided about the manufacturing sector due to its importance to the region's economy.

As noted previously, manufacturing employment in the GO VA 1 region has struggled over the last few decades but has stabilized since the Great Recession ended. In the first quarter of 2002, manufacturers employed 26,346 people in the GO VA 1 region and shed 8,377 jobs through the period ending with the first quarter of 2010 (two quarters after the end of the Great Recession). Since then, manufacturing employment has risen as high as 18,221 in 2012 and now stands at 17,134 in the fourth quarter of 2018, which is a slight increase from 2017.



As shown in the following table, 10 of the 21 manufacturing industries in GO VA 1 lost jobs over the last five years. The largest job losses were in fabricated metal products, with a decrease of 567 jobs, followed by machinery manufacturing which declined by 521 jobs.

The three manufacturing industries that added more than 100 employees over the past five years are:

- Transportation equipment (+497 jobs, mostly in motor vehicle body, trailer, and parts manufacturing),
- Wood products (212), and
- Food (117).

Even though manufacturing jobs in GO VA 1 are expected to decline by 2,673 due to net contractions in employment, **13,786 manufacturing jobs will need to be filled in the region over the next decade** as individuals currently in those positions retire or move to alternative occupations.⁸

⁸ In 2016, the Bureau of Labor Statistics switched from replacement rates to separation rates. The BLS determined that a newer, more robust and more statistically sound model was necessary. More information about these changes can be found here: https://www.bls.gov/emp/documentation/separations-faqs.htm#Why_Change

Industry Snapshot, Manufacturing in GO VA 1

		Current			Historical				Forecast		
		Four Quarters Ending with 2018q4			Total Change over the Last 5 Years	Average Annual % Change in Employment 2013q4-2018q4			Over the Next 10 Years		
NAICS	Industry	Empl	Avg. Annual Wages	Location Quotient	Empl	GO VA Region 1	GO VA Region 1 Labor Shed	USA	Total Separations	Total Growth Demand	Avg. Annual Growth Percent
311	Food	509	\$36,941	0.35	117	5.4%	3.7%	1.8%	583	-43	-0.9%
312	Beverage and Tobacco Product	906	\$47,499	3.71	86	2.0%	4.4%	6.5%	1,036	-33	-0.4%
313	Textile Mills	525	\$37,152	5.22	-7	-0.3%	-3.5%	-0.9%	508	-134	-2.9%
314	Textile Product Mills	125	\$20,874	1.17	72	19.0%	-0.2%	0.5%	112	-43	-4.1%
315	Apparel	462	\$21,752	3.93	92	4.5%	1.0%	-4.2%	393	-196	-5.4%
316	Leather and Allied Product	7	\$31,514	0.25	4	18.1%	2.0%	-1.2%	7	0	-0.1%
321	Wood Product	1,397	\$31,802	3.69	212	3.3%	3.1%	2.6%	1,426	-203	-1.6%
322	Paper	56	\$34,344	0.17	-24	-6.9%	2.6%	-0.6%	54	-11	-2.2%
323	Printing and Related Support Activities	106	\$26,061	0.26	-8	-1.4%	-4.6%	-1.0%	101	-27	-2.9%
324	Petroleum and Coal Products	85	\$66,615	0.84	-11	-2.5%	-1.1%	0.1%	72	-18	-2.4%
325	Chemical	897	\$50,929	1.20	-94	-2.0%	0.8%	1.0%	777	-211	-2.6%
326	Plastics and Rubber Products	1,365	\$50,690	2.11	11	0.2%	-0.2%	2.1%	1,333	-243	-1.9%
327	Nonmetallic Mineral Product	786	\$36,125	2.10	84	2.3%	2.8%	2.1%	750	-151	-2.1%
331	Primary Metal	202	\$52,954	0.60	30	3.3%	-3.5%	-0.9%	180	-51	-2.9%
332	Fabricated Metal Product	1,100	\$43,654	0.83	-567	-8.0%	-1.0%	0.5%	1,052	-164	-1.6%
333	Machinery	1,920	\$54,699	1.93	-521	-4.7%	-0.6%	0.1%	1,783	-245	-1.4%
334	Computer and Electronic Product	315	\$40,923	0.34	-36	-2.2%	-3.8%	-0.1%	249	-69	-2.4%
335	Electrical Equipment, Appliance, and Component	1,148	\$50,328	3.23	-133	-2.2%	-1.5%	1.2%	1,072	-199	-1.9%
336	Transportation Equipment	3,689	\$40,822	2.38	497	2.9%	3.0%	2.4%	3,450	-433	-1.2%
337	Furniture and Related Product	1,210	\$32,659	3.33	-165	-2.5%	-3.3%	1.9%	1,195	-155	-1.4%
339	Miscellaneous	324	\$31,837	0.55	25	1.6%	1.1%	0.8%	308	-44	-1.4%
31	Manufacturing	17,134	\$43,828	1.49	-337	-0.4%	0.4%	1.1%	16,459	-2,673	-1.7%
	Total - All Industries	139,075	\$34,678	1.00	-4,544	-0.6%	0.1%	1.7%	147,553	-7,605	-0.6%

Source: JobsEQ® Data as of 2018Q4

The trends in manufacturing employment are similar in the GO VA 1 labor shed. Employment in 11 of the 21 manufacturing industries in the labor shed contracted over the past five years. The following eight manufacturing industries in the labor shed added more than 100 employees:

- Transportation equipment (+1419)
- Food (447)
- Wood products (434 jobs)
- Chemicals (429)
- Beverage and tobacco products (358)
- Nonmetallic mineral products (337)
- Paper (157)
- Miscellaneous (126)

While manufacturing jobs in the labor shed are expected to decline by 9,038 due to net contractions in employment, 63,278 manufacturing jobs are expected to open in the region over the next decade as individuals currently in those positions retire or move to alternative occupations.⁹

Industry Clusters

Clusters represent a geographic concentration of interrelated industries. **When clusters possess a location quotient (LQ)¹⁰ of 1.25 or greater they are said to possess a competitive advantage that makes it easier to attract like firms** because suppliers, skilled labor, and training providers presumably reside in the area. (A region can have a competitive advantage in a growing or declining industry.)

Of the 22 industry clusters¹¹ shown in the table and graphic below, GO VA 1 has a competitive advantage in 8 of them and the labor shed has a competitive advantage in 6 clusters. **Clusters with a competitive advantage are highlighted in green in the table below.** The cluster with the largest LQ is energy (3.22) followed by textile/leather manufacturing (3.17), wood/paper manufacturing (2.62), and agriculture (2.15) in the GO VA 1 region.¹² Not all clusters that have a competitive advantage in the GO VA 1 have a competitive advantage in the GO VA 1 labor shed and vice versa. For example, the LQ of the agriculture cluster is 2.15 in the GO VA 1 region but only 0.98 in the GO VA 1 labor shed.

⁹ Ibid.

¹⁰ The location quotient (LQ) is a measure of the relative size of an industry in a region compared to the average size in the nation. An LQ of 1.0 indicates an industry is the same size in the region as is average in the nation; an LQ of 2.0 means the industry is twice as large in the region compared to average; and an LQ of 1/2 indicates the industry is half as large regionally as average in the nation. By formula, the location quotient is the ratio of an industry's share of total employment within the region to the same industry's share of employment in the nation.

$$LQ = \frac{\text{Employment in industry } I \text{ in area } J / \text{Total employment in area } J}{\text{U.S. employment in industry } I / \text{Total U.S. employment}}$$

¹¹ Definitions of industry clusters can be found in Appendix 2.

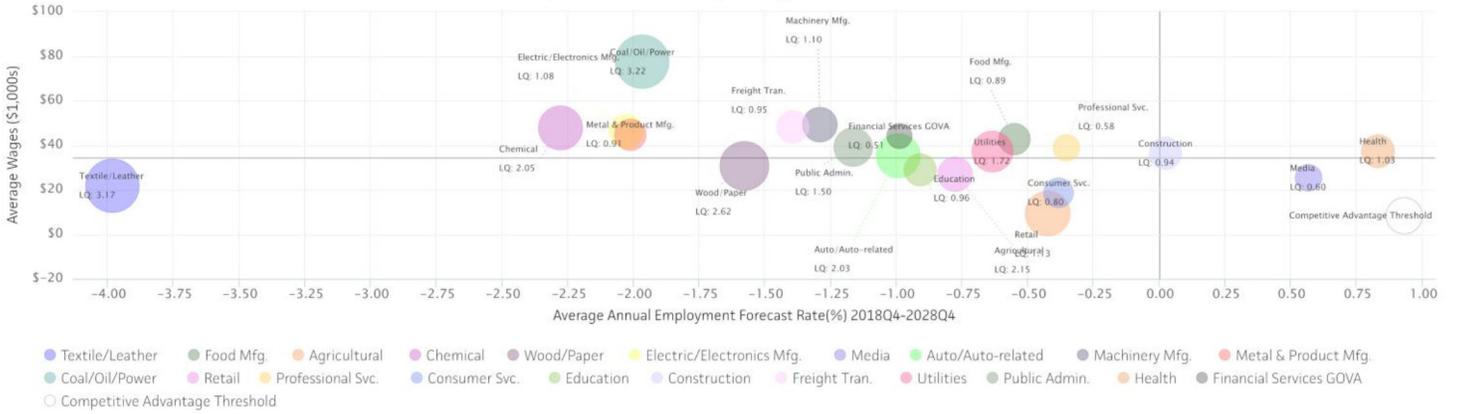
¹² The agriculture data do not include all family farms (since unemployment insurance quarterly returns are not required by all family farms). Thus, the LQ for agriculture in a region may be understated if the area contains a significant number of family farms.

Many of the clusters are in manufacturing industries and are associated with future employment declines, but also possess a much higher annual average wage than that of the overall region.

Industry Clusters as of 2018Q4						
	GO VA 1			GO VA 1 Labor Shed		
Industry Group	Average Annual Employment Forecast Rate (%) 2018Q4-2028Q4	Average Wages	Location Quotient	Average Annual Employment Forecast Rate (%) 2018Q4-2028Q4	Average Wages	Location Quotient
Textile/Leather Mfg.	-3.98	\$21,895	3.17	-3.67	\$32,265	2.09
Food Mfg.	-0.55	\$42,831	0.89	-0.67	\$38,406	0.64
Agricultural	-0.42	\$9,439	2.15	-0.24	\$13,562	0.98
Chemical	-2.28	\$47,853	2.05	-1.95	\$74,723	3.24
Wood/Paper	-1.58	\$30,827	2.62	-1.34	\$40,936	1.55
Electric/Electronics Mfg.	-2.03	\$46,298	1.08	-1.66	\$58,894	1.33
Media	0.57	\$25,458	0.60	-0.67	\$35,331	0.56
Auto/Auto-related Mfg.	-0.99	\$35,345	2.03	-0.49	\$43,510	1.57
Machinery Mfg.	-1.29	\$49,323	1.10	-1.13	\$51,249	0.85
Metal & Product Mfg.	-2.01	\$44,769	0.91	-1.43	\$51,204	1.12
Energy	-1.97	\$77,591	3.22	-1.63	\$76,575	1.40
Retail	-0.78	\$27,110	1.13	-0.47	\$31,437	1.07
Professional Svc.	-0.35	\$38,919	0.58	0.17	\$44,284	0.74
Consumer Svc.	-0.38	\$18,747	0.80	0.06	\$20,107	0.89
Education	-0.91	\$29,020	0.96	-0.26	\$35,965	1.10
Financial Services GOVA	-0.99	\$44,230	0.51	-0.06	\$55,616	0.70
Construction	0.02	\$36,462	0.94	0.54	\$44,400	0.97
Freight Tran.	-1.39	\$48,297	0.95	-0.76	\$53,528	1.03
Utilities	-0.64	\$37,246	1.72	-0.08	\$42,077	1.22
Public Admin.	-1.16	\$39,238	1.50	-0.69	\$42,732	0.95
Health	0.83	\$37,414	1.03	0.89	\$49,977	1.14

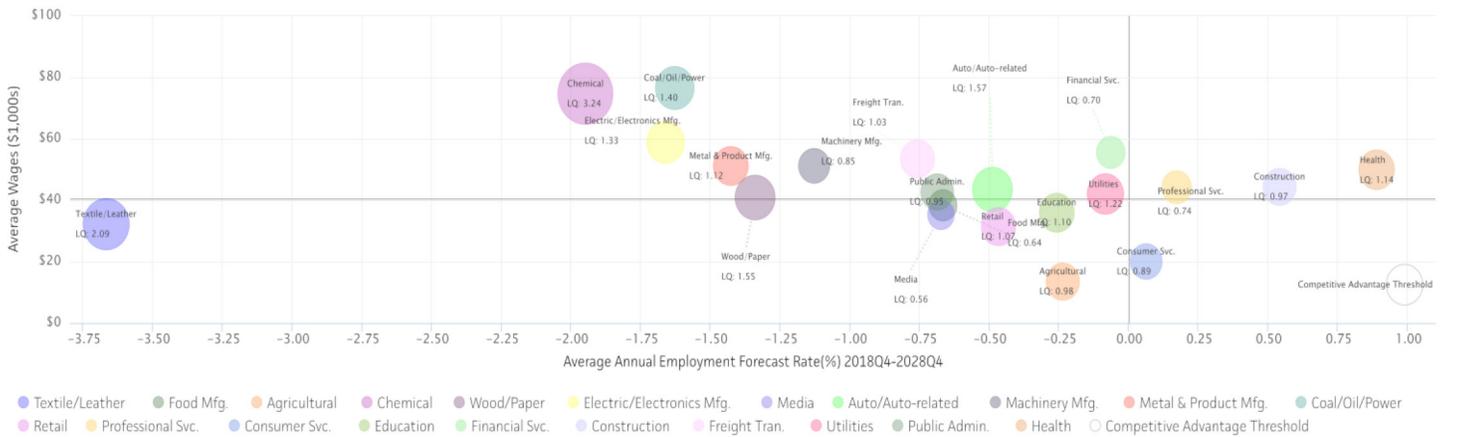
[Source: JobsEQ®](#)

Industry Clusters for GO Virginia Region 1 as of 2018Q4



Source: JobsEQ®, Data as of 2018Q4

Industry Clusters for GO Virginia Region 1 Labor Shed as of 2018Q4



Source: JobsEQ®, Data as of 2018Q4

Notes:

The LQ=1.25 cluster in the bottom right corner of the chart is being shown for reference purposes, denoting the threshold size of competitive advantage.

The horizontal line through the mid-section of the chart represents the average wage in the region.

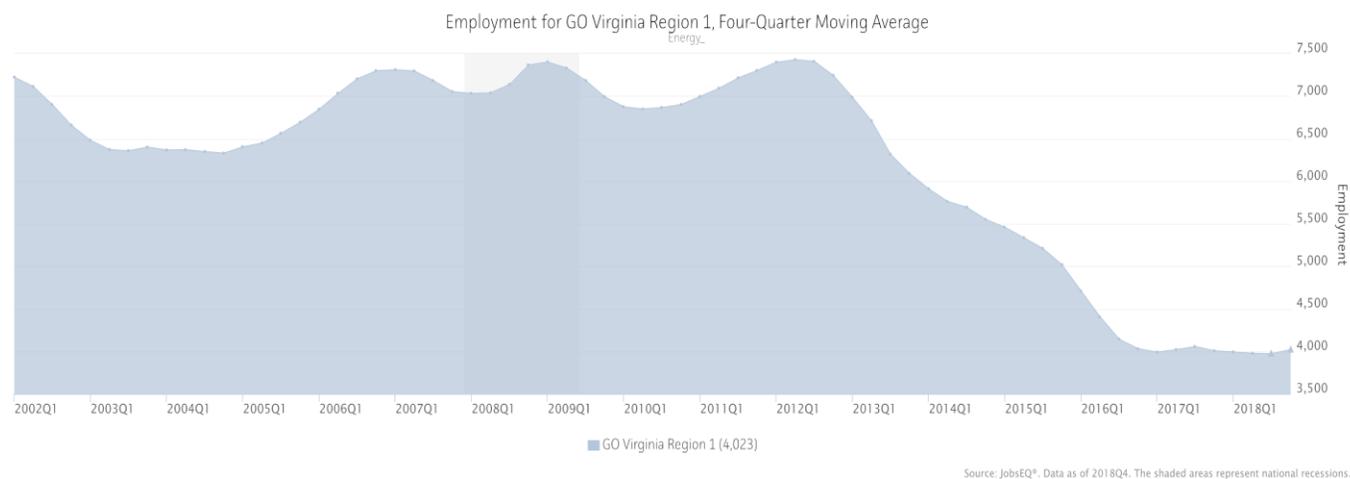
Energy Cluster

Additional detail about the energy cluster is provided here due to its importance to the GO VA 1 region's economy. This cluster pays a higher wage (\$77,591 in GO VA 1 and \$76,575 in GO VA 1 labor shed) than the average for all industries in the region.

The full definition of the energy cluster can be found in Appendix 2. In general, the energy cluster is defined as coal mining, crude petroleum and natural gas extraction, power generation, and natural gas transportation.

Despite gaining workers during the Great Recession, the energy cluster has generally declined since 2012. Employment in the energy cluster peaked at 7,430 in the second quarter of 2012 in GO VA 1 before falling to 3,993 in the first quarter of 2017. Since then the cluster has seen modest improvement, rising to 4,023 jobs in 2018Q4. The GO VA 1 labor shed shows a similar trend. Energy cluster employment peaked at 14,687 in the first quarter of 2009 and fell by 7,565 jobs to 7,122 in the fourth quarter of 2018.

However, following the introduction of plans by Dominion Energy for the construction of a hydroelectric pump project in Southwest Virginia¹³¹⁴, hydroelectric power generation has presented a growing energy enterprise in the region. Prior to the first quarter of 2016, employment in hydroelectric power generation had remained steadily low (8 at the end of 2015) and increased to 81 by the fourth quarter of the same year. Since then it has been declining steadily and reached 34 by the fourth quarter of 2018. Nearly all of this growth in hydroelectric has been concentrated within Carroll County, home to the Buck and Byllesby hydroelectric power plants.



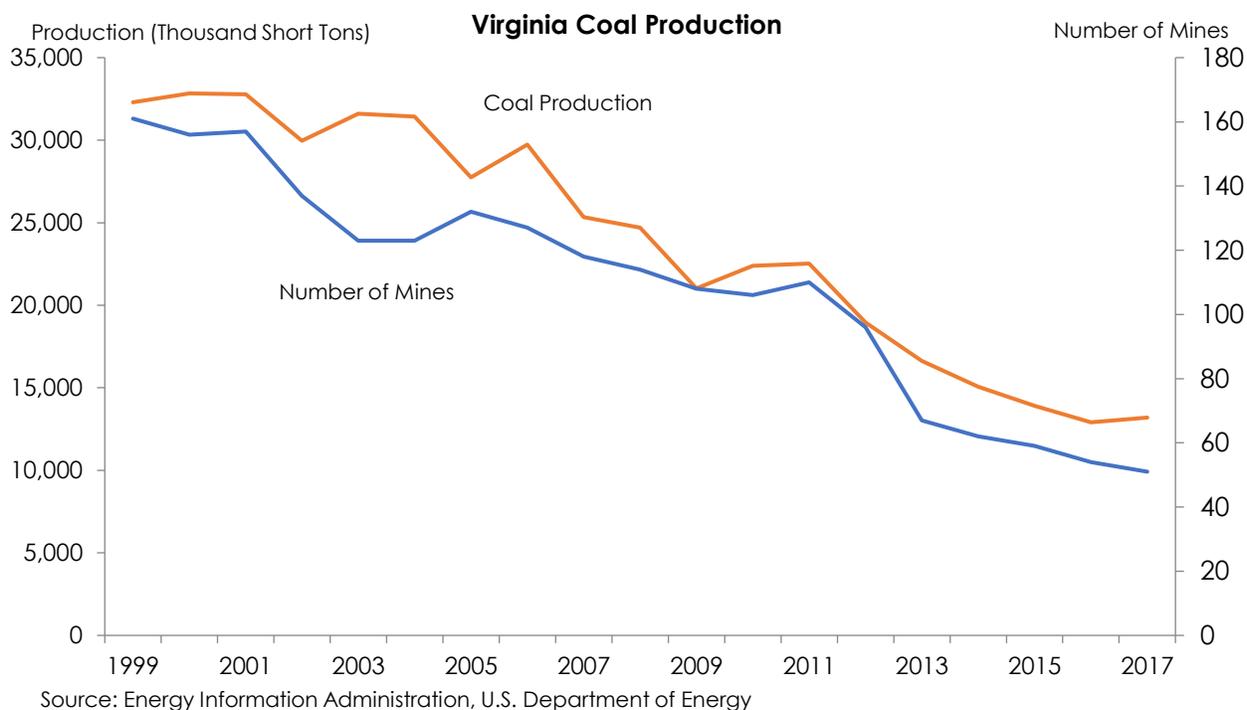
Given the importance of coal production within the energy sector in GO Virginia 1, the following section details research on coal production and employment and wage trends in the region and Virginia.

¹³ <https://www.dominionenergy.com/about-us/making-energy/renewables/water/powering-southwest-virginia>

¹⁴ http://www.bdtonline.com/news/hydroelectric-pump-project-may-energize-tazewell-county-economy/article_0b8a4fd8-a4b9-11e7-ba86-a3f067f6c26a.html

Virginia's Coal Production

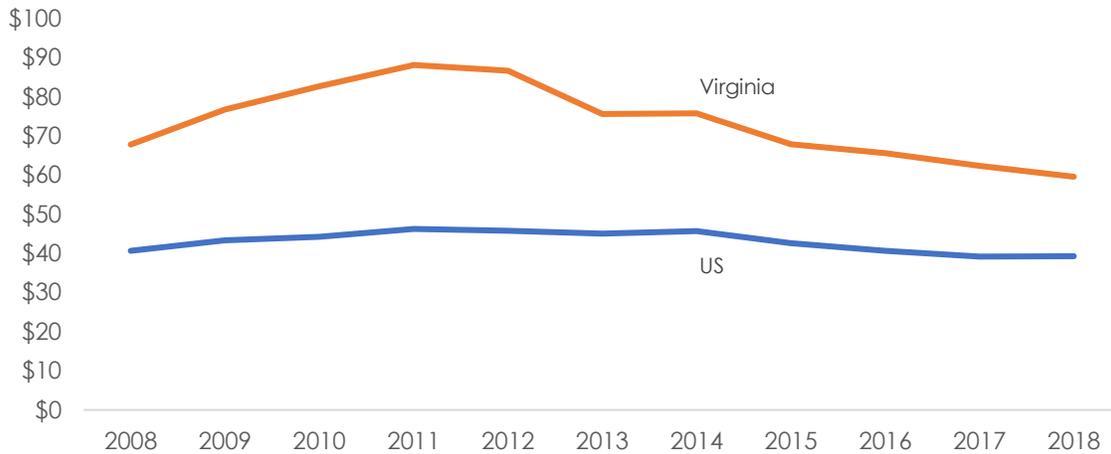
The total amount of coal produced in Virginia has been declining over the past two decades. Based on data from the U.S. Department of Energy, there were 96 active coal mines in Virginia that produced 19.0 million short tons of coal in 2012. The total tonnage decreased to 13.2 million in 2017, less than half of the 1999 production level. From 1999 to 2017, Virginia's coal production averaged a 4.8% decline per year. As a comparison, national coal production decreased 1.9% per year during the same time period.¹⁵ Declining coal production in Virginia shows that its importance to the national coal industry is waning. In 2007, Virginia accounted for 2.2% of total national coal production, which after ten years declined to 1.7% in 2017.



The price of coal for electric power in Virginia has consistently been at least 50% more than the national price. This price difference creates competitive issues for Virginia's coal mines. While the price of coal for electric power in Virginia increased much more than in the nation from 2008 to 2011, the difference in prices has since narrowed. Coal price to electric power in 2018 was \$59.58 per ton in Virginia compared to \$39.30 per ton in the nation. Coal can be mined more cheaply and on a larger scale in the western United States, keeping the national price growth rate more stable.

¹⁵ Source: Annual Coal Reports, U.S. Department of Energy, Energy Information Administration.

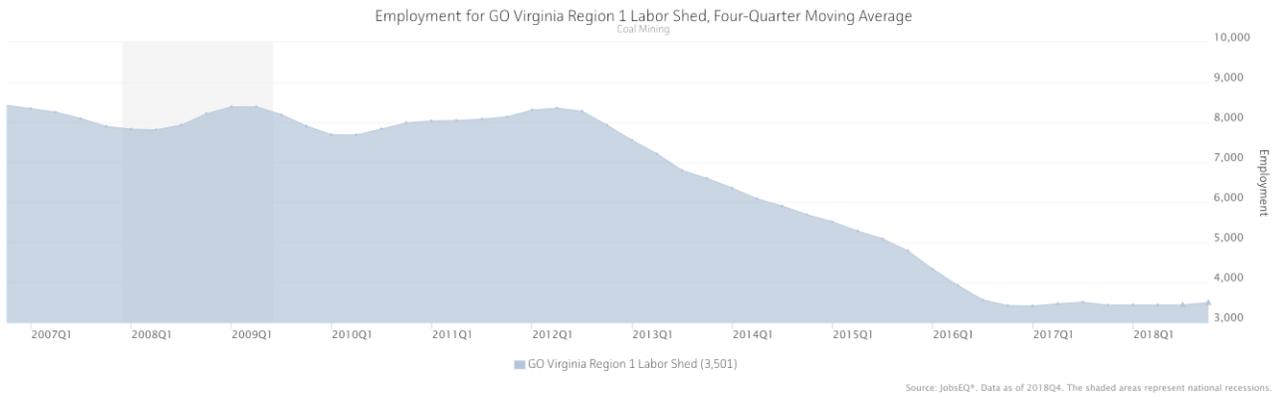
Virginia Coal Price (\$/Ton)



Source: Energy Information Administration, U.S. Department of Energy

Coal Employment and Wages in Virginia and Region One

Coal mines employ 62.5% of the energy cluster employees in the region and have seen more severe declines than the cluster overall. Trends at the state level follow the region, as almost all of Virginia's coal employment (98%) falls within GO Virginia Region 1. Similar to the energy cluster, the coal mining industry added jobs during the Great Recession. However, over the last five years, employment in coal mining has declined by over 38%. The region's coal mining employment fell steadily from a ten-year peak of 4,820 workers in the third quarter of 2012 and bottomed out at 2,313 in the fourth quarter of 2016 before experiencing modest recovery in 2017 and remaining flat in 2018. Employment stood at 2,514 in the fourth quarter of 2018. The GO VA 1 labor shed shows an even more severe decline of nearly 60% from the post-recession peak of 8,353 in the second quarter of 2012 to 3,501 workers in the fourth quarter of 2018.



Source: JobsEQ®. Data as of 2018Q4. The shaded areas represent national recessions.

The decline in coal mining employment over the past five years has largely occurred at underground mines. Five years ago, underground mines employed 1,499 workers compared to 1,543 people working on surface mines in the GO VA 1 region. Underground mining employment has increased at an annual average rate of 17.8% for the past five years while surface mines have increased at a rate of 0.6% on average in the region. Though underground mines were the primary coal mining employers in the region five years ago, surface mines now employ most of the coal miners in the region and labor shed.

As shown in the table below, with an average annual wage of \$85,197, coal mining pays a much higher wage than the \$34,678 average for the region based on the four quarters ending with the fourth quarter of 2018. Consequently, when coal miners lose their jobs, they have a larger ripple impact on the regional economy because of their reduced purchasing power. In conjunction with manufacturing, job losses in these relatively high paying positions lead to reduced sales at regional establishments such as retailers, restaurants, and doctors' offices. Appendix 4 examines potential high-wage job opportunities for those currently employed in coal mining occupations.

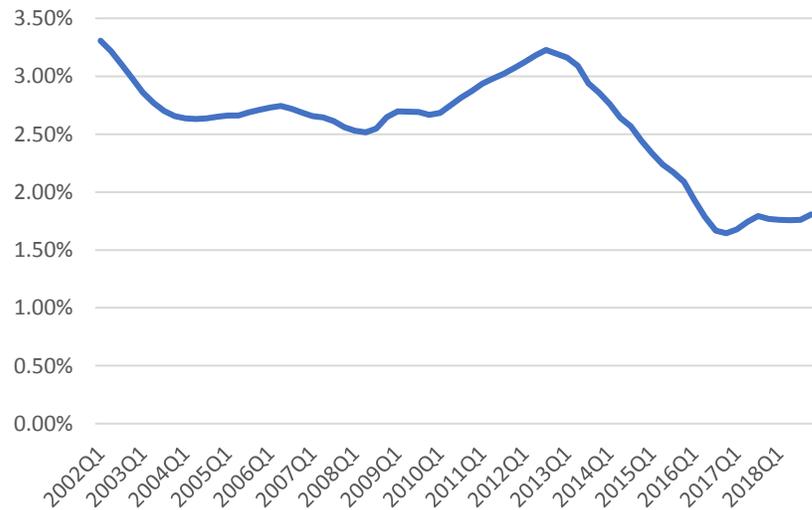
Industry Snapshot, Coal Mining in GO VA 1											
		Current			Historical				Forecast		
		Four Quarters Ending with 2018q4			Change: Last 5	Average Annual % Change in Employment 2013q4-2018q4			Over the Next 10 Years		
NAICS	Industry	Empl	Avg. Annual Wages	Location Quotient	Empl	GO VA Region 1	GO VA Region 1 Labor Shed	USA	Total Separations	Total Growth Demand	Avg. Annual Growth Percent
212111	Bituminous Coal and Lignite Surface Mining	1,543	\$73,603	73.85	44	0.6%	-4.0%	-7.3%	1,428	-381	-2.8%
212112	Bituminous Coal Underground Mining	971	\$85,096	41.01	-1,616	-17.8%	-17.3%	-8.6%	893	-249	-2.9%
212113	Anthracite Mining	0	n/a	0.00	-20	n/a	-52.0%	-5.3%	0	0	-1.1%
2121	Coal Mining	2,514	\$85,197	55.60	-1,591	-9.3%	-11.9%	-8.0%	2321	-631	-2.8%
	Total - All Industries	139,075	\$34,678	1.00	-4,544	-0.6%	-0.1%	1.7%	147,553	-7,605	-0.6%

Source: JobsEQ® Data as of 2018Q4

Employment Trend

The result of declining coal industry employment combined with modest employment growth in other industries in the region is that the importance of coal in the regional economy is waning. In 2002, 3.3% of regional workers were employed in the coal industry, but that fell to 1.8% in 2018. In 2018, the coal industry employment ranked 13th out of the 20 major industry sectors.

Coal Industry Employment as a Percentage of Region 1 Total Employment



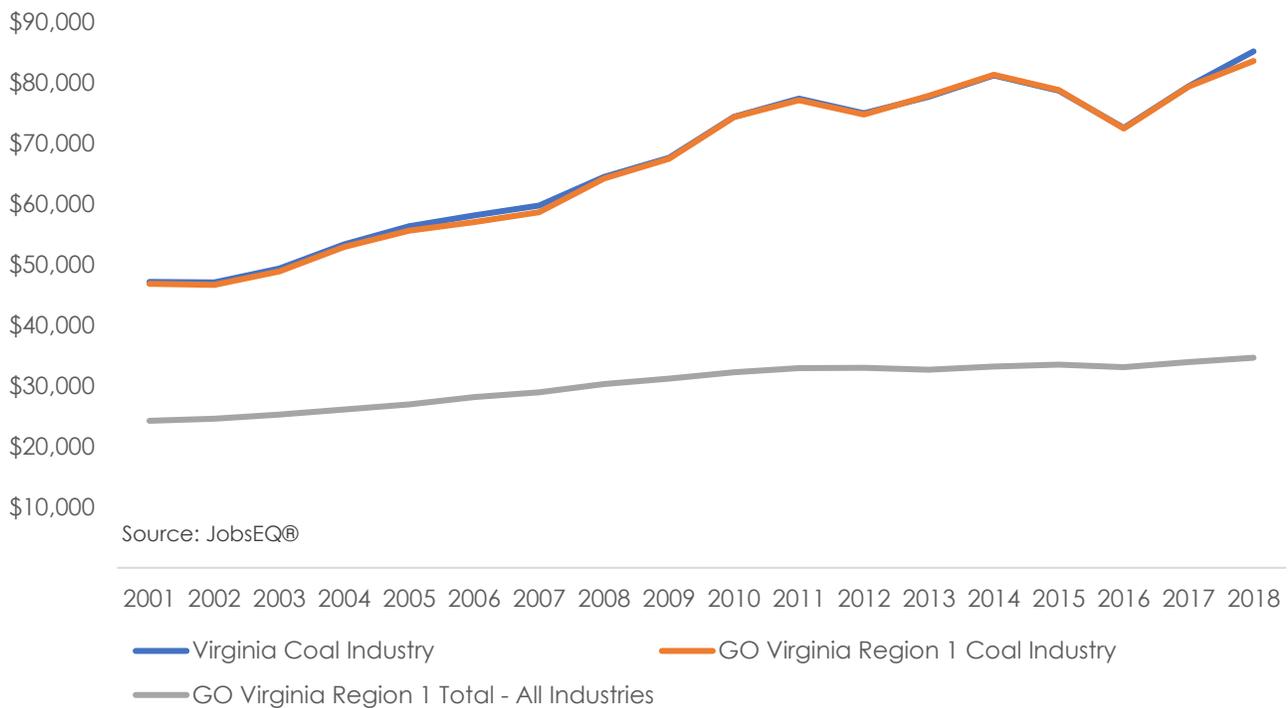
Source: JobsEQ®

Wage Trend

In Region 1, the coal industry's wages are much higher than the overall regional wage. In 2018, the annual average regional wage was \$34,678, less than half the annual average wage for the regional coal industry. Meanwhile, the annual average wage of Virginia's coal industry was \$85,255, as compared with

the \$56,280 state average wage. With 1.9% of regional employment, the coal industry accounted for 4.7% of total wages and salaries of the region in 2018.

Average Annual Wages of the Coal Industry and GO Virginia Region 1



Not only is the coal industry wage higher than the regional average—it has been growing faster. From 2001 to 2018, the annual average wage of the Region 1 coal industry has grown an average of 3.5% per year in nominal terms. This is faster than the 2.1% growth of the regional average wage, and on par with the 3.5% growth in the statewide average wage. Wages in the coal industry grew 5.3% over 2018.

Looking ahead, employment at coal mines is expected to decline at an annual average pace of 2.8% over the next decade. The expected continued decline is due to several factors:

- Although President Trump signed an executive order to dismantle the Clean Power Plan, coal production is not expected to rise significantly because of lower cost natural gas and renewable fuel sources that can be used to generate electricity.¹⁶ From the perspective of the electric utility firm, using coal or an alternative fuel source is based on profitability over long-term business plans.¹⁷
- There is currently a modest uptick in metallurgical coal for producing steel. The market for metallurgical coal is small relative to the kind of coal used in electricity generation, which is the

¹⁶ <https://www.nytimes.com/2017/03/28/business/energy-environment/trump-coal-executive-order-impact.html>

¹⁷ See, for example: http://www.cleveland.com/business/index.ssf/2009/11/american_municipal_power_will.html

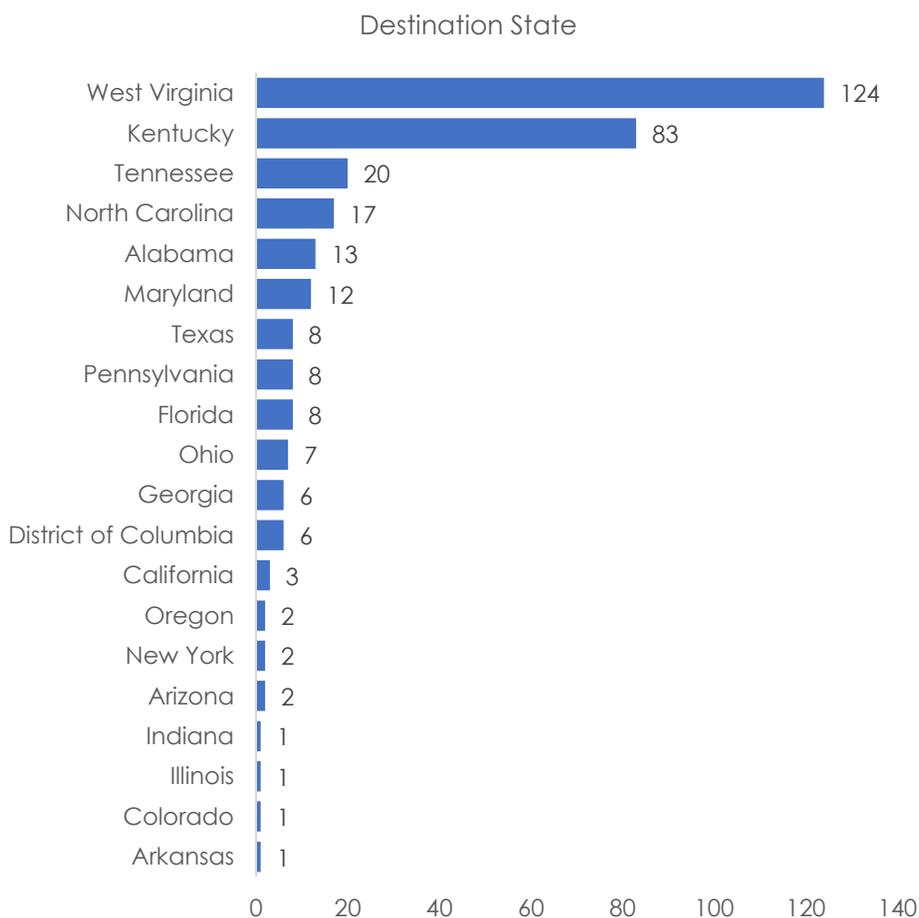
biggest use for coal.¹⁸ As history has shown, many analysts expect the demand for metallurgical coal to drop off in the future.¹⁹

- An increase in coal output does not necessarily translate into increased employment due to productivity gains²⁰ and the usage of overtime.

Coal Worker Migration

In 2017, 325 workers in the mining, quarrying, and oil and gas extraction industry separated from employment in Virginia and took new jobs outside the state. Most moved to neighboring states, specifically West Virginia (124), followed by Kentucky (83), and Tennessee (20).

Some of the workers in this industry took jobs in other sectors that same year. More than 400 workers in the industry who changed jobs (both staying within Virginia and leaving Virginia) stayed in mining, quarrying, and oil and gas extraction. The next most popular industry to move into was construction (122), followed by administrative and support and waste management and remediation services (98), and manufacturing (75).



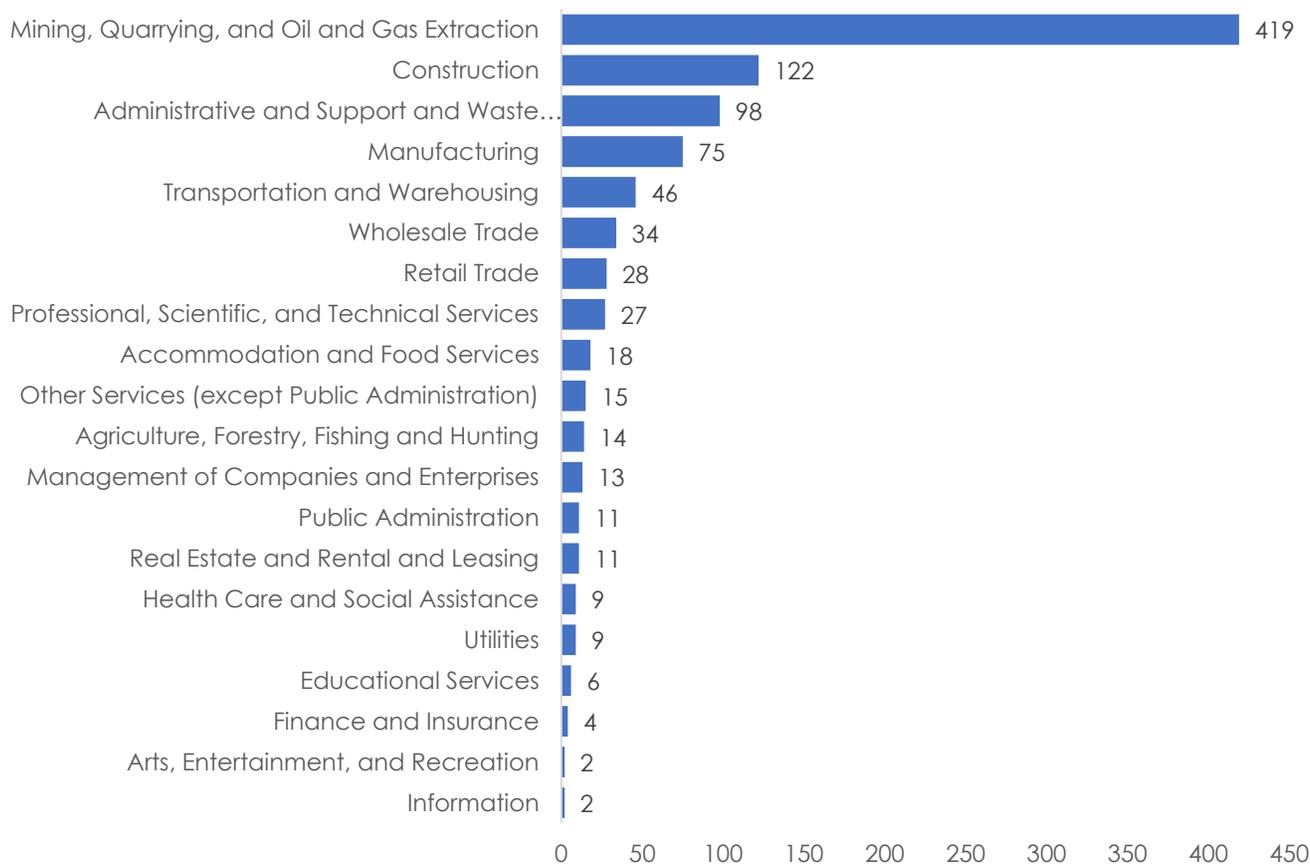
Source: U.S. Census Bureau, Center for Economic Studies, LEHD and Chmura

¹⁸ <http://www.npr.org/2017/06/02/531255253/fact-check-is-president-trump-correct-that-coal-mines-are-opening>

¹⁹ <https://www.forbes.com/sites/mergermarket/2017/03/01/uncertainty-burns-hot-for-us-coal/#7a02e3f251ec>
<https://www.eia.gov/todayinenergy/detail.php?id=29472>

²⁰ <https://siepr.stanford.edu/research/publications/what-killing-us-coal-industry>

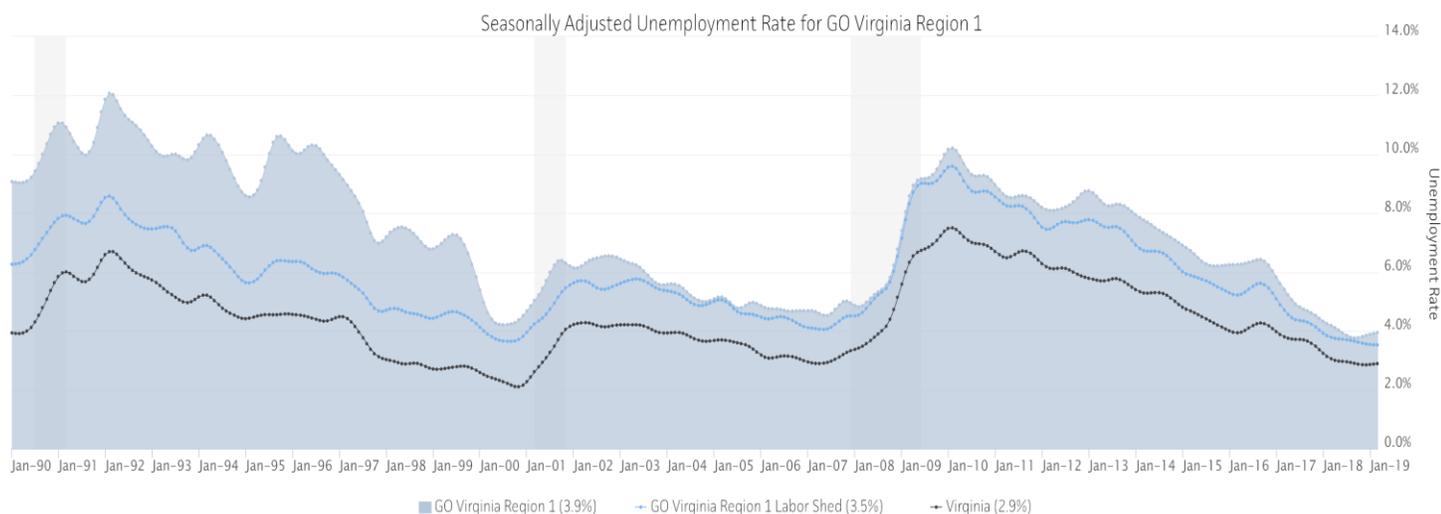
Destination Sector



Source: U.S. Census Bureau, Center for Economic Studies, LEHD and Chmura

Unemployment Rate

The unemployment rate in the GO VA 1 region reflects its relatively weak economy when compared to both its labor shed and the state of Virginia. The unemployment rate in GO VA 1 has been higher than its labor shed and the state since at least 1990. As of March 2019, the seasonally adjusted GO VA 1 unemployment rate was 3.9% compared to 3.5% in the labor shed and 2.9% in the state.



Source: JobSEQ*. Data as of Mar 2019. The shaded areas represent national recessions.

Top 20 Regional Industries

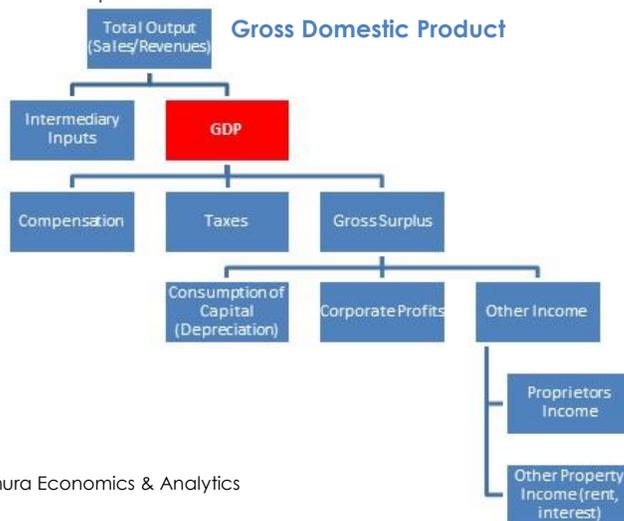
Analyzing the region's largest industries at the four-digit North American Industry Classification System (NAICS) level provides a deeper dive into the products and services that are driving the regional economy. The industries shown in bold type in the tables on the next two pages (pages 31-32) are considered export industries. They bring new wealth into the region as their goods are sold outside of the region.

The top 20 four-digit NAICS industries are ranked based on the GO VA 1 labor shed by gross domestic product (GDP), employment, and location quotient. The labor shed was used to rank industries in the following tables because it represents the broader area of opportunity for GO VA 1 residents (in terms of jobs) and economic developers (in terms of attracting similar industries).

Gross Domestic Product (GDP)

GDP is the final output from products and services produced in any region during a specific time and provides the broadest measure of economic performance. The difference between GDP and total output/sales in a region is that GDP does not include intermediary inputs—products and services used as inputs to produce other products and services. For that reason, GDP is considered the “value added” portion of total output. As shown in the figure below, the main components of GDP are compensation (wages, including salaries and benefits), gross surplus,²¹ and business taxes.

The top 20 GDP-producing industries in the GO VA 1 labor shed produce 42% of total GDP in the region and provide compensation for residents as well as taxes for localities. Seven of those industries export their



Source: Chmura Economics & Analytics

goods and services outside the region. Four of the top twenty industries are in manufacturing; the non-manufacturing export industries among the top twenty are colleges, universities, and professional schools; coal mining; and management of companies and enterprises. All the exporting industries in the region provide wages above the region's average (\$34,678) and labor shed's average (\$40,646).

The majority of the top 20 GDP industries in the GO VA 1 labor shed are non-export industries that tend to grow or decline with the region's economy. These include healthcare, elementary and secondary schools, real estate, restaurants, retail stores, and construction.

²¹ Gross surplus is made up of consumption of capital (depreciation), corporate profits, and other income (including proprietor's income, and other property income such as rents and interest). Self-employment income falls under the gross surplus portion of GDP rather than the compensation portion of GDP.

Top 20 Industries by Gross Domestic Product in GO VA 1 and Labor Shed

		Current (Four Quarters Ending with 2018Q4)						Employment Forecast Over the Next 10 Years					
		GDP (\$millions, as of 2017)		Employment		Average Annual Wages		Total Approx. Separations		Total Growth Demand		Avg. Annual Growth Percent	
NAICS	Industry	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed
6221	General Medical and Surgical Hospitals	\$176	\$3,039	3,127	31,475	\$42,001	\$63,309	2,304	23,831	-222	-540	-0.7%	-0.2%
3252	Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	\$89	\$2,006	492	6,931	\$53,402	\$102,106	430	6,119	-102	-1,322	-2.3%	-2.1%
6111	Elementary and Secondary Schools	\$472	\$1,984	8,194	29,743	\$30,638	\$36,876	7127	26,847	-919	-1,216	-1.2%	-0.4%
5313	Activities Related to Real Estate	\$230	\$1,737	234	1,665	\$34,033	\$43,498	228	1,695	9	220	0.4%	1.3%
6211	Offices of Physicians	\$297	\$1,616	2,833	13,559	\$73,755	\$83,585	2346	11,453	259	1,844	0.9%	1.3%
5312	Offices of Real Estate Agents and Brokers	\$275	\$1,487	217	1,267	\$46,177	\$49,553	196	1,154	-22	-110	-1.0%	-0.9%
6113	Colleges, Universities, and Professional Schools	\$102	\$1,431	1,471	17,663	\$43,824	\$47,476	1295	15,808	-42	74	-0.3%	0.0%
5311	Lessors of Real Estate	\$168	\$1,352	240	1,654	\$26,203	\$35,147	235	1,660	-38	-176	-1.7%	-1.1%
7225	Restaurants and Other Eating Places	\$244	\$1,226	9,482	43,576	\$14,714	\$15,266	15568	73,054	-375	121	-0.4%	0.0%
2121	Coal Mining	\$720	\$961	2,514	3,501	\$85,197	\$83,113	2321	3,231	-631	-879	-2.8%	-2.9%
5511	Management of Companies and Enterprises	\$132	\$856	1,359	9,307	\$64,605	\$67,998	1189	8,364	-85	-98	-0.6%	-0.1%
9221	Justice, Public Order, and Safety Activities	\$405	\$790	4,996	9,292	\$42,209	\$45,705	4261	8,099	-638	-813	-1.4%	-0.9%
3121	Beverage Manufacturing	\$466	\$785	906	1,836	\$47,517	\$44,250	1039	2,116	-33	-49	-0.4%	-0.3%
4411	Automobile Dealers	\$95	\$683	956	6,122	\$39,948	\$48,406	1109	7,275	6	357	0.1%	0.6%
9211	Executive, Legislative, and Other General Government Support	\$153	\$662	2,562	10,052	\$31,255	\$36,506	2340	9,375	-199	-367	-0.8%	-0.4%
5221	Depository Credit Intermediation	\$116	\$564	1,510	5,844	\$40,817	\$53,101	1352	5,368	-244	-681	-1.8%	-1.2%
4523	General Merchandise Stores, including Warehouse Clubs and Supercenters	\$203	\$549	4,251	11,580	\$24,182	\$24,706	5864	16,236	-35	292	-0.1%	0.2%
3361	Motor Vehicle Manufacturing	\$0	\$546	n/a	3,627	n/a	\$58,080	n/a	3,827	n/a	-124	n/a	-0.3%
3259	Other Chemical Product and Preparation Manufacturing	\$50	\$539	338	2,758	\$42,529	\$58,676	292	2,495	-103	-624	-3.5%	-2.5%

Top 20 Industries by Gross Domestic Product in GO VA 1 and Labor Shed													
		Current (Four Quarters Ending with 2018Q4)						Employment Forecast Over the Next 10 Years					
		GDP (\$millions, as of 2017)		Employment		Average Annual Wages		Total Approx. Separations		Total Growth Demand		Avg. Annual Growth Percent	
NAICS	Industry	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed
2382	Building Equipment Contractors	\$85	\$531	1,127	6,721	\$40,425	\$49,122	1168	7,158	5	412	0.0%	0.6%
Source: JobsEQ®													

Growth in GDP was positive for both GO VA 1 region and the labor shed (0.7% and 1.8% respectively). Eight of the industries mentioned above experienced negative GDP growth in the GO VA 1 region, most notably Management of Companies and Enterprises by -17.2%. Management of companies and enterprises in Region One predominantly comprises corporate, subsidiary, and regional managing offices with most workers in customer service, finance, computer, and assistant positions. In the labor shed, four industries showed negative GDP growth. Meanwhile, GDP in lessors of real estate and motor vehicle manufacturing increased by 13.8% and 15.8%, respectively, in the labor shed.

While manufacturing industries are well-represented in the top 20 GDP-driving industries in the labor shed, other industries stand out for high levels of employment. Post-secondary schools are a major employer in the labor shed but not the GO VA 1 region as many of the large schools, including Virginia Tech, Radford, and East Tennessee State University, are located on the outskirts of the region. Two other key industries in the region, company management and resin and synthetic manufacturing, also have large employment bases in areas on the edge of the labor shed in Sullivan County, Tennessee and Roanoke, Virginia, indicating an opportunity to attract similar companies to the core GO VA 1 region.

Employment had decreased in the GO VA 1 region by 0.3% in a year but had increased by 0.5% in the labor shed. 12 of the 20 industries in the table below had experienced a decrease in the GO VA 1 region; most by less than four percent, with the exception of business support services, which experienced a 9.6% decrease in employment.

Top 20 Industries by Employment in the GO VA 1 and Labor Shed												
		Current (Four Quarters Ending with 2018Q4)				Forecast Over the Next 10 Years						
		Employment		Average Annual Wages		Total Separations		Total Growth Demand		Avg. Annual Growth Percent		
NAICS	Industry	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed	
7225	Restaurants and Other Eating Places	9,482	43,576	\$14,714	\$15,266	15,568	73,054	-375	121	-0.4%	0.0%	
6221	General Medical and Surgical Hospitals	3,127	31,475	\$42,001	\$63,309	2,304	23,831	-222	-540	-0.7%	-0.2%	
6111	Elementary and Secondary Schools	8,194	29,743	\$30,638	\$36,876	7,127	26,847	-919	-1,216	-1.2%	-0.4%	
6113	Colleges, Universities, and Professional Schools	1,471	17,663	\$43,824	\$47,476	1,295	15,808	-42	74	-0.3%	0.0%	
6211	Offices of Physicians	2,833	13,559	\$73,755	\$83,585	2,346	11,453	259	1,844	0.9%	1.3%	

4451	Grocery Stores	3,882	12,610	\$16,546	\$18,131	5,358	17,821	-484	-1,012	-1.3%	-0.8%
4523	General Merchandise Stores, including Warehouse Clubs and Supercenters	4,251	11,580	\$24,182	\$24,706	5,864	16,236	-35	292	-0.1%	0.2%
9211	Executive, Legislative, and Other General Government Support	2,562	10,052	\$31,255	\$36,506	2,340	9,375	-199	-367	-0.8%	-0.4%
5613	Employment Services	1,106	9,507	\$26,063	\$25,482	1,267	11,121	-17	268	-0.2%	0.3%
5511	Management of Companies and Enterprises	1,359	9,307	\$64,605	\$67,998	1,189	8,364	-85	-98	-0.6%	-0.1%
9221	Justice, Public Order, and Safety Activities	4,996	9,292	\$42,209	\$45,705	4,261	8,099	-638	-813	-1.4%	-0.9%
6241	Individual and Family Services	3,918	8,468	\$24,499	\$25,083	5,294	11,568	1,093	2,598	2.5%	2.7%
6231	Nursing Care Facilities (Skilled Nursing Facilities)	2,466	8,308	\$25,945	\$30,834	2,398	8,276	-286	-590	-1.2%	-0.7%
5614	Business Support Services	2,414	7,545	\$29,488	\$29,016	2,728	8,767	-57	254	-0.2%	0.3%
5617	Services to Buildings and Dwellings	1,409	6,998	\$21,471	\$23,575	1,681	8,525	-22	184	-0.2%	0.3%
3252	Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	492	6,931	\$53,402	\$102,106	430	6,119	-102	-1,322	-2.3%	-2.1%
2382	Building Equipment Contractors	1,127	6,721	\$40,425	\$49,122	1,168	7,158	5	412	0.0%	0.6%
8131	Religious Organizations	1,434	6,574	\$15,370	\$16,309	1,512	7,066	-107	-242	-0.8%	-0.4%
4411	Automobile Dealers	956	6,122	\$39,948	\$48,406	1,109	7,275	6	357	0.1%	0.6%
5221	Depository Credit Intermediation	1,510	5,844	\$40,817	\$53,101	1,352	5,368	-244	-681	-1.8%	-1.2%
Source: JobsEQ®											

The region's competitive advantage in manufacturing is highlighted when the top industries are sorted by location quotient (LQ).²² Sixteen of the industries with the largest LQ in the labor shed are manufacturing. This competitive advantage represents an opportunity to attract similar firms that have wages above the regional average. Despite the expected contraction in employment for almost all of the top 20 LQ industries, separations demand is high in many of these industries, and economic development efforts can be devoted toward attraction and retention of these key manufacturing companies.

Top 20 Industries by Location Quotient in the GO VA 1 and Labor Shed													
		Current (Four Quarters Ending with 2018Q4)						Employment Forecast Over the Next 10 Years					
		Location Quotient		Employment		Average Annual Wages		Total Separations		Total Growth Demand		Avg. Annual Growth Percent	
NAICS	Industry	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed
3252	Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	5.95	20.59	492	6,931	\$53,402	\$102,106	430	6119	-102	-1,322	-2.3%	-2.1%
2121	Coal Mining	55.6	19.02	2,514	3,501	\$85,197	\$83,113	2321	3231	-631	-879	-2.8%	-2.9%
3151	Apparel Knitting Mills	11.04	11.81	109	474	\$23,119	\$24,817	95	417	-48	-204	-5.6%	-5.5%

²² The location quotient measures the degree to which an industry is concentrated or specialized in a region relative to the nation, by computing the ratio of the share of an industry's employment in a region to the same industry's share of employment in the nation.

3259	Other Chemical Product and Preparation Manufacturing	4.44	8.9	338	2,758	\$42,529	\$58,676	292	2495	-103	-624	-3.5%	-2.5%
3353	Electrical Equipment Manufacturing	6.67	7.51	841	3,852	\$49,512	\$58,056	759	3548	-149	-549	-1.9%	-1.5%
3133	Textile and Fabric Finishing and Fabric Coating Mills	0.17	5.53	5	617	\$39,453	\$52,008	5	600	-2	-148	-3.9%	-2.7%
3365	Railroad Rolling Stock Manufacturing	n/a	4.96	n/a	402	n/a	\$64,109	n/a	392	n/a	-28	n/a	-0.7%
3361	Motor Vehicle Manufacturing	n/a	4.22	n/a	3,627	n/a	\$58,080	n/a	3827	n/a	-124	n/a	-0.3%
3362	Motor Vehicle Body and Trailer Manufacturing	15.98	4.19	2,351	2,506	\$31,381	\$31,919	2364	2518	-287	-309	-1.3%	-1.3%
3272	Glass and Glass Product Manufacturing	5.32	4.05	417	1,293	\$29,967	\$47,134	403	1291	-93	-214	-2.5%	-1.8%
3352	Household Appliance Manufacturing	1.12	3.98	63	911	\$39,978	\$45,910	60	873	-13	-175	-2.3%	-2.1%
3351	Electric Lighting Equipment Manufacturing	5.3	3.38	230	595	\$43,076	\$48,166	222	579	-34	-83	-1.6%	-1.5%
3131	Fiber, Yarn, and Thread Mills	11.61	3.26	299	341	\$20,190	\$21,760	283	325	-77	-87	-3.0%	-2.9%
3262	Rubber Product Manufacturing	1.49	3.02	182	1,508	\$52,298	\$55,604	172	1449	-44	-309	-2.7%	-2.3%
1110	Crop Production (Proprietors)	5.63	2.64	1,426	2,727	\$5,233	\$5,430	1108	2157	-64	-22	-0.5%	-0.1%
2373	Highway, Street, and Bridge Construction	4.67	2.56	2,080	4,641	\$40,689	\$43,648	2099	4744	49	240	0.2%	0.5%
3379	Other Furniture Related Product Manufacturing	7.75	2.55	256	343	\$33,802	\$32,251	252	341	-52	-62	-2.2%	-2.0%
3211	Sawmills and Wood Preservation	5.19	2.49	447	874	\$31,506	\$34,331	480	946	-54	-92	-1.3%	-1.1%
8122	Death Care Services	3.25	2.35	469	1,383	\$26,671	\$30,242	535	1610	-55	-110	-1.2%	-0.8%
5221	Depository Credit Intermediation	0.99	0.95	1,510	5,844	\$40,817	\$53,101	1352	5368	-244	-681	-1.8%	-1.2%
Source: JobsEQ®													

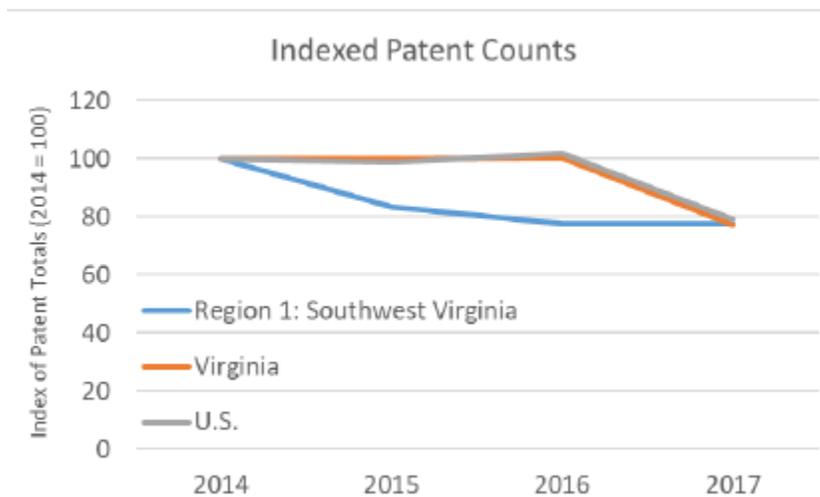
Building on Region's Export Industries

The key drivers in GO VA 1 and the labor shed are the manufacturing sector and energy cluster—both produce products that are exported out of the region and thus bring more wealth into the region than non-exporting industries. National and international factors have impacted both manufacturing and energy that have led to significant employment declines in the region. However, as noted in the strategy section of this report, GO VA 1 can build on the strengths in manufacturing and diversify and grow the regional economy with jobs that pay more than the regional average.

Innovation

Innovation is important in a region because it leads to potential new products and services that drive employment growth. Patents, although often considered a lagging indicator of innovation, provide a benchmark for a comparative view of a region's innovation activity.

As shown in the following chart, the number of patents issued in GO VA Region 1 over the past four years was highest in 2014 at 54 and declined to 42 in both 2016 and 2017. In contrast, patents in Virginia and in the nation stayed at about the same level from 2014 through 2016, before declining about 20% in 2017. Patents in GO VA Region 1 were issued over this time period for a variety of technologies including electric transformers or inductances, mining machines, and magnet manufacturing.



Source: *Regional Entrepreneurial Assessment Project*, Teconomy Partners LLC, December 2018

Small Business Innovation Research (SBIR) grants also provide a measure of innovation in a region because they represent seed funding from the federal government. There have been five SBIR awards between 2010 and 2017 in the GO VA 1 region, mostly related to aquaculture:

- Innovative Removal of Agriculturally Related Pollutants from Surface Water Tributaries in the Chesapeake Bay Watershed - 2014
- Rural Community Well Water Treatment Field Pilot - 2014
- Improving Commercial Fish Meal Free Aquaculture Diets - 2013
- Development of Novel Calcium Receptor Based Mineral Supplementation Technologies for Inland Shrimp Aquaculture - 2010
- Optimizing Inland Tank Based Recirculation Aquaculture Methods to Produce Cobia Under Reduced Water Salinity Conditions - 2010

Occupations

Although the manufacturing sector and energy cluster drive the local economy, a review of the occupations for all industries shows the top two major groups are office and administration support, and sales, which cross over many different industries for the GO VA 1 region and its labor shed. Production occupations, which reflect the manufacturing and coal mining presence, make up the third-largest group of occupations in GO VA 1 and the fourth-largest in its labor shed. Food preparation and serving-related occupations rank fourth in GO VA 1 and third in the GO VA 1 labor shed.

Over the next 10 years beginning with the fourth quarter of 2018, the fastest growing occupation group in GO VA 1 is expected to be personal care and service occupations with a 0.9% annual average rate of growth. The occupation groups with the largest projected employment growth over this period are personal care and service (+557 jobs); healthcare support (288); and community and social service (234). Over the same period, the highest separation demand (due to retirements and workers moving from one occupation to another) is expected in office and administrative support (20,754), sales (20,384), and food preparation and service (19,380). Within the labor shed, the occupation groups forecast to have the highest demand due to growth are healthcare practitioners and technical (+2,503 jobs); personal care and service (2,091); and healthcare support (1,915). For the labor shed, the occupation groups forecast

to have the highest separation demand are office and administrative support (88,779 jobs); food preparation and serving (86,828); sales (79,937); and production (46,880).

Occupation Mix in the GO VA 1 and Labor Shed													
		Current (Four Quarters Ending with 2018Q4)						Forecast Over the Next 10 Years					
		Employment		Average Annual Wages		Unemployment Rate		Total Approx. Separation Demand		Total Growth Demand		Avg. Annual Growth Percent	
SOC	Occupation Title	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed
11	Management	9,026	30,468	\$89,100	\$95,500	1.4%	1.6%	6,686	23,228	-313	122	-0.4%	0.0%
13	Business and Financial Operations	4,362	20,909	\$61,500	\$63,300	2.9%	2.6%	3,771	18,476	-170	207	-0.4%	0.1%
15	Computer and Mathematical	2,041	9,804	\$64,700	\$71,200	2.9%	2.7%	1,330	6,510	27	555	0.1%	0.6%
17	Architecture and Engineering	1,928	8,713	\$71,000	\$76,000	3.0%	2.7%	1,334	6,125	-120	-186	-0.6%	-0.2%
19	Life, Physical, and Social Science	687	4,005	\$69,400	\$74,300	1.9%	1.8%	595	3,525	-39	-87	-0.6%	-0.2%
21	Community and Social Service	3,226	10,533	\$38,100	\$41,300	2.2%	1.9%	3,506	11,526	234	829	0.7%	0.8%
23	Legal	759	3,154	\$71,700	\$77,000	1.6%	1.4%	451	1,933	-32	13	-0.4%	0.0%
25	Education, Training, and Library	8,250	33,798	\$45,300	\$46,600	2.2%	2.1%	6,713	28,106	-581	-106	-0.7%	0.0%
27	Arts, Design, Entertainment, Sports, and Media	1,557	7,097	\$41,900	\$42,700	2.5%	2.2%	1,429	6,696	-96	-234	-0.6%	-0.3%
29	Healthcare Practitioners and Technical	8,007	42,259	\$62,100	\$71,000	1.8%	1.6%	4,362	22,768	171	2,503	0.2%	0.6%
31	Healthcare Support	3,814	17,623	\$26,400	\$27,900	4.2%	3.9%	4,407	20,595	288	1,915	0.7%	1.0%
33	Protective Service	4,395	12,392	\$38,100	\$38,200	3.8%	3.5%	3,571	11,891	-564	-724	-1.4%	-0.6%
35	Food Preparation and Serving Related	11,599	50,921	\$20,100	\$21,200	6.2%	5.9%	19,380	86,828	-396	413	-0.3%	0.1%
37	Building and Grounds Cleaning and Maintenance	4,337	18,108	\$22,400	\$24,600	4.9%	4.8%	5,223	22,400	-196	27	-0.5%	0.0%
39	Personal Care and Service	5,711	20,387	\$21,600	\$23,500	3.4%	3.3%	8,563	30,743	557	2,091	0.9%	1.0%
41	Sales and Related	14,629	58,204	\$29,500	\$32,700	4.2%	4.1%	20,384	79,937	-978	-2,398	-0.7%	-0.4%
43	Office and Administrative Support	19,333	81,849	\$30,300	\$32,600	4.1%	3.8%	20,754	88,779	-1,805	-4,785	-1.0%	-0.6%
45	Farming, Fishing, and Forestry	713	1,519	\$28,200	\$27,700	6.0%	6.2%	945	2,065	-88	-139	-1.3%	-1.0%
47	Construction and Extraction	7,465	25,552	\$38,400	\$39,200	5.1%	4.8%	7,474	26,123	-328	474	-0.4%	0.2%
49	Installation, Maintenance, and Repair	5,896	25,223	\$40,000	\$42,800	2.8%	2.7%	5,311	23,400	-437	-346	-0.8%	-0.1%
51	Production	11,798	45,075	\$34,300	\$36,400	4.0%	3.9%	11,986	46,880	-1,949	-5,979	-1.8%	-1.4%
53	Transportation and Material Moving	9,543	38,461	\$31,700	\$32,900	4.8%	4.6%	10,782	45,192	-791	-1,107	-0.9%	-0.3%
Source: JobsEQ®													
Average wages represent all covered employment as of 2017													

Though many of the occupations supporting manufacturing are forecast to decline along with the sector, there is still demand for replacements due to retirements and individuals changing jobs. Over the next 10 years, an estimated 5,637 team assemblers will be needed in the labor shed, along with 1,119 machinists, and 1,456 welders, cutters, solderers, and brazers. Additionally, during the same period the labor shed is forecast to demand a large number of workers in manufacturing occupations paying wages significantly above-average. These occupations include first-line supervisors (2,008); chemical equipment operators and tenders (1,105); and sales representatives for wholesale and manufacturing (925).

Top 20 Manufacturing Occupations by Employment in the GO VA 1 and Labor Shed											
		Current (Four Quarters Ending with 2018Q4)				Forecast Over the Next 10 Years					
		Employment		Average Annual Wages		Total Separation Demand		Total Growth Demand		Total Demand	
SOC	Title	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed
51-2092	Team Assemblers	1,815	6,558	\$28,600	\$31,000	1842	6,859	-431	-1,222	1411	5,637
51-1011	First-Line Supervisors of Production and Operating Workers	639	2,506	\$56,700	\$61,700	576	2,276	-77	-268	500	2,008
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	462	1,826	\$35,300	\$38,200	476	1,901	-124	-458	351	1,443
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	427	1,579	\$25,700	\$27,200	547	2,035	-47	-156	500	1,879
51-4121	Welders, Cutters, Solderers, and Brazers	558	1,525	\$38,200	\$40,200	563	1,549	-42	-93	521	1,456
51-9011	Chemical Equipment Operators and Tenders	117	1,429	\$44,000	\$47,800	108	1,365	-27	-260	81	1,105
49-9041	Industrial Machinery Mechanics	339	1,272	\$44,200	\$47,500	282	1,064	-21	-62	262	1,002
51-4041	Machinists	302	1,243	\$39,800	\$42,100	289	1,201	-25	-82	264	1,119
49-9071	Maintenance and Repair Workers, General	273	1,173	\$33,900	\$36,600	248	1,067	-34	-139	214	928
51-2022	Electrical and Electronic Equipment Assemblers	267	1,137	\$32,800	\$33,700	267	1,151	-76	-299	191	853
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	300	1,105	\$56,400	\$60,200	282	1,044	-34	-118	248	925
53-3032	Heavy and Tractor-Trailer Truck Drivers	280	990	\$37,800	\$40,000	272	972	-41	-123	231	849
51-9198	Helpers--Production Workers	219	973	\$26,100	\$28,100	305	1,360	-27	-111	278	1,250
11-1021	General and Operations Managers	236	966	\$89,500	\$97,700	179	735	-29	-111	150	624
51-9199	Production Workers, All Other	175	860	\$25,300	\$29,500	186	917	-18	-78	168	839
43-5071	Shipping, Receiving, and Traffic Clerks	233	854	\$31,600	\$32,300	211	777	-39	-136	172	641
17-2112	Industrial Engineers	176	842	\$75,300	\$81,700	110	533	-5	-9	105	524
43-9061	Office Clerks, General	248	824	\$28,100	\$29,800	256	857	-52	-167	204	691
51-4072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	211	809	\$35,000	\$33,000	211	822	-49	-169	163	653
43-4051	Customer Service Representatives	215	787	\$25,300	\$29,800	252	925	-29	-103	223	822

Source: JobsEQ®
Average wages represent all covered employment as of 2017

Over the next ten years beginning with the fourth quarter of 2018, employment is expected to decline among nineteen of the top 20 occupations supporting the energy sector in GO VA 1 and the labor shed. However, significant demand is still forecast for several occupations paying above-average wages due to separations. Wages for first-line supervisors of construction and extraction workers (\$59,300), continuous mining machine operators (\$48,500), and roof bolters within mining (\$48,500) are well above the regional average wage.

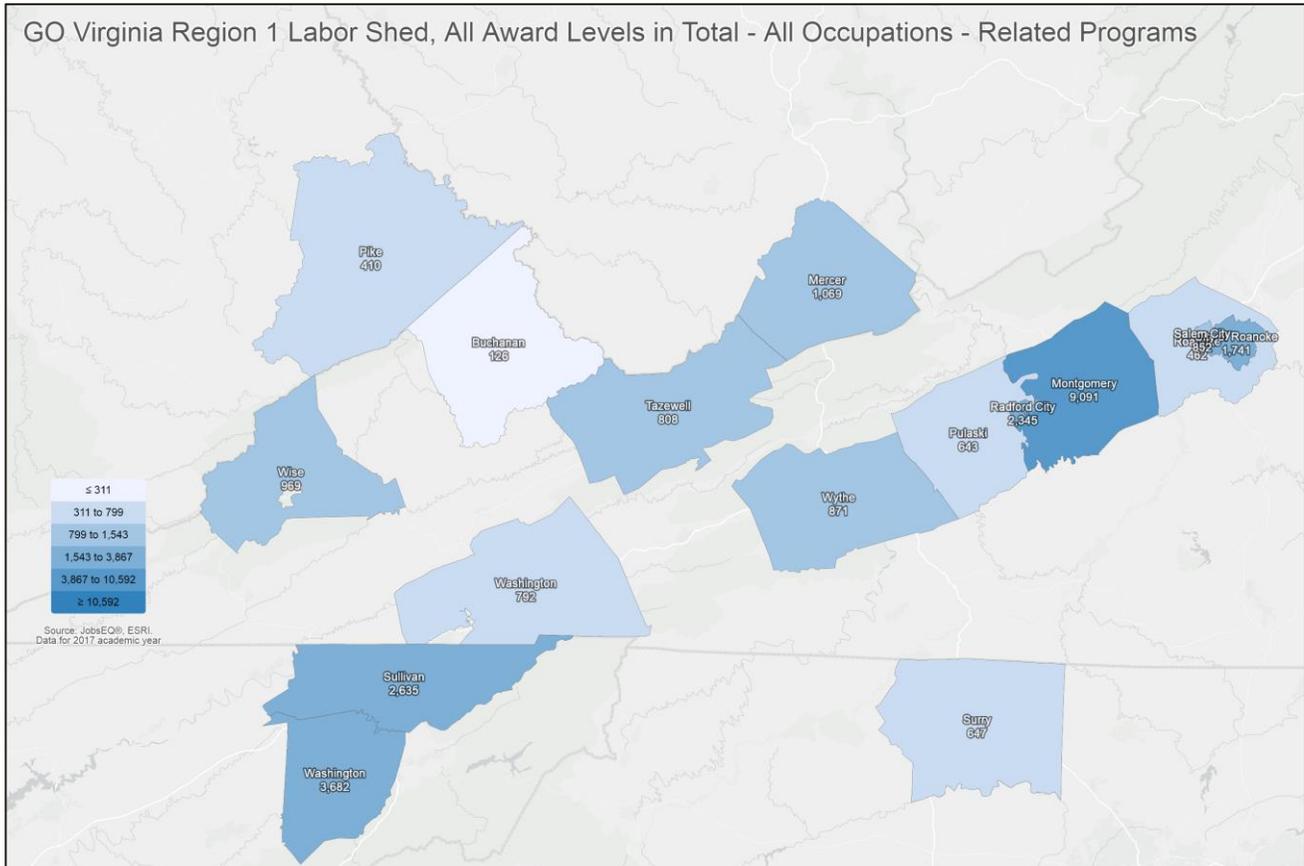
Top 20 Energy Occupations by Employment in the GO VA 1 and Labor Shed

		Current (Four Quarters Ending with 2018Q4)				Forecast Over the Next 10 Years					
		Employment		Average Annual Wages		Total Separation Demand		Total Growth Demand		Total Demand	
SOC	Title	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed	GO VA 1	Labor Shed
47-2073	Operating Engineers and Other Construction Equipment Operators	351	526	\$35,900	\$38,300	334	503	-79	-113	255	391
47-5041	Continuous Mining Machine Operators	236	381	\$44,600	\$48,500	241	390	-56	-89	186	301
53-3032	Heavy and Tractor-Trailer Truck Drivers	237	328	\$37,800	\$40,000	226	314	-42	-55	184	259
47-1011	First-line Supervisors of Construction Trades and Extraction Workers	215	315	\$64,300	\$59,300	184	270	-40	-57	144	213
49-9051	Electrical Power-Line Installers and Repairers	41	256	\$63,900	\$62,400	29	191	-6	-15	23	176
47-5061	Roof Bolters, Mining	149	210	\$46,300	\$48,500	159	225	-36	-51	124	174
49-9041	Industrial Machinery Mechanics	132	197	\$44,200	\$47,500	103	157	-23	-28	81	129
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	132	189	\$48,900	\$47,500	109	157	-30	-42	79	115
47-2111	Electricians	117	179	\$45,900	\$45,300	113	176	-26	-33	86	143
53-7032	Excavating and Loading Machine and Dragline Operators	109	172	\$39,000	\$40,200	104	166	-25	-38	79	129
49-9071	Maintenance and Repair Workers, General	89	143	\$33,900	\$36,600	77	126	-19	-25	58	101
47-5042	Mine Cutting and Channeling Machine Operators	97	139	\$40,000	\$42,100	100	142	-23	-32	77	110
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	70	139	\$59,600	\$60,300	53	108	-14	-20	39	88
51-8013	Power Plant Operators	20	131	\$64,200	\$65,200	16	111	-2	-4	14	107
47-5081	Helpers--Extraction Workers	97	128	\$28,600	\$31,500	108	142	-17	-21	91	120
11-1021	General and Operations Managers	64	124	\$89,500	\$97,700	48	93	-10	-16	38	77
43-9061	Office Clerks, General	69	112	\$28,100	\$29,800	70	116	-15	-24	55	92
47-5071	Roustabouts, Oil and Gas	73	104	\$30,500	\$33,500	90	130	6	8	96	138
53-7111	Mine Shuttle Car Operators	68	104	\$48,200	\$48,100	64	97	-27	-41	37	56
43-4051	Customer Service Representatives	18	92	\$25,300	\$29,800	21	108	-4	-13	17	95

Source: JobsEQ®
Average wages represent all covered employment as of 2017

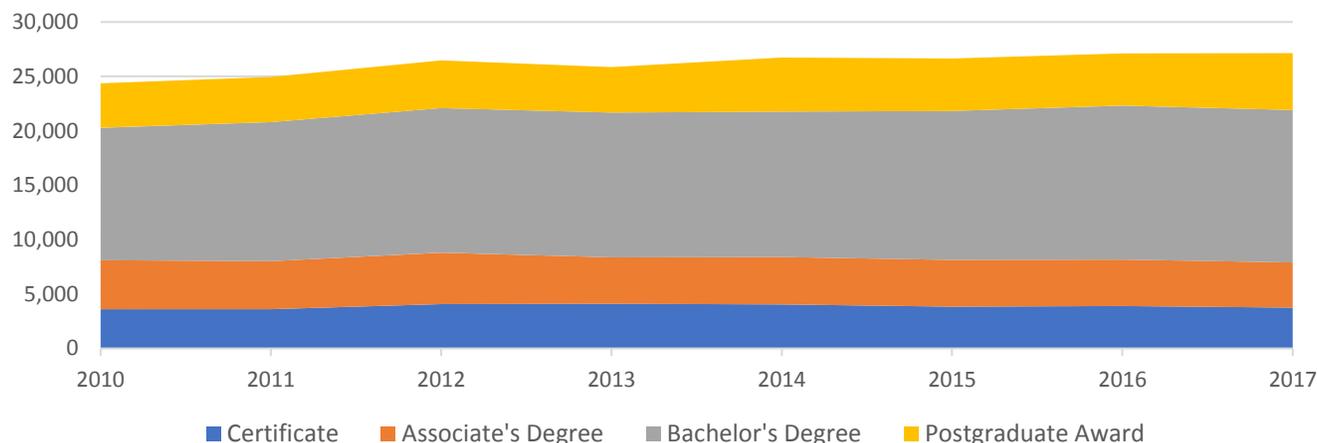
Education

Postsecondary education in GO VA 1 is heavily influenced by the large institutions within the labor shed. As shown in the map below, most awards in the region come from Virginia Tech in Montgomery County, Virginia; East Tennessee State University (ETSU) in Johnson City, Tennessee; and Radford University in Radford, Virginia. Schools within the GO VA 1 core region account for 3.0% of the region's awards of postgraduate degrees, 5.4% of the region's bachelor's degrees, 27.9% of the region's associate's degrees, and 39.6% of region's certificates.



Within the labor shed, the number of awards has not changed significantly over the last five years. The total number of awards was greater than 27,000 from all institutions in 2017. Increases over this period were primarily in bachelor's degrees and doctorates. While numerous national, state, and regional studies suggest a "middle skills" gap in training for jobs that typically require more than a high school education but less than a 4-year degree, the number of associate's degrees awarded in the region has stayed roughly the same over the past seven years.

GO VA 1 Labor-Shed Awards by Level Over Time



Source: JobsEQ®

Virginia Tech, ETSU, Radford, and King University award 82% of the bachelor's degrees in the labor shed. The community colleges in the list of the top higher education institutions below awarded 77% of the certificates and 89% of the associate's degrees in the labor shed. The seven schools in the core GO VA 1 region are italicized.

Postsecondary Awards by School, 2016-2017 Academic Year

	Certificate	Associate's	Bachelor's	Postgraduate	Total
Virginia Tech	0	49	6,184	2,426	8,659
East Tennessee State	0	0	2,383	1,061	3,444
Radford	9	0	1,993	343	2,345
Northeast State Community	466	901	0	0	1,367
Virginia Western Community	555	735	0	0	1,290
King University	0	33	961	274	1,268
<i>Wytheville Community</i>	545	326	0	0	871
<i>Mountain Empire Community</i>	391	292	0	0	683
Surry Community	199	448	0	0	647
New River Community	194	449	0	0	643
Concord University	0	0	463	119	582
<i>Southwest Virginia Community</i>	259	310	0	0	569
<i>Virginia Highlands Community</i>	289	230	0	0	519
Roanoke College	0	0	487	0	487
Edward Via College of	0	0	0	432	432
University of Pikeville	0	28	197	171	396
Jefferson College of Health	9	67	198	93	367
American National University	165	142	32	26	365
Bluefield State College	0	91	199	0	290
<i>UVA-Wise</i>	0	0	286	0	286
<i>Emory & Henry College</i>	0	0	246	27	273
<i>Bluefield College</i>	0	2	231	6	239
Hollins University	0	0	158	79	237
Miller-Motte Technical College-	179	46	0	0	225
All Schools in the Labor Shed	3,749	4,152	14,018	5,224	27,143

Source: JobsEQ®. Awards data as of the 2016-2017 academic year

The top bachelor's degree award programs in the labor shed are business, engineering, health, social sciences, biological sciences, and psychology. Similarly, the top postgraduate award programs are health, education, engineering, business, public administration and social services, and computer and information sciences. While health professions remain at the top for certificate awards, liberal arts and sciences top the list for associate's degrees.

Postsecondary Awards Related to Key Clusters

	Certificate	Associate's	Bachelor's	Postgraduate	Total
Health Professions and Related Programs	1,465	979	1,333	1,629	5,406
Business, Management, Marketing, And Related Support Services	174	405	2,672	500	3,751
Liberal Arts and Sciences, General Studies and Humanities	670	1,681	359	14	2,724
Engineering	9	37	1,574	652	2,272
Education	13	31	371	866	1,281
Social Sciences	0	93	964	113	1,170
Biological and Biomedical Sciences	0	0	772	94	866
Computer and Information Sciences And Support Services	60	116	448	180	804
Psychology	0	0	670	67	737
Family and Consumer Sciences/Human Sciences	62	22	587	48	719
All Programs	3,749	4,152	14,018	5,224	27,143

Source: JobsEQ®

Awards data as of the 2016-2017 academic year, related occupation data as of 2018Q4.

Note: Figures may not sum due to rounding.

Certificates and Associate's Degrees

The table below shows the number of total certificates (which can take less than 1-4 years to complete, though most of these certificates take less than 2 years to complete) and associate's degrees awarded within the GO VA 1 region that are directly applicable to the 4 target industries. Three of these titles can be achieved through certification alone (though 13 of the 37 construction trades certificates were from certificates that required more than two years but less than four years).

Certificates and Associate's Degrees Awarded in GO VA 1 Region

Program Title	Total Certificates	Associate's	Adv Manufacturing	Food and Beverage	Energy and Minerals	IT
Computer and Information Sciences, General	29	17				•
Construction Trades, General	37	0			•	
Electrician	23	12			•	
Environmental Control Technologies/Technicians, Other	5	6	•		•	
Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician	32	6		•		

Industrial Production Technologies/Technicians, Other	27	18	•	•	•
Industrial Technology/Technician	0	10	•	•	
Manufacturing Engineering Technology/Technician	29	0	•	•	•
Precision Metal Working, Other	16	13	•		
Welding Technology/Welder	68	0	•		•

Source: JobsEQ®

Awards data as of the 2016-2017 academic year, related occupation data as of 2018Q4

Note: Figures may not sum due to rounding.

Internships

Internships also provide a good way for people to gain experience to enter into a specific industry. The table below shows the top ten internships by occupation posted online within the GO VA 1 region within the last year, as of May 30, 2019.

Occupations in GO Virginia Region 1

SOC	Title	Total Ads
13-1081	Logistics Engineers	18
29-2052	Pharmacy Technicians	18
17-2112	Industrial Engineers	18
29-1063	Internists, General	12
17-2199	Manufacturing Engineers	10
13-1071	Human Resources Specialists	8
49-9071	Maintenance and Repair Workers, General	8
17-2141	Mechanical Engineers	6
13-1023	Purchasing Agents, Except Wholesale, Retail, and Farm Products	5
13-2051	Financial Analysts	5

The table below shows the top 10 employers that offered internships in the GO VA 1 region in the last year ending in May 30, 2019. Volvo group was the major provider of internships in the region, having posted 79 online job postings ranging from logistics engineer, financial analyst, engineers, etc. As one of the largest businesses in the labor shed, the Volvo Group maintains a significant workforce through internship programs. These internships are mostly located in Dublin (Pulaski County), just east of the core region, where residents in the labor shed and eastern counties of the core region can take advantage of these work opportunities.

Employers in GO Virginia Region 1

Employer Name	Number of Ads
Volvo Group	79
LifePoint Health	14
K-VA-T	13
Ballad Health	10
CGI	8
Coperion	6
Walgreens	4

ArborMetric Solutions, LLC.	4
Emory and Henry College	4
Group Trucks Operations	4

Source: JobsEQ RTI

Apprenticeships

Apprenticeships within the GO VA1 region can be used to assess the opportunities available to the people in the region to learn and apply new skills in the labor force. The following table shows the apprenticeship opportunities within the counties and cities of the GO VA 1 region as of May 30, 2019.

Registered Apprenticeship Sponsors, GO Virginia Region 1

Occupation	Sponsor	Address	City	Zip Code	County/City
Cosmetologist	First Impression Salon & Spa	151 Gate City Highway	Bristol	24201	Bristol
Optician, Dispensing li	Sam's Club Optical & Optometry Center	13249 Lee Hwy	Bristol	24202	Bristol
Optician, Dispensing li	Walmart Vision Center	13245 Lee Highway	Bristol	24201	Bristol
Cosmetologist	Crystals Kut N Edge	Po Box 932 746 Park Avenue	Pounding Mill	24637	Tazewell County
Cosmetologist	Hair Volution LLC	N.W./Po Box 38	Norton	24273	Norton
Cosmetologist	Mane On Park Avenue, LLC	605 Park Ave 746 Park Avenue	Norton	24273	Norton
Nail Technician	Hair Volution LLC	N.W./Po Box 38	Norton	24273	Norton
Nursery School Attendant	Kid's Central Coeburn 1 & 2 Head Start	% P.O. Box 661	Norton	24273	Norton
Optician, Dispensing li	Wal-Mart Super Center Vision Center # 1302	Plaza Shopping Center	Norton	24273	Norton
Teacher Aide I	Kid Central At Pound Head Start	Po Box 661	Norton	24273	Norton
Teacher Preschool	Kid Central At Pound Head Start	Po Box 661	Norton	24273	Norton
Cosmetologist	Genesis Hair Unisex Salon	P.O. Box 2328	Wise	24293	Wise County
Optician, Dispensing li	Weberling, Douglas R. , OO	1701 Euclid Ave Suite D	Bristol	24201	Wise County
Nail Technician	Olive Branch Day Spa, Inc.	Po Box 1416	Clintwood	24228	Dickenson County
Cosmetologist	Shear Dream	27021 Riverside Drive	Grundy	24614	Scott
Electrician, Maintenance	Komatsu Mining Corp Group	811 Boone Trail Road	Duffield	24244	Scott
Machinist	Komatsu Mining Corp Group	811 Boone Trail Road	Duffield	24244	Scott
Optician, Dispensing li	Repko Family Vision Center	241 Gate City Hwy	Gate City	24251	Scott
Welder, Combination	Komatsu Mining Corp Group	811 Boone Trail Road	Duffield	24244	Scott
Optician, Dispensing li	Wal-Mart Vision Center	775 Regional Park Road	Lebanon	24266	Russell County
Highway Construction Insp	RS&H	252 West Main Street Suite 1	Abington	24210	Washington County
Maintenance Mechanic	AGC North America	18370 Oak Park Drive	Abingdon	24210	Washington County
Optician, Dispensing li	Eye Physicians of Southwest	328 A Cumming St.	Abingdon	24210	Washington County
Optician, Dispensing li	Wal Mart Vision 0154	16032 15 Mile Road	Abingdon	24210	Washington County
Barber	Downtown Barber Shop	651 North Main Street, Suite 1	Marion	24354	Smyth County
Caseworker, Family	Marion: Chilhowie Head Start Site	P.O. Box 745 109 Mason Alley	Chilhowie	24319	Smyth County
Optician, Dispensing li	Envision Eye Care	1020 Terrace Dr	Marion	24354	Smyth County
Teacher Aide I	Marion: Chilhowie Head Start Site	P.O. Box 745 109 Mason Alley	Chilhowie	24319	Smyth County

Teacher Aide I	Marion Head Start	602 Iron Street	Marion	24354	Smyth County
Teacher Aide I	Marion: Bland Head Start Site	P.O. Box 479 76 Seddon Street	Bland	24315	Bland County
Child Care Dev Specialist	Marion: Rural Retreat Head Start Site	514 Main Street	Rural Retreat	24368	Wythe County
Child Care Dev Specialist	Marion: Max Meadows Head Start	165 Grove Street	Max Meadows	24360	Wythe County
Computer Supp Specialist	Wythe County	340 South Sixth Street	Wytheville	24382	Wythe County
Cosmetologist	Scissor Shack, LLC	417 South Main Street	Rural Retreat	24368	Wythe County
Cosmetologist	The Worx's	290 South 8th Street	Wytheville	24382	Wythe County
Cosmetologist	Turning Heads Salon	665 East Main Street	Wytheville	24382	Wythe County
Fire Marshall	Town of Wytheville	185 Spring Street	Wytheville	24382	Wythe County
Highway Construction Insp	Town of Wytheville	185 Spring Street	Wytheville	24382	Wythe County
HVAC-Environmental-Ctrl	Wythe Sheet Metal, Inc.	735 East Lexington Street	Wytheville	24382	Wythe County
Maintenance Mechanic	Klockner Pentaplast	555 East Buck Avenue	Rural Retreat	24362	Wythe County
Police Officer, Patrol	Town of Wytheville	185 Spring Street	Wytheville	24382	Wythe County
Teacher Aide I	Marion: Rural Retreat Head Start Site	514 Main Street	Rural Retreat	24368	Wythe County
Teacher Aide I	Marion: Max Meadows Head Start	165 Grove Street	Max Meadows	24360	Wythe County
Cosmetologist	Db Barbershop and Salon, LLC	225 South Main Street	Galax	24333	Galax
Counselor, Guidance	Rooftop of VA Hillsville Head Start	P.O. Box 853	Galax	24333	Carroll County
Nursery School Attendant	Liddle Adventure Learning Academy	564 Industrial Drive	Hillsville	24343	Carroll County
Nursery School Attendant	Liddle Adventure Learning Academy	564 Industrial Drive	Hillsville	24343	Carroll County
Nursery School Attendant	Liddle Tykes CDC	59 Melrose Lane	Galax	24333	Carroll County
Nursery School Attendant	Liddle Tykes CDC	59 Melrose Lane	Galax	24333	Carroll County
Nursery School Attendant	Rooftop of VA Hillsville Head Start	P.O. Box 853	Galax	24333	Carroll County
Office Manager/Admin. Ser	Liddle Tykes CDC	59 Melrose Lane	Galax	24333	Carroll County
Silk-Screen Cutter	Vanguard Furniture	564 Industrial Park Road	Hillsville	24343	Carroll County
Teacher Preschool	Rooftop of VA Hillsville Head Start	P.O. Box 853	Galax	24333	Carroll County
Upholsterer, Inside	Vanguard Furniture	564 Industrial Park Road	Hillsville	24343	Carroll County
Upholsterer, Inside	Vanguard Furniture	564 Industrial Park Road	Hillsville	24343	Carroll County

Source: Virginia Department of Labor and Industry, accessed June 2019

Out of the 55 apprenticeships offered, most were offered in Carroll County and Wythe County with 11 & 13 apprenticeships, respectively. The remaining counties and cities offered less than ten each. The most popular apprenticeships were for cosmetologists and opticians dispensing II, offering 10 and 9 positions, respectively. While apprenticeships for cosmetologists are the most popular, the average annual wage for the occupation is \$25,900, less than the regional average annual wage.

Gaps

This section details immediate and potential gaps in occupations and skills to support employment growth in GO VA 1. Current demand is based on Real-Time Intelligence (RTI) gathered and analyzed by Chmura from online job postings. Long-term needs and gaps are based on JobsEQ analytics.

Current Gaps

Job openings identify an immediate skills gap for employers and opportunities for job seekers. Large numbers of job postings for individual occupations suggest an apparent skills gap as many businesses need the same skills. As shown in the table below, first-line supervisors of retail sales workers and retail salespersons top the list of jobs posted online in GO VA 1.²³ Fifteen of the top twenty occupations based on the number of job postings typically do not require postsecondary education.

Occupations with a high number of job postings that typically require more than a high school diploma (such as an industry-recognized credential, associate's degree, etc.) are primarily in logistics, warehousing, and distribution (heavy and tractor-trailer truck drivers); education (teachers, tutors etc.) and healthcare (registered nurses, physicians).

GO VA 1 Job Postings for Top 20 Occupations, 2019Q1			
SOC	Occupation	Typical Entry-Level Education	Count
41-2031	Retail Salespersons	Less than high school	800
53-3032	Heavy and Tractor-Trailer Truck Drivers	2-year certificate or degree	457
41-1011	First-Line Supervisors of Retail Sales Workers	Less than high school	437
35-3021	Combined Food Preparation and Serving Workers, Including Fast Food	Less than high school	320
29-1141	Registered Nurses	Bachelor's degree	252
21-1093	Social and Human Service Assistants	Less than high school	215
43-4051	Customer Service Representatives	Less than high school	192
43-5081	Stock Clerks, Sales Floor	Less than high school	189
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	Less than high school	173
49-9071	Maintenance and Repair Workers, General	Less than high school	158
25-3099	Tutors	Bachelor's degree	126
41-2011	Cashiers	Less than high school	119
11-9051	Food Service Managers	Less than high school	116
41-3099	Sales Representatives, Services, All Other	Less than high school	108
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	Less than high school	107
29-1127	Speech-Language Pathologists	Postgraduate degree	101
25-3099	Teachers and Instructors, All Other	Bachelor's degree	94

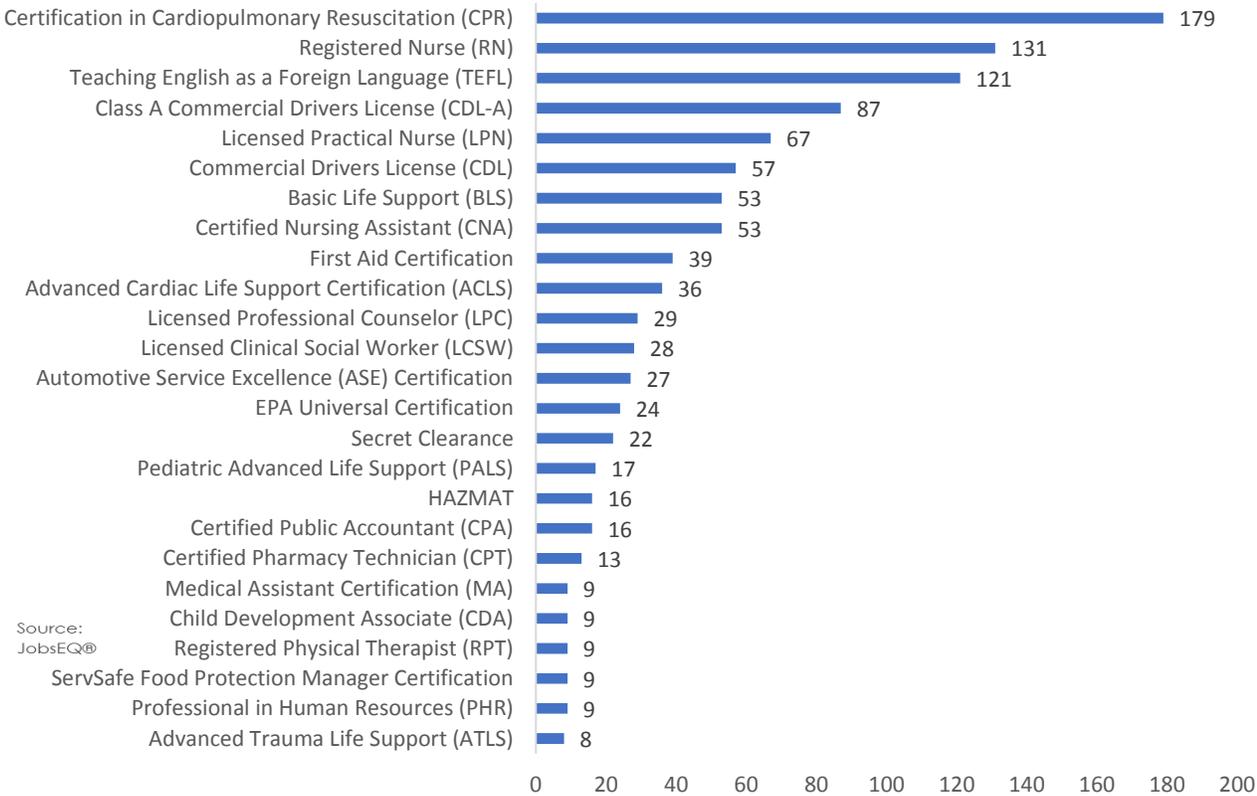
²³ Counts of unique job postings may not equate with actual job demand. For example, job postings may be placed in anticipation of possible openings that do not materialize. Moreover, slight variations of ads may be placed such that the number of ads exceeds the actual number of openings.

53-7062	Laborers and Freight, Stock, and Material Movers, Hand	Less than high school	94
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	Less than high school	91
53-3031	Driver/Sales Workers	Less than high school	89

Source: JobsEQ®

Similarly, certifications requested in the text of online job postings primarily support the healthcare sector. Cardiopulmonary Resuscitation (CPR) tops the list of the top 25 certifications requested in job ads over the first quarter of 2019. Registered Nurse (RN) was the 2nd most requested certification (131 postings). Teaching English as a Foreign Language appeared in 121 ads over this period, but all were for online/work from home/remote teachers. Class A Commercial Driver's License (CDL-A) had 87 postings, and a general CDL appeared in 57 posts. Additional certifications not in the healthcare sector include Licensed Clinical Social Worker (28), Automotive Service Excellence (27), EPA Universal (24), and HAZMAT (16). Several job posts in the IT field require a secret clearance, and others requested the certified professional coder (CPC) and certified coding specialist (CCS) certifications. Manufacturing certifications included the certified electronic systems technician (EST), six sigma yellow belt (ICYB), and the industrial electronics certification (IND).

GO VA 1 Openings by Certification
First Quarter 2019

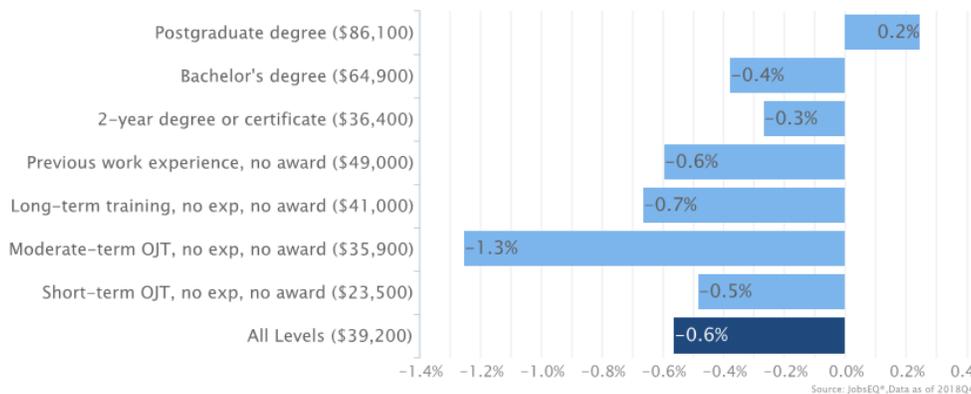


Projected Gaps

Skills and occupations that are in demand today may not be in demand in the months or years ahead when a student finishes a training program or education. For that reason, long-term gaps need to be considered in conjunction with current needs.

Expected growth rates for occupations vary by the education and training required. While all employment in GO VA 1 is projected to decline at an average annual rate of 0.6% over the next ten years, occupations typically requiring a 2-year degree or certificate are expected to decline at a slower rate (0.3% per year) and those requiring a postgraduate degree are expected to grow 0.2% per year.²⁴

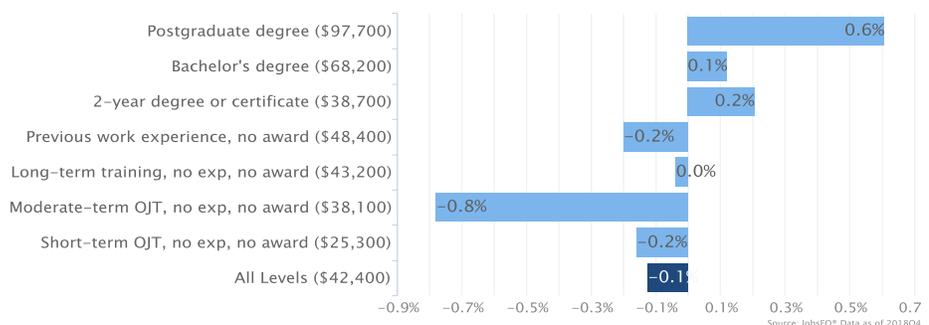
Annual Average Projected Job Growth by Training Required for GO Virginia Region 1



The outlook at all training levels improves in the GO VA 1 labor shed. Though employment overall is projected to stay flat over the next ten years, occupations that typically require a postgraduate degree are expected to grow at an average annual rate of 0.6% over this period. Occupations that typically require a 2-year degree or certificate are projected to grow at an annual average rate of 0.2% and occupations requiring a bachelor's degree are projected to grow an annual 0.1% on average.

Further detail on the apparent long-term skills gaps is based on the total annual demand created from growth in industries needing the occupation as well as from positions that need to be filled because individuals are retiring or moving to a

Annual Average Projected Job Growth by Training Required for GO Virginia Region 1 Labor Shed



²⁴ Employment by occupation data estimates are as of 2018Q4. Education levels of occupations are based on BLS assignments. Forecast employment growth uses national projections from the Bureau of Labor Statistics adapted for regional growth patterns.

different occupation. In this case, a shortage of qualified workers could potentially occur if individuals are not being trained or educated to fill the openings.

The potential supply shortfall or gap is an underlying force that the labor market will resolve in one way or another, such as by employers recruiting from further distances for these occupations, wages going up to attract more candidates, demand and wages both enticing more residents to get training for this occupation, or companies deciding to relocate to another labor market with more ample supply.

Potential gaps in key occupations for regional drivers and occupation clusters specified in previous sections are identified using a test of significance and dominance.²⁵ **The key sectors are advanced manufacturing, energy, and information technology.** Occupations that account for a substantial share of total employment (1% or greater) in the given sector are considered significant, while if 20% or more of an occupation's total employment is in the sector, it is considered dominant.

Among occupations at the detailed level in GO VA 1, the largest projected potential shortfalls are for cashiers; food preparation and serving workers; and retail salespersons. For these occupations, which typically do not require education beyond a high school diploma or equivalent for entry, there is a potential annual supply gap of at least 500 workers per occupation over the next decade. Occupations that require a postsecondary non-degree award, such as an industry recognized certification, and have high annual demand include heavy and tractor-trailer truck drivers, and nursing assistants.

Potential Occupation Gaps over 10 Years in GO VA 1: Occupations with Total Annual Demand > 100								
SOC	Title	Typical Education Need For Entry	Current Employment 2018Q4	Relevant to Key Drivers	Avg. Annual Wages 2018	Annual Growth Demand	Annual Separation Demand	Total Annual Demand/Potential Supply Gap
41-2011	Cashiers	Less than high school	5,210	•	\$18,600	-55	918	862
35-3021	Combined Food Preparation and Serving Workers, Including Fast Food	Less than high school	4,034		\$18,200	2	732	734
41-2031	Retail Salespersons	Less than high school	3,983		\$24,500	-13	556	542
39-9021	Personal Care Aides	High school diploma or equivalent	2,620		\$17,400	63	404	467
43-4051	Customer Service Representatives	High school diploma or equivalent	3,176	•	\$25,300	-7	395	389
35-3031	Waiters and Waitresses	None	1,894		\$19,100	-8	346	338
43-5081	Stock Clerks and Order Fillers	High school diploma or equivalent	2,406	•	\$23,400	-13	295	282
43-9061	Office Clerks, General	High school diploma or equivalent	2,639		\$28,100	-33	287	254
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	Less than high school	1,871	•	\$25,700	-7	249	241
53-3032	Heavy and Tractor-Trailer Truck Drivers	Postsecondary non-degree award	2,494	•	\$37,800	-21	250	230
11-9013	Farmers, Ranchers, and Other Agricultural Managers	High school diploma or equivalent	3,278		\$61,200	-13	234	222

²⁵ This approach of significance and dominance was used in *The Commonwealth of Virginia WIOA Combined State Plan for July 1, 2016 through June 30, 2020*.

Potential Occupation Gaps over 10 Years in GO VA 1: Occupations with Total Annual Demand > 100								
SOC	Title	Typical Education Need For Entry	Current Employment 2018Q4	Relevant to Key Drivers	Avg. Annual Wages 2018	Annual Growth Demand	Annual Separation Demand	Total Annual Demand/Potential Supply Gap
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	Less than high school	1,614		\$22,400	-6	202	195
41-1011	First-Line Supervisors of Retail Sales Workers	High school diploma or equivalent	1,870		\$38,500	-8	190	181
31-1014	Nursing Assistants	Postsecondary non-degree award	1,571		\$22,800	-5	172	167
51-2092	Team Assemblers	High school diploma or equivalent	1,927	•	\$28,600	-44	197	153
37-2012	Maids and Housekeeping Cleaners	Less than high school	1,277		\$18,200	-9	160	151
47-2061	Construction Laborers	Less than high school	1,401	•	\$25,300	1	141	142
35-2021	Food Preparation Workers	Less than high school	904		\$19,000	-5	147	142
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	High school diploma or equivalent	1,670		\$30,500	-29	162	133
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	High school diploma or equivalent	973		\$29,200	-4	133	129
43-3031	Bookkeeping, Accounting, and Auditing Clerks	Some college, no degree	1,320		\$33,600	-17	136	118
43-1011	First-Line Supervisors of Office and Administrative Support Workers	High school diploma or equivalent	1,296		\$44,400	-10	121	111
33-3012	Correctional Officers and Jailers	High school diploma or equivalent	2,027		\$37,000	-37	148	111
11-1021	General and Operations Managers	Bachelor's degree	1,454	•	\$89,500	-6	115	110
35-2014	Cooks, Restaurant	Less than high school	780		\$22,200	0	108	108
25-9041	Teacher Assistants	Some college, no degree	1,196		\$22,700	-8	116	108
29-1141	Registered Nurses	Bachelor's degree	2,056		\$51,700	3	105	107
49-9071	Maintenance and Repair Workers, General	High school diploma or equivalent	1,187	•	\$33,900	-8	111	103
43-4171	Receptionists and Information Clerks	High school diploma or equivalent	814		\$24,100	-1	103	103
31-1011	Home Health Aides	High school diploma or equivalent	643		\$19,200	21	82	103
39-9011	Childcare Workers	High school diploma or equivalent	762		\$21,500	-4	106	102

Source: JobsEQ®
Occupation wages are as of 2017 and represent the average for all Covered Employment

Most of the detailed occupations with the largest projected potential shortfalls have annual average wages below the regional average. Only two of the top 20 have above-average wages—farmers, ranchers, and other agricultural managers; and first-line supervisors of retail workers. Out of the 31 occupations with more than 100 annual openings projected, 5 occupations have above-average wages, and many require advanced training. Occupations which typically require a high school diploma or less and pay above-average wages include first-line supervisors of office and administrative support workers; first-line supervisors of retail sales workers; and industrial machinery mechanics. The top 30 occupations with above-average wages and high forecast demand are shown in the table below.

Top 30 Occupations with Above-Average Wages

SOC	Title	Typical Education Need For Entry	Current Employment 2018Q4	Avg. Annual Wages 2017	Total Annual Demand Over the Next 10 Years
11-9013	Farmers, Ranchers, and Other Agricultural Managers	High school diploma or equivalent	3,278	\$61,200	222
41-1011	First-Line Supervisors of Retail Sales Workers	High school diploma or equivalent	1,870	\$38,500	181
43-1011	First-Line Supervisors of Office and Administrative Support Workers	High school diploma or equivalent	1,296	\$44,400	111
11-1021	General and Operations Managers	Bachelor's degree	1,454	\$89,500	110
29-1141	Registered Nurses	Bachelor's degree	2,056	\$51,700	107
25-2021	Elementary School Teachers, Except Special Education	Bachelor's degree	1,407	\$53,300	80
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	High school diploma or equivalent	864	\$56,400	76
47-1011	First-line Supervisors of Construction Trades and Extraction Workers	High school diploma or equivalent	815	\$64,300	72
13-2011	Accountants and Auditors	Bachelor's degree	780	\$66,900	65
51-4121	Welders, Cutters, Solderers, and Brazers	High school diploma or equivalent	691	\$38,200	65
41-3099	Sales Representatives, Services, All Other	High school diploma or equivalent	548	\$48,500	64
51-1011	First-Line Supervisors of Production and Operating Workers	High school diploma or equivalent	808	\$56,700	64
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	Bachelor's degree	1,044	\$56,000	57
49-9041	Industrial Machinery Mechanics	High school diploma or equivalent	678	\$44,200	51
47-2111	Electricians	High school diploma or equivalent	453	\$45,900	43
33-3051	Police and Sheriff's Patrol Officers	High school diploma or equivalent	713	\$41,800	39
11-9199	Managers, All Other	Bachelor's degree	560	\$92,000	35
21-1023	Mental Health and Substance Abuse Social Workers	Master's degree	306	\$38,500	34
13-1071	Human Resources Specialists	Bachelor's degree	371	\$51,700	33
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	High school diploma or equivalent	448	\$59,600	32
13-1161	Market Research Analysts and Marketing Specialists	Bachelor's degree	281	\$65,900	31
41-3021	Insurance Sales Agents	High school diploma or equivalent	331	\$53,100	31
13-1199	Business Operations Specialists, All Other	Bachelor's degree	362	\$60,100	31
25-2022	Middle School Teachers, Except Special and Career/Technical Education	Bachelor's degree	552	\$51,800	31
21-1014	Mental Health Counselors	Master's degree	241	\$39,500	30
51-4041	Machinists	High school diploma or equivalent	347	\$39,800	30
11-3031	Financial Managers	Bachelor's degree	348	\$102,500	27
13-1111	Management Analysts	Bachelor's degree	306	\$80,300	27
47-2152	Plumbers, Pipefitters, and Steamfitters	High school diploma or equivalent	279	\$39,300	27
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	High school diploma or equivalent	375	\$38,700	27

Source: JobsEQ®

The table below presents the top thirty occupations, based on total annual demand projected, for occupations that meet the criteria of significance or dominance in at least one of the key regional sectors and have average wages above the regional average of \$38,200. Eighteen of the top thirty occupations are attainable with less than an associate's degree, including sales representatives; first-line supervisors; industrial machinery mechanics; electricians; machinists; and computer user support specialists. The remaining 12 occupations typically require at least a bachelor's degree, including general and operations managers; software developers; computer systems analysts; and mechanical engineers.

GO VA 1 Top 30 Occupations Supporting Key Drivers with Above-Average Wages					
SOC	Title	Typical Education Need For Entry	Current Employment 2018Q4	Avg. Annual Wages 2017	Total Annual Demand Over the Next 10 Years
41-1011	First-Line Supervisors of Retail Sales Workers	High school diploma or equivalent	1870	\$38,500	181
11-1021	General and Operations Managers	Bachelor's degree	1454	\$89,500	110
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	High school diploma or equivalent	864	\$56,400	76
47-1011	First-line Supervisors of Construction Trades and Extraction Workers	High school diploma or equivalent	815	\$64,300	72
51-4121	Welders, Cutters, Solderers, and Brazers	High school diploma or equivalent	691	\$38,200	65
51-1011	First-Line Supervisors of Production and Operating Workers	High school diploma or equivalent	808	\$56,700	64
49-9041	Industrial Machinery Mechanics	High school diploma or equivalent	678	\$44,200	51
47-2111	Electricians	High school diploma or equivalent	453	\$45,900	43
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	High school diploma or equivalent	448	\$59,600	32
51-4041	Machinists	High school diploma or equivalent	347	\$39,800	30
47-2152	Plumbers, Pipefitters, and Steamfitters	High school diploma or equivalent	257	\$39,300	27
13-1111	Management Analysts	Bachelor's degree	336	\$80,300	27
15-1151	Computer User Support Specialists	Some college, no degree	371	\$40,500	26
43-5061	Production, Planning, and Expediting Clerks	High school diploma or equivalent	257	\$44,000	23
15-1132	Software Developers, Applications	Bachelor's degree	252	\$76,200	22
15-1121	Computer Systems Analysts	Bachelor's degree	358	\$70,600	21
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	High school diploma or equivalent	277	\$48,900	21
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	High school diploma or equivalent	223	\$39,000	19
11-2022	Sales Managers	Bachelor's degree	242	\$149,400	19
47-5041	Continuous Mining Machine Operators	None	236	\$44,600	19
17-2141	Mechanical Engineers	Bachelor's degree	302	\$89,200	17
13-1051	Cost Estimators	Bachelor's degree	172	\$60,600	16
13-1023	Purchasing Agents, Except Wholesale, Retail, and Farm Products	Bachelor's degree	245	\$59,300	15
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	Bachelor's degree	157	\$82,900	14
17-2112	Industrial Engineers	Bachelor's degree	208	\$75,300	13

GO VA 1 Top 30 Occupations Supporting Key Drivers with Above-Average Wages

SOC	Title	Typical Education Need For Entry	Current Employment 2018Q4	Avg. Annual Wages 2017	Total Annual Demand Over the Next 10 Years
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	High school diploma or equivalent	193	\$38,600	13
47-5061	Roof Bolters, Mining	High school diploma or equivalent	149	\$46,300	12
53-7032	Excavating and Loading Machine and Dragline Operators	High school diploma or equivalent	149	\$39,000	12
27-1024	Graphic Designers	Bachelor's degree	153	\$44,900	12
15-1142	Network and Computer Systems Administrators	Bachelor's degree	221	\$65,400	12

Source: JobsEQ®

Industry Targets

Based on the analysis of industries in GO VA 1 and identification of the regional strengths raised during stakeholder engagement, **the following industries and clusters are presented as industry targets that can provide above-average wages for residents in the region:**

Key Targets for GO VA Region One				
	Advanced Manufacturing	Food and Beverage Manufacturing	Energy and Minerals	Information Technology
Location Quotient	1.49	0.89	3.22	0.50
Average Annual Wage	\$43,828	\$42,831	\$77,591	\$64,700
Employment	17,134	1,413	4,023	2,041
Export Sector	✓	✓	✓	✓
	The region possesses above-average wages and competitive advantages in many manufacturing industries.	Prominence of agriculture in the region creates a fertile environment to attract food and beverage manufacturers to the area.	High wages and competitive advantages showcase the importance of energy to the region.	Defined at an occupation level due to their importance across many industries. CGI, DP Facilities South, and Northrop Grumman are examples of this emerging cluster.

Source: JobsEQ & Chmura

Given the significant natural, recreational and cultural assets of the region, Southwest Virginia has invested heavily in building the tourism industry. According to the Virginia Tourism Corporation Economic Impact of Domestic Travel in Virginia report, travelers spent a total of \$1,043.37 million in Southwest Virginia, an increase of \$394 million since 2004, which makes this industry one of the significant revenue generators in the region. Tourism and healthcare are critically important to the region's economy. As part of a comprehensive economic development strategy, these two industries are often part of a prospective employer's decision to locate or expand in a region. Assets in tourism and healthcare add to the quality of life equation which have become an important part of the site selection formula.

However, due to the relatively low wages of the tourism industry when compared to the region's average, the tourism industry is not included in the target industries of GO Virginia Region One. Similarly, health care was not selected as a potential target as it generally grows with the region's population and is not targeted by economic developers for expansion into a region.

GO Virginia continues to stress the importance of these two industries in SWVA, but projects involving these two industries will not be eligible for GO Virginia funding.

The analysis in this section considers whether a sufficient number of workers are in the GO VA 1 region or labor shed with the skills needed to attract the target industries. The threshold for an ample supply of workers varies across industries and occupations, but a general threshold of a ratio of at least 50:1 of potential candidates (employed plus unemployed) to the new employer demand is used. If gaps exist for occupations that the new firms would require, the number of individuals in an alternative occupation that could be trained for the occupation in demand is considered (referred to below as extended employment) along with new graduates in the region that possess the required skills.

Advanced manufacturing experienced an increase in employment by 2.6% from 16,696 in 2017 to 17,134 in 2018 and an increase in average annual wages from \$42,617 to \$43,828 over the same time period. For food and beverage manufacturing, average annual wages increased by 2.5 % from \$41,797 to \$42,831, while employment decreased by -0.3% from 1,418 to 1,413. For the energy and minerals industry in the GO VA 1 region, employment increased by 0.4% from 4,008 to 4,023 and average annual wages increased by 4.4% from \$74,286 to \$77,591. For those working in IT in the GO VA 1 region, employment decreased by 2.9% down to 2,041. Most of those job losses were in the computer systems design industry.

Given the general increase in employment and average annual wages in these four sectors, along with their fairly high location quotients and exporting capabilities, they remain as potential targets.

A closer look at the traded and local sectors within the GO VA 1 regions showed that while employment had decreased across both type of sectors (-0.06% and -0.75% respectively), total wages had increased in the traded sectors by 3.09% and by 1.47% in local sectors. This increase in wages might be due to expansion in some industries within manufacturing, as the aggregate manufacturing industry grew employment by 2.6% to 17,134 in the last year.

Employment in GO VA 1 by Traded/Local Sectors

Sector	Employment 2017	Employment 2018	# Change in Employment	% Change Employment
Local	95,289	95,227	-62	-0.06%
Traded	44,181	43,848	-333	-0.75%
Total	139,470	139,075	-395	-0.28%

Total Wages in GO VA 1 by Traded/Local Sectors

Sector	Total Wages 2017	Total Wages 2018	\$ Change in Total Wages	% Change in Total Wages
Local	\$2,861,035,007	\$2,903,168,643	\$42,133,636	1.47%
Traded	\$1,711,236,155	\$1,764,093,937	\$52,857,782	3.09%
Total	\$4,572,271,162	\$4,667,262,580	\$94,991,418	2.07%

The following industries, which had more than 50 employees last year, added in 100 employees in the last year

- Truck Trailer manufacturing (+126 employees)
- Mining Machinery and Manufacturing (122)
- Motor vehicle body manufacturing (100)

Similarly, the energy and minerals industry had also experienced an increase in employment; increasing by 0.4% to 4,023. The industries that added in the most jobs were:

- Bituminous Coal underground mining (+42 employees)
- Electric Power generation (39)
- Drilling Oil and Gas Wells (10)

Advanced Manufacturing

There is no standard definition of advanced manufacturing. Some would argue that all manufacturing industries are transforming toward “advanced” with the use of total quality management, statistical process control, and just-in-time inventories.

Four industries within the advanced manufacturing cluster are examined to illustrate potential regional labor pool and supply chain capacity and gaps with the advanced manufacturing cluster. The four industries—transportation equipment manufacturing; plastics and rubber products manufacturing; chemical manufacturing; and electrical equipment, appliance, and component manufacturing—were chosen because they pay above-average wages and account for a significant share of regional employment (as indicated by the location quotients). Each of these industries except transportation equipment manufacturing has experienced employment decline in the labor shed over the past five years, mirroring overall decline in manufacturing in the region.

Illustrative Advanced Manufacturing Industries, Four Quarters Ending 2018Q4							
NAICS	Manufacturing	GO VA 1			GO VA 1 Labor Shed		
		Employment	Avg. Annual Wages	Location Quotient	Employment	Avg. Annual Wages	Location Quotient
325	Chemical	897	\$50,929	1.20	11,480	\$90,007	3.78
336	Transportation Equipment	3,689	\$40,822	2.38	10,344	\$61,182	1.64
326	Plastics and Rubber Products	1,365	\$50,690	2.11	4,614	\$50,239	1.75
335	Electrical Equipment, Appliance, and Components	1,148	\$50,328	3.23	5,671	\$55,504	3.92

Source: JobsEQ®

For chemical manufacturing in the GO VA 1 region, employment has increased by 5.7% and average annual wages have increased by 3.5%. For transportation equipment, employment increased by 2.8% and average annual wages increased by 0.6%. For plastics and rubber products, employment decreased by 0.4% while wages increased by 2.7%. For electrical equipment, appliance, and components employment increased by 4.2%, while average annual wages decreased by 0.9%.

Chemical Manufacturing

If a chemical manufacturing firm needing 100 employees were to consider expanding into the region, it would find that the labor force of GO VA 1 has a few occupations with low potential candidates (shaded in red in the table below). Among the top 10 occupations typically required in this industry, GO VA 1 has ample supply for four occupations. The lowest ratio of potential candidates to openings is for chemists, followed by mixing and blending machine setters, operators, and tenders; chemical engineers; chemical plant and system operators; chemical equipment operators and tenders; and chemical technicians. However, there is ample supply for all of the top 10 occupations in the GO VA 1 labor shed.

What-If Report for Chemical Manufacturing (100 workers)										
Occ Code	Title	New Employer Demand	GO VA 1 Empl ¹	GO VA 1 Labor Shed Empl ¹	GO VA 1 Unempl ¹	Labor Shed Unempl ¹	GO VA 1 Regional Avg Wage ²	GO VA 1 Empl Extended	GO VA 1 Ratio	Labor Shed Ratio
51-9011	Chemical Equipment Operators and Tenders	8	186	1,325	3	22	\$44,000	128	24	168
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	6	140	511	6	23	\$35,900	732	24	89
51-9111	Packaging and Filling Machine Operators and Tenders	6	392	1,066	18	46	\$34,000	6,491	68	185
19-2031	Chemists	4	46	350	1	6	\$89,700	170	12	89
51-1011	First-Line Supervisors of Production and Operating Workers	4	873	2,945	20	64	\$56,700	1,192	223	752
51-8091	Chemical Plant and System Operators	3	94	610	2	15	\$53,700	444	32	208
19-4031	Chemical Technicians	3	70	490	1	7	\$51,800	253	24	166
49-9041	Industrial Machinery Mechanics	3	721	1,998	12	32	\$44,200	2,828	244	677
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	3	693	2,383	25	83	\$35,300	1,932	239	822
17-2041	Chemical Engineers	2	46	347	2	12	\$99,300	180	24	179

Source: JobsEQ.

¹Occupation employment and unemployment are place-of-residence data. Data as of 2018Q4 unless noted otherwise.

²Occupation wages are as of 2017 and represent the average for all Covered Employment.

Note: Employment extended refers to regional workers with skills similar to the specified occupation and currently or previously employed in an occupation with wages no more than 10% higher than the average wage of the specified occupation.

Most of the occupations with the highest average wages typically require postsecondary education and are potentially under-supplied with lower candidate-to-opening ratios. In particular, chemists, chemical technicians, and chemical engineers typically require an associate's or bachelor's degree and have low ratios in GO VA 1. However, there is ample supply in the GO VA 1 labor shed, and, as shown in the table that follows, higher education institutions in the region conferred 290 awards to graduates in the 2016-2017 academic year in programs that would enable them to fill these positions.

Regional Postsecondary Programs for Chemical Manufacturing Related Occupations			
Title/School	Annual Awards - GO VA Region 1 Labor Shed		
	Certificates and 2yr Degrees	4yr Degrees	Postgraduate Degrees
40.0501 Chemistry, General			
Bluefield College	0	2	0
Concord University	0	11	0
East Tennessee State University	0	30	12
Emory & Henry College	0	6	0
Hollins University	0	2	0
King University	0	1	0
Radford University	0	26	0
Roanoke College	0	10	0
University of Pikeville	0	5	0
Virginia Polytechnic Institute and State University	0	46	24
41.0301 Chemical Technology/Technician			
Northeast State Community College	9	0	0
14.0701 Chemical Engineering			
Virginia Polytechnic Institute and State University	0	100	6
Total			
Total	9	239	42

Transportation Equipment Manufacturing

In the case of a hypothetical location or expansion of a transportation equipment manufacturing firm needing 100 employees, the labor force of GO VA 1 has a sufficient supply of potential candidates for the top occupations. Among the top 10 occupations typically required in this industry, GO VA 1 has ample supply for eight occupations. The lowest ratio of potential candidates to openings is for aerospace engineers; and aircraft structure, surfaces, rigging, and systems assemblers. However, as shown in the table below, there is a large potential candidate-to-opening ratio for all of the top 10 occupations in the GO VA 1 labor shed.

What-If Report for Transportation and Equipment Manufacturing (100 workers)										
Occ Code	Title	New Employer Demand	GO VA 1 Empl ¹	Empl GO VA 1 Labor Shed ¹	GO VA 1 Unempl ¹	Labor Shed Unempl ¹	GO VA 1 Regional Avg Wage ²	GO VA 1 Empl Extended	GO VA 1 Ratio	Labor Shed Ratio

51-2092	Team Assemblers	20	2,186	6,851	131	389	\$28,600	89	116	362
51-1011	First-Line Supervisors of Production and Operating Workers	4	873	2,945	20	64	\$56,700	1,192	223	752
51-4121	Welders, Cutters, Solderers, and Brazers	4	702	1,918	38	98	\$38,200	6,111	185	504
17-2112	Industrial Engineers	3	205	984	6	26	\$75,300	505	70	337
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	3	693	2,383	25	83	\$35,300	1,932	239	822
51-4041	Machinists	3	392	1,389	6	22	\$39,800	1,385	133	470
17-2011	Aerospace Engineers	2	29	100	1	2	\$100,800	534	15	51
51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	2	37	71	2	4	\$49,200	0	19	37
51-2099	Assemblers and Fabricators, All Other	2	317	956	26	76	\$28,500	0	172	516
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	2	225	535	6	13	\$39,000	441	115	274

Source: JobsEQ.

¹Occupation employment and unemployment are place-of-residence data. Data as of 2018Q1 unless noted otherwise.

²Occupation wages are as of 2017 and represent the average for all Covered Employment.

Note: Employment extended refers to regional workers with skills similar to the specified occupation and currently or previously employed in an occupation with wages no more than 10% higher than the average wage of the specified occupation.

Six of the top 10 occupations pay above-average wages, but typically require a bachelor's degree or moderate- to long-term on-the-job training. These occupations include first-line supervisors, industrial engineers, machinists, and aerospace engineers. However, there is ample supply in the GO VA 1 labor shed, and, as shown in the table that follows, higher education institutions in the region graduated over 1,400 people in the 2016-2017 academic year with awards related to these positions. Welders, cutters, solderers, and brazers pay at the level of regional average wages (\$38,200), and have ample supply in both GO Virginia 1 and the labor shed.

Regional Postsecondary Programs for Transportation Equipment Manufacturing Related Occupations			
Title/School	Annual Awards - GO VA Region 1 Labor Shed		
	Certificates and 2yr Degrees	4yr Degrees	Postgraduate Degrees
47.0608 Aircraft Powerplant Technology/Technician			
Northeast State Community College	9	0	0
14.3501 Industrial Engineering			
Virginia Polytechnic Institute and State University	0	152	76
15.1503 Packaging Science			
Virginia Polytechnic Institute and State University	0	18	0
48.0503 Machine Shop Technology/Assistant			
Northeast State Community College	9	0	0
Surry Community College	9	0	0

Regional Postsecondary Programs for Transportation Equipment Manufacturing Related Occupations			
	Annual Awards - GO VA Region 1 Labor Shed		
Title/School	Certificates and 2yr Degrees	4yr Degrees	Postgraduate Degrees
14.0201 Aerospace, Aeronautical and Astronautical/Space Engineering			
Virginia Polytechnic Institute and State University	0	147	41
14.1001 Electrical and Electronics Engineering			
Virginia Polytechnic Institute and State University	0	143	110
14.1901 Mechanical Engineering			
Virginia Polytechnic Institute and State University	0	416	89
Total			
Total	27	876	316

Plastics and Rubber Products Manufacturing

The GO VA One region is generally well-equipped to handle an expansion or relocation of a plastics and rubber products manufacturing firm. The typical occupation mix for a plastics and rubber products manufacturing company primarily consists of production occupations and transportation and material moving occupations. The demand and regional labor supply is shown in the following table for an expansion of 100 employees in this industry. Among the top 10 occupations typically required in this industry, GO VA 1 has ample supply for six occupations. The lowest ratio of potential candidates to openings is for tire builders; molding, core making, and casting machine setters, operators, and tenders, metal and plastic; and extruding and drawing machine setters, operators, and tenders, metal and plastic. However, as shown in the table below, there is a large potential candidate-to-opening ratio for all of the top 10 occupations in the GO VA 1 labor shed.

What-If Report for Plastics and Rubber Products Manufacturing (100 workers)										
Occ Code	Title	New Employer Demand	GO VA 1 Empl ¹	Empl GO VA 1 Labor Shed ¹	GO VA 1 Unempl ¹	Labor Shed Unempl ¹	GO VA 1 Regional Avg Wage ²	GO VA 1 Empl Extended	GO VA 1 Ratio	Labor Shed Ratio
51-4072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	11	254	789	10	28	\$35,000	735	24	74
51-2092	Team Assemblers	7	2,186	6,851	131	389	\$28,600	89	331	1,034
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	5	210	505	6	14	\$38,600	87	43	104
51-1011	First-Line Supervisors of Production and Operating Workers	5	873	2,945	20	64	\$56,700	1,192	178	602
51-9041	Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	4	158	541	4	13	\$33,800	2,355	41	139

51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	4	693	2,383	25	83	\$35,300	1,932	180	617
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	3	2,115	8,710	165	633	\$25,700	5	760	3,114
53-7064	Packers and Packagers, Hand	3	647	2,266	64	211	\$22,200	1,251	237	826
51-9197	Tire Builders	3	39	215	1	7	\$38,300	0	13	74
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	2	197	762	7	26	\$34,900	5,637	102	394

Source: JobsEQ.

¹Occupation employment and unemployment are place-of-residence data. Data as of 2018Q4 unless noted otherwise.

²Occupation wages are as of 2017 and represent the average for all Covered Employment.

Note: Employment extended refers to regional workers with skills similar to the specified occupation and currently or previously employed in an occupation with wages no more than 10% higher than the average wage of the specified occupation.

All of the top 10 occupations typically require a high school diploma or less. One of the top 10 occupations, first-line supervisors of production and operating workers, pays above-average wages, with no postsecondary education typically required but moderate-term on-the-job training.

Electrical Equipment, Appliance, and Component Manufacturing

The GO VA One region is generally well-equipped to handle an expansion or relocation of an electrical equipment, appliance, and component manufacturing firm. The typical occupation mix for this industry primarily consists of production occupations and transportation and material moving occupations. The demand for and the regional supply of labor supply is shown in the following table for an expansion of 100 employees in this industry. Among the top 10 occupations typically required in this industry, GO VA 1 has ample supply for six occupations. The lowest ratio of potential candidates to openings is for coil winders, tapers, and finishers; electrical and electronic equipment assemblers; and electromechanical equipment assemblers. However, as shown in the table below, there is an ample supply of potential candidates relative to expected demand for all of the top 10 occupations in the GO VA 1 labor shed.

What-If Report for Electrical Equipment, Appliance, and Component Manufacturing (100 workers)										
Occ Code	Title	New Employer Demand	GO VA 1 Empl ¹	Empl GO VA 1 Labor Shed ¹	GO VA 1 Unempl ¹	Labor Shed Unempl ¹	Regional Avg Wage ²	Empl Extended	GO VA 1 Ratio	Labor Shed Ratio
51-2022	Electrical and Electronic Equipment Assemblers	13	270	1,069	11	42	\$32,800	65	22	85
51-2092	Team Assemblers	12	2,186	6,851	131	389	\$28,600	89	193	603
17-2071	Electrical Engineers	3	96	604	3	16	\$91,200	724	33	207
51-1011	First-Line Supervisors of Production and Operating Workers	3	873	2,945	20	64	\$56,700	1,192	297	1,003
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	3	693	2,383	25	83	\$35,300	1,932	239	822
51-2021	Coil Winders, Tapers, and Finishers	2	65	183	2	7	\$36,600	1,761	34	95

43-4051	Customer Service Representatives	2	3,243	10,197	165	481	\$25,300	2,342	1,704	5,339
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	2	197	762	7	26	\$34,900	5,637	102	394
51-2023	Electromechanical Equipment Assemblers	2	56	202	2	7	\$32,700	52	29	104
11-1021	General and Operations Managers	2	1,507	6,173	38	147	\$89,500	7,186	772	3,160

Source: JobsEQ.

¹Occupation employment and unemployment are place-of-residence data. Data as of 2018Q1 unless noted otherwise.

²Occupation wages are as of 2017 and represent the average for all Covered Employment.

Note: Employment extended refers to regional workers with skills similar to the specified occupation and currently or previously employed in an occupation with wages no more than 10% higher than the average wage of the specified occupation.

Eight of the top 10 occupations typically require a high school diploma or less for entry. Three of the top 10 occupations pay above-average wages, including electrical engineers; general and operations managers; and first-line supervisors of production and operating workers. The highest-paying jobs typically require a bachelor's degree or moderate- to long-term on-the-job training.

Food and Beverage Manufacturing

Agriculture is an important industry in the GO VA 1 region. Twenty percent of the state's farms are in the GO VA 1 region, with cattle and calve sales exceeding \$240 million and total crop sales at \$57.4 million.²⁶ As Virginia's total cattle sales total \$680 million, the GO VA 1 region makes up 35.4% of Virginia's cattle sales.

Agriculture in GO VA 1			
	GO VA 1 Total in 2012	GO VA 1 Total in 2017	Percent in Virginia in 2017
Farms	9,750	8,705	20%
Farmland (acres)	1,546,658	1,336,785	17%
Milk from Cows (\$)	\$25,733,000	\$20,955,000	6%
Cattle & Calves Sold	282,289	269,150	33%
Cattle & Calves Sold (\$)	\$253,569,000	\$240,794,000	35%
Total Crop Sales (\$)	\$49,673,000	\$57,350,000	4%
Total Livestock Sales (\$)	\$314,567,000	\$290,904,000	11%

Source: Census of Agriculture (2012 & 2017)

Both the number of farms and the total farmland acreage decreased in GO VA One and across the state. The number of farms decreased from 2012 to 2017 in the state of Virginia (-6.1%) and the GO VA One region (-10.7%), while total farmland acreage decreased 6.1% in Virginia and 13.6% in the GO VA

²⁶ These figures should be considered conservative as cities are not included in the Census dataset, and non-disclosed data are mostly counted as zero. For example, there were 1,798 cattle and calves sold in Wise County in 2017, but the market value from these sales is withheld to avoid disclosing data for individual farms. To be conservative, Chmura has counted this non-disclosed value as zero in our analysis.

One region.²⁷ Total livestock sales in GO VA Region One declined 8% over this period; however, total crop sales rose 15%. At the national level, the number of farms declined by 3.2% while farmland decreased 1.5% over the same five-year period.²⁸

Food and beverage manufacturing is a natural extension to the agriculture industry that would bring jobs at various skill levels. One specific industry within food and beverage manufacturing, animal slaughtering and processing, is explored because of the stated need of local farmers for such a facility since they currently ship cattle to the Midwest for slaughtering and processing. Food and beverage manufacturing, in general, is also explored as a target industry.

Animal Slaughtering and Processing

The labor force of GO VA 1 would be fairly well prepared for a hypothetical location or expansion of an animal slaughtering and processing firm, with a few exceptions. For this analysis, Chmura used a need for 20 employees by a firm in this industry as a stress test for the region's labor force.²⁹ Among the top 10 occupations typically required in this industry, GO VA 1 has ample supply for seven occupations. Though GO VA 1 has short supply of two occupations – meat, poultry, and fish cutters and trimmers; and slaughterers and meat packers—the labor shed has sufficient employment to offer a favorable candidate/opening ratio. Additionally, there is a potential supply for the top two occupations of workers currently employed in other industries with similar skills and comparable wages (employment extended).

What-If Report for Animal Slaughtering and Processing (20 workers)										
Occ Code	Title	New Employer Demand	GO VA 1 Empl ¹	GO VA 1 Labor Shed Empl ¹	GO VA 1 Unempl ¹	Labor Shed Unempl ¹	GO VA 1 Regional Avg Wage ²	GO VA 1 Empl Extended	GO VA 1 Candidate/Opening Ratio	Labor Shed Candidate/Opening Ratio
51-3022	Meat, Poultry, and Fish Cutters and Trimmers	5	59	387	3	18	\$24,500	3,344	13	81
51-3023	Slaughterers and Meat Packers	3	18	153	1	8	\$25,200	836	6	54
51-3021	Butchers and Meat Cutters	1	176	526	14	39	\$29,400	2,876	189	565
53-7061	Cleaners of Vehicles and Equipment	1	312	1,224	21	77	\$24,600	0	333	1,300
51-1011	First-Line Supervisors of Production and	1	873	2,945	20	64	\$56,700	1,192	892	3,009
51-3099	Food Processing Workers, All Other	1	17	91	1	4	\$24,000	0	18	95
51-9198	Helpers-- Production Workers	1	348	1,458	28	111	\$26,100	3,832	376	1,569
49-9041	Industrial Machinery Mechanics	1	721	1,998	12	32	\$44,200	2,828	733	2,030

²⁷ Source: Census of Agriculture (2012 & 2017)

²⁸ Ibid.

²⁹ County Business Patterns from the U.S. Census indicate about 60% of establishments in this industry have 19 or fewer employees.

53-7051	Industrial Truck and Tractor Operators	1	585	2,027	22	72	\$33,600	3,906	607	2,099
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	1	693	2,383	25	83	\$35,300	1,932	718	2,466

Source: JobsEQ.

¹Occupation employment and unemployment are place-of-residence data. Data as of 2018Q4 unless noted otherwise.

²Occupation wages are as of 2017 and represent the average for all Covered Employment.

Note: Employment extended refers to regional workers with skills similar to the specified occupation and currently or previously employed in an occupation with wages no more than 10% higher than the average wage of the specified occupation.

The top 10 occupations needed in the animal slaughtering and processing industry have low education requirements and most pay below-average wages. All of the top 10 occupations typically require a high school diploma or less, though they may require experience and on-the-job training. Two of the occupations pay wages above the regional average: first-line supervisors of production and operating workers (\$56,700); and industrial machinery mechanics (\$44,200).

Food and Beverage Manufacturing

Food and beverage manufacturers in the GO VA 1 region pay an annual average wage of \$43,716, which is higher than the average wage (\$34,678) in the region. It is also an industry that generally does not experience steep declines during recessions thus providing stability to a regional economy.

As is true of all industries, attracting companies in this industry requires that the region demonstrate its sufficient labor availability. The GO VA 1 region is generally well-equipped to handle an expansion of food and beverage manufacturing. The typical occupation mix for a food and beverage manufacturing company primarily includes production and transportation and material moving occupations. The demand and regional labor supply is shown in the following table for a food and beverage manufacturing company that expects to hire 100 workers (only occupations with employer demand greater than one are shown).

The average wage of all occupations associated with a typical food and beverage manufacturing expansion of 100 employees is \$32,867, slightly below the regional average wage of \$34,678 but higher than the lowest average annual wage in the region, which is \$27,020 in Grayson County. The typical entry-level education for most of these occupations is a high school degree or less. Only six of the 100 jobs in the expansion typically require an award or degree (managers, scientists, and truck drivers).

While the majority of these jobs require no previous experience, on-the-job training is key to occupations in this industry. Of the 100 new jobs created by a food and beverage manufacturing expansion, 46 workers typically require short-term on-the-job training, and another 38 employees require moderate-term on-the-job training. Eight workers (bakers, industrial machinery mechanics, maintenance and repair workers, and butchers and meat cutters) will require long-term training and another six employees (supervisors, managers, and scientists) typically do not require on-the-job training.

Three of the top four in-demand occupations for a food and beverage manufacturer are food processing workers (SOC 51-3000). When comparing the food and beverage manufacturer's new demand with the region's labor supply, food processing workers are also the only occupation with a clear gap in supply. When the region is expanded to the labor shed, the gap dissipates in all but three of

the top occupations: slaughterers and meat packers (40 potential candidates per opening); food cooking machine operators and tenders (40 potential candidates per opening); and food processing workers, all other (48 potential candidates per opening).

To ensure there are enough workers to fill all the openings, the food and beverage manufacturer would likely need to attract and upskill people in the extended labor supply, defined as regional workers with skills similar to the specified occupation and currently or previously employed in an occupation with wages no more than 10% higher than the average wage of the specified occupation. When the extended labor supply is added to the potential candidate pool, there are no gaps for the food and beverage manufacturing industry in the labor shed.

What-If Report for GO Virginia Region 1, Food & Beverage Manufacturing

SOC	Title	New Empl Dem and	Employment		Unemployment		Avg Wage		Empl Extended		Unempl Extended		Potential Candidate/Opening Ratio	
			GOV A 1	Labor Shed	GOV A 1	Labor Shed	GOVA 1	Labor Shed	GOV A 1	Labor Shed	GOV A1	Labor Shed	GOV A 1	Labor Shed
51-9111	Packaging and Filling Machine Operators and Tenders	9	392	1,066	18	46	\$34,000	\$33,900	6,491	16,361	403	1,006	45	124
51-3092	Food Batchmakers	7	91	343	3	9	\$30,300	\$30,800	822	3,170	42	157	13	50
51-3022	Meat, Poultry, and Fish Cutters and Trimmers	7	59	387	3	18	\$24,500	\$24,900	3,344	10,780	203	628	9	58
51-3011	Bakers	4	172	615	6	22	\$23,400	\$24,500	5,072	17,753	243	880	44	159
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	4	2,115	8,710	165	633	\$25,700	\$27,200	5	2,125	1	91	570	2,336
53-7064	Packers and Packagers, Hand	4	647	2,266	64	211	\$22,200	\$22,400	1,251	12,737	65	666	178	619
51-3023	Slaughterers and Meat Packers	4	18	153	1	8	\$25,200	\$27,500	836	2,078	83	214	5	40
51-1011	First-Line Supervisors of Production and Operating Workers	3	873	2,945	20	64	\$56,700	\$61,700	1,192	2,095	19	34	297	1,003
51-9198	Helpers-- Production Workers	3	348	1,458	28	111	\$26,100	\$28,100	3,832	13,889	262	909	125	523
53-7051	Industrial Truck and Tractor Operators	3	585	2,027	22	72	\$33,600	\$33,300	3,906	14,958	248	901	202	700
51-3093	Food Cooking Machine Operators and Tenders	2	17	72	2	9	\$27,700	\$28,400	1,632	7,075	117	475	10	40
51-3099	Food Processing Workers, All Other	2	17	91	1	4	\$24,000	\$25,900	0	0	0	0	9	48
53-3032	Heavy and Tractor-Trailer Truck Drivers	2	2,653	8,234	88	257	\$37,800	\$40,000	1,406	4,596	63	177	1,371	4,246
49-9041	Industrial Machinery Mechanics	2	721	1,998	12	32	\$44,200	\$47,500	2,828	9,679	86	285	367	1,015
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	2	693	2,383	25	83	\$35,300	\$38,200	1,932	6,852	120	400	359	1,233
49-9071	Maintenance and Repair Workers, General	2	1,347	5,021	40	143	\$33,900	\$36,600	464	1,257	13	35	694	2,582
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	2	140	511	6	23	\$35,900	\$37,500	732	1,888	28	67	73	267
41-2031	Retail Salespersons	2	4,062	16,042	185	701	\$24,500	\$25,000	938	4,225	51	224	2,124	8,372

41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	2	872	3,803	21	85	\$56,400	\$60,200	146	714	3	14	447	1,944
51-9012	Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	2	87	267	1	4	\$39,100	\$40,500	767	1,498	32	67	44	135

Energy and Minerals

As noted earlier, the energy cluster has a location quotient of 3.22 indicating that employment in the GO VA 1 region is more than three times as concentrated in the region as it is in the nation. Moreover, the annual average wage in the cluster was \$77,591 in the first quarter of 2018—more than double the \$34,678 average wage in the GO VA 1 region.

Unfortunately, 62.5% of the employment in this strong regional asset is tied to coal mining, which is in decline. Alternative uses for coal may revive the industry at some future date. However, these technologies are still in the research phase and therefore should be considered aspirational. For example, researchers at Virginia Tech are working with industry partners in a \$1 million pilot project funded in part by a U.S. Department of Energy National Energy Technology Laboratory grant to extract rare earth minerals from coal.³⁰ Virginia Tech officials have indicated that they hope to construct a mobile pilot plant in Southwest Virginia to extract these minerals from coal that are in short supply but high demand in advanced manufacturing.

Additional electric power generation and alternative energy sources may also be a source of employment growth for the energy cluster in GO VA 1. Dominion Energy is considering a pumped hydro storage facility in Southwest Virginia coalfields.³¹ A feasibility study is underway and, according to company sources, the plant could generate approximately 50 jobs when it is in operation.

Wind and solar projects have also been considered in the GO VA 1 region that would diversify the energy cluster away from its dependence on the coal industry.³² Both industries pay well in the nation. During the fourth quarter of 2018, the national annual average wage in solar electric power generation was \$100,170 and wind electric power generation employees earned an annual average \$106,735.

³⁰ Source: <https://vtnews.vt.edu/articles/2016/03/research-rareearth.html>

³¹ http://www.heraldcourier.com/news/dominion-energy-wants-to-build-pumped-hydro-storage-facility-in/article_ee0cdcf0-6973-50d7-8148-f75541c5fd33.html

³² http://www.richmond.com/business/southwest-virginia-from-coal-power-to-wind-power/article_87431ec9-a7fb-533f-afaa-09fbfb3f10dd.html

Industry Snapshot of Energy_ in GO Virginia Region 1 and Labor Shed, 2018q4											
NAICS	Industry	Current				Employment Forecast Over Next 10 Years					
		Employment		Average Annual Wages		Total Separation		Total Growth Demand		Avg. Annual Growth Percent	
		GOVA 1	Labor Shed	GOVA 1	Labor Shed	GOVA 1	Labor Shed	GOVA 1	Labor Shed	GOVA 1	Labor Shed
211120	Crude Petroleum Extraction	81	110	\$144,924	\$116,064	74	99	1	-2	0.1%	-0.1%
211130	Natural Gas Extraction	103	261	\$98,630	\$73,035	94	236	2	2	0.2%	0.1%
212111	Bituminous Coal and Lignite Surface Mining	1,543	1814	\$73,603	\$73,456	1,428	1679	-381	-448	-2.8%	-2.8%
212112	Bituminous Coal Underground Mining	971	1686	\$85,096	\$80,753	893	1551	-249	-432	-2.9%	-2.9%
212113	Anthracite Mining	0	1	n/a	\$50,205	0	0	0	0	-1.1%	-1.1%
212311	Dimension Stone Mining and Quarrying	55	55	\$36,775	\$36,774	52	52	-12	-12	-2.4%	-2.4%
212312	Crushed and Broken Limestone Mining and Quarrying	326	581	\$48,935	\$49,609	306	551	-70	-118	-2.4%	-2.3%
212313	Crushed and Broken Granite Mining and Quarrying	22	46	\$32,381	\$37,220	22	46	-3	-7	-1.2%	-1.5%
212319	Other Crushed and Broken Stone Mining and Quarrying	29	36	\$35,264	\$36,779	28	35	-4	-6	-1.6%	-1.7%
212321	Construction Sand and Gravel Mining	0	58	n/a	\$49,071	0	60	0	-4	-1.9%	-0.7%
213111	Drilling Oil and Gas Wells	140	143	\$79,969	\$79,542	154	157	11	11	0.7%	0.7%
213112	Support Activities for Oil and Gas Operations	193	226	\$54,146	\$55,497	212	249	16	20	0.8%	0.9%
213113	Support Activities for Coal Mining	195	383	\$63,963	\$62,721	214	421	15	32	0.8%	0.8%
213115	Support Activities for Nonmetallic Minerals (except Fuels) Mining	12	12	\$32,152	\$32,599	13	13	2	2	1.7%	1.6%
221111	Hydroelectric Power Generation	34	330	\$64,299	\$93,853	31	302	1	19	0.4%	0.5%
221112	Fossil Fuel Electric Power Generation	43	113	\$79,983	\$85,447	33	87	-10	-27	-2.6%	-2.7%
221121	Electric Bulk Power Transmission and Control	9	9	\$75,994	\$74,614	8	8	-1	-1	-1.7%	-1.7%
221122	Electric Power Distribution	124	821	\$62,931	\$77,399	101	700	-17	-47	-1.5%	-0.6%
221210	Natural Gas Distribution	13	234	\$67,353	\$76,181	11	198	-2	-36	-1.8%	-1.7%
324110	Petroleum Refineries	12	12	\$57,653	\$57,553	10	10	-3	-3	-2.4%	-2.4%
324121	Asphalt Paving Mixture and Block Manufacturing	1	17	\$32,386	\$65,387	0	15	0	-1	-0.4%	-0.8%
324122	Asphalt Shingle and Coating Materials Manufacturing	6	6	\$51,821	\$51,642	5	5	-1	-1	-1.4%	-1.4%
324199	All Other Petroleum and Coal Products Manufacturing	67	67	\$69,754	\$69,728	57	57	-15	-15	-2.5%	-2.5%
486210	Pipeline Transportation of Natural Gas	44	82	\$69,916	\$88,708	39	73	-5	-11	-1.1%	-1.4%
486910	Pipeline Transportation of Refined Petroleum Products	0	9	n/a	\$110,906	0	9	0	0	-0.8%	-0.2%
Source: JobsEQ®											

Information Technology

With the large investment of broadband in the region and expansion of Northrop Grumman and CGI into Lebanon, Virginia over the last decade, information technology occupations are an emerging driver of growth in the region, though not necessarily tied to a particular sector. Technology skills are increasingly needed in every industry to stay competitive. However, the growing concentration of information technology skills in the region points to an opportunity to attract firms that need such skills.

As shown in the table below, computer and math occupations pay a much higher average wage than that of the GO VA 1 region—\$64,700 compared to \$38,200. With 2,041 people in the region working in computer and math occupations, the location quotient (LQ) for the occupation is 0.5, meaning that workers with these skills have a concentration half that found in the nation, on average. The LQ for the labor shed is a bit higher at 0.59. Consequently, attracting firms that need computer and math talent is an aspirational strategy.

Occupation Snapshot of Computer and Mathematical Occupations, Four Quarters Ending with 2018Q4							
SOC	Occupation	GO Virginia Region 1			GO Virginia Region 1 Labor Shed		
		Employment	LQ	Annual Mean Wage ¹	Employment	LQ	Annual Mean Wage ¹
15-0000	Computer and Mathematical Occupations	2,041	0.50	\$64,700	9,804	0.59	\$71,200
15-1111	Computer and Information Research Scientists	9	0.31	\$89,600	54	0.48	\$98,700
15-1121	Computer Systems Analysts	358	0.65	\$70,600	1,529	0.68	\$76,100
15-1122	Information Security Analysts	45	0.45	\$76,300	225	0.54	\$86,100
15-1131	Computer Programmers	73	0.29	\$65,400	598	0.59	\$84,800
15-1132	Software Developers, Applications	252	0.31	\$76,200	1,351	0.40	\$81,900
15-1133	Software Developers, Systems Software	167	0.43	\$84,500	695	0.44	\$90,800
15-1134	Web Developers	72	0.49	\$59,100	366	0.62	\$57,000
15-1141	Database Administrators	70	0.65	\$67,500	340	0.78	\$72,100
15-1142	Network and Computer Systems Administrators	221	0.63	\$65,400	1,097	0.77	\$71,000
15-1143	Computer Network Architects	73	0.48	\$81,800	404	0.66	\$86,600
15-1151	Computer User Support Specialists	371	0.64	\$40,500	1,636	0.69	\$43,700
15-1152	Computer Network Support Specialists	108	0.61	\$49,100	552	0.77	\$55,800
15-1199	Computer Occupations, All Other	144	0.48	\$65,800	566	0.46	\$75,900
15-2011	Actuaries	7	0.39	\$89,400	37	0.49	\$97,300
15-2021	Mathematicians	1	0.35	\$81,100	6	0.63	\$87,200
15-2031	Operations Research Analysts	52	0.52	\$68,100	246	0.61	\$69,100
15-2041	Statisticians	18	0.48	\$62,800	96	0.64	\$69,100
15-2091	Mathematical Technicians	0	0.53	\$47,200	1	0.84	\$49,700
15-2099	Mathematical Science Occupations, All Other	1	0.56	\$44,800	3	0.63	\$49,800

Source: [JobsEQ®](#)

Employment data as of 2018Q4. Demand data reflect place-of-work employment; retirements reflect place-of-residence data

1. Wage data are as of 2017 and represent the average for all Covered Employment.

If a new I.T. firm requiring 25 new employees were to be established in the GO VA 1 region, it would find a sufficient number of applicants with the required skills. The following table illustrates this, with the potential candidate to opening ratio in the column below highlights in green all occupations where there are at least 50 employed in the region for every 1 the expanding firm is expected to hire. This 50 to 1 ratio is used by expanding firms and site selectors as a baseline to ensure skilled workers can be hired in the region.

What-If Report for GO Virginia Region 1, NAICS 5415 - Computer Systems Design and Related Services									
SOC	Title	New Employer Demand	Empl (Place of Residence) ¹	Unempl ¹	Regional Avg Wage ²	National Avg Wage ²	Empl Extended	Unempl Extended	Potential Candidates per Opening
15-1132	Software Developers, Applications	4	236	5	\$76,200	\$106,700	1,065	26	60
15-1121	Computer Systems Analysts	2	333	8	\$70,600	\$92,700	529	14	171
15-1151	Computer User Support Specialists	2	365	19	\$40,500	\$54,200	298	16	192
15-1133	Software Developers, Systems Software	2	144	3	\$84,500	\$111,800	1,260	30	74
11-3021	Computer and Information Systems Managers	1	116	3	\$106,300	\$149,700	551	13	120
15-1143	Computer Network Architects	1	59	1	\$81,800	\$107,900	1,163	26	59
15-1152	Computer Network Support Specialists	1	90	5	\$49,100	\$67,500	0	0	94
15-1199	Computer Occupations, All Other	1	122	4	\$65,800	\$91,100	1,703	59	126
15-1131	Computer Programmers	1	73	3	\$65,400	\$87,500	607	16	76
43-4051	Customer Service Representatives	1	3,243	165	\$25,300	\$35,600	2,342	131	3,408
11-1021	General and Operations Managers	1	1,507	38	\$89,500	\$123,500	7,186	96	1,544
15-1122	Information Security Analysts	1	36	1	\$76,300	\$99,700	1,105	25	37
13-1111	Management Analysts	1	319	12	\$80,300	\$93,400	1,574	43	331
13-1161	Market Research Analysts and Marketing Specialists	1	262	8	\$65,900	\$71,400	1,186	34	270
15-1142	Network and Computer Systems Administrators	1	206	3	\$65,400	\$86,300	342	9	209
43-9061	Office Clerks, General	1	2,802	135	\$28,100	\$33,900	2,502	108	2,936
41-3099	Sales Representatives, Services, All Other	1	557	16	\$48,500	\$63,000	0	0	573
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	1	153	4	\$82,900	\$92,000	1,193	26	157
15-1134	Web Developers	1	68	3	\$59,100	\$74,100	71	3	71

Source: JobsEQ®

1. Occupation employment and unemployment are place-of-residence data--that is, referring to workers who reside in the named locality

2. Occupation wages are as of 2017 and represent the average for all Covered Employment

Two industries are considered under the information technology cluster as potentials for business attraction:

- Computer Systems Design (Cybersecurity)
- Data Centers

Computer Systems Design (Cybersecurity)

Absent from the above list of occupations is cybersecurity. Although firms across almost all industry types are adding positions in cybersecurity, the Bureau of Labor Statistics has not yet classified it within its standard occupation classification (SOC) system. However, based on JobsEQ Real Time Intelligence (RTI), the vast majority of job posts that describe a need for cybersecurity skills are also categorized as information security analysts (SOC 15-1122). The computers systems design and related services industry employs the largest share of information security analysts (28.1%).

Within the GO VA 1 labor shed, these firms employed 5,223 people in the fourth quarter of 2018 at an annual average wage of \$61,518.

If a computer systems design and related services firm with 200 employees were to expand to the GO VA 1 labor shed, they would find a sufficient number of applicants with the skills needed. The potential candidate to opening ratio in the column below highlights in green all occupations where there are at least 50 employed in the region for every 1 the expanding firm is expected to hire. This 50 to 1 ratio is used by expanding firms and site selectors as a baseline to ensure skilled workers can be hired in the region.

What-If Report for GO Virginia Region 1 Labor Shed, NAICS 5415 - Computer Systems Design and Related Services									
SOC	Title	New Employer Demand	Empl (Place of Residence) ¹	Unempl ¹	Regional Avg Wage ²	National Avg Wage ²	Empl Extended	Unempl Extended	Potential Candidates per Opening
15-1132	Software Developers, Applications	30	1,289	25	\$81,900	\$106,700	5,072	121	44
15-1121	Computer Systems Analysts	18	1,445	33	\$76,100	\$92,700	2,837	69	82
15-1151	Computer User Support Specialists	14	1,570	74	\$43,700	\$54,200	1,178	55	117
15-1133	Software Developers, Systems Software	12	667	15	\$90,800	\$111,800	6,144	141	57
15-1131	Computer Programmers	11	552	20	\$84,800	\$87,500	2,808	70	52
11-3021	Computer and Information Systems Managers	8	693	19	\$126,400	\$149,700	2,634	58	89
15-1199	Computer Occupations, All Other	7	576	15	\$75,900	\$91,100	6,530	212	85
15-1142	Network and Computer Systems Administrators	7	1,041	14	\$71,000	\$86,300	2,773	60	151
11-1021	General and Operations Managers	6	6,173	147	\$97,700	\$123,500	21,192	335	1,053
41-3099	Sales Representatives, Services, All Other	6	2,281	59	\$51,600	\$63,000	0	0	390
15-1143	Computer Network Architects	4	383	4	\$86,600	\$107,900	5,689	118	97
43-4051	Customer Service Representatives	4	10,197	481	\$29,800	\$35,600	11,400	717	2,670
13-1111	Management Analysts	4	1,529	51	\$84,700	\$93,400	6,104	172	395
13-1199	Business Operations Specialists, All Other	3	2,123	70	\$63,600	\$75,700	1,895	60	731
15-1152	Computer Network Support Specialists	3	526	24	\$55,800	\$67,500	0	0	183
15-1122	Information Security Analysts	3	230	5	\$86,100	\$99,700	5,980	130	78
11-9199	Managers, All Other	3	2,344	22	\$98,300	\$113,200	7,168	184	789
13-1161	Market Research Analysts and Marketing Specialists	3	1,321	36	\$58,700	\$71,400	9,392	240	452

43-9061	Office Clerks, General	3	10,342	473	\$29,800	\$33,900	19,402	666	3,605
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	3	780	19	\$84,600	\$92,000	5,069	102	267
15-1134	Web Developers	3	349	13	\$57,000	\$74,100	337	15	121

Source: JobsEQ®

1. Occupation employment and unemployment are place-of-residence data--that is, referring to workers who reside in the named locality.
2. Occupation wages are as of 2017 and represent the average for all Covered Employment

Data as of 2018Q4 unless noted otherwise

Note: Employment extended refers to regional workers with skills similar to the specified occupation and currently employed in an occupation with wages no more than 10% higher than the average wage of the specified occupation.

The candidate-to-opening ratio for applied software developers is slightly below 50. However, as shown in the table that follows, higher education institutions in the region conferred 377 awards to graduates in the 2016-2017 academic year in programs that would enable them to fill these positions.

Regional Postsecondary Programs, Software Developers			
Title/School	Annual Awards - GO VA Region 1 Labor Shed		
	Certificates and 2yr Degrees	4yr Degrees	Postgraduate Degrees
11.0103 Information Technology			
American National University	0	0	0
King University	0	85	0
Surry Community College	10	0	0
Virginia Highlands Community College	0	0	0
11.0201 Computer Programming/Programmer, General			
American National University	1	0	0
Surry Community College	0	0	0
11.0202 Computer Programming, Specific Applications			
Surry Community College	4	0	0
11.0701 Computer Science			
Radford University	0	57	0
Roanoke College	0	4	0
The University of Virginia's College at Wise	0	7	0
14.0901 Computer Engineering, General			
Virginia Polytechnic Institute and State University	0	123	69
14.0903 Computer Software Engineering			
The University of Virginia's College at Wise	0	2	0
26.1103 Bioinformatics			
Virginia Polytechnic Institute and State University	0	0	7
51.2706 Medical Informatics			
King University	0	8	0
Total	15	286	76
Source: JobsEQ® Data as of the 2017 academic year			

Data Centers

DP Facilities South invested \$65 million in Wise County on a 22-acre site to construct a Mission Critical Tier III Data Center.³³ The site, which officially opened in April 2017, employs 40 people.³⁴ The broadband fiber in the area and low cost of living relative to Northern Virginia where many data centers are clustered, make the GO VA 1 region attractive for additional data centers.

If a data center with 50 employees were to expand to the GO VA 1 region, they would find a sufficient number of applicants with the skills needed. The potential candidate to opening ratio in the column below highlights in green all occupations where there are at least 50 employed in the region for every 1 the expanding firm is expected to hire. This 50 to 1 ratio is used by expanding firms and site selectors as a baseline to ensure skilled workers can be hired in the region.

What-If Report for GO Virginia Region 1 Labor Shed, Occupation Mix: Data Centers									
SOC	Title	New Employer Demand	Empl (Place of Residence) ¹	Unempl ¹	Regional Avg Wage ²	National Avg Wage ²	Empl Extended	Unempl Extended	Potential Candidates per Opening
11-3021	Computer and Information Systems Managers	30	693	19	\$126,400	\$149,700	2,634	58	24
15-1142	Network and Computer Systems Administrators	7	1,041	14	\$71,000	\$86,300	2,773	60	151
15-1143	Computer Network Architects	3	383	4	\$86,600	\$107,900	5,689	118	129
15-1199	Computer Occupations, All Other	2	576	15	\$75,900	\$91,100	6,530	212	296
15-1151	Computer User Support Specialists	2	1,570	74	\$43,700	\$54,200	1,178	55	822
49-9071	Maintenance and Repair Workers, General	2	5,021	143	\$36,600	\$40,300	1,257	35	2,582
41-3099	Sales Representatives, Services, All Other	2	2,281	59	\$51,600	\$63,000	0	0	1,170
43-1011	First-Line Supervisors of Office and Administrative Support Workers	1	5,283	118	\$48,400	\$58,500	6,677	127	5,401
11-2021	Marketing Managers	1	398	7	\$123,200	\$145,600	9,676	235	405
	Total Annual Payroll				\$5,136,000	\$6,120,000			

Source: JobsEQ®

1. Occupation employment and unemployment are place-of-residence data--that is, referring to workers who reside in the named locality.
2. Occupation wages are as of 2017 and represent the average for all Covered Employment

Data as of 2018Q4 unless noted otherwise

Note: Figures may not sum due to rounding.

³³ <http://wjhl.com/2017/04/20/mineral-gap-to-build-65-million-data-center-in-wise-county-40-new-jobs/>

³⁴ <http://www.datacenterdynamics.com/content-tracks/colo-cloud/dp-facilities-opens-65m-data-center-in-virginia/98188.fullarticle>

Note: Employment extended refers to regional workers with skills similar to the specified occupation and currently or previously employed in an occupation with wages no more than 10% higher than the average wage of the specified occupation.

The candidate-to-opening ratio for computer and information systems managers is at 24 potential candidates per opening. However, as shown in the table that follows, higher education institutions in the region graduated 706 people in the 2016-2017 academic year with degrees that would enable them to fill these positions.

Regional Postsecondary Programs, Computer and Information Systems Managers			
Title/School	Annual Awards GO Virginia Region 1 Labor Shed		
	Certificates and 2yr Degrees	4yr Degrees	Postgraduate Degrees
11.0101 Computer and Information Sciences, General			
Bluefield State College	0	8	0
East Tennessee State University	0	59	16
Mountain Empire Community College	21	0	0
New River Community College	14	0	0
Northeast State Community College	32	0	0
Roanoke College	0	4	0
Southwest Virginia Community College	8	0	0
University of Pikeville	0	2	0
Virginia Highlands Community College	10	0	0
Virginia Polytechnic Institute and State University	0	200	74
Virginia Western Community College	35	0	0
Wytheville Community College	7	0	0
11.0103 Information Technology			
American National University	0	0	0
King University	0	85	0
Surry Community College	10	0	0
Virginia Highlands Community College	0	0	0
11.0202 Computer Programming, Specific Applications			
Surry Community College	4	0	0
11.0401 Information Science/Studies			
Concord University	0	5	0
Radford University	8	16	0
Surry Community College	0	0	0
11.0701 Computer Science			
Radford University	0	57	0
Roanoke College	0	4	0
The University of Virginia's College at Wise	0	7	0
11.1001 Network and System Administration/Administrator			
American National University	11	0	0
11.1003 Computer and Information Systems Security/Information Assurance			
American National University	4	1	0
Radford University	0	0	0
Surry Community College	0	0	0
Valley College-Princeton	0	0	0

Regional Postsecondary Programs, Computer and Information Systems Managers

Title/School	Annual Awards GO Virginia Region 1 Labor Shed		
	Certificates and 2yr Degrees	4yr Degrees	Postgraduate Degrees
Virginia Polytechnic Institute and State University	0	0	0
Wytheville Community College	0	0	0
52.1201 Management Information Systems, General			
Bluefield College	0	0	0
Bluefield State College	0	1	0
The University of Virginia's College at Wise	0	3	0
Total	164	452	90
Source: JobsEQ® Data as of the 2017 academic year			

Appendix 1.1: Labor Shed

A region's labor shed reflects the geographic area from which firms attract their workers. Consequently, when attracting firms to the region it is important to include the skills of all potential workers even if they reside outside the GO VA 1 region. In addition, some residents of the GO VA 1 region work for firms outside of the regional footprint. Oftentimes, they receive intraregional training, so it is important for training providers and educators to take those skills into account when developing their offerings.

The definition for the GO VA 1 labor shed considers the mobility of the residents commuting into or out of the region. In addition to the 13 counties and 3 cities in the GO VA 1 region, the following localities are used to define the GO VA 1 labor shed:



- City of Roanoke, Virginia
- City of Salem, Virginia
- Hawkins County, Tennessee
- Mercer County West Virginia
- Montgomery County, Virginia
- Pike County, Kentucky
- Pulaski County, Virginia
- Radford City, Virginia
- Roanoke County, Virginia
- Sullivan County, Tennessee
- Surry County, North Carolina
- Washington County, Tennessee

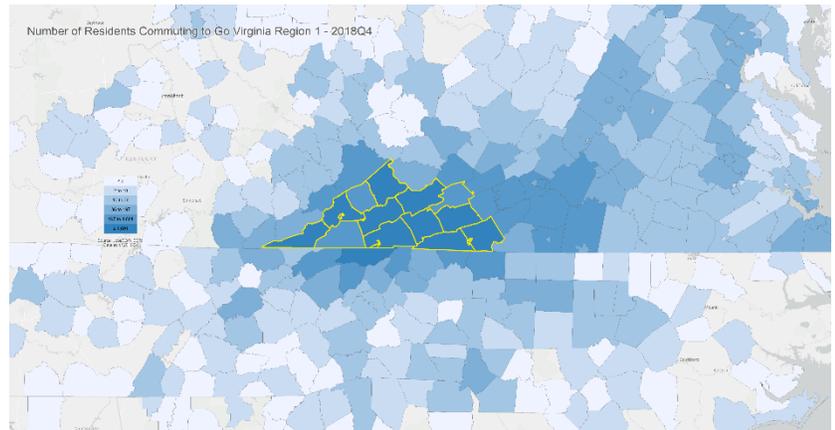
All the localities except the City of Salem were added because they have at least a combination of 600 people commuting to or from the GO VA 1 region (see the table below). The City of Salem (374 commuters to and from the region) was added because it is in the center of Roanoke County and City.

Number of Residents Commuting To and From Go VA Region 1 with 600 or More Commuters, 2018Q4	
Locality	Total Commuters
Washington County, Virginia	38,007
Tazewell County, Virginia	24,838
Smyth County, Virginia	23,298
Wise County, Virginia	22,068
Wythe County, Virginia	20,552
Russell County, Virginia	15,829
Carroll County, Virginia	15,102
Sullivan County, Tennessee	13,692
Buchanan County, Virginia	11,971
Lee County, Virginia	10,580
Bristol City, Virginia	10,284
Grayson County, Virginia	8,911
Scott County, Virginia	8,749
Galax City, Virginia	7,207
Dickenson County, Virginia	7,047
Norton City, Virginia	4,464
Mercer County, West Virginia	3,469
Bland County, Virginia	3,428

Pulaski County, Virginia	2,554
Surry County, North Carolina	1,982
Washington County, Tennessee	1,974
Montgomery County, Virginia	1,691
City of Roanoke, Virginia	1,007
Roanoke County, Virginia	843
Hawkins County, Tennessee	787
Radford City, Virginia	742
Pike County, Kentucky	635
Source: JobsEQ	

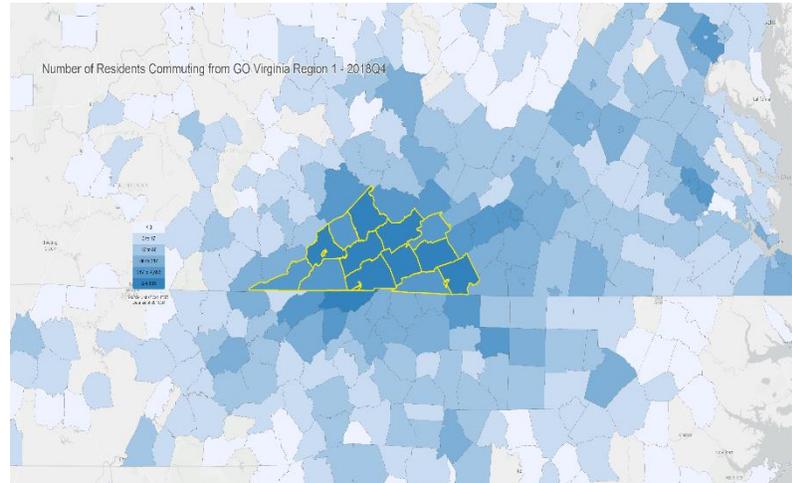
Number of Residents Commuting to GO VA Region 1

Number of Residents Commuting to Go VA Region 1 with 600 or More Commuters, 2018Q4	
Locality	Commuters
Washington County, Virginia	19,175
Tazewell County, Virginia	11,644
Smyth County, Virginia	11,387
Wise County, Virginia	10,970
Wythe County, Virginia	10,011
Russell County, Virginia	8,990
Carroll County, Virginia	8,514
Sullivan County, Tennessee	7,011
Lee County, Virginia	5,913
Buchanan County, Virginia	5,654
Grayson County, Virginia	5,483
Bristol City, Virginia	4,601
Scott County, Virginia	4,239
Dickenson County, Virginia	3,849
Galax City, Virginia	2,314
Mercer County, West Virginia	2,034
Bland County, Virginia	1,811
Norton City, Virginia	1,613
Pulaski County, Virginia	723
Montgomery County, Virginia	601
Source: JobsEQ	



Number of Residents Commuting from GO VA Region 1

Number of Residents Commuting from Go VA Region 1 with 600 or More Commuters, 2018Q4	
Locality	Commuters
Washington County, Virginia	18,831
Tazewell County, Virginia	13,194
Smyth County, Virginia	11,911
Wise County, Virginia	11,098
Wythe County, Virginia	10,541
Russell County, Virginia	6,839
Sullivan County, Tennessee	6,681
Carroll County, Virginia	6,588
Buchanan County, Virginia	6,317
Bristol City, Virginia	5,683
Galax City, Virginia	4,893
Lee County, Virginia	4,668
Scott County, Virginia	4,510
Grayson County, Virginia	3,428
Dickenson County, Virginia	3,198
Norton City, Virginia	2,851
Pulaski County, Virginia	1,831
Bland County, Virginia	1,616
Surry County, North Carolina	1,567
Washington County, Tennessee	1,525
Mercer County, West Virginia	1,435
Montgomery County, Virginia	1,090
City of Roanoke, Virginia	726
Source: JobsEQ	



Appendix 1.2: Cluster Definitions

With the exception of information technology, clusters in this report are identified by industry. The information technology cluster is defined by occupations because it is not necessarily tied to a particular industry sector but is emerging in importance and pays relatively high wages compared the region's average. The occupations that make up the information technology cluster are listed in the table on page 58 of the report.

The 22 industries clusters used in this report are defined as follows:

Agriculture

- 111 Crop Production
- 112 Animal Production
- 114 Fishing, Hunting and Trapping
- 115 Support Activities for Agriculture and Forestry
- 3111 Animal Food Manufacturing
- 3112 Grain and Oilseed Milling
- 3253 Pesticide, Fertilizer, and Other Agricultural Chemical Manufacturing

Auto/Auto-related

- 811 Repair and Maintenance
- 3336 Engine, Turbine, and Power Transmission Equipment Manufacturing
- 3361 Motor Vehicle Manufacturing
- 3362 Motor Vehicle Body and Trailer Manufacturing
- 3363 Motor Vehicle Parts Manufacturing

Chemical

- 3251 Basic Chemical Manufacturing
- 3252 Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing
- 3255 Paint, Coating, and Adhesive Manufacturing
- 3256 Soap, Cleaning Compound, and Toilet Preparation Manufacturing
- 3259 Other Chemical Product and Preparation Manufacturing
- 3261 Plastics Product Manufacturing
- 3262 Rubber Product Manufacturing
- 3271 Clay Product and Refractory Manufacturing
- 3272 Glass and Glass Product Manufacturing
- 3274 Lime and Gypsum Product Manufacturing
- 3279 Other Nonmetallic Mineral Product Manufacturing

Energy

- 486 Pipeline Transportation
- 2111 Oil and Gas Extraction
- 2121 Coal Mining
- 2123 Nonmetallic Mineral Mining and Quarrying
- 2131 Support Activities for Mining
- 2211 Electric Power Generation, Transmission and Distribution
- 2212 Natural Gas Distribution
- 3241 Petroleum and Coal Products Manufacturing

Construction

- 2361 Residential Building Construction
- 2362 Nonresidential Building Construction
- 2371 Utility System Construction
- 2372 Land Subdivision
- 2373 Highway, Street, and Bridge Construction
- 2379 Other Heavy and Civil Engineering Construction
- 2381 Foundation, Structure, and Building Exterior Contractors
- 2382 Building Equipment Contractors
- 2383 Building Finishing Contractors
- 2389 Other Specialty Trade Contractors
- 3273 Cement and Concrete Product Manufacturing

Consumer Service

481 Air Transportation
485 Transit and Ground Passenger Transportation
487 Scenic and Sightseeing Transportation
493 Warehousing and Storage
531 Real Estate
711 Performing Arts, Spectator Sports, and Related Industries
713 Amusement, Gambling, and Recreation Industries
721 Accommodation
722 Food Services and Drinking Places
812 Personal and Laundry Services
814 Private Households

Education

611 Educational Services
712 Museums, Historical Sites, and Similar Institutions
813 Religious, Grantmaking, Civic, Professional, and Similar Organizations

Electric/Electronics Manufacturing

3332 Industrial Machinery Manufacturing
3333 Commercial and Service Industry Machinery Manufacturing
3341 Computer and Peripheral Equipment Manufacturing
3342 Communications Equipment Manufacturing
3343 Audio and Video Equipment Manufacturing
3344 Semiconductor and Other Electronic Component Manufacturing
3345 Navigational, Measuring, Electromedical, and Control Instruments Manufacturing
3351 Electric Lighting Equipment Manufacturing
3352 Household Appliance Manufacturing
3353 Electrical Equipment Manufacturing
3359 Other Electrical Equipment and Component Manufacturing

Financial Service

521 Monetary Authorities - Central Bank
522 Credit Intermediation and Related Activities
523 Securities, Commodity Contracts, and Other Financial Investments and Related Activities
524 Insurance Carriers and Related Activities
525 Funds, Trusts, and Other Financial Vehicles
533 Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)

Food and Beverage Manufacturing

3111 Animal Food Manufacturing
3112 Grain and Oilseed Milling
3113 Sugar and Confectionery Product Manufacturing
3114 Fruit and Vegetable Preserving and Specialty Food Manufacturing
3115 Dairy Product Manufacturing
3116 Animal Slaughtering and Processing
3117 Seafood Product Preparation and Packaging
3118 Bakeries and Tortilla Manufacturing
3119 Other Food Manufacturing
3121 Beverage Manufacturing

Freight Transportation

482 Rail Transportation
483 Water Transportation
484 Truck Transportation
488 Support Activities for Transportation
491 Postal Service
492 Couriers and Messengers

Health

621 Ambulatory Health Care Services
622 Hospitals
623 Nursing and Residential Care Facilities
624 Social Assistance

Machinery Manufacturing

3322 Cutlery and Handtool Manufacturing
3325 Hardware Manufacturing
3327 Machine Shops; Turned Product; and Screw, Nut, and Bolt Manufacturing
3329 Other Fabricated Metal Product Manufacturing
3331 Agriculture, Construction, and Mining Machinery Manufacturing
3334 Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manufacturing
3335 Metalworking Machinery Manufacturing
3339 Other General Purpose Machinery Manufacturing
3346 Manufacturing and Reproducing Magnetic and Optical Media
3364 Aerospace Product and Parts Manufacturing
3365 Railroad Rolling Stock Manufacturing
3366 Ship and Boat Building
3369 Other Transportation Equipment Manufacturing
3391 Medical Equipment and Supplies Manufacturing
3399 Other Miscellaneous Manufacturing

Media

511 Publishing Industries (except Internet)
512 Motion Picture and Sound Recording Industries
515 Broadcasting (except Internet)
519 Other Information Services
3231 Printing and Related Support Activities

Metal and Product Manufacturing

2122 Metal Ore Mining
3311 Iron and Steel Mills and Ferroalloy Manufacturing
3312 Steel Product Manufacturing from Purchased Steel
3313 Alumina and Aluminum Production and Processing
3314 Nonferrous Metal (except Aluminum) Production and Processing
3315 Foundries
3321 Forging and Stamping
3323 Architectural and Structural Metals Manufacturing
3324 Boiler, Tank, and Shipping Container Manufacturing
3326 Spring and Wire Product Manufacturing
3328 Coating, Engraving, Heat Treating, and Allied Activities

Pharmaceutical

3254 Pharmaceutical and Medicine Manufacturing

Professional Service

516 Internet Publishing and Broadcasting
517 Telecommunications
518 Internet Service Providers, Web Search Portals, and Data Processing Services
532 Rental and Leasing Services
541 Professional, Scientific, and Technical Services
551 Management of Companies and Enterprises
561 Administrative and Support Services

Public Administration

921 Executive, Legislative, and Other General Government Support
922 Justice, Public Order, and Safety Activities
923 Administration of Human Resource Programs
924 Administration of Environmental Quality Programs
925 Administration of Housing Programs, Urban Planning, and Community Development
926 Administration of Economic Programs
927 Space Research and Technology
928 National Security and International Affairs

Other

9999 Unclassified

Retail

423 Merchant Wholesalers, Durable Goods

424 Merchant Wholesalers, Nondurable Goods
425 Wholesale Electronic Markets and Agents and Brokers
441 Motor Vehicle and Parts Dealers
442 Furniture and Home Furnishings Stores
443 Electronics and Appliance Stores
444 Building Material and Garden Equipment and Supplies Dealers
445 Food and Beverage Stores
446 Health and Personal Care Stores
447 Gasoline Stations
448 Clothing and Clothing Accessories Stores
451 Sporting Goods, Hobby, Book, and Music Stores
452 General Merchandise Stores
453 Miscellaneous Store Retailers
454 Non-store Retailers

Textile/Leather

3131 Fiber, Yarn, and Thread Mills
3132 Fabric Mills
3133 Textile and Fabric Finishing and Fabric Coating Mills
3141 Textile Furnishings Mills
3149 Other Textile Product Mills
3151 Apparel Knitting Mills
3152 Cut and Sew Apparel Manufacturing
3159 Apparel Accessories and Other Apparel Manufacturing
3161 Leather and Hide Tanning and Finishing
3162 Footwear Manufacturing
3169 Other Leather and Allied Product Manufacturing

Utilities

562 Waste Management and Remediation Services
2213 Water, Sewage and Other Systems

Wood/Paper

113 Forestry and Logging
3211 Sawmills and Wood Preservation
3212 Veneer, Plywood, and Engineered Wood Product Manufacturing
3219 Other Wood Product Manufacturing
3221 Pulp, Paper, and Paperboard Mills
3222 Converted Paper Product Manufacturing
3371 Household and Institutional Furniture and Kitchen Cabinet Manufacturing
3372 Office Furniture (including Fixtures) Manufacturing
3379 Other Furniture Related Product Manufacturing

Appendix 1.3: Regional Variations by Planning District

This appendix provides high-level industry and workforce information to show the regional variation in the GO VA 1 region by planning district commission.

LENOWISCO

The health care and social assistance sector employs the most people in LENOWISCO (Planning District Commission 1) followed by retail trade and public administration. Based on its current mix of industries, the region is expected to shed an annual average 0.9% employment over the next ten years beginning with the four quarters ending with the fourth quarter of 2018.

Industry Snapshot in LENOWISCO, VA PDC, 2018q4

NAICS	Industry	Current			5-Year History			10-Year Forecast					
		Four Quarters Ending with 2018q4			Total Change	Empl Last 'n' Years	Avg Ann % Chg in Empl	Region	Separations (Approximate)			Growth	
		Empl	Avg Ann Wages	LQ					Total New Demand	Exits	Transfers	Empl	Avg Ann Rate
62	Health Care and Social Assistance	4,568	\$36,319	1.20	-130		-0.6%	4,704	2,170	2,246	287	0.6%	
44	Retail Trade	4,060	\$23,549	1.45	-318		-1.5%	4,593	2,244	2,839	-491	-1.3%	
92	Public Administration	2,868	\$42,661	2.30	32		0.2%	1,981	1,030	1,398	-446	-1.7%	
61	Educational Services	2,698	\$31,780	1.24	-271		-1.9%	1,944	1,116	1,202	-374	-1.5%	
72	Accommodation and Food Services	2,073	\$13,929	0.87	19		0.2%	3,056	1,427	1,796	-166	-0.8%	
31	Manufacturing	1,453	\$44,467	0.66	209		3.2%	1,152	513	876	-238	-1.8%	
56	Administrative and Support and Waste Management and Remediation Services	1,399	\$25,638	0.82	137		2.1%	1,454	660	895	-101	-0.7%	
23	Construction	1,157	\$28,967	0.77	-265		-4.0%	1,065	399	713	-47	-0.4%	
11	Agriculture, Forestry, Fishing and Hunting	1,080	\$6,689	2.98	-44		-0.8%	991	478	627	-114	-1.1%	
81	Other Services (except Public Administration)	885	\$25,947	0.76	-27		-0.6%	834	430	512	-108	-1.3%	
48	Transportation and Warehousing	831	\$48,725	0.71	-59		-1.4%	711	351	471	-111	-1.4%	
54	Professional, Scientific, and Technical Services	736	\$42,068	0.42	-129		-3.2%	531	224	376	-69	-1.0%	
42	Wholesale Trade	515	\$55,599	0.51	-129		-4.4%	406	186	308	-88	-1.9%	
52	Finance and Insurance	489	\$38,232	0.47	-82		-3.1%	361	163	265	-67	-1.5%	
21	Mining, Quarrying, and Oil and Gas Extraction	382	\$61,021	3.29	-1,108		-23.8%	304	118	242	-56	-1.6%	
51	Information	380	\$51,319	0.73	-215		-8.6%	273	123	215	-64	-1.8%	
71	Arts, Entertainment, and Recreation	351	\$16,903	0.67	43		2.6%	456	214	263	-21	-0.6%	
53	Real Estate and Rental and Leasing	204	\$30,638	0.45	11		1.1%	165	88	105	-28	-1.5%	
55	Management of Companies and Enterprises	184	\$61,528	0.47	-116		-9.3%	136	58	99	-21	-1.2%	
22	Utilities	145	\$67,273	1.05	-76		-8.1%	106	45	79	-17	-1.3%	
99	Unclassified	35	\$24,592	0.87	35		n/a	35	16	22	-3	-1.0%	
	Total - All Industries	26,495	\$32,825	1.00	-2,484		-1.8%	25,280	11,831	15,792	-2,342	-0.9%	

Source: JobsEQ®
Data as of 2018Q4
Note: Figures may not sum due to rounding.

All of the clusters in LENOWISCO are forecast to see declines in employment over the next ten years (with the exception of health) beginning with the fourth quarter of 2018. The exception is the health care cluster where employment is expected to grow an average 0.71% over the next ten years. It also pays an annual average wage higher than the average for the region, but it is not considered an export industry. In other words, it grows based on population growth and demographics rather than demand from consumers outside of the region.

Industry Clusters for LENOWISCO, VA PDC as of 2018Q1			
Industry Group	Average Annual Employment Forecast Rate(%) 2018Q4-2028Q4	Average Wages	LQ
Agricultural	-0.86	\$2,833	2.53
Auto/Auto-related	-0.99	\$41,674	0.58
Chemical	-3.69	\$41,569	0.59
Coal/Oil/Power	-1.60	\$60,202	2.03
Construction	-0.54	\$30,632	0.84
Consumer Svc.	-0.83	\$16,407	0.74
Education	-1.45	\$30,369	1.12
Food Mfg.	-1.15	\$26,106	0.51
Freight Tran.	-1.93	\$50,150	0.94
Health	0.61	\$36,053	1.20
Machinery Mfg.	-0.72	\$52,326	0.81
Professional Svc.	-1.00	\$36,124	0.62
Public Admin.	-1.68	\$42,077	2.31
Retail	-1.34	\$26,637	1.20
Utilities	-1.77	\$33,789	1.28
Wood/Paper	-2.41	\$30,515	3.23
Source: JobsEQ®			
Data as of 2018Q4			

Occupation Snapshot in LENOWISCO, VA PDC, 2018q4

SOC	Title	Current							5-Year History		10-Year Forecast				
		Four Quarters Ending with 2018q4			2018q4				Total Change	Avg Ann % Chg in Empl	Total New Demand	Separations		Growth	
		Empl	Avg Ann Wages ¹	LQ	Unempl	Unempl Rate	Online Job Ads ²	Empl	Region	Exits		Transfers	Empl	Avg Ann Rate	
11-0000	Management Occupations	1,811	\$86,900	1.13	24	1.3%	36	-147	-1.5%	1,162	674	628	-141	-0.8%	
13-0000	Business and Financial Operations Occupations	772	\$59,900	0.56	19	3.1%	13	-68	-1.7%	577	218	427	-68	-0.9%	
15-0000	Computer and Mathematical Occupations	317	\$62,000	0.41	8	3.2%	11	-70	-3.9%	179	54	146	-21	-0.7%	
17-0000	Architecture and Engineering Occupations	275	\$66,600	0.60	12	3.3%	6	-69	-4.4%	172	67	124	-19	-0.7%	
19-0000	Life, Physical, and Social Science Occupations	145	\$64,000	0.67	2	2.0%	3	-28	-3.5%	108	37	86	-15	-1.1%	
21-0000	Community and Social Service Occupations	667	\$37,600	1.55	15	2.4%	45	12	0.4%	755	265	450	40	0.6%	
23-0000	Legal Occupations	195	\$65,800	0.90	2	1.6%	0	-7	-0.7%	97	46	68	-17	-0.9%	
25-0000	Education, Training, and Library Occupations	1,993	\$44,900	1.34	42	2.3%	26	-193	-1.8%	1,348	801	771	-224	-1.2%	
27-0000	Arts, Design, Entertainment, Sports, and Media Occupations	227	\$38,400	0.48	4	2.2%	10	-49	-3.8%	171	87	115	-31	-1.4%	
29-0000	Healthcare Practitioners and Technical Occupations	1,794	\$62,000	1.19	38	2.0%	82	-111	-1.2%	932	474	486	-28	-0.2%	
31-0000	Healthcare Support Occupations	854	\$25,700	1.15	48	4.2%	13	8	0.2%	999	491	478	30	0.3%	
33-0000	Protective Service Occupations	1,504	\$37,300	2.65	57	3.9%	16	-67	-0.9%	898	525	631	-258	-1.9%	
35-0000	Food Preparation and Serving Related Occupations	2,276	\$19,700	1.01	197	6.4%	90	27	0.2%	3,554	1,699	2,026	-171	-0.8%	
37-0000	Building and Grounds Cleaning and Maintenance Occupations	845	\$22,300	0.92	59	5.0%	17	3	0.1%	899	470	508	-79	-1.0%	
39-0000	Personal Care and Service Occupations	1,204	\$20,600	1.07	47	3.4%	8	-31	-0.5%	1,907	960	834	113	0.9%	
41-0000	Sales and Related Occupations	2,739	\$28,300	1.03	140	4.6%	216	-281	-1.9%	3,430	1,710	2,058	-338	-1.3%	
43-0000	Office and Administrative Support Occupations	3,841	\$29,500	1.00	192	4.2%	97	-131	-0.7%	3,569	1,851	2,205	-488	-1.3%	
45-0000	Farming, Fishing, and Forestry Occupations	131	\$32,400	0.76	12	6.3%	0	3	0.4%	119	41	110	-32	-2.7%	
47-0000	Construction and Extraction Occupations	1,128	\$37,400	0.92	89	5.2%	14	-657	-8.8%	1,030	381	730	-80	-0.7%	
49-0000	Installation, Maintenance, and Repair Occupations	1,058	\$39,800	1.04	40	2.9%	31	-333	-5.3%	811	336	599	-124	-1.2%	
51-0000	Production Occupations	1,131	\$33,200	0.71	76	4.1%	43	-2	0.0%	974	429	733	-188	-1.8%	
53-0000	Transportation and Material Moving Occupations	1,588	\$30,900	0.87	100	4.9%	43	-295	-3.4%	1,532	721	1,016	-205	-1.4%	
	Total - All Occupations	26,495	\$37,500	1.00	n/a	n/a	821	-2,484	-1.8%	25,224	12,338	15,228	-2,342	-0.9%	

Source: JobsEQ®

Data as of 2018Q4 unless noted otherwise

Note: Figures may not sum due to rounding.

1. Occupation wages are as of 2017 and should be taken as the average for all Covered Employment

2. Data represent found online ads active within the last thirty days in the selected region; data represents a sampling rather than the complete universe of postings. Ads lacking zip code information but designating a place (city, town, etc.) may be assigned to the zip code with greatest employment in that place for queries in this analytic. Due to alternative county-assignment algorithms, ad counts in this analytic may not match that shown in RTI (nor in the popup window ad list).

Cumberland Plateau

The retail sector employs the most people in Cumberland Plateau (Planning District Commission 2) followed by healthcare and mining. Mining is the third largest sector in terms of employment but has a very large LQ of 20.37. Based on its current mix of industries, the region is expected to shed an annual average 1.0% employment over the next ten years beginning with the four quarters ending with the fourth quarter of 2018.

Industry Snapshot in Cumberland Plateau, VA PDC, 2018q4

NAICS	Industry	Current			5-Year History			10-Year Forecast				
		Four Quarters Ending with 2018q4			Total Change	Empl Last 'n' Years	Avg Ann % Chg in Empl	Separations (Approximate)			Growth	
		Empl	Avg Ann Wages	LQ				Empl	1 3 5	Region	Total New Demand	Exits
44	Retail Trade	4,928	\$24,030	1.36	-330		-1.3%	5,583	2,726	3,448	-591	-1.3%
62	Health Care and Social Assistance	4,569	\$40,344	0.93	-132		-0.6%	4,566	2,150	2,225	192	0.4%
21	Mining, Quarrying, and Oil and Gas Extraction	3,058	\$82,059	20.37	-886		-5.0%	2,204	916	1,880	-592	-2.1%
61	Educational Services	2,941	\$29,671	1.05	-645		-3.9%	2,141	1,220	1,313	-392	-1.4%
92	Public Administration	2,378	\$35,293	1.48	46		0.4%	1,643	854	1,159	-370	-1.7%
23	Construction	2,209	\$39,357	1.14	-216		-1.9%	2,086	768	1,373	-55	-0.3%
72	Accommodation and Food Services	2,148	\$14,550	0.70	-36		-0.3%	3,121	1,469	1,849	-197	-1.0%
81	Other Services (except Public Administration)	1,843	\$25,232	1.23	58		0.6%	1,811	908	1,082	-179	-1.0%
31	Manufacturing	1,829	\$45,564	0.65	-106		-1.1%	1,346	633	1,080	-366	-2.2%
54	Professional, Scientific, and Technical Services	1,733	\$47,787	0.76	172		2.1%	1,411	546	915	-50	-0.3%
56	Administrative and Support and Waste Management and Remediation Services	1,335	\$31,461	0.60	244		4.1%	1,371	627	850	-107	-0.8%
48	Transportation and Warehousing	1,218	\$48,301	0.80	-210		-3.1%	990	506	679	-196	-1.7%
11	Agriculture, Forestry, Fishing and Hunting	863	\$11,558	1.84	26		0.6%	770	378	497	-106	-1.3%
52	Finance and Insurance	807	\$46,250	0.60	-106		-2.4%	586	269	435	-118	-1.6%
42	Wholesale Trade	698	\$45,793	0.53	-121		-3.1%	570	255	422	-107	-1.7%
51	Information	410	\$25,794	0.61	-306		-10.6%	470	153	268	50	1.1%
55	Management of Companies and Enterprises	376	\$56,920	0.74	-168		-7.1%	274	118	201	-45	-1.3%
22	Utilities	308	\$46,671	1.72	-80		-4.5%	229	95	167	-33	-1.1%
53	Real Estate and Rental and Leasing	276	\$31,347	0.47	-36		-2.4%	212	118	140	-45	-1.8%
71	Arts, Entertainment, and Recreation	274	\$36,841	0.40	9		0.7%	347	165	203	-21	-0.8%
99	Unclassified	65	\$28,088	1.24	65		150.2%	64	30	41	-6	-1.0%
	Total - All Industries	34,266	\$38,513	1.00	-2,759		-1.5%	32,223	15,229	20,328	-3,335	-1.0%

Source: JobsEQ®
Data as of 2018Q4
Note: Figures may not sum due to rounding.

Nearly all of the clusters in Cumberland Plateau are forecast to see declines in employment over the next ten years beginning with the fourth quarter of 2018. The exceptions are the healthcare and media

clusters, where employment is expected to grow an average 0.41% and 1.56%, respectively, over the next ten years. The health cluster also pays an annual average wage higher than the average for the region, but it is not considered an export industry. In other words, it grows based on population growth and demographics rather than demand from consumers outside of the region.

Industry Clusters for Cumberland Plateau, VA PDC as of 2018Q4			
Industry Group	Average Annual Employment Forecast Rate(%) 2018Q4-2028Q4	Average Wages	LQ
Textile/Leather	-4.68	\$21,149	1.30
Agricultural	-1.09	\$8,459	1.60
Wood/Paper	-2.47	\$32,625	1.00
Media	1.56	\$22,875	0.70
Auto/Auto-related	-0.96	\$36,678	0.72
Machinery Mfg.	-1.56	\$52,201	1.00
Metal & Product Mfg.	-2.23	\$40,951	1.81
Coal/Oil/Power	-2.14	\$83,106	10.30
Retail	-1.32	\$26,878	1.14
Professional Svc.	-0.67	\$41,556	0.67
Consumer Svc.	-1.02	\$19,181	0.62
Education	-1.24	\$27,736	1.10
Financial Svc.	-1.56	\$44,138	0.60
Construction	-0.30	\$38,859	1.14
Freight Tran.	-2.04	\$51,245	1.18
Utilities	-1.17	\$36,961	2.27
Public Admin.	-1.68	\$35,357	1.48
Health	0.41	\$41,069	0.93
Source: JobsEQ® Data as of 2018Q4			

Occupation Snapshot in Cumberland Plateau, VA PDC, 2018q4

SOC	Title	Current						5-Year History		10-Year Forecast				
		Four Quarters Ending with 2018q4			2018q4			Total Change	Avg Ann % Chg in Empl	Separations			Growth	
		Empl	Avg Ann Wages ¹	LQ	Unempl	Unempl Rate	Online Job Ads ²			Empl	Region	Total New Demand	Exits	Transfers
11-0000	Management Occupations	2,059	\$91,700	0.99	34	1.8%	42	-143	-1.3%	1,333	689	806	-162	-0.8%
13-0000	Business and Financial Operations Occupations	1,273	\$61,900	0.71	38	3.3%	20	-73	-1.1%	1,014	364	725	-75	-0.6%
15-0000	Computer and Mathematical Occupations	741	\$64,300	0.73	21	3.4%	32	3	0.1%	502	128	357	17	0.2%
17-0000	Architecture and Engineering Occupations	469	\$67,900	0.80	16	3.7%	2	-68	-2.7%	282	112	213	-42	-0.9%
19-0000	Life, Physical, and Social Science Occupations	181	\$64,400	0.65	4	2.4%	5	-13	-1.4%	145	46	111	-13	-0.7%
21-0000	Community and Social Service Occupations	675	\$38,800	1.21	16	2.6%	50	20	0.6%	724	267	448	9	0.1%
23-0000	Legal Occupations	187	\$64,700	0.67	4	1.9%	1	-6	-0.6%	93	45	65	-16	-0.9%
25-0000	Education, Training, and Library Occupations	2,245	\$47,900	1.17	54	2.6%	38	-415	-3.3%	1,537	913	873	-249	-1.2%
27-0000	Arts, Design, Entertainment, Sports, and Media Occupations	350	\$41,800	0.57	9	2.9%	12	-55	-2.9%	294	134	184	-25	-0.7%
29-0000	Healthcare Practitioners and Technical Occupations	2,026	\$63,600	1.04	48	2.1%	134	-123	-1.2%	1,034	524	552	-42	-0.2%
31-0000	Healthcare Support Occupations	850	\$28,200	0.89	51	4.8%	25	-7	-0.2%	1,005	483	486	36	0.4%
33-0000	Protective Service Occupations	1,106	\$39,000	1.51	51	4.2%	6	9	0.2%	687	402	472	-188	-1.8%
35-0000	Food Preparation and Serving Related Occupations	2,352	\$20,200	0.80	212	7.3%	152	-22	-0.2%	3,628	1,745	2,084	-201	-0.9%
37-0000	Building and Grounds Cleaning and Maintenance Occupations	880	\$22,700	0.74	66	5.9%	22	22	0.5%	949	509	527	-87	-1.0%
39-0000	Personal Care and Service Occupations	1,217	\$23,400	0.84	56	4.0%	8	62	1.1%	1,816	932	829	55	0.4%
41-0000	Sales and Related Occupations	3,523	\$30,800	1.02	185	4.9%	262	-262	-1.4%	4,392	2,145	2,642	-395	-1.2%
43-0000	Office and Administrative Support Occupations	4,967	\$30,800	1.00	256	4.7%	105	-184	-0.7%	4,544	2,397	2,812	-665	-1.4%
45-0000	Farming, Fishing, and Forestry Occupations	144	\$31,400	0.64	12	7.4%	0	32	5.2%	152	47	134	-29	-2.2%
47-0000	Construction and Extraction Occupations	3,048	\$40,500	1.93	176	5.5%	19	-545	-3.2%	2,719	980	2,063	-323	-1.1%
49-0000	Installation, Maintenance, and Repair Occupations	1,654	\$40,400	1.26	63	3.2%	40	-387	-4.1%	1,220	528	911	-218	-1.4%
51-0000	Production Occupations	1,692	\$35,000	0.82	102	4.7%	37	-176	-2.0%	1,350	604	1,073	-328	-2.1%
53-0000	Transportation and Material Moving Occupations	2,627	\$33,300	1.12	161	5.3%	60	-426	-3.0%	2,391	1,121	1,665	-395	-1.6%
	Total - All Occupations	34,266	\$40,500	1.00	n/a	n/a	1,072	-2,759	-1.5%	31,811	15,115	20,031	-3,335	-1.0%

Source: JobsEQ®

Data as of 2018Q4 unless noted otherwise

Note: Figures may not sum due to rounding.

1. Occupation wages are as of 2017 and should be taken as the average for all Covered Employment

2. Data represent found online ads active within the last thirty days in the selected region; data represents a sampling rather than the complete universe of postings. Ads lacking zip code information but designating a place (city, town, etc.) may be assigned to the zip code with greatest employment in that place for queries in this analytic. Due to alternative county-assignment algorithms, ad counts in this analytic may not match that shown in RTI (nor in the popup window ad list).

Mount Rogers

The manufacturing sector employs the most people in Mount Rogers (Planning District Commission 3) followed by healthcare, retail trade, and accommodation and food services. Based on its current mix of industries, the region is expected to shed an annual average 0.2% employment over the next ten years beginning with the four quarters ending with the fourth quarter of 2018.

Industry Snapshot in Mount Rogers, VA PDC, 2018q4														
NAICS	Industry	Current			5-Year History			10-Year Forecast						
		Four Quarters Ending with 2018q4			Total Change	Empl Last 'n' Years	Avg Ann % Chg in Empl	Separations (Approximate)			Growth			
		Empl	Avg Ann Wages	LQ	Empl	1 3 5	Region	Total New Demand	Exits	Transfers	Empl	Avg Ann Rate		
31	Manufacturing	13,852	\$43,532	2.14	-440		-0.6%	11,287	4,934	8,422	-2,069	-1.6%		
62	Health Care and Social Assistance	11,298	\$37,309	1.01	-2		0.0%	12,460	5,492	5,684	1,284	1.1%		
44	Retail Trade	10,501	\$24,130	1.27	172		0.3%	13,504	6,092	7,706	-294	-0.3%		
72	Accommodation and Food Services	7,122	\$15,407	1.01	87		0.2%	11,342	5,067	6,378	-103	-0.1%		
61	Educational Services	5,162	\$32,233	0.81	-476		-1.8%	4,356	2,233	2,404	-280	-0.6%		
92	Public Administration	4,540	\$40,220	1.23	53		0.2%	3,782	1,717	2,331	-266	-0.6%		
23	Construction	3,869	\$38,342	0.87	228		1.2%	4,048	1,391	2,486	170	0.4%		
56	Administrative and Support and Waste Management and Remediation Services	3,596	\$25,817	0.71	902		5.9%	4,249	1,774	2,406	68	0.2%		
81	Other Services (except Public Administration)	3,578	\$22,728	1.04	617		3.9%	3,874	1,823	2,171	-119	-0.3%		
48	Transportation and Warehousing	2,789	\$44,422	0.80	141		1.0%	2,854	1,247	1,673	-65	-0.2%		
11	Agriculture, Forestry, Fishing and Hunting	2,606	\$13,246	2.43	-13		-0.1%	2,776	1,211	1,590	-25	-0.1%		
42	Wholesale Trade	1,920	\$44,075	0.64	-403		-3.7%	1,823	735	1,215	-127	-0.7%		
54	Professional, Scientific, and Technical Services	1,744	\$48,949	0.33	-61		-0.7%	1,549	563	944	42	0.2%		
52	Finance and Insurance	1,489	\$47,457	0.48	-79		-1.0%	1,284	520	843	-79	-0.5%		
71	Arts, Entertainment, and Recreation	1,196	\$18,852	0.77	90		1.6%	1,703	757	929	17	0.1%		
51	Information	884	\$36,632	0.58	-35		-0.8%	869	313	548	7	0.1%		
55	Management of Companies and Enterprises	799	\$68,933	0.68	-112		-2.6%	694	264	449	-19	-0.2%		
53	Real Estate and Rental and Leasing	557	\$38,077	0.41	-55		-1.9%	511	250	297	-36	-0.7%		
22	Utilities	401	\$45,327	0.98	-58		-2.7%	356	130	230	-3	-0.1%		
21	Mining, Quarrying, and Oil and Gas Extraction	232	\$45,367	0.68	-38		-3.0%	197	73	150	-25	-1.1%		
99	Unclassified	180	\$24,269	1.49	180		n/a	194	84	115	-5	-0.3%		
	Total - All Industries	78,315	\$33,626	1.00	699		0.2%	82,429	36,129	48,228	-1,928	-0.2%		

Source: JobsEQ®
Data as of 2018Q4
Note: Figures may not sum due to rounding.

Most of the clusters in Mount Rogers are forecast to see declines in employment over the next ten years beginning with the fourth quarter of 2018. Exceptions are the healthcare, construction, media, and professional services clusters. Agriculture and consumer services are expected to be roughly stagnant on average over the next ten years. In healthcare, employment is expected to grow an average 1.08% over the next ten years. It also pays an annual average wage higher than the average for the region, but it is not considered an export industry. In other words, it grows based on population growth and demographics rather than demand from consumers outside of the region. Likewise, the construction and utilities clusters are expected to grow 0.37% and -0.04%, respectively, per year on average, and each pay an annual average wage above that of the region overall; still, neither of these are considered an export industry. However, the professional services cluster is expected to grow at an annual average rate of 0.07% and pays an annual average wage above the regional average and is considered an export industry.

Industry Clusters for Mount Rogers, VA PDC as of 2018Q4			
Industry Group	Average Annual Employment Forecast Rate(%) 2018Q4-2028Q4	Average Wages	LQ
Textile/Leather	-3.92	\$21,976	5.05
Food Mfg.	-0.42	\$44,773	1.33
Agricultural	-0.07	\$12,249	2.26
Chemical	-2.19	\$48,497	3.38
Wood/Paper	-1.19	\$30,683	3.12
Electric/Electronics Mfg.	-1.90	\$45,998	1.74
Media	0.32	\$27,404	0.63
Auto/Auto-related	-1.00	\$34,808	3.09
Machinery Mfg.	-1.33	\$47,650	1.25
Metal & Product Mfg.	-1.81	\$48,651	0.82
Coal/Oil/Power	-1.01	\$52,678	0.52
Retail	-0.34	\$27,390	1.11
Professional Svc.	0.07	\$38,566	0.52
Consumer Svc.	-0.08	\$19,272	0.89
Education	-0.50	\$29,143	0.85
Construction	0.37	\$36,981	0.88
Freight Tran.	-0.84	\$45,825	0.85
Utilities	-0.04	\$38,342	1.63
Public Admin.	-0.60	\$39,478	1.23
Health	1.08	\$36,487	1.01
Source: JobsEQ® Data as of 2018Q4			

Occupation Snapshot in Mount Rogers, VA PDC, 2018q4

SOC	Title	Current							5-Year History		10-Year Forecast				
		Four Quarters Ending with 2018q4			2018q4				Total Change	Avg Ann % Chg in Empl	Total New Demand	Separations		Growth	
		Empl	Avg Ann Wages ¹	LQ	Unempl	Unempl Rate	Online Job Ads ²	Empl	Region	Exits		Transfers	Empl	Avg Ann Rate	
11-0000	Management Occupations	5,157	\$90,100	1.09	67	1.3%	134	-105	-0.4%	3,878	1,923	1,964	-10	0.0%	
13-0000	Business and Financial Operations Occupations	2,317	\$61,700	0.57	63	2.6%	56	-3	0.0%	2,010	681	1,356	-27	-0.1%	
15-0000	Computer and Mathematical Occupations	982	\$65,600	0.42	28	2.6%	20	-54	-1.1%	677	172	474	32	0.3%	
17-0000	Architecture and Engineering Occupations	1,185	\$72,900	0.88	32	2.7%	19	-143	-2.3%	760	291	527	-59	-0.5%	
19-0000	Life, Physical, and Social Science Occupations	360	\$72,600	0.57	7	1.7%	12	-3	-0.2%	303	94	219	-11	-0.3%	
21-0000	Community and Social Service Occupations	1,884	\$37,800	1.48	33	1.9%	163	164	1.8%	2,261	779	1,298	185	0.9%	
23-0000	Legal Occupations	377	\$78,800	0.59	5	1.4%	2	10	0.6%	228	93	135	1	0.0%	
25-0000	Education, Training, and Library Occupations	4,012	\$44,400	0.91	85	2.0%	67	-315	-1.5%	3,247	1,714	1,641	-108	-0.3%	
27-0000	Arts, Design, Entertainment, Sports, and Media Occupations	980	\$43,200	0.70	23	2.4%	54	8	0.2%	868	394	514	-40	-0.4%	
29-0000	Healthcare Practitioners and Technical Occupations	4,186	\$61,800	0.94	75	1.6%	321	31	0.1%	2,566	1,137	1,188	241	0.6%	
31-0000	Healthcare Support Occupations	2,110	\$25,900	0.97	92	3.8%	102	58	0.6%	2,691	1,251	1,218	222	1.0%	
33-0000	Protective Service Occupations	1,785	\$38,400	1.06	60	3.4%	39	41	0.5%	1,422	729	812	-118	-0.7%	
35-0000	Food Preparation and Serving Related Occupations	6,972	\$20,200	1.04	414	5.6%	466	92	0.3%	11,802	5,294	6,533	-25	0.0%	
37-0000	Building and Grounds Cleaning and Maintenance Occupations	2,612	\$22,300	0.96	131	4.5%	114	59	0.5%	3,179	1,592	1,617	-30	-0.1%	
39-0000	Personal Care and Service Occupations	3,290	\$21,300	0.99	109	3.1%	51	56	0.3%	5,397	2,641	2,367	389	1.1%	
41-0000	Sales and Related Occupations	8,366	\$29,500	1.06	329	3.8%	747	65	0.2%	11,585	5,318	6,511	-245	-0.3%	
43-0000	Office and Administrative Support Occupations	10,524	\$30,200	0.93	418	3.7%	290	648	1.3%	10,837	5,251	6,238	-652	-0.6%	
45-0000	Farming, Fishing, and Forestry Occupations	438	\$25,900	0.86	24	5.5%	3	43	2.1%	586	155	458	-28	-0.7%	
47-0000	Construction and Extraction Occupations	3,289	\$37,200	0.91	177	4.7%	63	113	0.7%	3,396	1,169	2,152	75	0.2%	
49-0000	Installation, Maintenance, and Repair Occupations	3,185	\$39,900	1.06	97	2.6%	124	4	0.0%	2,842	1,094	1,842	-94	-0.3%	
51-0000	Production Occupations	8,976	\$34,200	1.89	376	3.9%	141	-193	-0.4%	7,714	3,340	5,807	-1,433	-1.7%	
53-0000	Transportation and Material Moving Occupations	5,327	\$31,300	0.99	267	4.5%	196	122	0.5%	6,066	2,537	3,722	-192	-0.4%	
	Total - All Occupations	78,315	\$37,600	1.00	n/a	n/a	3,184	699	0.2%	84,315	37,650	48,593	-1,928	-0.2%	

Source: JobsEQ®

Data as of 2018Q4 unless noted otherwise

Note: Figures may not sum due to rounding.

1. Occupation wages are as of 2017 and should be taken as the average for all Covered Employment

2. Data represent found online ads active within the last thirty days in the selected region; data represents a sampling rather than the complete universe of postings. Ads lacking zip code information but designating a place (city, town, etc.) may be assigned to the zip code with greatest employment in that place for queries in this analytic. Due to alternative county-assignment algorithms, ad counts in this analytic may not match that shown in RTI (nor in the popup window ad list).

Appendix 1.4: Transferable Jobs from Coal Mining

Loading Machine Operators, Underground Mining (53-7033). The table on the following page shows potential occupations for which coal miners in the GO VA 1 labor shed are suitable to be trained. The nine bolded occupations in the first row are coal industry jobs with employment over 100 in the GO VA 1 labor shed. The ten occupations below each coal job title are the top jobs for which workers in the specified coal mining job can most easily be trained. It excludes any occupations that employ less than ten people in the region. For example, operating engineers in GO VA 1 have skills that lend themselves towards most easily re-training to be tapers as well as welders, cutters, solderers, and brazers. The number in parentheses after the job title refers to the current employment in the GO VA 1 labor shed. As workers are not as likely to take pay cuts when changing jobs, occupations with average annual wages less than 90% of the coal mining job's wage are excluded.

Occupations highlighted in green in the table on the next page are the transferable jobs from coal mining that support manufacturing industries. The predominant employer of these jobs is manufacturing. These eight occupations are summarized in the table below. Many of these jobs, especially first-line supervisors of production and operating workers, are projected to have a high level of separations (workers that are retiring or switching to a new occupation) over the next ten years. In addition, if the region is successful in growing its manufacturing sector, demand for these occupations will climb higher. A large supply of potential labor needing minimal training can already be found in the region's coal mining industry. If coal mining employment continues to decline, these in-demand manufacturing occupations offer comparable wages and minimal additional training requirements to workers whose jobs may be in jeopardy.

Manufacturing Occupations that Transfer from Prevalent Coal Mining Jobs in the GO VA Region One Labor Shed					
SOC	Title	Current		Forecast Over the Next 10 Years	
		Employment 2018Q4	Avg. Annual Wages 2017	Total Separations	Total Growth Demand
51-4121	Welders, Cutters, Solderers, and Brazers	2,049	\$40,200	2,103	2,017
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	332	\$40,200	320	265
49-9043	Maintenance Workers, Machinery	508	\$44,800	494	458
51-4052	Pourers and Casters, Metal	27	\$38,200	23	16
51-4051	Metal-Refining Furnace Operators and Tenders	68	\$43,800	62	53
51-8093	Petroleum Pump System Operators, Refinery Operators, and Gaugers	99	\$58,900	90	78
17-3023	Electrical and Electronic Engineering Technicians	471	\$59,400	388	361
51-1011	First-Line Supervisors of Production and Operating Workers	3,077	\$61,700	2,817	2,531

Source: JobsEQ
 Note: occupation wages should be taken as the average for all covered employment

Operating Engineers and Other Construction Equipment Operators (47-2073)	Continuous Mining Machine Operators (47-5041)	Roof Bolters, Mining (47-5061)	Supervisors of Construction and Extraction Workers (47-1011)	Excavating and Loading Machine and Dragline Operators (53-7032)	Electricians (47-2111)	Mobile Heavy Equipment Mechanics, Except Engines (49-3042)	Heavy and Tractor-Trailer Truck Drivers (53-3032)	Mine Cutting and Channeling Machine Operators (47-5042)	Mine Shuttle Car Operators (53-7111)	General Maintenance and Repair Worker (49-9071)
47-2082 Tapers (47)	53-7111 Mine Shuttle Car Operators (104)	49-3043 Rail Car Repairers (155)	49-2093 Electrical and Electronics Installers and Repairers, Transportation Equipment (58)	47-2082 Tapers (47)	47-2082 Tapers (47)	49-3043 Rail Car Repairers (155)	43-5052 Postal Service Mail Carriers (1413)	53-7111 Mine Shuttle Car Operators (104)	47-5021 Earth Drillers, Except Oil and Gas (80)	47-2051 Cement Masons and Concrete Finishers (502)
51-4121 Welders, Cutters, Solderers, and Brazers (2,049)	47-5061 Roof Bolters, Mining (211)	53-7073 Wellhead Pumps (51)	51-8012 Power Distributors and Dispatchers (44)	51-4121 Welders, Cutters, Solderers, and Brazers (2049)	53-7041 Hoist and Winch Operators (16)	53-7021 Crane and Tower Operators (179)	43-5041 Meter Readers, Utilities (183)	51-8093 Petroleum Pump System Operators, Refinery Operators, and Gaugers (99)	47-5041 Continuous Mining Machine Operators (383)	51-4122 Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders (332)
51-4122 Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders (332)	53-7033 Loading Machine Operators, Underground Mining (79)	49-9043 Maintenance Workers, Machinery (508)	27-2021 Athletes and Sports Competitors (44)	51-4122 Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders (332)	49-3043 Rail Car Repairers (155)	51-8013 Power Plant Operators (179)	53-7041 Hoist and Winch Operators (16)	51-8013 Power Plant Operators (179)	53-7033 Loading Machine Operators, Underground Mining (79)	47-5071 Roustabouts, Oil and Gas (136)
47-2121 Glaziers (124)	49-3043 Rail Car Repairers (156)	49-2093 Electrical and Electronics Installers and Repairers, Transportation Equipment (58)	53-6051 Transportation Inspectors (96)	53-7041 Hoist and Winch Operators (16)	47-2171 Reinforcing Iron and Rebar Workers (55)	51-8021 Stationary Engineers and Boiler Operators (164)	53-4021 Railroad Brake, Signal, and Switch Operators (94)	53-7073 Wellhead Pumps (51)	49-3043 Rail Car Repairers (155)	53-7041 Hoist and Winch Operators (16)
53-7041 Hoist and Winch Operators (16)	53-7021 Crane and Tower Operators (180)	53-7033 Loading Machine Operators, Underground Mining (79)	49-9012 Control and Valve Installers and Repairers, Except Mechanical Door (186)	47-5042 Mine Cutting and Channeling Machine Operators (140)	53-7021 Crane and Tower Operators (179)	49-2093 Electrical and Electronics Installers and Repairers, Transportation Equipment (58)	43-5011 Cargo and Freight Agents (156)	53-7032 Excavating and Loading Machine and Dragline Operators (333)	47-5012 Rotary Drill Operators, Oil and Gas (56)	43-5041 Meter Readers, Utilities (183)
47-2081 Drywall and Ceiling Tile Installers (252)	53-7073 Wellhead Pumps (51)	51-8093 Petroleum Pump System Operators, Refinery Operators, and Gaugers (99)	49-9051 Electrical Power-Line Installers and Repairers (1045)	47-2161 Plasterers and Stucco Masons (68)	47-2021 Brickmasons and Blockmasons (294)	47-5021 Earth Drillers, Except Oil and Gas (80)	53-4031 Railroad Conductors and Yardmasters (300)	47-5021 Earth Drillers, Except Oil and Gas (80)	53-7021 Crane and Tower Operators (179)	51-4052 Pourers and Casters, Metal (27)
47-2044 Tile and Marble Setters (151)	51-8092 Gas Plant Operators (69)	47-5031 Explosives Workers, Ordnance Handling Experts, and Blasters (33)	51-8099 Plant and System Operators, All Other (73)	47-2044 Tile and Marble Setters (151)	47-2221 Structural Iron and Steel Workers (279)	53-7073 Wellhead Pumps (51)	53-3021 Bus Drivers, Transit and Intercity (515)	53-7033 Loading Machine Operators, Underground Mining (79)	49-3011 Aircraft Mechanics and Service Technicians (293)	49-3021 Automotive Body and Related Repairers (704)
51-4052 Pourers and Casters, Metal (11)	47-4061 Rail-Track Laying and Maintenance Equipment Operators (77)	47-4061 Rail-Track Laying and Maintenance Equipment Operators (77)	17-3023 Electrical and Electronic Engineering Technicians (471)	47-2073 Operating Engineers and Other Construction Equipment Operators (2249)	51-8021 Stationary Engineers and Boiler Operators (164)	49-9043 Maintenance Workers, Machinery (508)	47-5021 Earth Drillers, Except Oil and Gas (80)	53-7041 Hoist and Winch Operators (16)		49-3043 Rail Car Repairers (155)
47-2071 Paving, Surfacing, and	51-8099 Plant and System Operators, All	53-7021 Crane and Tower	51-1011 First-Line Supervisors of	49-3043 Rail Car Repairers (155)	49-2093 Electrical and Electronics	49-9097 Signal and Track Switch	33-9093 Transportation Security	49-3021 Automotive Body and		47-2044 Tile and Marble

Tamping Equipment Operators (12)	Other (73)	Operators (179)	Production and Operating Workers (3077)		Installers and Repairers, Transportation Equipment (58)	Repairers (52)	Screeners (76)	Related Repairers (704)		Setters (151)
51-8099 Plant and System Operators, All Other (14)	51-4051 Metal-Refining Furnace Operators and Tenders (68)	53-6051 Transportation Inspectors (96)	13-1199 Business Operations Specialists, All Other (2207)	49-3021 Automotive Body and Related Repairers (704)	47-5021 Earth Drillers, Except Oil and Gas (80)	51-8093 Petroleum Pump System Operators, Refinery Operators, and Gaugers (99)	53-7021 Crane and Tower Operators (179)	49-9043 Maintenance Workers, Machinery (508)		51-9051 Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders (131)

Source: JobsEQ

Appendix 2: Region One High School Graduation Rates (2017)

Region One High School Graduation Rates (2017)					
Locality	Division Graduation Rate Percentage	State Graduation Rate	National Graduation Rate (2017)	Post Graduate Enrollment Percentage	# of Students Earning Industry Credentials
Bland	95.2	91.6	85	72	124
Buchanan	90			64	518
Carroll	91.3			53	616
Dickenson	91.4			54	393
Grayson	90.6			62	385
Lee	84.5			63	246
Russell	89.6			70	928
Scott	94.6			67	581
Smyth	94.9			60	323
Tazewell	88.9			72	934
Washington	91.6			71	1700
Wise	96.3			65	892
Wythe	93.5			72	1157
Bristol	90.7			68	234
Galax	92.9			69	326
Norton	95.3	70	51		

Source: Bristol Virginia School Board

Appendix 3: Industry Target SWOT Analysis

Advanced Manufacturing

	Strengths	Challenges	Opportunities	Threats
Economic Factors	<ul style="list-style-type: none"> • GDP supporting incoming wealth to the region • Wages can attract employers seeking lower cost of goods produced • Industry experienced an increase in employment and average annual wages 	<ul style="list-style-type: none"> • Manufacturing sector has been in decline for the past two decades but seems to be leveling 	<ul style="list-style-type: none"> • GO VA investments in projects that lift wages within target clusters 	<ul style="list-style-type: none"> • Continued loss of millennials which affects quality of life and workforce • Available labor may be tight in the future if this trend continues

Workforce	<ul style="list-style-type: none"> • LQ: 1.49 shows a sufficient supply of workers to attract new firms • Unemployed miners have transferrable skills into manufacturing • Manufacturing culture is established and competitive but has some deficiencies as well • Established Southwest Virginia Alliance for Manufacturers 	<ul style="list-style-type: none"> • Lack of industry recognized credentials and certifications; need more engagement from employers • Lack of understanding of occupations available • Lack of alignment in educational programs with needs of industry • Current training system isn't as responsive and flexible as regional companies need it to be 	<ul style="list-style-type: none"> • Development or alignment of communication with employers regarding existing resources available for workforce development • Target groups of workforce to include those on Temporary Assistance for Needy Families, those in recovery, and returning citizens. • Opportunities to coordinate across existing initiatives to focus on the following priorities: <ol style="list-style-type: none"> 1. Align existing skillsets of unemployed miners to advanced manufacturing skillsets and support credentialing 2. Align educational programs with needs of industry; create industry clusters: nest career pathways inside sector strategies 3. Include advanced manufacturing curricula (design, coding, robotics in K12) 4. Find creative ways to strengthen the pipeline to programs 5. Create apprenticeship and internship programs 	<ul style="list-style-type: none"> • Low enrollment rates may not help close skills gaps • Mindset of the unemployed working 2-3 jobs to bring in income is hindering enrollment • The reality of time management for upskilling vs. short-term needs for income
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Infrastructure	<ul style="list-style-type: none"> • 10 industrial parks • 2 – 3 new ones in the planning stages • 4 established Center of Excellence sites 	<ul style="list-style-type: none"> • Some parks may not have all of the necessary infrastructure needed to support target industries • Lack of certifications for the majority of the industrial parks 	<ul style="list-style-type: none"> • Multiple sites are available and some are potentially product ready. 	<ul style="list-style-type: none"> • The lack of access to asset data threatens our ability to tell our story fully
Innovation	<ul style="list-style-type: none"> • Some R&D work is underway with existing manufacturers • Access to business supportive resources such as GENEDGE and Manufacturing Technology Center 	<ul style="list-style-type: none"> • Lack of critical mass of R&D • Few new, emerging businesses are recruited to the area because they are perceived as too risky with such scarce resources • The reach of GENEDGE and MTC is too restricted. 	<ul style="list-style-type: none"> • Select the right projects to grow tech transfer into targeted clusters • Connect to the specifics of the companies currently engaged in R&D efforts • Proximity to VA Tech, ETSU, and tele-initiatives from UVA to UVa-Wise • Change VA policies to broaden the scope of GENEDGE and MTC • Working groups can raise awareness of expanded scope and missions 	<ul style="list-style-type: none"> • Few new, emerging businesses are recruited to the area as they are seen as too risky with such scarce resources

Agriculture and Food/Beverage Manufacturing

	Strengths	Challenges	Opportunities	Threats
Economic Factors	<ul style="list-style-type: none"> GDP reflects baseline exports supporting a growing basic industry 33% of the cattle sold in VA is from the region and 35% of the wealth generated. Wages: \$42,831 AAR is an attractive (low) wage for food processing companies looking to boost their profits 	<ul style="list-style-type: none"> Tends to be lower wage occupations Industry is projected to decline over time due to automation, innovation, and productivity gains 	<ul style="list-style-type: none"> Vertically integrate industry cluster connecting agribusiness' supply chain Identify opportunities to add value to existing agriculture and forestry activities 	<ul style="list-style-type: none"> Organic livestock prices drop nationally Population decline Disinvestment
Workforce	<ul style="list-style-type: none"> LQ of 2.15 Ample supply of labor with only a few exceptions to include difficulties in finding experienced labor and state opposition Some shared skillsets exist between agribusiness and manufacturing Recently established Smart Farming program at Mountain Empire Community College 	<ul style="list-style-type: none"> Lack of industry recognized credentials and certifications, and understanding of the industry needs Lack of understanding of occupations available in agribusiness Lack of alignment in educational programs with needs of industry Aging farmers and lack of next generation growers 	<ul style="list-style-type: none"> Work with existing agribusinesses to seek new value added opportunities Align educational programs with needs of industry, supporting agriculture and forestry entrepreneurship Development of the SWVA Livestock & Educational Center, offering internships to students interested in the agriculture industry 	<ul style="list-style-type: none"> Lack of knowledge of educational programs may not close skills gaps Current image of "farming" and lack of knowledge of occupation prospects may not attract the next generation of growers therefore limiting growth in industry

<p style="text-align: center;">Infrastructure</p>	<ul style="list-style-type: none"> Existing Farms (8,705) Presence of heritage breeds and legacy farms contribute to a regional identity in this sector Region has abundant water and good climate for certain crops 	<ul style="list-style-type: none"> Shortage of grazing land for grass fed cattle Gap in food processing facilities in region – specifically slaughter and processing firms Gaps in organically certified farms Not all industrial sites have access to rail – an important component for food/beverage processing 	<ul style="list-style-type: none"> Multiple sites are project ready but could benefit from being certified for food/beverage manufacturing There is capacity for more medium-sized food/beverage processing companies and suppliers could be recruited to the region 	<ul style="list-style-type: none"> The labor-intensive process for obtaining certification may hinder a locality's ability to work through the process Farm acreage decreased -10.7 in the region, compared to -6.1 in VA, indicating a decline in agriculture
<p style="text-align: center;">Innovation</p>	<ul style="list-style-type: none"> Some small-scale agriculture R&D work is underway (maple syrup, and industrial hemp) which may lead to new products and markets Appalachian Sustainable Development has a well-defined network of farmers/growers and ability to deliver training/education Rooted in Appalachia is an 18-month produce initiative that is catching on in the region 	<ul style="list-style-type: none"> Few existing farms are exploring R&D or innovation to new product or systems; Few agribusinesses have continuous improvement mindsets 	<ul style="list-style-type: none"> The region needs more information on the "as is" state of R&D spending in the region (current state) Grocers and growers in vertically integrated business may have a win/win value proposition 	<ul style="list-style-type: none"> Negative trends for new farmer entries into the region Lack of recruiting people into educational programs

Information and Emerging Technology

	Strengths	Challenges	Opportunities	Threats
Economic Factors	<ul style="list-style-type: none"> • Export service industry • Among the highest wages in the region, but lower than the state and nation • Low cost of living, resulting in firms paying lower salaries, which may attract corporations to the region • Growing sector across all industries • Low corporate tax rate and utility costs, excluding network expenses • Various incentives available to companies 	<ul style="list-style-type: none"> • Only a few IT firms exist in the region; hard to justify a sector strategy within the larger professional business services cluster when the sector has only two large firms 	<ul style="list-style-type: none"> • Research supports some millennials and creative workers prefer a non-urban place to live and work 	<ul style="list-style-type: none"> • Perceptions remain about the region's lack of assets for creative workers

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Workforce</p>	<ul style="list-style-type: none"> • Emerging cluster with CGI, NGC, DP Facilities South and Wize Solutions • Data support adequate labor availability • CGI and NGC success stories; 700+ employees between the two companies over 10 years in the region • Skills are transferrable to various industries • Educational system is strong and focused on building IT, cyber and UAV skills • Firms employing IT professionals experience lower attrition in the region than urban centers • MECC's Smart Farming program established the first Unmanned Aerial Associates Degree program in the state 	<ul style="list-style-type: none"> • Lack of industry recognized credentials and certifications, as well as understanding of the industry needs limits ability to attract participants into programs • Lack of understanding of occupations available limits enrollment in programs • Lack of alignment in educational programs with needs of industry especially new/emerging technologies; need more engagement from employers • STEM Focus: skillset requires critical thinking skills often developed in Math and Science courses • Unused capacity/low enrollment in technology programs 	<ul style="list-style-type: none"> • Growing interest in STEM • A data-driven approach is gaining traction with all economic development efforts • Institutions of education and training are moving toward more internships, opening up opportunities for expanding the Ignite Internships program 	<ul style="list-style-type: none"> • Population decline makes it challenging to recruit the next generation of workers (replacements) • Math skills won't have an opportunity to mix/blend with business acumen • High school graduates are discouraged about their access to higher education • Continued funding for programs recently started through grant funding
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<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Infrastructure</p>	<ul style="list-style-type: none"> • Redundant and robust fiber in technology parks and major regional thoroughfares • Redundant electrical grid • Outdoor amenities attractive to technology professionals are abundant in the region 	<ul style="list-style-type: none"> • Keeping broadband infrastructure up to date • Lack of last-mile and middle-mile coverage throughout the region • Lack of co-working spaces for people who work remotely • Competitive wages may not be attractive when recruiting experienced workers from outside the region although cost of living is lower in the region • No one outside the region knows the CGI and NGC success story as it relates to workforce 	<ul style="list-style-type: none"> • Capacity continues to increase for site-readiness with the establishment of two new RIFAs in the region • Region has made some early stage investments into UAV • Synergies exist between Eastern Kentucky and the UAV Center • Funding made available through the Cumberland Plateau Company's CProp to reinvest income revenues from the CPC Broadband project 	<ul style="list-style-type: none"> • Aging broadband infrastructure threatens the region's ability to recruit and sustain technology businesses • Other rural areas across the U.S. are catching up to the region with broadband deployment; competition is increasing
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Innovation</p>	<ul style="list-style-type: none"> • Success story of UAV flight with Medicine Drop at RAM puts the region on the map for innovation in unmanned systems • Relationships built with UAV companies (Flirty and Aurora) 	<ul style="list-style-type: none"> • Low activity in new business startups in the technology space exists in the region • Few small to medium-sized technology firms exist in SWVA 	<ul style="list-style-type: none"> • UAVs provide distribution options in the absence of interstate highways moving goods and services 	<ul style="list-style-type: none"> • Politics and red tape involved with inter-state partnerships could present barriers

Energy and Minerals

	Strengths	Challenges	Opportunities	Threats
Economic Factors	<ul style="list-style-type: none"> • GDP 8.5%; High export industries 2.6% Labor Shed; .3% VA • Abundant Workforce • Among the highest wages in the region (\$77,591) • Pilot Wind/Solar/hydroelectric "pump storage" projects being explored • Highest quality metallurgical coal in the world exists in Region One • Access to VA Tech's world class mining engineering program • Research initiated in rare earth minerals and other uses of carbon 	<ul style="list-style-type: none"> • Continued expected decline in coal and natural gas markets • The decline affects suppliers, small community businesses, schools, local governments, etc. • Lack of profitable business model for much of solar, wind and alternate sources of energy • Public sentiment against fossil fuels (coal and gas) • Limited investor potential coupled with complex governmental regulations for assistance such as Opportunity Zones. 	<ul style="list-style-type: none"> • Policies for possible revenue-sharing authorities across multiple jurisdictions can benefit from a "win" (e.g. pump storage, solar, etc.) • Continuing global demand for metallurgical coal for steel industry • Potential to pioneer rare earth metals production from coal processing 	<ul style="list-style-type: none"> • Commercial power providers withdraw support from alternative energy projects • Continued declines in fossil fuels • Global competition for met coal • Economics of new technology

Workforce	<ul style="list-style-type: none"> • LQ : 3.22 (Mining - highest concentration of any skillset in the region which equals a competitive advantage) Highest concentration of expertise fall in energy section in GOVAR1 • Existing skillsets are transferrable to various manufacturing operations 	<ul style="list-style-type: none"> • Lack of industry recognized credentials and certifications and understanding of the industry needs • Lack of understanding of occupations available • Lack of alignment in educational programs with needs of industry especially alternative energy • Aging workforce; workforce outwardly migrating or considering relocation • Mindset • Historical high wages within coal industry • Historical perception of labor unions in region. 	<ul style="list-style-type: none"> • Find creative ways to boost enrollment in manufacturing or other training programs leveraging existing skillsets from training and experienced miners • Leverage industry expertise in creative ways such as establishing a test mine with resident experts to test new systems /equipment 	<ul style="list-style-type: none"> • Population decline makes it challenging to recruit the next generation or workers in alternative energy • Lack of available jobs threaten the success of any new workforce program success in recruitment • Time requirements for certifying experienced technical workers
Infrastructure	<ul style="list-style-type: none"> • Redundant and robust electrical grid • Existing unused mines and mineral resources • Regulatory agencies such as DMME are supportive of alternative energy and new uses of reclaimed and abandoned mine land • Abundant reclaimed land for development 	<ul style="list-style-type: none"> • Decline in railroad usage may threaten the continued upkeep and existence of existing railways for CSX and NS • Access to power grid from suitable alternative energy sites (reclaimed land) • Significant acreage both surface and mineral held by non-resident corporations. 	<ul style="list-style-type: none"> • Reuse of available mine land for solar farms or higher altitude areas for wind farms • Continuing production of coal provides opportunity for rare earth metal recovery 	<ul style="list-style-type: none"> • Continued or lack of public support for alternative energy projects (e.g. wind, solar, pump storage, etc.) • Advancement of battery or storage capabilities • Sentiment against "old coal"

Innovation	<ul style="list-style-type: none"> • Current research being conducted on coal to carbon products • Current research underway on retrieving rare earth metals • Potential of carbon based products from wood products (pellets) 	<ul style="list-style-type: none"> • Lack of critical mass of R&D and advanced research in these fields of study • Lack of funds in SWVA to recruit early-stage, emerging technology companies • Time required to develop commercial projects and incentive investments 	<ul style="list-style-type: none"> • Leverage and explore new technology of carbon based products including economics • Leverage research results on retrieving rare earth metals 	<ul style="list-style-type: none"> • Timeframe for progress on research for both coal to carbon and rare earth minerals may be significant
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Appendix 4: TEconomy Partners Region One Entrepreneurial Assessment

TEconomy Partners, LLC was engaged by the GO Virginia State Board to provide each GO Virginia region an assessment of its entrepreneurial development position, to facilitate a situational assessment of the region's entrepreneurial ecosystem, and to help identify with local leaders priority actions to help strengthen the ecosystem. The following slides outline their assessment in Region One and recommended priority actions.

Assessment of Ideation in Region 1

Overall Assessment:

Region is enhancing ecosystem via well-organized efforts of Opportunity SWVA but demonstrates limited deal flow for new traded sector startups, lacks “critical mass” despite emerging activities and identified opportunities.

Strengths and Opportunities:

- High concentrations of startups (10-year cohort) in region's targeted industry clusters including Advanced Mfg., Ag & Food Processing, Energy/Natural Resource Products
- Patent growth – the region more than doubled its patents from 2014 to 2017, though from a small base (17 to 40)
- Positive in-migration of top talent, along with growth overall in the highly-educated working age population
- Emergence of regional Business Challenges energizing grassroots ideation though largely “lifestyle” companies in nature (non-traded sector)
- Opportunities raised regarding Cybersecurity; Drone tech; Coal by-products; Agriculture
- Major emphasis on, successes with tourism startups

Gaps and Weaknesses:

- Patent levels lag the state and comparable rural regions on a per capita basis
- Concerns regarding fundamental entrepreneurial acumen and culture in the region
- Lack of regional entrepreneurial “deal flow” or “critical mass” in traded sectors; activity largely in non-traded areas

1

Assessment of Commercial Viability in Region 1

Overall Assessment:

Region has a lack of value-added, domain-specific entrepreneurial services and resources to advance promising early-stage companies.

Strengths and Opportunities:

- Strength of efforts by SBDCs, VA Community Capital, Others for guidance/consulting; however, not domain-specific
- Access to SBA Microloans via People, Inc.

Gaps and Weaknesses:

- Lack of a regional accelerator program
- Insufficient entrepreneurial mentoring in the region
- Gap in/need for Angel investor funding
- Very few federal SBIR/STTR awards to small, innovative companies; lags the state on per capita basis, but comparable to other rural regions

2

Assessment of Market Entry in Region 1

Overall Assessment:

Region has assets to leverage but lacks venture and other key sources of risk capital as well as the serial entrepreneurs and mentors vital to this stage of company development.

Strengths and Opportunities:

- Employment in and growth from younger, traded sector firms – share comparable to state and ahead of other rural regions; young firms contributing to overall growth
- VCEDA Seed Capital Matching Fund making a significant difference (see sidebar)
- Several regional incubator assets: Abingdon, Pioneer Center, Richlands, Crossroads (Galax), The Nest at UVa-Wise (new)
- Strength and support of Opportunity SWVA and local/regional economic development organizations

Gaps and Weaknesses:

- Lack of serial entrepreneurs for mentoring/business assistance
- VC Investments – no regional investments/deal activity in recent years

VCEDA Seed Capital Matching Fund Assisting Early-Stage Companies

The Virginia Coalfield Economic Development Authority has implemented a Seed Capital Matching Fund in the last year and a half to support regional entrepreneurs. The funds, with a maximum award of \$10,000 with a required match, are flexible to broadly cover business expenses, for example for equipment purchases or working capital.

To date, 36 small businesses have received a grant award and cumulatively employ approximately 300 in the SWVA region. While the majority are not in traded sector industries, in the latest round 3 companies with drone technologies received awards.

3

Assessment of Growth & Scalability in Region 1

Overall Assessment:

Entrepreneurship bolstering employment declines in most all major traded sectors; though concerns regarding follow-on funding, and broader challenges of population decline and workforce skills to significantly scale regional companies.

Strengths and Opportunities:

- Major industry clusters active in entrepreneurial development, adding net new jobs (see sidebar)

Gaps and Weaknesses:

- SBA loan volume, value, and change are lagging state and comparable rural regions
- Working age population declines, especially young working age adults
- Lack of sources for follow-on funding a concern for scale-up

Industry Cluster	Economic Development Position in Region	Contribution of Entrepreneurship
Agriculture & Food Processing	Emerging Strength	Very Significant
Business Services	Sizable/Weak Growth	Very Significant
Energy, Natural Resources, & Finished Products	Specialized/Declining	Very Significant
Engineering, R&D, Testing & Technical Services	Declining	Very Significant
Financial & Insurance Services	Emerging Strength	Very Significant
Health Care Services	Sizable/Declining	Very Significant
Information Technology & Communications Services	Emerging Strength	Significant
Life Sciences	Declining	Very Significant
Manufacturing	Specialized/Declining	Very Significant
Ship Building, Aerospace, & Defense	Declining	Minimal
Transportation, Distribution and Logistics	Sizable/Declining	Very Significant

4

Potential Priority Actions Identified for Entrepreneurial Development in Region 1

- Promote and develop stronger ideation programming, resources targeting traded sector opportunities.
- Establish intensive accelerator programming and domain-specific resources to advance, scale promising early-stage startups.
- Address need for more startup risk capital for early-stage market entry by traded sector companies in the region.
- Concept of a “Regional Entrepreneurial Quarterback”.

Potential Priority Action: Promote and develop stronger ideation programming, resources targeting traded sector opportunities.

Rationale:

- Address limited deal flow/ideation for traded sectors in the region with opportunities identified in several existing, emerging tech areas, many of which represent broader state strengths with opportunities to align.
- Seize momentum of (and expand) regional business/pitch competitions, entrepreneurship programming and emphasis at UVa.-Wise, ecosystem work of Opportunity SWVA.



Possible Activities:

- **Seek collaborative opportunities with other VA regions/organizations via pilot projects in targeted technology/industry areas**, e.g. drone technologies, agriculture, Cybersecurity, coal by-products – all areas with broader state industry, research strengths.
- **Collaborate with Statewide SBDC's Innovation Commercialization Assistance Program and possibly other universities with NSF iCorps sites** (such as UVA) to support ideation programs in the region with targeted outreach to companies receiving SBIRs and broader base of technology-oriented potential entrepreneurs in the region – tap into networks of counselors found across NSF iCorps sites in Virginia.
- **Provide matching funds for business challenges** across the region to enhance participation, incent ideation in traded sector tech, market areas.
- **Establish a talent outreach program that supports experiential learning projects and entrepreneurial exploration with students** in relevant courses/degree programs through collaborations with faculty.
- **Encourage entrepreneurship by creating 1-stop website for entrepreneurs** to coordinate resources/assistance along with “success stories”. Importance of highlighting successes within the region to promote entrepreneurship.

Illustrative Best Practice Examples:

- **Charlotte:** Ventureprise at UNC, Charlotte leverages its NSF i-Corps site to bring a customer discovery/mentorship program to non-university related, early-stage, innovation-driven startups in the region. Successful teams then able to tap micro-grant (up to \$10k) or seed grant (up to \$50k) from statewide NC IDEA program.
- **Oklahoma:** i2e Venture Assessment Program designed to help entrepreneurs investigate product/market fit of a new business concept through a five week program of workshops and individual feedback and direction with follow-on recommendations on next steps needed to advance business concept.
- **Nashville:** Vanderbilt Wond'ry Innovation Garage program pairs a corporate sponsor with teams of Vanderbilt students and faculty to tackle an issue or project identified by the company, with both undergrad and graduate students participating and committing to 5-10 hours per week.

6

Potential Priority Action: Establish intensive accelerator programming and domain-specific resources to advance, scale promising early-stage startups.

Rationale:

- Need for deeper value-added services, guidance, mentoring, fundamental business guidance to entrepreneurs with promising early-stage companies in advanced technologies and traded sectors.
- Clusters of regional strength and activity require domain-specific expertise lacking in the region (e.g. in agriculture, drone technologies, potentially cybersecurity).
- Need for additional resources and guidance on how to access, for example federal SBIR/STTR awards, SBA loans.



Possible Activities:

- **Create intensive accelerator programming**, perhaps at Uva-Wise aligned with new Nest facility and entrepreneurship programming, in a multi-week or phase “bootcamp” model, with a complementary pilot program with Entrepreneur(s)-in-Residence (EIRs) to assist in advisory roles and to link innovation to market opportunities.
- **Leverage regional presence of UVa.** to tap into broader expertise of i.Lab, Darden School of Business, related programming and resources.
- **Further examine, engage traded sector companies** that have received VA-CEDA Seed Capital Matching Funds, won pitch competitions for potential accelerator, value-added services.

Illustrative Best Practice Examples:

- **Chattanooga, TN:** Co.Starters 9 week lean startup program followed by Co.Lab Accelerator mentoring program for high-growth potential startups
- **Raleigh-Durham:** Blackstone Entrepreneurs Network North Carolina that provides expert venture coaching through a veteran group of EIRs

7

Potential Priority Action: Address need for more startup risk capital for early-stage market entry by traded sector companies in the region

Rationale:

- Modest levels of early-stage funding in the region are making a difference, with small tranches available to startups via the VA-CEDA Seed Matching Fund, VCC, and People, Inc. Microloans but these funds are limited and there is no VC invested in the region, very limited use of federal SBIR awards, and SBA Loans. Potential indigenous Angel Investors/Funds are largely on the sidelines.

Possible Activities:

- **Organize a formal angel investor network in the region.** Given lack of understanding of innovation-based businesses of high-net worth individuals consider creating an in-house capacity to conduct due diligence with support from GO Virginia.
- **Seek to form a regional or multi-region student seed fund** for investments in promising student ideation as UVa.-Wise and other institutions build out entrepreneurial ecosystem.
- **Address need for increased funding of statewide angel investment tax credit, which is actively used by Virginia angel groups.** There is a \$5 million cap in available credits each year, after which credits are prorated, which makes its benefit level uncertain for investors.
- **Consider SBIR/STTR grant writing assistance and matching fund** to boost funding opportunities for small innovative companies and to advance traded sector activities.

Illustrative Best Practice Examples:

- **Susquehanna, PA:** Rural Business Innovation organization provides business technical assistance for accessing financing, along with a micro-loan startup grants, as well as a network of incubators near local colleges and universities (including Bucknell).
- **Chattanooga, TN:** Two seed funds are active in the region, Chattanooga Renaissance Fund and Lamp Post Group.
- **Ohio Third Frontier:** 34 pre-seed or seed funds established across regions of Ohio, capitalized at approximately \$6-\$7 million on average, with matching state investments.



8

Proposed GO Virginia Action: Establish Regional Quarterbacks for Entrepreneurial Development in Each GO Virginia Region

Specific Activities:

- Identify opportunities and needs for regional entrepreneurial development within traded sector industries
- Ensure an implementation capacity on priority actions
- Provide a “front door” in each region for entrepreneurs to receive coordinated services among service providers

Service Delivery Approach:

- Performance-based grants developed in consultation with each region to address priorities
- In each region, an advisory committee will be created to oversee the efforts of the regional quarterbacks
- Potential for multi-regional applications
- VRIC proposal articulates additional entrepreneurial activities that need to be coordinated with the regional GO Virginia efforts

Budget Rationale:

- Award \$200k-\$300k per region to fund a full-time professional to serve as the regional quarterback. Funding could yet be made available in FY 2019.
- The regional quarterback would be tasked with advancing a regional strategic plan and prioritizing strategic investments, with the input from regional entrepreneurial ecosystem stakeholders, under the auspices of the GO VA Regional Boards.
- Once a regional prioritization investment plan is developed, further funding would be available in FY 2020 and thereafter to fill the gaps identified, including funding for efforts such as: EIRs, incubators, accelerators, mentor networks, etc.

Comparable Best Practice Model: Launch Tennessee

- Supports a network of Entrepreneur Centers, located in six cities across the state that provide entrepreneurs access to a mix of support services, including: wayfinding for entrepreneurs, boot camps, mentorship, co-working space, and initial pre-seed grants.
- In 2016, Launch Tennessee made grants to its Entrepreneur Centers of \$200,000 to \$375,000 for each center. These centers serve a much smaller area than GO Virginia regions.

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Appendix 5: List of Strategic Plans Reviewed

For the Region One 2017 Growth and Diversification Plan, twenty strategic plans were reviewed and evaluated including plans from neighboring states as well as documents related to regional initiatives promoting the creative economy. The analysis for the updated 2019 Growth and Diversification Plan included a review of eleven additional regional strategic plans or annual reports. These included the review of economic development strategic plans as well as publications from planning districts within the GO VA Region One geography. Below is a listing of these strategic plans and publications.

Plan/Report	Website	2017 Review	2019 Review
Appalachian Spring Strategic Plan (2014 Draft)		x	
Blueprint for Entrepreneurial Growth and Economic Prosperity in Southwest Virginia (April 2012)	http://aproject.org/resources/reports/#tab-blueprints	x	
Blueprint for Attracting and Sustaining Advanced Manufacturing in Southwest Virginia (April 2014)	http://aproject.org/resources/reports/#tab-blueprints	x	
Cumberland Plateau PDC 2016 CEDS		x	
Cumberland Plateau PDC 2018 CEDS	http://www.cppdc.org/Reports/CEDS%202018.pdf		x
e-Connectivity @ USDA Broadband Resources for Rural America	www.usda.gov/broadband		x
LENOWISCO PDC 2015 CEDS	http://lenowisco.org/reports-and-media.html	x	
LENOWISCO PDC Site Study		x	
LENOWISCO PDC Agricultural Strategic Plan (2017)	http://www.lenowisco.org/reports-and-media.html		x
Mount Rogers PDC 2013 CEDS	http://www.mrpdc.org/news.htm	x	
Mount Rogers PDC 2018 CEDS	http://www.mrpdc.org/docs/MRPDC%202018%20CEDS%20Final.pdf		x
Mount Rogers PDC SET – Stronger Economics Together (2016)	http://www.mrpdc.org/set.org/	x	
Mountain Association for Community Economic Development (MACED) Kentucky 2016-2020 Plan	http://www.maced.org/	x	
New River Mount Rogers Workforce Development Board Strategic Plan (2016)	http://nrmrwib.org/about-us/documents-of-interest/strategic-plans/	x	
New River Mount Rogers Workforce Development Board Strategic Plan (2017-2020)	https://vcwnewrivermtrogers.com/about-us/strategic-plan/		x
Rapid Response/Power Update Strategic Work – Virginia Tech Office of Economic Development (June 6, 2017)		x	
SOAR Blueprint for Economic Growth – Eastern Kentucky	http://www.soar-ky.org/blueprint	x	
Southwest Virginia Workforce Development Board - Local Strategic Plan (2016-2020)	https://vcwsouthwest.com/		x
Southwest Virginia Alliance For Manufacturing, Inc. 2017-2018 Strategic Plan	http://swvam.org/	x	
Southwest Virginia Alliance For Manufacturing, Inc. 2018-2019 Strategic Plan	https://www.swvam.org/wp-content/uploads/2018/06/2018-2019-SVAM-Strategic-Plan.pdf		x

SWVA Creative Economy Plan (Friends of SWVA)			x
SWVA Cultural Heritage Foundation/Friends of SWVA Regional Impact Annual Report (2016)	http://www.opportunityswva.org/wp-content/uploads/2017/02/Economic-Impacts-in-Southwest-Virginia-1.pdf	x	
SWVA Cultural Heritage Foundation/Friends of SWVA Regional Impact Annual Report (2018-2019)	https://friendsofswva.org/about/annualreport/		x
VA Rural Center – Partnership of the Center for Rural Virginia and the Council for Rural Virginia – Strategic Plan Assessment Report to the Virginia Tobacco Indemnification Community and Revitalization Commission (TIC)		x	
VCEDA Agricultural Strategic Plan (2017)	http://www.vaceda.org/wp-content/uploads/2017/11/VCEDA-Agricultural-Strategic-Plan-FINAL-1.pdf	x	
VCEDA Annual Report (2018)	http://www.vaceda.org/wp-content/uploads/2019/03/Final-Annual-Report.pdf		x
VCEDA Business Plan (2017)		x	
VCEDA Lead Generation Project Review - Sanford Holshouser (2014)		x	
VCEDA Site Selection Study – Timmons Group (2016)		x	
VCEDA - The Economic Impact of Virginia Coalfield Economic Development Authority in Southwest Virginia and Virginia (2018)	http://www.vaceda.org/wp-content/uploads/2018/12/Chmura-Economic-Impact-Report-of-VCEDA.pdf		x
Virginia Tech Workforce Analysis		x	

Appendix 6: Regional Funding Sources

REGION ONE GRANT FUNDING OPPORTUNITIES			
Funding Source	Investment Priorities	Website	*Eligible for GO VA Match
Appalachian Regional Commission (ARC)			
Appalachian Regional Commission	Economic Opportunities; Ready Workforce; Infrastructure; Natural & Cultural Assets; Leadership & Community Capacity.	https://www.arc.gov	✓
ARC POWER	Building a Competitive Workforce; Enhancing Access to and Use of Broadband Services; Fostering Entrepreneurial Activities; Developing Industry Cluster in Communities; Technical Assistance to Develop New Projects & Support Current.	POWER@arc.gov	✓
Agriculture and Forestry Industries Development Fund (AFID)			
Agriculture and Forestry Industries Development Fund	Strategic Plans for Agriculture and/or Forestry; Economic Development; Local policies and ordinances that better support Agriculture and or Forestry; Based Business, Agritourism, and other Rural Enterprises; New Plans, Policies or Programs that will lead to the Preservation of Working Lands; Business Plans for Projects that will have a significant and lasting positive impact on the local Agriculture and/or Forestry Sector; Local initiatives supporting Agriculture and/or Forestry based businesses; Projects that advance the interests of Agriculture and/or Forestry in the locality.	https://www.vdacs.virginia.gov/agriculture-afid-facility-grants.shtml	
Economic Development Administration (EDA)			
Economic Development Administration	Collaborative Regional Innovation; Public/Private Partnerships; Advanced Manufacturing; Impact of declining use of coal; Effects of Natural Disasters; Urban Water Restoration; IT Infrastructure; Impact of Industry Restructuring; Job-driven Skills Development; Capital Access for Ethnically Diverse Businesses; Science and Health Care; Global Competitiveness; Environmentally-Sustainable Development; Underserved Communities.	https://eda.gov/funding-opportunities/	✓

EDA POWER Initiative	Communities & Regions impacted by the coal economy as it relates to Coal Mining; Coal-Fired Power Plants; Related Manufacturing/Transportation; Logistics Supply Chain Businesses and Industries.	Power@eda.gov	✓
GO Virginia Region One (GO VA)			
Per Capita	Regional Collaboration; Higher Paying Jobs; New Revenue to the Region; Growing and strengthening industry sectors such as advanced manufacturing, agriculture/food and beverage manufacturing, information and emerging technologies, and energy and minerals through activities such as talent development and retention, increasing innovation and infrastructure development. Projects involve at least 2 localities in Region One.	www.goswva.org	
Competitive	Projects involving inter-regional collaboration. Projects must align with the industry targets and strategies in each collaborating region.		
USDA Rural Development (USDA)			
Rural Cooperative Development Grant Program	The Rural Cooperative Development Grant program helps improve the economic condition of rural area by helping individuals and businesses start, expand or improve rural cooperatives and other mutually-owned businesses through Cooperative Development Centers. Funds May Be Used for developing and operating a Rural Cooperative Development Center. Examples of technical assistance and other service the Centers provide are: Conducting feasibility studies, Developing business plans, Providing leadership and operational improvement training, Facilitating strategies planning.	http://www.rd.usda.gov/contact-us/state-offices/va	✓
Rural Energy for America Program Renewable Energy Systems & Energy Efficiency Improvement Loans and Grants in Virginia	This program provides guaranteed loan financing and grant funding to agricultural producers and rural small businesses for renewable energy systems or to make energy efficiency improvements.		✓
Rural Micro entrepreneur Assistance Program in Virginia	Provides loans and grants to Microenterprise Development Organizations (MDOs) to: Provide microloans to help microenterprises startup and growth through a Rural Microloan Revolving Fund; Provide training and technical assistance to microloan borrowers and micro entrepreneurs.		✓

Rural Community Development Initiative Grants	Awarded to help non-profit housing and community development organizations, low-income rural communities and federally recognized tribes support housing, community facilities and community and economic development projects in rural areas. Funds May be Used to improve housing, community facilities, and community and economic development projects in rural areas.		✓
Community Connect Grants	This program helps fund broadband deployment into rural communities where it is not yet economically viable for private sector providers to deliver service.		✓
Rural Business Development Grants in Virginia	Competitive grant designed to support targeted technical assistance, training and other activities leading to the development or expansion of small and emerging private businesses in rural areas which will employ 50 or fewer new employees and has less than \$1 million in gross revenue.		✓
Community Facilities Direct Loan & Grant Program in Virginia	Provides affordable funding to develop essential community facilities in rural areas. An essential community facility is defined as a facility that provides an essential service to the local community for the orderly development of the community in a primarily rural area, and does not include private, commercial or business undertakings. Funds can be used to purchase, construct, and/or improve essential community facilities, purchase equipment and pay related project expenses.		✓
Virginia Coalfield Economic Development Authority (VCEDA)			
VCEDA Seed Capital Matching Fund	VCEDA region for-profit businesses one year and under with less than 10 full-time employees are eligible to apply for dollar-for-dollar matching grants from the VCEDA Seed Capital Matching Fund. Applicants work with the Small Business Development Centers at Mountain Empire and Southwest Virginia community colleges to prepare the applications to VCEDA.	http://www.vceda.org/	✓**
Virginia Department of Housing and Community Development (DHCD)			
Community Development Block Grants (CDBG)	Activities Benefiting Low- and Moderate-Income Persons; Activities Which Aid in the Prevention or Elimination of Slums or Blight; Activities Designed to Meet Community Needs having a Particular Urgency.	https://www.dhcd.virginia.gov	

Industrial Revitalization Fund (IRF)	Clear relationship to a local or regional economic development strategy; High degree of blight and deterioration to be addressed; Project Readiness; Project with a clear end use that will have clear and significant community economic impact; High economic distress in project locality.		
Virginia Department of Mines, Minerals and Energy (DMME)			
Abandoned Mine Land Program	Programs that prioritize sites based on human, health, and safety and is charged with reclaiming these sites.	https://www.dmme.virginia.gov/	✓
Power Plus Grant	Work with local developers and leaders in finding projects that create a positive and economic community improvement.		✓
Virginia Economic Development Partnership (VEDP)			
Virginia Economic Development Partnership	Virginia Economic Development Partnership offers a range of incentives and services to encourage business growth and reduce the costs of opening or expanding a business facility within the Commonwealth. Incentives include discretionary cash grants, infrastructure development grants, tax credits and exemptions, customized training, technical support programs, and financing assistance.	https://www.vedp.org/	
Virginia Tobacco Region Revitalization Commission			
Research and Development	Support research within Southern and Southwest Virginia that has a high likelihood of moving into a commercialization stage with accompanying job creation and private sector capital investment, also within those regions.	https://www.revitalizeva.org/	
Last Mile Funding	Provide one-time financial assistance to supplemental construction costs by private sector broadband service providers, in partnership with local units of government, to extend service to areas that presently are unserved by any broadband provider.		
Special Projects	Support either Regional Economic Development projects, or projects that Expand Access to Healthcare for residents of a multi-locality service area.		
The Tobacco Region Opportunity Fund (TROF)	Provides performance-based monetary grants to localities in Virginia's tobacco producing regions to assist in the creation of new jobs and investments, whether through new business attraction or existing business expansion.		
Southwest and Southside Virginia Economic Development	Building and utility infrastructure creation or improvements for economic development sites, including acquisition and/or development of land and physical		

	improvements; Programs and facilities to provide workforce training; Support of traditional economies, and new opportunities for economic diversification, such as new industry and employment clusters, and entrepreneurial development; Enhancements to regional tourism infrastructure that demonstrate ability to attract measurable visitor revenues from outside the tobacco region.		
Agribusiness	Projects that will result in measurable and reportable increases in: net new farm income; net new cost reductions for farm operations; value-added activities for Tobacco Region products; retention and expansion of farm and farm-related employment; leveraging of private investment by producers in their farm operations; agritourism spending, and exporting, of farm products beyond the Tobacco Region.		
Education Grant Program	Initiatives designed to assist residents of the tobacco region in obtaining levels of education previously not promoted, or available, in the region. Provide STEM-H and/or Advanced Manufacturing workforce training; Provide training in conjunction with a private company's commitment to create new jobs and/or fill existing job openings where there are direct articulated employment linkages between program graduates and employers.		

* Although the funding source may be eligible for use as GO Virginia match, the match funds must be applicable to the proposed project and necessary to the success of the project.

** Not all funding from VCEDA is eligible for GO Virginia match due to being state funds, however, some funding is originated from the localities.

Appendix 7: The Heart Project Regional Conversations

The following slides include the “bold steps” that resulted from The Heart Project’s regional conversations, in which 35 business roundtable discussions were held across Region One.



Southwestern Virginia Region Wide Business Roundtable The Results!

Heart Project Partners:

Southwest Virginia Alliance for Manufacturing’s Center of Excellence, Virginia Career Works
Southwestern Region, Virginia Career Works New River / Mount Rogers Region, and
GENEDGE, Virginia’s Manufacturing Extension Partner



The Heart Project

Helping Coal Impacted Businesses ... One Business at a time

How Do We Get There?

Bold Steps That Appeared In More Than One Business Round Table

- **Region Wide Marketing Effort*******

- Create a Marketing Campaign that Clearly Defines the Strengths of the Region in a Way That Attracts***
- Promote our Region's Economic Successes (i.e. Current Business Growth) Through State-Wide Media****
- Marketing Program "Eat Local, Buy Local, and Do Local" *

- Marketing The Region*

- Develop Regionwide Marketing Effort to Attract Workforce, Businesses, Tourist, Etc.
- Marketing Driven Action (WOW Marketing Video Going Viral)
- Use TV, YouTube, Podcasts, Etc. To Market Region

BOLD STEPS



2

The Heart Project

Helping Coal Impacted Businesses ... One Business at a time

How Do We Get There?

Bold Steps That Appeared In More Than One Business Round Table

- **Establish Regional Planning Board Composed of All Stakeholders Industry Led *******

- Create "Team SWVA" to Study and Direct Regional Efforts***
- Community Planning**
- Regional Brainstorming Sessions *
- Create an Action Team of Regional Industry Leaders (who are passionate) to Create a Long-Term Vision and Strategic Plan and do

- Road Shows

- Establish a Planning Board Composed of all Stakeholders Led by Industry
- Develop a Regional Strategic Plan that Identifies the Companies Already Here that we can Focus on Supporting Growing and Expanding

BOLD STEPS



3

How Do We Get There?
 Bold Steps That Appeared In More Than One Business Round Table

- **Utilize Older Generation to Mentor and Train Up Coming Youth******
 - Develop Regional Mentoring System to Train Advocates for Economic and Workforce Strengths of SWVA (Partnerships Between Public & Private, Education, Higher Education, Chambers of Commerce, Counties / Cities / Towns, Social Organizations, and Other Non-Profit Organizations or Agencies) i.e. “Advocate For Southwest Virginia” (Similar to Forward Wise County with a Region Wide and Broader Focus)*
 - Regional Job Mentoring Program Between High Schools, Colleges, and Regional Businesses*
 - Mentoring Program

- **Grow Regional Apprenticeships *******

 **BOLD STEPS**

How Do We Get There?
 Bold Steps That Appeared In More Than One Business Round Table

- **Provide Funding Mechanism to Support Expansion of Existing and New Business Development in the Region*****
 - Work with Elected State Representatives to Allocate Funding for Job Development for Existing Businesses / Changing the Current Incentive Program to Better Support Existing Businesses**
 - Create State and Local Tax Credits for Existing Businesses that Submit a Plan for Expansion and Job Growth*

- **Facilitate “How to Make our Next Great Thing” Similar to Eureka Ranch Approach*****
 - Expand Technology Center to Become Regional with Offerings in Cluster Areas Such as Technology, Advanced Manufacturing, Health Services, Tourism and Related Services*
 - Central Entity (What If, Idea Zone, Innovation Bridge) Leading to Innovation Action*

 **BOLD STEPS**

The Heart Project

Helping Coal Impacted Businesses ... One Business at a time

How Do We Get There?

Bold Steps That Appeared In More Than One Business Round Table

- **Expand UVA-Wise Economic Development Forum into a 2 Day Event Including More Brainstorming Sessions Between Economic Developers, Workforce Developers, and Regional Businesses****

- Expand the Economic Development Forum to 2 Days Making it a Working Conference*

- Expand the Economic Development Forum to Two Days and Make it a Working Conference (less speeches from specific guests)
- Expand the UVA-Wise Economic Development Forum to a Two-Day Event and Include Workshops

- **Develop Mountain Top Solar Farms******

- Develop Ridge Lines in Support of Technology Development such as Satellite Communications, Terrestrial Based

Communications Links, and Wi-Fi Development****

BOLD STEPS

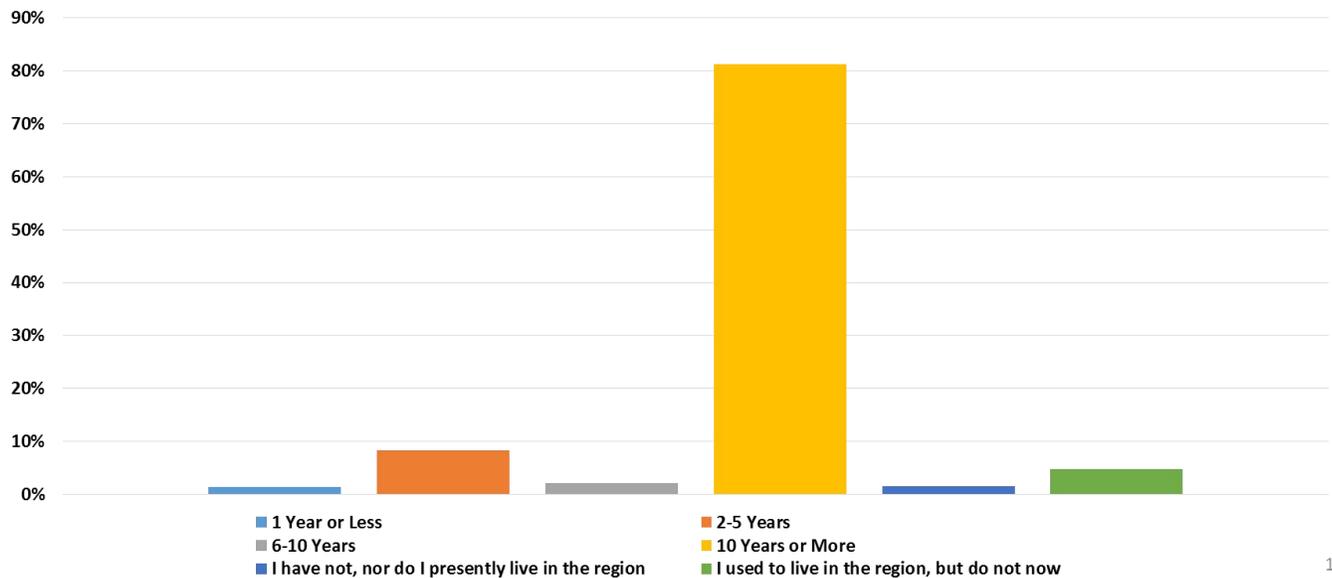


Appendix 8: Region One Community Survey Results

An online community survey was distributed in summer 2019 in order to gather input on the state of the region's economy and identify what stakeholders view as regional strengths, challenges, and opportunities. Over a three week period from June 24, 2019 – July 12, 2019, 144 stakeholders responded to the survey, which included on average 25 questions depending on responses. The majority of respondents are full-time employed residents of Region One, aged between 55-64 and 35-44. More than 81% of respondents have lived in the region for ten years or more. This section highlights many of the responses received from the community survey. The complete slide deck of the survey results can be accessed on the GO Virginia Region One website at www.goswva.org. The comments displayed are excerpts of responses received and not an exhaustive list.

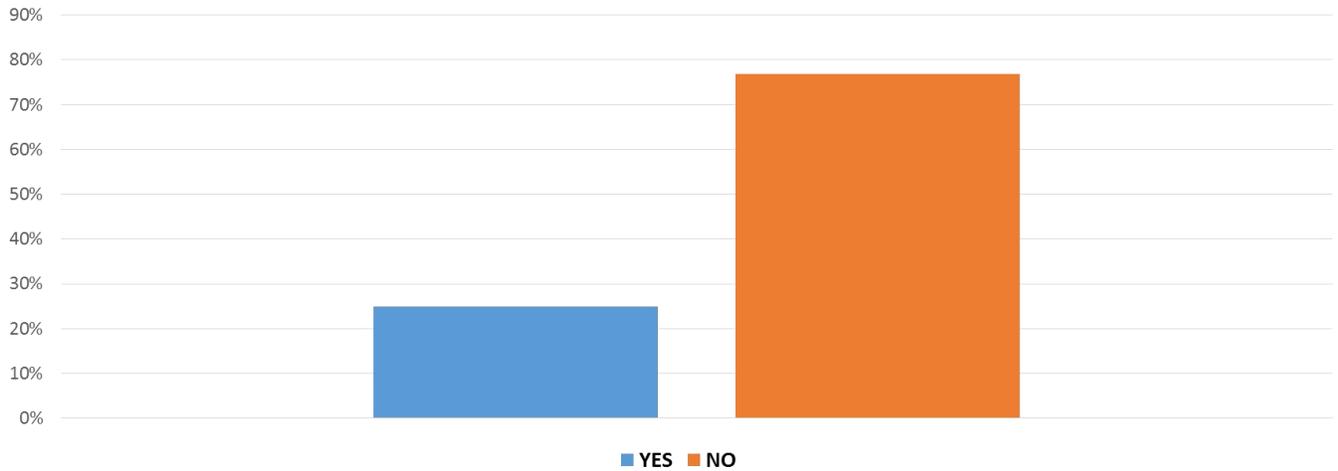


Q1: How long have you lived in the region?





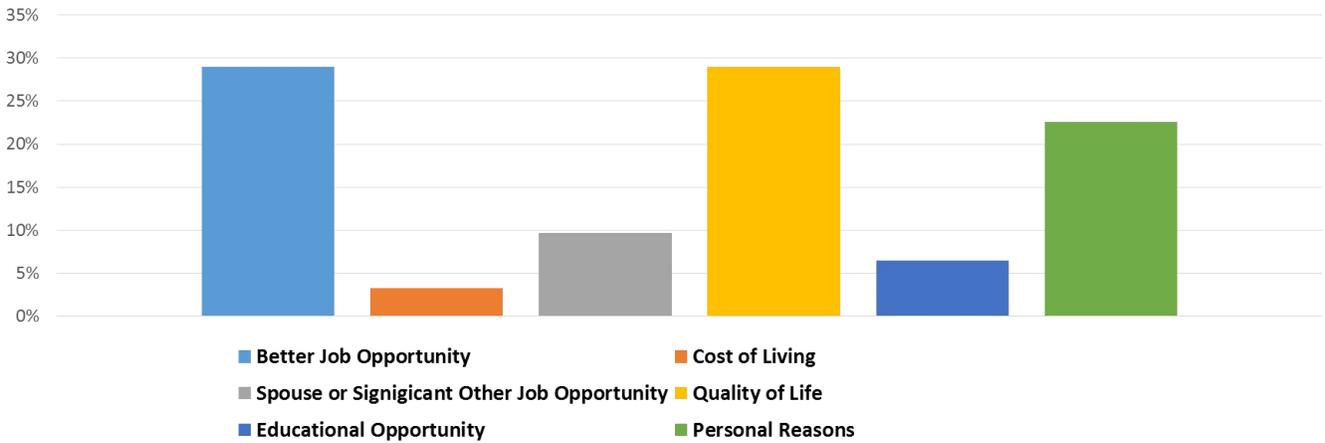
Q4: Are you currently considering re-locating out of the region?



2



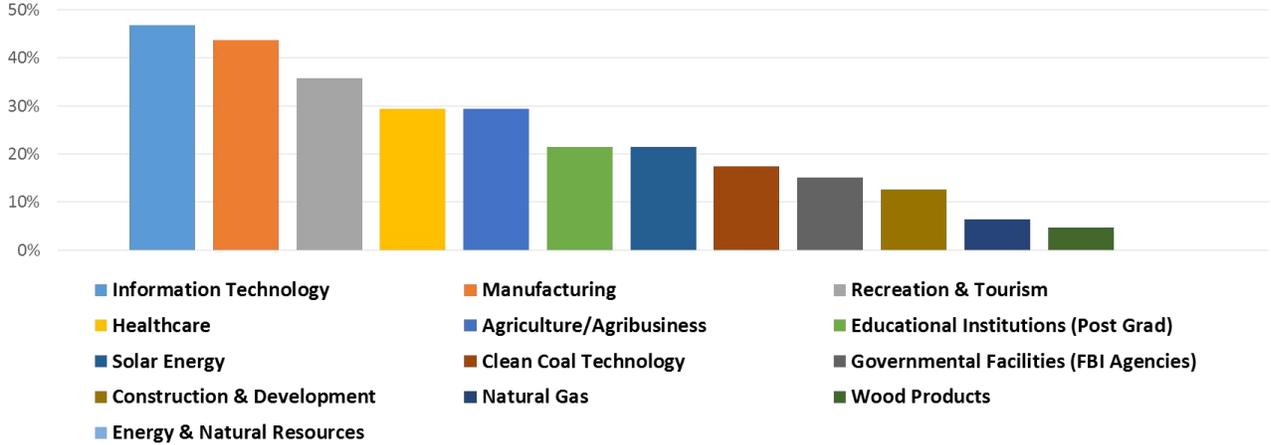
Q5: If you answered yes, please indicate the primary reason you are considering relocation.



3



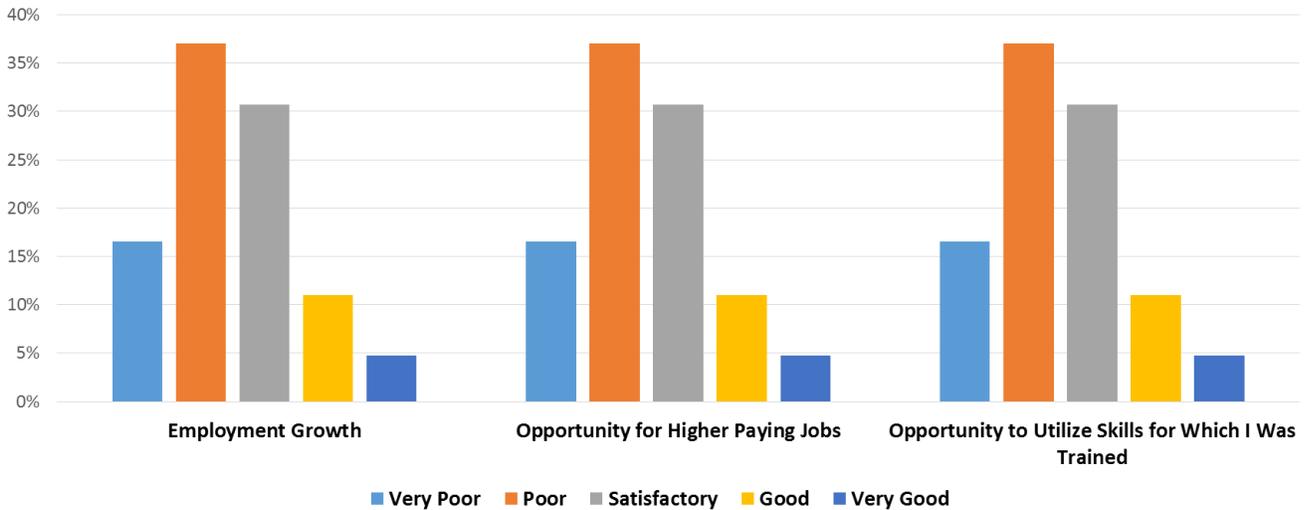
Q6: What type of industries should economic developers attract to the region to add higher-paying jobs? (Select up to 3)



4



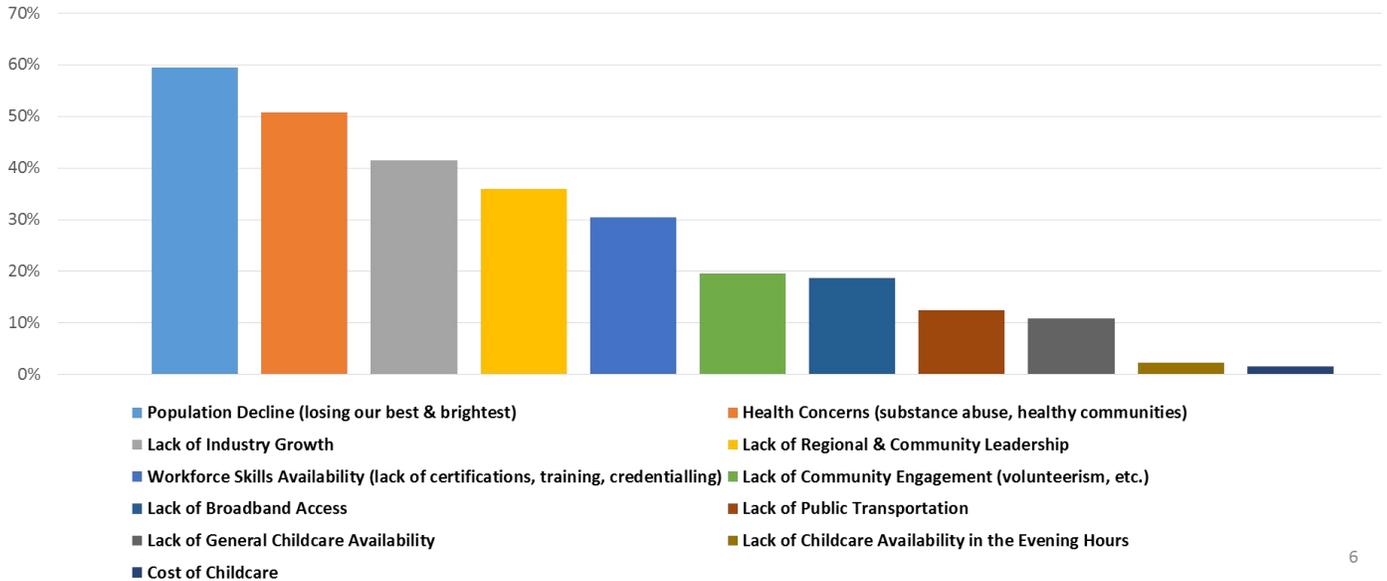
Q7: How would you rate the following current economic conditions of the region?



5



Q8: What key challenges do you feel your community must overcome to achieve economic advancement? (Select up to 3)



6

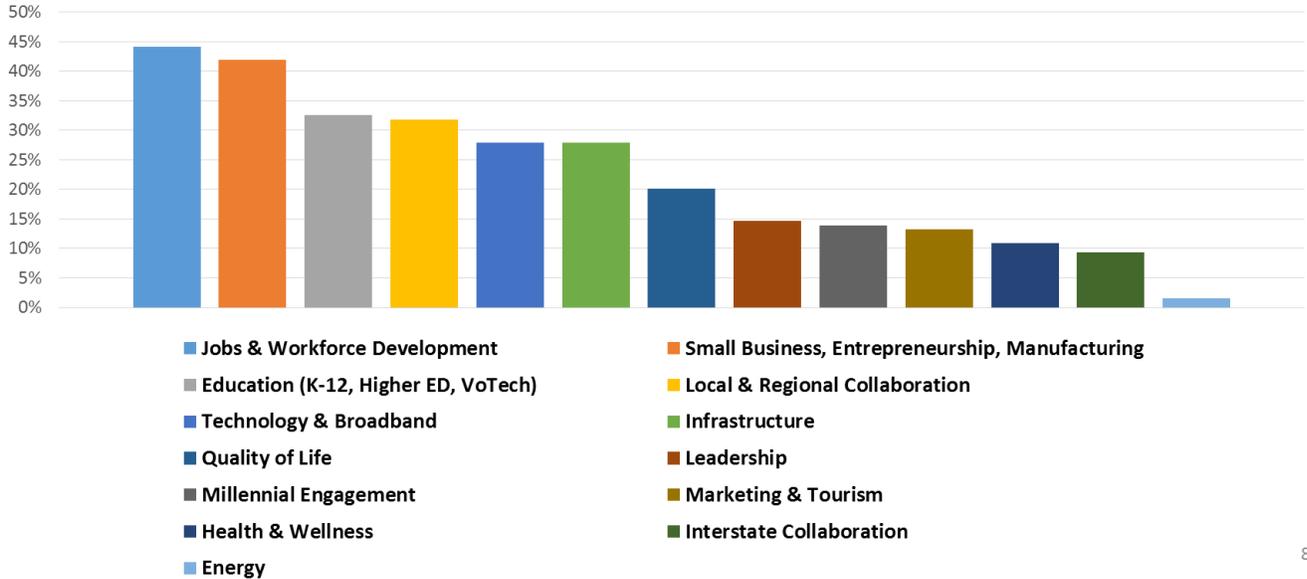
Q9: What types of partnerships will be needed at the local, regional and state level to improve the economic situation in the region?

- Investment funds, incentives to attract investments, better workforce training, better education for K-12
- Education, government, healthcare, financial and citizens
- Revenue sharing between municipalities within PDCs as well as between PDCs in the same general region
- All types – all overlap somehow. Partner silos still exist, but we’ve improved greatly
- Maximizing the existing ones
- Federal, State and Local leaders working in a bipartisan partnership.
- Provide infrastructure updating, affordable “high speed” internet, natural gas
- Venture capitalization by private investors and business leaders, not academics
- What is already underway with various agriculture groups
- Community College Systems and Industry partnerships. More support for the arts, more support for locally grown food, more support for microbusinesses
- Partnerships are vital for our success. Partnerships across localities, regions and states are each important and can make a strong impact. We need to think collaboratively
- Interstate economic development. Border county economies can have more to do with the communities across a state line than with other counties in the Commonwealth

7



Q10: What are the most important things that the Region One Council should consider to help the region address economic challenges? (Select up to 3)



8



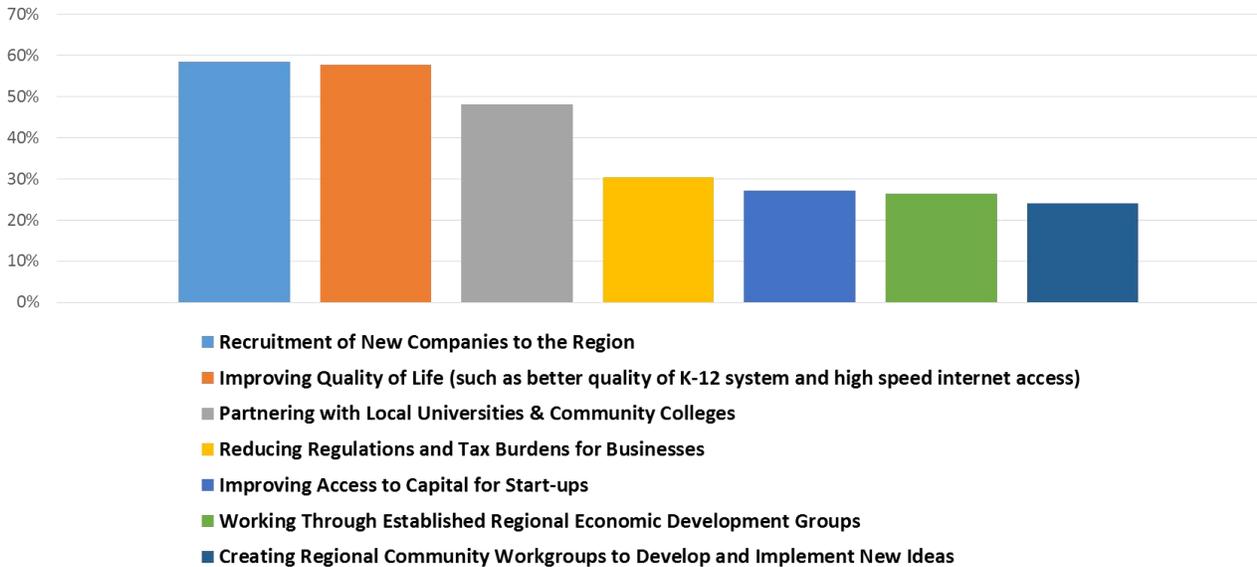
Q11: What are the most important tools and resources to build economic growth? (Select up to 3)



9



Q12: What are the most effective ways to create more jobs, raise wages and diversify the economy in the region? (Select up to 3)



10



Q13: What is currently working at the state or regional level that needs to be continued, supported and/or scaled to improve the regional economy?

- Seed Capital program, entrepreneurship challenges, regional economic branding efforts
- We have many regional groups working in collaboration with the community colleges, and workforce development
- Regional approach
- GOVA working with other funding sources for the sake of efficiency and effectiveness. Ecotourism in its infancy. Community Colleges working with employers directly
- Available “ready” lots for manufacturing
- RIFA, education is strong here at all levels. Families are not. Opportunities for better healthcare and wellness are still limited
- There is a regional coalition building across the state line that needs to be broadened and strengthened.
- GENEDGE is making it really easy for businesses to learn about and have access to grants that are available
- The regional Workforce Development Boards are an effective resource for aligning the needs of the region with the resources and training capacity needed to address them.
- The focus on expanding existing businesses and supporting new and small business
- Tax and infrastructure incentives; an additional focus on small business development to bolster downtowns; any efforts to strengthen the educational system

11

Appendix 9: GO Virginia Working Project Guidance

This document provides guidance for the development of funding applications for GO Virginia per capita and competitive grants. This guidance was developed from the GO Virginia Code language and Scoring Guidelines, as well as the precedents set by previous Board decisions. This is a working document that will be updated on a regular basis to capture Board policies that may impact application development. The following is DHCD's guidance as of December 4, 2018.

Workforce:

Program Duplication: GO Virginia can be used to develop and implement new and innovative trainings that are not currently available within that region, or within a reasonable distance of the project location. For projects replicating training that exists elsewhere in the region or Commonwealth, projects that can effectively scale an existing program will be more appropriate than those duplicating an existing program. This can be achieved by larger scale and more expansive collaborations across regions and between regions.

Industry Partnerships: GO Virginia strongly encourages private-industry partnerships for all GO Virginia projects. Securing financial and resource commitments from private-industry partners is a best practice, along with commitments to hire trainees or to upskill existing employees. Projects that address an explicit industry need, and demonstrate a clear demand for the skills and credentials will be the most successful. Projects that can demonstrate a long-term demand for the project will be more successful than those aiming to address a short-term need. Single business demand for workforce is not sufficient as more than one business must benefit.

Sustainability: GO Virginia funds should be utilized to build the region's capacity to create jobs in the targeted clusters, and projects that demonstrate the ability to sustain that capacity will be most successful. Projects that reflect a short-term solution that is financially or functionally unsustainable will be less successful. Furthermore, projects that lead to a new or expanded obligation for the State will be less successful than those that can be sustained through non-State resources.

Online Platforms: GO Virginia can be utilized to establish platforms that will match talent with available opportunities (jobs or training), as is being pursued throughout the Commonwealth. Regions should pursue opportunities that can be scaled across boundaries, or systems that work in coordination with existing platforms, to avoid duplication of efforts. GO Virginia funds should be focused on the buildout of such platforms, while marketing and outreach (for the platform or for a training program) would be more appropriately sourced from matching funds.

K-12 Projects: GO Virginia can be used to develop stronger connections between secondary education and the creation of higher paying jobs in the traded sectors. Projects that demonstrate a direct line of sight to such job creation through student credentialing or work-based learning (internships and apprenticeship) will have the best alignment with GO Virginia. Projects that implement new curriculum or learning opportunities that directly align with the region's targeted industries and include direct commitments from businesses will be prioritized. General academic or capital requests are not appropriate. As the period of time between the project and outcomes such as job creation extends, projects will become less competitive for GO Virginia funds. Projects with longer timelines to job creation, including those focused on early childhood and primary education, are not appropriate for GO Virginia.

Precedents: Based on program guidelines and prior decisions by the Board, applications for the following are discouraged:

- **Healthcare and nursing training programs:** Healthcare is not generally considered a traded sector and therefore does not meet the mission of the GO Virginia program. The Board will consider future applications that will create higher paying jobs and generate out-of-state revenue despite being a non-traded sector, such as a medical center of excellence or specialized/innovative model.

- **K-12 Capital Requests:** Funding requests for the construction of a school or high-school vocational center will inherently offer an assortment of courses, including a significant portion that are not in line with the region's growth and diversification plan. This is considered to be a general responsibility of the local school system and the Department of Education, and is not an appropriate use of GO Virginia funds.
- **State Salaries:** Projects that lead to a new or expanded obligation to the State will be less successful than those that can be sustained through federal, private or local funds. Funding for positions at state-funded entities such as the community colleges should only be considered where a non-state source of funding to sustain those positions can be identified.
- **Scholarships:** Since scholarships can only be sustained through ongoing funding injections, this is not a sustainable use of GO Virginia funds. While scholarships can reduce the cost of existing trainings for recipients, it does not build the region's capacity to train.

Sites:

Site Development: GO Virginia funds can be used to advance a site up the Virginia Business Ready Sites Program (VBRSP) tier system through the Virginia Economic Development Partnership (VEDP). Localities and property owners are encouraged to work with VEDP to ensure that all sites are properly characterized within VirginiaScan. GO Virginia funds can be used for preliminary site due diligence, site grading and preparation, and limited infrastructure development. Prospective sites should be evaluated and prioritized based on a demand analysis to assure that the region is developing the right sites to align with the industry clusters identified in the growth and diversification plans.

Infrastructure: GO Virginia funds can be used for site specific improvements or infrastructure necessary for the development of that site, and not for general public infrastructure improvements such as roads and bridges, or upgrading water and sewer infrastructure for a locality. GO Virginia funds should leverage other state and non-state sources of funding where possible.

Revenue Sharing: It is unlikely that every locality will have a site that is appropriate for joint development through GO Virginia, and localities are highly encouraged to collaborate to act in the collective interest of the region. A Regional Industrial Facility Authority (RIFA) is considered a best practice for revenue sharing between the participating localities. A RIFA allows any two or more localities to jointly invest (a RIFA can secure debt) and share tax revenue generated from a project. Revenue sharing through a RIFA aligns with the GO Virginia requirements of local participation and local match. While RIFA's are encouraged, regions can also consider other cooperative agreements and structures to develop sites by two or more localities in which development costs and/or revenues are shared.

Speculative Development: While GO Virginia funding can be used to advance a site to business-readiness, projects should be able to document clear demand for the site to reduce the risk of speculative development. Projects that demonstrate the highest likelihood for immediate high wage job creation outcomes through active prospects or a clear history of prospect activity within the targeted clusters will be most successful. Information regarding any prospects forfeited due to the lack of business-ready sites should be included with the application. Committed prospects ["bird in hand"] are not required to pursue site preparation or enhancements (see Incentive Packages below).

Workforce Connection: Projects will be most successful when they demonstrate a clear understanding of the labor shed for the site, particularly with mega-site developments that have the potential for thousands of jobs. Projects should ensure adequate population and skills to support a future business in one of the target industries, and should outline plans to address relevant skills gaps where necessary.

Marketing: Projects will be most successful when there is coordination with VEDP and there is a clear marketing plan in place for the site. The marketing plan should target the region's priority clusters, and

should include metrics for gaging the success of the marketing efforts so they can be corrected or expanded to hit targets.

Precedents: Based on program guidelines and prior decisions by the Board, applications for the following are discouraged:

- **Infrastructure:** GO Virginia funding cannot be used for the development of transportation infrastructure such as roads, bridges, tunnels, exits, public transportation, etc. GO Virginia funding should not be used for general public infrastructure for a locality, without a clear line of sight to an economic development project that will create higher wage jobs in a traded sectors.
- **Incentive Packages:** GO Virginia funding is not a business incentive and shall not be used as part of a prospect incentive package. Incentives do not build the region's long-term capacity for job creation, and therefore do not meet the mission of GO Virginia. Furthermore, GO Virginia funding should not be requested for the benefit of a single business, so GO Virginia will not fund site improvements for a single bird-in-hand prospect.

Startup Ecosystems:

Opportunities: GO Virginia funds can be used to build the fundamental building blocks of regional startup ecosystems, such as incubators, accelerators, and forms of business funding (notably, seed funds). Such components should be prioritized based on the work of TEconomy Partners, LLC, and based on the direction provided in the growth and diversification plans. GO Virginia can assist with service development or expansion, programming, fund development, etc. However, funding to construct a new facility would be more appropriately sourced from matching funds, and could be funded through local or private matching funds.

Salaries: GO Virginia can fund staffing for startup ecosystem initiatives, where a non-state revenue model has been identified to sustain those positions.

Sustainability: Projects that demonstrate the ability to sustain the startup ecosystem enhancements will be most successful, while projects that reflect a short-term solution should demonstrate a clear demand to justify an effort that may not be sustainable. Seed funds that have an evergreen component are encouraged.

Retention: Given the mobility of many entrepreneurial activity, projects will be most successful with a demonstrated plan or proven track-record for retaining those startups within the region or the Commonwealth.

Metrics: The success of entrepreneurial ecosystem projects should be quantifiable, to every extent possible. Projects that have an established system for tracking outcomes, immediate and long-term, will be best able to demonstrate success and the return on GO Virginia's investment.

Precedents: Based on program guidelines and prior decisions by the Board, applications for the following are discouraged:

- **Startup Funding:** GO Virginia funding should be directed toward startup and programmatic expenditures, and should not be utilized to fund startups or entrepreneurs directly. Business capital, seed funds, or award funds should be funded by match.

Appendix 10: GO Virginia Future Project Guidance

Memorandum

TO: Virginia Growth and Opportunity Board Members

FROM: John O. "Dubby" Wynne, Chairman

RE: Areas of Opportunity for Future GO Virginia Funding

DATE: December 11, 2018

Ever since the Virginia Growth and Opportunity Board awarded its first round of project grants on December 12, 2017, the GO Virginia Regional Councils have developed and proposed many projects to grow and diversify Virginia's economy. Guided by the shared mission to encourage regional cooperation and create higher-paying jobs from traded sector areas in every region, and in alignment with the needs and opportunities identified through their respective regional plans, the Board has now approved 29 projects that are starting to make a difference.

As GO Virginia moves into its second year of grant making, and as each region begins the process to update its growth and diversification plan, the Board thought it important to outline some concepts that may help the regional councils and their leaders develop additional projects that could have a lasting impact on the regions as well as the economy of Virginia as a whole. In short, we look at this exercise as one to help the regions better focus and prioritize initiatives as the plan update process unfolds next year.

In reviewing the initial plans, the Board found that there were four common themes – talent pipelines, site development, innovation and entrepreneurial ecosystems, and scale up activities - as areas of opportunity across the nine GO Virginia regions that could benefit from some strategic thinking on implementation and to ensure alignment across regional boundaries and with other statewide efforts. While the Board wants to continue the "bottom up" approach of project development – meaning each region should advance those project applications best aligned with its specific needs – the existence of so much commonality in needs among the regions requires some effort to avoid inefficiency and duplication with existing programs, and to advance projects that create opportunities for a statewide, coordinated program where appropriate.

At the same time, it is becoming increasingly important that the Board define parameters around project performance, return on investment, the acceptable timeline between project spending and actual job creation, additional direction on what types of expenditures will be permitted, and potential maximum grant caps. Those issues run through all four focus areas outlined below, and policies to address them will evolve over the coming months. GO Virginia Future Project Guidance

Finally, one common theme through all these focus areas, and GO Virginia generally, is the vital need for business leadership. The regional councils must be aggressive in setting the agenda and advancing those projects that best meet regional needs. GO Virginia is intended to be transformational, not incremental, in its thinking, and such leadership is essential to its success.

Therefore, the main goal of the outreach to the regional chairs and vice chairs is to review the current thinking and proposed direction for each of the four common project themes and to use this concept paper to raise issues about how to best move these efforts forward.

Workforce

No issue is more important to the economic diversification, growth, and competitiveness of Virginia than the quality of its workforce. Although Virginia generally has a highly skilled and highly educated workforce, there are significant gaps in the pipeline of talent for those industry clusters that are expected to grow the most in the future. These gaps show up not only in the lack of communication between businesses and the education providers about courses and training needs to be provided for future workers, but even in the most basic information relating to current and future job opportunities so business and industry can work together toward common goals, particularly to nurture the creation of higher paying jobs in traded sectors. Without such basic information, or any degree of certainty regarding the quality of existing data, it is virtually impossible to address the core problems.

In short, talent—its recruitment, retention, and development—is a central concern of employers in every region of Virginia, and it has become a chief concern of policymakers across party and regional lines. This focus is timely because the needs are multifaceted and pressing. They include (i) aligning Virginia talent with current and prospective job opportunities, (ii) adapting education and training programs to meet current and prospective Virginia business needs, and (iii) attracting and retaining needed talent from outside Virginia.

While solving these workforce challenges in Virginia is a complex undertaking and beyond the scope and capabilities of GO Virginia and its limited funding, we do believe that the GO Virginia initiative and the regional councils can play a role in helping to address the concerns outlined above. By targeting our limited resources, and through business leader engagement and collaboration with other stakeholders, we believe progress can be made through regional initiatives.

Specifically, we see several areas where the GO Virginia regional councils could focus their funding requests:

Systematic Assessment of Employer Needs for Talent – Regional councils could initiate projects to enhance the functioning of the labor market, and the ancillary education and training market, by remedying the information gap related to the current and anticipated talent needs of Virginia business employers, especially in targeted sectors. Many regional growth and diversification plans GO Virginia targeted high-demand and/or high-growth sectors include technology (cyber, big data/data analytics, etc.), life sciences, skilled trades, and specialized manufacturing. Through smartphone apps and other technology solutions, industry trade fairs, and other business-education partnership opportunities, these information gaps can be closed to move a region's workforce ahead.

The Talent/Job Interface: Matching Talent with Employment Opportunities – Support programs that enhance the functioning of the labor market by establishing effective mechanisms by which students/parents and adults can learn about and access employment opportunities and related educational/experiential programs. These opportunities would be focused on key industries and clusters identified in each region as important to its future economic growth and diversification. These can include concepts such as “manufacturing days” to expose students/parents/teachers to job opportunities, increased job mentoring and counseling, and additional apprenticeships and internships.

Improving Alignment: Promoting Education-to-Employment Pipelines – What we have repeatedly found is that the business and education communities exist in silos, functioning separate from each other and not aligning to develop the pipeline of skilled workers needed by local companies. The Board believes that the business leadership on the regional councils can be strategically used to improve the alignment between the education and training that is and will be available to Virginians (from high schools, colleges, and other providers) and the current and anticipated needs of Virginia businesses, especially in clusters targeted for high-impact growth in years ahead. A key strategy for improving this alignment is to create business and education (higher education and K-12) collaborations that get students onto education/training tracks—often referred to as pipeline programs or pathways—that provide tailored education/training regimens, curriculum development, experiential workplace opportunities (internships, etc.), and eventual employment. As previously noted, supporting additional internships and apprenticeships will also be key to this effort.

Each of these focus areas are dependent upon a thorough understanding of the talent pipeline needs identified by businesses in each region. We need to begin by asking some of the following questions:

1. Do you have accurate data on where the best opportunities are for higher wage traded sector job opportunities and what exactly is needed to fill any gaps?
2. What can be done to ensure GO Virginia investments in meeting these needs are impactful and sustainable?
3. Does the region have a systematic approach for addressing these issues across business, government, and training providers beyond narrow, opportunistic initiatives? How do we particularly get higher ed and business in closer alignment and partnership?

Site Development

There are several existing models already in Virginia which, with minor modifications, could serve as the foundation for a GO Virginia initiative around joint site development. Starting in 2016, the Virginia Economic Development Partnership used the newly-created Business Ready Sites Program to help spur the development of new industrial sites around the state by providing funding for planning, infrastructure development, and permitting. Funding for the program was immediately over-subscribed, further evidence of the desperate need localities see to have shovel ready product to facilitate economic growth. Although some funding was restored for this initiative in 2018, it is insufficient to meet the need to develop sites primed for target clusters. Further, the Business Ready Sites Program does not require greater regional collaboration which remains a cornerstone of GO Virginia activities. Nevertheless, these efforts are not mutually exclusive and can be coordinated.

GO Virginia funding can be used as a catalyst to advance regional cooperation on site development and to advance sites “up” the tier status. Site grading, limited infrastructure development, and other final preparatory activities could be supported by GO Virginia after a site has advanced through initial stages of the Business Ready Sites Program. GO Virginia funding, along with the financial benefits provided in the Virginia Collaborative Economic Development Act, could unlock significant resources to advance the state’s goal of having more shovel ready sites available for development.

Having a link to GO Virginia would also ensure both better alignment between site development (specifically, how they are designed and marketed) with the industry clusters identified as priorities in the regional growth and diversification plans and the availability of workforce to serve in new and expanding companies. Prospective sites should be evaluated and prioritized based on a demand analysis and with the understanding that not every locality will have a GO Virginia supported location, but instead, that localities should come together and act in their collective interest.

If a region considers a joint-site development project, there is already a mechanism in Virginia to aid any willing collaborative partners on joint site development – the Virginia Regional Industrial Facilities Act. Any two or more localities can organize to create a regional industrial facilities authority (RIFA) in accordance with the Act. The RIFA allows two or more localities to jointly invest in a site development project and share the tax revenues generated from the project. The GO Virginia Board has already established the precedent that the revenue sharing that occurs under a RIFA aligns with requirements of GO Virginia for local participation and match, and that a RIFA, or similar contractual obligation binding multiple localities, must exist in order for grant funds to be provided.

It must also be understood that GO Virginia is not the sole source of funding for site development. The Tobacco Commission has already been active in supporting megasites, and federal (USDA, EDA) and state funds (CDBG, VDOT) are also available to assist with various components of a development. GO Virginia should be the last source of funding in to close any gaps, not the seed capital to get a project initiated.

As the joint effort with VEDP moves ahead, we will be finalizing the policies related to the site development initiative.

Entrepreneurial Ecosystem

This concept refers to activities that foster the necessary elements of a thriving startup culture and “entrepreneurial ecosystem” in each region. In short, GO Virginia could be a catalyst to facilitate the development of the fundamental building blocks of such an effort, or to enhance the ones already in place that may lead to new, growing industry clusters and aligned with the broader needs and opportunities identified in the updated regional growth and diversification plans.

Over the past few months, the TEconomy team has been analyzing the entrepreneurial ecosystem in each region and has developed both a statewide implementation plan and recommendations for how to close any gaps in the existing activities at the regional level. Based on that analysis, the preliminary thinking is that each region could get a GO Virginia funded “quarterback” to better coordinate existing efforts and ensure alignment with the new initiatives as determined in each region. The goal would be to provide promising entrepreneurs a path to success through coordinated services to get their ideas to market. Using the analysis on gaps observed by the TEconomy team in each region, regions will then prioritize their needs and determine which of the various recommendations has the greatest chance of success. This will include a thorough review of existing resources and how best they can be modified and repurposed to meet the new coordinated structure.

At the same time, there is an initiative emerging from the Virginia Research Investment Committee effort on commercializing research opportunities at our public universities that has the opportunity to augment what GO Virginia believes is possible at the regional level. This initiative, which could advance bench-to-licensing efforts, support entrepreneurs in residence, more translational research, and a reorganization of the state's existing technology related programs, could build on the regional recommendations of TEconomy. Legislation and budget actions may be considered during the 2019 session on this separate, but complementary, effort.

All of these activities would then be supported through state assistance for the best commercialization efforts and a seed fund to advance the most promising business opportunities – so long as they lead to higher paying traded sector job growth. In short, these initiatives bring together the resources to identify and nurture promising business opportunities with the often lacking funds needed to get them closer to development.

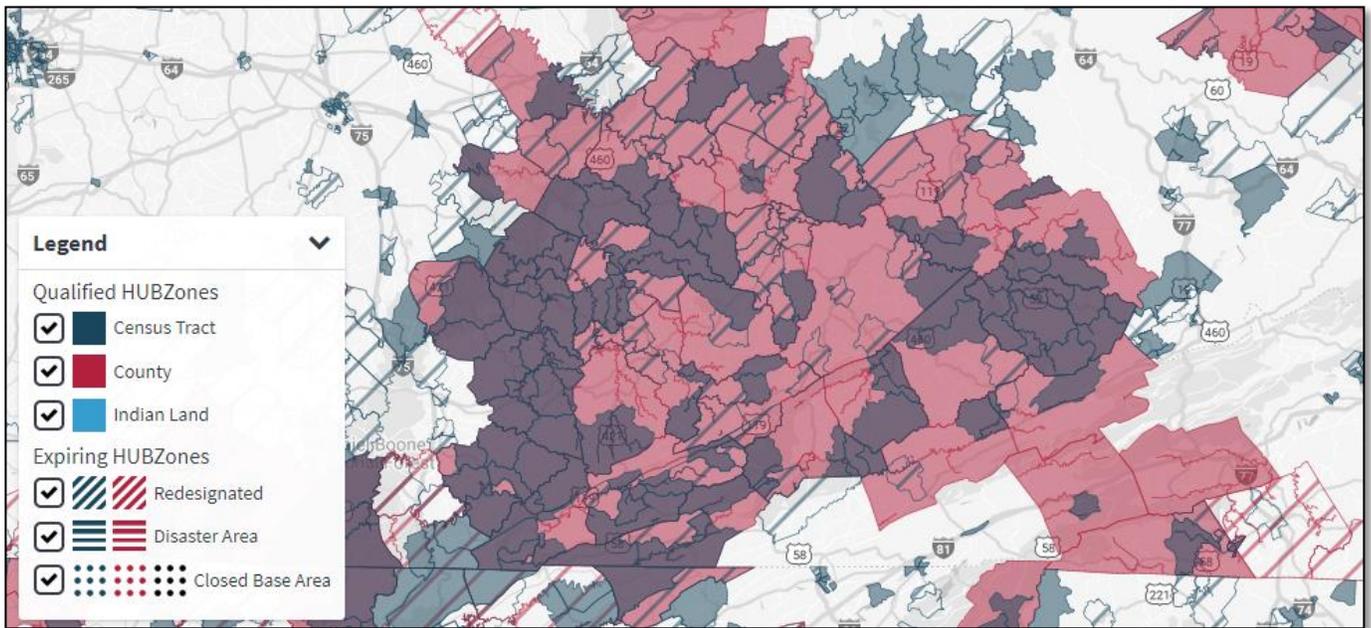
In order to assist with the regional effort, it may be useful for the regional council to have an advisory committee on entrepreneurial implementation that includes local entrepreneurs and others who have successfully navigated the maze from concept to product to help vet the best project opportunities and target regional investments. The efforts of this committee would be supported by the dedicated staff and other resources provided through GO Virginia and which achieve regional priorities.

Scale Ups

An often ignored and misunderstood path to job creation and economic diversification is through the scaling up of successful small and medium sized enterprises already in a region and which are aligned with the designated growth industry clusters. By working with these companies to grow and retain them – through specific initiatives such as business mentoring, increased access to capital, enhancing access to new customers and suppliers, and other scale-up activities – Virginia's regions have the opportunity to significantly enhance their economic prospects.

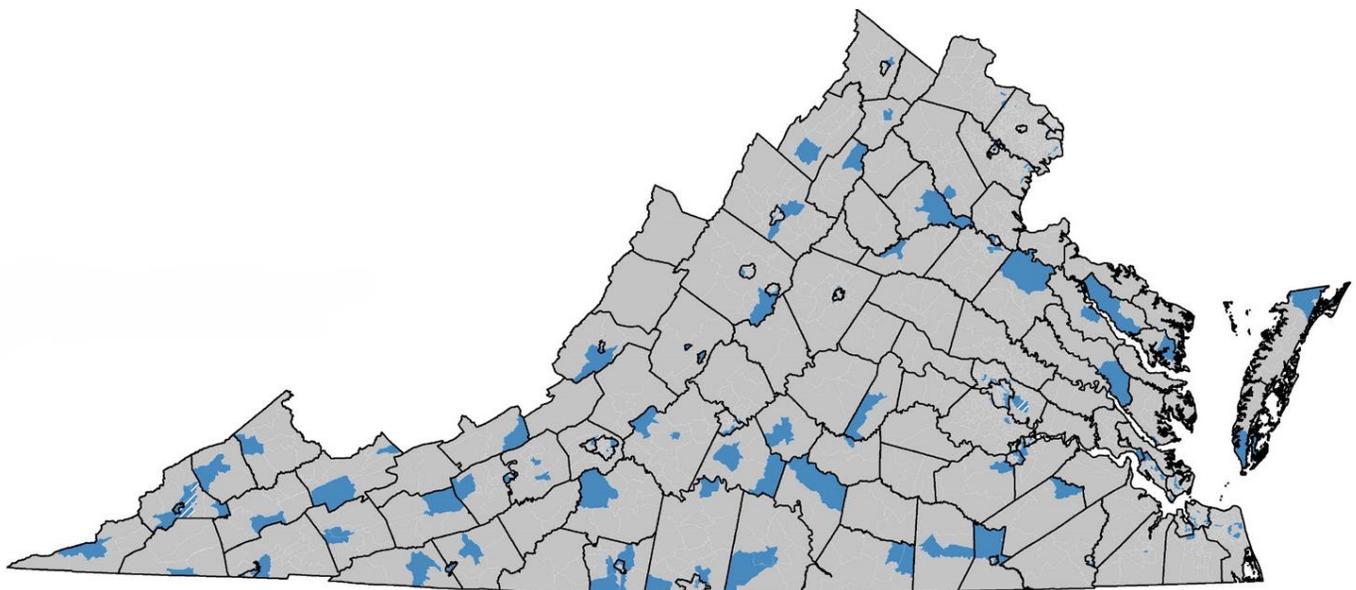
In order to shape potential projects in the scale-ups area, it will be important to first differentiate these scale up activities from those provided in the entrepreneurial ecosystem effort and to outline the best ways to identify, grow, and retain these companies. Efforts could include retooling existing business recruitment, retention, and expansion activities to identify growing companies, better coordinate services provided to them, and to grow supply chains and other efforts foundational to their sustainable growth in a region.

Appendix 11: HUBZone Map



Source: <https://maps.certify.sba.gov/hubzone/map#center=39.828200,-98.579500&zoom=5>

Appendix 12: Virginia Opportunity Zones Map



Source: <https://www.dhcd.virginia.gov/opportunity-zones-oz>

Appendix 13: Revision Log

Changes made to this document are captured in the chart below.

Date	Name/Org.	Revision Type	Reason
August 25, 2017	S. Blevins/UVa-Wise	Version 1 – 2017 GD Plan	Original
September 15, 2017	S. Blevins/UVa-Wise	Version 2 – 2017 GD Plan	Incorporated Feedback from Regional Council
December 30, 2018	R. Lee/UVa-Wise	Version 3 – 2017 GD Plan	Chmura update to quantitative data analysis – July 2018
August 1, 2019	S. Blevins/UVa-Wise	Version 1 – 2019 GD Plan	Original

