

DECEMBER 2021 THIRD EDITION

### **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's Overarching Goals

- 1. Create higher paying jobs
- 2. Promote regional/state collaboration
- 3. Generate out-of-state revenue
- 4. Diversify and strengthen the economy

\*Note: This document is not a strategic economic development plan for Southwest Virginia, nor is it envisioned to be comprehensive in addressing all of 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.

## **Table of Contents**

EXECUTIVE SUMMARY	
Growth and Diversification Plan	3
Methodology	3
Region One Overview	5
Highlight of Progress	6
Regional Collaboration Overview	7
Regional Participation	7
Targeted Industries & Strategies	7
INTRODUCTION	9
GO VIRGINIA REGION ONE MAP	11
SWVA BY THE NUMBERS	13
Region One Labor Shed	13
Economic and Workforce Data Analysis 2021 Overview	14
Educational Attainment	16
Employment	17
REGION ONE PRIORITIES	
EXISTING REGIONAL STRATEGIC PLANS	21
SWVA BEYOND THE NUMBERS	23
Region One Industry Targets	23
Advanced Manufacturing	25
Agriculture/Food & Beverage Manufacturing	
Animal Slaughtering and Processing	
Energy and Minerals	
Information & Emerging Technology	
Project Sustainability and Potential Match	
Region One Growth Strategies	
Talent Development	
Sites & Infrastructure	
VEDP Site Characterization Study	
VEDP Site Characterization Map	
Innovation & Scale Up Support	
Other Regional Strategies	
REGION ONE PROJECTS OVERVIEW	43
GO Virginia Region One Implementation Activity	43
GO Virginia Region One Target Industry Activity	46

GO Virginia Region One Investments	48
Project Pipeline Development Process	51
Process for Apply for GO Virginia Funding	53
Project Monitoring Data Tracking and Benchmarking	53
APPENDIX	55
APPENDIX 1: Quantitative Data Analysis: CHMURA ECONOMICS & ANALYTICS	56
Background	57
Labor Shed	58
Economic Landscape	60
Demographics	60
Drivers of Growth: Industry Structure	70
Occupations	92
Background	57
Education	95
Gaps	102
Potential GO VA Region 1 Industry Target	111
Appendix 1: Labor Shed	136
Appendix 2: Cluster Definitions	139
Appendix 3: Regional Variations by Planning District	143
Appendix 4: Transferable Jobs from Coal Mining	152
APPENDIX 2: Economic Impact of COVID-19 In GO VA Region 1: CHMURA ECONOMICS & ANALYTIC	S155
APPENDIX 3: Region One High School Graduation Rates (2021)	173
APPENDIX 4: TEConomy Partners & Region One Entrepreneurial Trends	174
Update on Entrepreneurial Trends: Phase I of Analysis of Startup Activity & Firm Dynamics	174
Update on Entrepreneurial Trends: Phase II of Broader Innovation Ecosystem Measures	180
APPENDIX 5: List of Strategic Plans Reviewed	184
APPENDIX 6: Regional Funding Sources	187
APPENDIX 7: GO Virginia Regional Partners	193
APPENDIX 8: Region One Approved Projects	198
APPENDIX 9: Region One Community Survey Results	209
APPENDIX 10: GO Virginia Working Project Guidance	187
APPENDIX 11: HUBZone Map	220
APPENDIX 12: Virginia Opportunity Zones Map	221

## **EXECUTIVE SUMMARY**

In the summer of 2019, the GO Virginia Region One Council published the second Growth and Diversification Plan for the thirteen counties and three cities that comprise Region One. The original plan was published in 2017. This release represents an update to the 2017 and 2019 plans, providing adjusted priorities in some areas and an evaluation of the 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. GO Virginia is a bipartisan, business-led economic development initiative that is changing how Virginia's diverse regions collaborate on economic and workforce development activities. The effort exists to promote private-sector job growth and diversification throughout the Commonwealth, emphasizing high-wage careers and regional collaboration across all job market segments. The 2016 legislation required each region to develop its diversification plan and update it at least every two years.

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 State 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.

Each GO Virginia Region has a support organization that provides administrative support to applicants and subgrantees. The support organization for GO Virginia Region One is The University of Virginia's College at Wise (UVA Wise), located in Wise, Virginia. The Virginia Department of Housing and Community Development (DHCD) serves as the statewide support organization for the GO Virginia program.

### **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. This plan 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 region's entrepreneurial activity, and advance joint site and infrastructure development. This plan guides the regional council, which is primarily employer and business led in supporting efforts to develop, recruit and/or retain the talent needed in the region; grow existing businesses, develop existing clusters, and

scale up small and mid-sized companies; establish start-ups from commercializing research and supporting entrepreneurs; and advance joint site and infrastructure development needs towards business-readiness.

The Region One Growth and Diversification Plan is not a strategic economic development plan for Southwest Virginia, nor is it envisioned to be comprehensive in addressing all of 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

Incorporating input from a broad range of stakeholders in updating 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 survey, regional stakeholder conversations, stakeholder interviews, and quantitative analysis of economic demographic metrics provided by Chmura Economics and Analytics. Statewide initiatives such as the TEConomy Partners report offered valuable data on strategies related to scaling up business and developing an entrepreneurship ecosystem. Additionally, with the effects of the COVID-19 pandemic, Chmura Economics and Analytics completed an economic impact study. It provided an analysis of the impacts of COVID-19 on the Region One industries, recovery data, and opportunities for growth in rural areas.

In an attempt not to duplicate the various regional initiatives developed since 2019, the Region One Council leveraged the input of regional stakeholders who have updated their strategic plans over the past two years.

Similar to the development of the 2017 and 2019 Growth and Diversification Plans, an online community survey was distributed in summer 2021 to gather input on the state of the region's economy and identify what stakeholders view as regional strengths, challenges, and opportunities. Over four weeks, 132 stakeholders responded to the survey, which included an average of 14 questions depending on responses. The majority of respondents are full-time employed residents of Region One. More than 84% 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, 13.64% indicated yes for better job opportunities, personal reasons, and improved quality of life. The majority of respondents rated the economic situation poor as it related to employment growth, high-wage job opportunities, opportunities to utilize skills for which they were trained, affordable housing, and affordable childcare.

Aligning with Region One's industry targets, respondents indicated that economic developers should be attracting information technology, manufacturing, and agriculture/agribusiness industries to the region. The importance of attracting recreation and tourism, solar energy, healthcare, energy and natural resources, and government facilities (FBI agencies) industries to the region were noted throughout the survey. Key regional challenges to economic advancement pointed to population decline, health concerns, and lack of general childcare availability. When asked what the Region One Council should consider when addressing the region's challenges, responses varied widely, but specified a significant focus on jobs and workforce development, technology and broadband, small business and entrepreneurship, and infrastructure. The most important tools and resources to build economic growth varied widely as well, but top responses included working as a region or across county lines, support for

existing and regional businesses, utilizing federal, state, or private funding for infrastructure, and providing access to capital for small business start-ups. The most effective ways to create more jobs, raise wages, and diversify the economy in the region include improving the quality of life (such as a better quality of K-12 systems and high-speed internet access), recruiting new companies to the region, and improving access to capital for start-ups and existing businesses.

Related to COVID-19, 50.76% of individuals worked remotely temporarily but returned to in office/inperson work activities. While 18.94% stated that COVID-19 did not impact their work and 17.42% worked remotely temporarily and their employer is now offering a hybrid work model of work from home and in person. Business owners reported that 15.91% scaled up activities, 3.79% temporarily closed, and .76% permanently closed. Thirty-nine percent of business owners utilized federal, state, or local COVID-19 assistance programs. These programs included Paycheck Protection Program (PPP), Coronavirus Aid, Relief, and Economic Security (CARES) Act, Small-Business Administration (SBA) loans, Rebuild Virginia Grant, Economic Injury Disaster Loan (EIDL), and livestock assistance programs. 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 Region One Council considers the Growth and Diversification Plan a living document that will be updated on an ongoing basis as additional action plans, feasibility studies, and stakeholder conversations evolve.

## **Region One Overview**

Region One is located in the most southwest corner of the Commonwealth, is mainly rural, and has historically had the weakest economic growth of all of the GO Virginia regions in the state. Prior to the COVID-19 pandemic, employment declined 0.9% in the four quarters ending with the first quarter of 2020. By comparison, employment grew 1.0% in the state and 1.1% in the nation. Region One lost an estimated 11,584



jobs, equivalent to 8.5% of the regional workforce, at the height of the pandemic in the first quarter of 2020.

The Appalachian Mountains run through many of the 13 counties and three cities that comprise the region. The beauty and rural amenities of the region also bring the challenges of a sparsely populated area and mountains that can present navigated difficulties to residents seeking 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 \$82,951 in the four quarters ending with the first quarter of 2021, coal mining pays more than double the regional average wage of \$37,461.<sup>1</sup> Regulatory and environmental concerns, cheaper energy alternatives such as natural gas, and the declining cost of both solar and wind power have led to a weakening coal industry. Since the fourth quarter of 2013, there has been a loss of 2,239 coal mining jobs in the region, down from 4,108. The region's coal mining industry saw a modest employment gain of 127 jobs between the fourth quarter of 2016 and the second quarter of 2019, but employment has since declined. An estimated 1,869 people worked in the coal mining industry in Region 1 in the first quarter of 2021.

Manufacturing, another high-paying sector at \$46,848 in the first quarter of 2021, 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 Region 1, 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 stood at 16,994 prior to the pandemic (the first quarter of 2020) but fell to 15,338 as of the first quarter of 2021.

No other major industry sectors have added enough jobs to replace those lost over the past year and decade in GO VA Region 1. Like many rural areas across the nation, the relatively small number of firms leads to a lack of alternative opportunities if workers are displaced due to firm relocations, closings, or layoffs. Often, these workers 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 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.

## **Highlights of Progress**

Since the organization of GO Virginia Region One, a total of 21 projects have been funded, totaling \$3,449,502. Region One has participated in one competitive project in conjunction with Region Three.

The GO Virginia State Board authorized the use of \$14.66M in statewide competitive funds to respond to the unprecedented economic conditions facing Virginia due to the immediate and long-term effects of the coronavirus on regional economies. This initiative focused resources on economic resilience and recovery while staying true to the GO Virginia mission. Region One has a total of three Economic Resilience and Recovery (ERR) projects that were funded, totaling \$268,496. Region One has one Competitive ERR project that was funded in the amount of \$2,950,000. (See the Region One Implementation Overview section for a complete list of funded projects.)

<sup>&</sup>lt;sup>1</sup> DHCD has shared a regional average wage of \$35,571 with Region 1, to be the salary threshold for applications on future GO Virginia projects. As average wages change over time, this report will use the latest available data, and discuss differences between estimates as relevant.

After four years of operations, 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 update on the second edition of the 2019 Growth and Diversification Plan, there are now five Regional Industrial Facilities Authorities (RIFAs) that have been formed. These include:

- Blue Ridge Crossroads Economic Development Authority (Counties of Carroll, Grayson, and City of Galax)
- Cumberland Plateau RIFA (Counties of Buchanan, Tazewell, and Russell)
- Lonesome Pine RIFA (Counties of Dickenson, Lee, Scott, Wise, and City of Norton)
- Pathway Park RIFA (Counties of Bland and Smyth)
- Smyth-Washington Industrial Facilities Authority (Counties of Smyth and Washington)

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

## **Targeted Industries & Strategies**

The 2017 and 2019 Growth and Diversification Plans for Region One identified four targeted industries with the best potential to grow and create higher-paying employment opportunities. These include **advanced manufacturing**, **agriculture and food/beverage manufacturing**, **energy and minerals**, **and information technology**. After a 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.

Given the region's significant natural, recreational, and cultural assets, Southwest Virginia has invested heavily in building the tourism industry. Tourism and healthcare are critically important to the region's economy. However, due to the relatively low wages of the tourism industry when compared to the region's average, tourism is not included in the target industries of GO Virginia Region One. Similarly, healthcare 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.

As the Region One Council canvassed the area for input on the update of the plan, the foundational strategies initially identified were affirmed and, therefore, will remain relatively the same. Additionally, the plan development benefitted from four years of experience with prioritized and funded projects at the state level. Thus, the 2021 regional strategy framework is in alignment with GO Virginia priorities and includes the following:

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

This framework represents a practical yet aspirational approach to diversifying the region's economy and provides guidance to stakeholders as 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.

#### Innovation and Scale Up Support Strategies

**Strategy 1:** Develop approach to address recommendations in the 2021 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

#### 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

#### **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

## INTRODUCTION

First time visitors to Southwest Virginia are often surprised by what they find. Contrary to what they hear from media sources, there are overwhelming opportunities present in the region. Opportunities to leverage strengths and assets which range from natural beauty and culture, to craftsmanship, cuisine, music, and the ingenuity and talent of the citizens offer a solid foundation on which to build. And yet, the existence of what appear to be overwhelming challenges are present as well. Continued population decline and challenging health and educational attainment metrics tend to overshadow the tremendous progress being made 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 area be able to address complex issues and realize true opportunities.

This is the third edition of the Southwest Virginia Growth and Diversification Plan sponsored by the GO Virginia Region One Council. Since the first plan was designed in the summer of 2017, over \$6,717,748 in investment from GO Virginia has been committed to 25 projects. Additionally, significant advances have been made in projects which were not on the region's radar screen five years ago.

Key investments serve as a catalytic agent to launch strategic and foundational action. Aligning the educational infrastructure and programs with regional employer needs as well as creating a culture of entrepreneurship and leveraging the significant capacity Southwest Virginia has in manufacturing and agriculture have gained traction since GO Virginia launched in 2017. Partnering with other funders in the region has enabled GO Virginia to achieve accomplishments which could not have been realized alone. Leveraging GO Virginia funding investments from Virginia Tobacco Region Revitalization Commission, Appalachian Regional Commission, Thompson Charitable Foundation, Office of Abandoned Mine Lands and Reclamation, Virginia Coalfield Economic Development Authority, United States Department of Agriculture, Manufacturing Technology Center, Cumberland Plateau Planning District Commission, GENEDGE, The University of Virginia's Strategic Investment Fund, Ascent Virginia, Blue Ridge Crossroads Economic Development Authority, Mount Rogers Planning District Commission, LENOWISCO Planning District Commission, Wise County Board of Supervisors, Virginia Department of Energy, U.S. Economic Development Administration, Emory and Henry College, Dickenson County, Grayson County, U.S. Department of the Interior/U.S. Department of Energy, Appalachian Voices, and Solar Foundation.

among a long list of leveraged funding has enabled Southwest Virginia to pool resources that can make a difference in economic diversification.

Creative projects exploring alternative energy in Virginia's "energy" region, literally growing the grain industry from the ground up in order to leverage the craft brewing movement as well as improvements in sites and locations specifically designed to assist employers with expansions and recruitment of new industry are all examples of significant investments made possible through partnership and regional collaboration. Investments in projects such as these had the work of hundreds of stakeholders across the region have turned nascent projects into viable investments which have the potential to transform the trajectory of Southwest Virginia's future.

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.

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 Southwest Virginia, 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 intricate challenges.

The theme of the Southwest Virginia Region One Growth and Diversification Plan since the very first publication has been to "Think again."

#### Think Again – A challenge to reimagine Southwest Virginia.

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.





## **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 2019 Growth and Diversification Plan metrics. 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 and the COVID-19 impacts in Region One are also included in the update. This section includes an overview of the Region One economic and workforce data and the changes in data since the 2019 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 Labor Shed**

GO Virginia Region One borders four states that provide job opportunities for residents of the region. From an economic development perspective, the adjoining counties are home to firms that GO Virginia Region One should consider as cluster and supply chain assets. For example, both 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 Virginia Region One. Likewise, Pike County, Kentucky, should be included in discussions with prospects in energy-related businesses.

As shown in the accompanying map, communication patterns indicate that three counties in Tennessee and one in Kentucky, West Virginia, and North Carolina have enough migration in and out of Region One to warrant inclusion in the GO Virginia Region One 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 Region One labor shed includes six additional Virginia localities. Including Virginia and other states, the 12 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 GO Virginia Region One. The City of Salem was added because it is in the center of Roanoke County, which met the 600-commuter threshold.<sup>2</sup>

Employment in the Region 1 labor shed fared better than employment in Region 1 in the last year, declining 6.1% over the four quarters ending with the first quarter of 2021. The labor shed is slightly less dependent on coal mining (0.5% percent of total employment versus 1.5% in Region 1) and manufacturing (11.5% vs 12.0% in Region 1).

Commuting patterns by occupation reveal which workers are drawn into Region One for work, as well as which workers may be commuting out of the region for employment. While opportunities exist outside the region, these workers may be interested in employment opportunities closer to home which would provide a shorter commute. The largest net loss is in transportation and material moving occupations--such as labor and material movers, drivers, and packers and packagers-- followed by production occupations, which are primarily found in manufacturing. Also, notable, more than 1,000 workers in healthcare practitioners and technical occupations leave the region for work each day. GO Virginia Region One also attracts workers, with the greatest numbers of net positive commuters in business and financial operations and management occupations.

## Economic and Workforce Data Analysis 2021 Overview

Employment in GO Virginia Region One 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, an encouraging sign for manufacturing is that employment has stabilized over the last few years (prior to the pandemic). Employment is another important driver in the region—the energy cluster (particularly coal mining)—has lost nearly 4,000 jobs since 2012.

In GO Virginia Region One, both the manufacturing sector and energy cluster pay a higher average wage than all other industries. 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.

The region's average annual wage has increased over the past two years to \$37,461.<sup>3</sup> A total of 375,761 people live in GO Virginia Region One in 2020 according to the Census Bureau, and the population has suffered an annual average decrease of 0.7% since 2010. Looking ahead, **projections in JobsEQ anticipate the region will contract an annual average 0.8% per year between 2021 and 2031—a loss of 28,950 people**. This projected population loss has increased from previous reports as county-level population data are revised. Ongoing efforts in GO Virginia Region One to attract and retain population may also shift this projection.

<sup>&</sup>lt;sup>2</sup> A detailed explanation of the methodology used to create the GO VA Region 1 labor shed is in Appendix 1.

<sup>&</sup>lt;sup>3</sup> DHCD has shared a regional average wage of \$35,571 with Region 1, to be the salary threshold for applications on future GO Virginia projects. As average wages change over time, this report will use the latest available data, and discuss differences between estimates as relevant.

The larger GO Virginia Region One labor shed was home to 1.28 million people in 2020, with an average annual population decrease of -0.2% since 2010. Population in the labor shed is projected to decline an average 0.2% per year through 2031 for a loss of 22,489 residents. Population growth in the state of Virginia and the nation are both expected to increase an annual average of 0.5% and 0.6%, respectively, over the same period.

The age cohorts in Region 1 are skewed toward a lower percentage of younger individuals when compared to both the region's labor shed and the state. To some extent, this is due to the presence of Virginia Tech, East Tennessee State University, Radford University, and other schools in the labor shed, but also presumably because some of the younger residents leave the region for better job opportunities. In GO Virginia Region One, 18.7% of the population is aged 18 to 34 years, compared with 22.1% in the labor shed and 23.5% in the state. In contrast, 21.3% of the population in Region One is 65 years and older compared with 19.5% in the labor shed and 15.0% in Virginia.

The labor force participation rate in GO VA Region 1 is relatively low when compared to the state. This is 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. According to the American Community Survey of 2015-2019, the labor force participation rate of the civilian population aged 16 and older in Region 1 was 49.1%, compared with 54.2% in the labor shed and 65.2% in the state.

The percentage of the population with a disability in Region 1 is more than double that of the state, at 21.3% for individuals aged 18-64, according to the ACS 2015-2019. Additionally, only 28.8% of individuals with disabilities in Region 1 participate in the labor force, compared to 45.0% in the state.

The annual average wage in GO VA Region 1 was \$43,200 for all occupations in 2020 for the 128,169 people employed in the region. Thirty-four percent of the workers—or 43,908 people—in Region 1 are employed in occupations that paid above-average wages in 2020.

There are significant differences within the target sectors of the percentage of people earning aboveaverage wages. For example, about 29.5% of workers in food and beverage manufacturing are employed in occupations that pay wages above the regional average, compared with about 62.9% of workers in the energy cluster. These preliminary baseline measures are summarized in the table below.

Cluster Employment for Four Quarters Ending 2021 Quarter 1						
	Occupations With Above- Average	Total - All	Percent of Occupations Paying Above-			
Cluster	Wages	Occupations	Average Wages			
Energy	2,122	3,373	62.9%			
Food and Beverage	430	1,459	29.5%			
Advanced Manufacturing	4,701	15,167	31.0%			
Information Technology	812	884	91.9%			
TotalAll Occupations	43,908	128,169	34.3%			
Source: JobsEQ Note: wages are as of 2020						

The three cities and 13 counties in Region 1 have a wide range of employment and wages. The largest county—Washington County—has nearly 10 times the employment (20,101) as the smallest locality— Bland County (2,277), highlighting the wide range of employment within the region. Buchanan County has the highest average annual wage (\$47,010) in the region, mostly due to its high concentration of mining. The lowest average annual wage is \$28,312 in Grayson County.

Demographic Summary <sup>1</sup>						
		Percent				
	GO VA Region 1	Region 1 Labor Shed	Virginia	GO VA Region 1	Region 1 Labor Shed	Virginia
Economic	<u>,</u>	Į	<u>,</u>			
Labor Force Participation Rate and Size (civilian population age 16 years and older)	49.1%	54.2%	65.2%	156,352	576,773	4,356,86 8
Armed Forces Labor Force	0.0%	0.1%	1.8%	128	779	120,385
Veterans, Aged 18-64	4.2%	4.8%	8.1%	9,532	37,969	420,632
Mean Commute Time (minutes)				25.1	23.1	28.7
Commute via Public Transportation	0.4%	1.0%	4.4%	557	5,280	184,534
Union Membership <sup>3</sup>	5.1%	3.9%	4.1%	—	—	
Social						
Disconnected Youth <sup>2</sup>	2.3%	1.7%	1.5%	379	1,217	6,725
Children in Single-Parent Families (% of all children)	35.7%	36.1%	31.0%	23,433	82,185	549,076
With a Disability, Age 18-64	21.3%	16.9%	9.5%	46,564	130,526	486,156
With a Disability, Age 18-64, Labor Force Participation Rate and Size	28.8%	31.9%	45.0%	13,427	41,696	218,843
Foreign Born	1.3%	3.1%	12.4%	5,112	39,924	1,051,55 9
Speak English Less Than Very Well (population age 5 years and older)	0.6%	1.4%	5.9%	2,261	17,319	471,645

1. ACS 2015-2019, unless noted otherwise

2. Disconnected Youth are individuals aged 16-19 years old 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 GO VA Region 1 falls short of that in both the labor shed and state. In Region 1, 14.5% of the population does not have a high school diploma, compared with 12.0% in the labor shed and 8.7% in the state. Similarly, a high school diploma is the highest educational attainment level for 35.8% of Region 1 residents compared with 32.6% in the labor shed and 22.9% in Virginia. At the other end of the spectrum, only 11.3% of Region 1 residents possess a bachelor's degree and another 6.1% have

postgraduate degrees. This is compared with 15.2% and 9.4%, respectively, in the labor shed and 23.6% and 17.1%, respectively, in the state. The region has a higher proportion of residents with their highest educational attainment being an associate degree (10.7%) than the labor shed (10.0%) and state (8.3%).



Educational Attainment, Population Aged 25-64 2015-2019

Schools across Region 1 have outperformed the state average for Standards of Learning (SOL) pass rates. Nearly all school divisions in the region have higher pass rates in math, as shown in the table below, while some cities and counties saw pass rates below the state average in reading and science. Green shading represents a pass rate higher than the state average while red shading shows a pass rate lower than the state average. GO VA Region 1 exceeds the state average pass rate for all three subjects.

#### Employment

Similar to the nation, GO VA Region 1 experienced a sharp decline in employment due to the COVID-19 pandemic. In the four quarters ending with the second quarter of 2020, employment was down 10.0% from a year earlier in the region compared with a 10.2% loss in the labor shed and 9.8% in the state over the same period.

Overall employment in Region 1 has been declining since the start of the Great Recession. Between 2017 and 2019 (prior to the pandemic), overall employment in the region declined 1.3%, to 137,138 workers. In 2020, as the COVID-19 pandemic disrupted all aspects of the global economy, employment in Region 1 declined sharply. Overall employment in the region declined by 5.4% to 129,461 workers over the year ending 2020Q4. As of the first quarter of 2021, overall employment dropped by 8,626 workers (or 6.3%) since the start of the pandemic in 2020Q1. Employment has fallen to 128,169 as of the first quarter of 2021.



Since the start of the GO Virginia initiative in spring 2017, there have been several business closings resulting in lost jobs in Region 1. The following six closures reported by the Virginia Economic Development Partnership combine for a loss of 1,315 jobs in the region:

- Komatsu Mining Corp. in Tazewell County closed in March 2021, eliminating 128 jobs
- Utility Trailer Manufacturing Co. closed in June 2020, eliminating 470 jobs in Washington County
- Sykes Enterprises laid off 197 Buchanan County workers in September 2019
- Bristol Compressors International closed in September 2018, eliminating 470 jobs in Washington<sup>-</sup> County
- Coca-Cola Bottling Co. closed a facility in Bristol, eliminating 10 jobs in October 2018
- Titan Wheel Corp. in Smyth County closed in December 2017, eliminating 40 jobs

However, there have been several announcements in 2021. In October 2021, medical glove manufacturers Blue Star NBR, LLC and American Glove Innovations (AGI) announced plans to invest \$714 million in a manufacturing facility in Wythe County. The investment is expected



to create 2,500 jobs.<sup>4</sup> In the LENOWISCO Planning District, Internet provider Earthlink announced a plan to

<sup>&</sup>lt;sup>4</sup> Source: https://www.virginiabusiness.com/article/joint-venture-bringing-2500-jobs-to-wythe-county/

open a customer support center in Norton. The center is expected to add 285 jobs to the region.<sup>5</sup> In the Cumberland Plateau Planning District, Pure Salmon is expected to add about 230 jobs to farm fish for sale worldwide.<sup>6</sup>

Employment in the GO VA Region 1 labor shed also remains below its previous peak level prior to the Great Recession, and has fallen further due to the pandemic. Employment peaked at 600,412 in the second quarter of 2007 in the labor shed, dropping by 72,880 jobs (or 12.14%) to 527,532 as of the first quarter of 2021. The labor shed's motor vehicle electrical and electronic equipment manufacturing industry is poised to expand as TORC Robotics announced plans to build a new facility at the Virginia Tech Corporate Research Center in Montgomery County. The investment of \$8.5 million will create 350 new jobs.<sup>7</sup>

<sup>&</sup>lt;sup>5</sup> Source: <u>https://www.wjhl.com/news/local/earthlink-bringing-285-jobs-to-southwest-virginia/</u>

<sup>&</sup>lt;sup>6</sup> Source: <u>https://www.bdtonline.com/news/fish-farm-on-the-horizon-tazewell-county-s-project-jonah-finally-coming-to-fruition/article\_ce145a6c-0e83-11eb-ad07-e7c6ed884e84.html</u>

<sup>&</sup>lt;sup>7</sup> Source: <u>https://www.wdbj7.com/2020/08/26/torc-robotics-to-expand-in-montgomery-co-creating-350-new-jobs/.</u>

# **REGION ONE PRIORITIES**

GO Virginia Region One has one simple goal: **repurpose the Southwest Virginia 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	1	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**

The analysis for the 2021 updated Growth and Diversification Plan included a review of twelve regional strategic plans or annual reports. The full list of plans reviewed in 2017, 2019, and 2021 may be found in the appendix.

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), Workforce Development Boards (WDBs), and InvestSWVA. Overall target sectors are listed in purple text with sub-sectors displayed in black text.

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

\*VCEDA - Virginia Coalfield Economic Development Authority

\*\*VIAA - Virginia's Industrial Advancement Alliance

Among the common targets are agriculture, manufacturing focusing on food and beverage processing, plastics, advanced material, wood products and fabricated materials, and information technology targeting data centers, call centers and software engineering/development. Existing businesses and tourism were also common targets among the regional entities.

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 is 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.

# SWVA BEYOND THE NUMBERS

## **Region One Industry Targets**

Based on the analysis of industries in GO Virginia 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 Virginia Region One						
	Advanced Manufacturing	Food and Beverage Manufacturing	Energy and Minerals	Information Technology		
Location Quotient	1.44	0.96	3.18	0.60		
Average Annual Wage	\$46,848 \$48,657		\$74,723	\$72,000		
Employment	15,338	1,477	3,397	2,351		
Export Sector	$\checkmark$	$\checkmark$	~	✓		
	The region possesses above-average wages and competitive advantages in many manufacturing industries.	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.			

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 \$663.5 million in GO VA Region 1 in 2019, an increase of \$68.8 million since 2015, 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 of an area, 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, tourism is not included in the target industries of GO Virginia Region 1. 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 GO VA Region 1 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.

Prior to the pandemic, advanced manufacturing experienced an increase in employment by 2.0% from 16,681 in 2017 to 17,020 in 2019 and an increase in average annual wages from \$42,552 to \$44,214 over the same time period. For food and beverage manufacturing, average annual wages increased by 6.4% from \$41,860 to \$44,519, while employment grew by 5.1% from 1,393 to 1,465. For the energy and minerals industry in GO VA Region 1, employment decreased by 3.8% from 4,039 to 3,888 and average annual wages increased by 4.7% from \$74,510 to \$77,985. For those working in IT in Region 1, employment increased by 1.3% to reach 2,451 in 2019.

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 Region 1 shows that traded sectors experienced a greater impact due to the pandemic. Employment decreased for both local (-4.47%) and traded (-8.11%) sectors; however, total wages increased in 2020 the local sectors by 0.55%, but decreased by 5.90% in traded sectors. The decline in total wages is tied to the loss of more than 3,400 jobs in traded sectors over this period.

The following manufacturing industries in Region 1 localities have weathered the pandemic relatively well, adding at least 50 employees over the year ending with the first quarter of 2021:

- All Other Plastics Product Manufacturing (+96 employees)
- Upholstered Household Furniture Manufacturing (+83)
- Other Aircraft Parts and Auxiliary Equipment Manufacturing (+72)
- Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing (+65)
- Fruit and Vegetable Canning Manufacturing (+59)

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

## **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). Prior to 2017, each of these industries except transportation equipment manufacturing in the region. Between 2017 and 2019, employment in chemical manufacturing and transportation equipment manufacturing has grown. As the COVID-19 pandemic has drawn attention to domestic pharmaceutical manufacturing and biotech companies, and with the proximity of the biotech cluster in Charlottesville,<sup>8</sup> biotech industries such as pharmaceutical and medicine manufacturing or medical equipment and supplies manufacturing may be expected to grow in the future and warrant further exploration in a later update.

Illustrative Advanced Manufacturing Industries, Four Quarters Ending 2021Q1							
		C	GO VA Regior	า 1	GO VA Region 1 Labor Shed		
NAICS	Manufacturing	Empl	Avg. Annual Wages	Location Quotient	Empl	Avg. Annual Wages	Location Quotient
325	Chemical	794	\$53,175	1.07	11,756	\$85,402	3.86
336	Transportation Equipment	2,975	\$45,982	2.13	8,060	\$64,588	1.40
326	Plastics and Rubber Products	1,397	\$55,581	2.33	4,512	\$53,157	1.83
335 Electrical Equipment, Appliance, and Components 1,131 \$53,732 3.44 5,452 \$57,973 4.02							
Source:	Source: JobsEQ®						

Between 2017Q1 and 2021Q1, employment in chemical manufacturing in GO VA Region 1 has decreased by 9.4% and average annual wages have increased by 8.2%. For transportation equipment, employment decreased by 18.3% and average annual wages increased by 10.7%. For plastics and rubber products, employment decreased by 0.7% while wages increased by 10.8%. Employment in electrical equipment, appliance, and components increased by 1.9%, while average annual wages increased by 7.2%.

Detailed analyses may be found in the appendix.

<sup>&</sup>lt;sup>8</sup> <u>https://cvillebiohub.org/</u>

## Agriculture/Food & Beverage Manufacturing

Agriculture is an important industry in GO VA Region 1. Twenty percent of the state's farms are in Region 1, with sales of cattle and calves exceeding \$240 million and total crop sales at \$57.4 million.<sup>9</sup> As Virginia's cattle sales total \$680 million, Region 1 makes up 35.4% of Virginia's cattle sales.

Agriculture in GO VA Region 1								
Region 1 Total in Region 1 Total in Percent in Virginia ir								
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 (\$)	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 Region 1 and across the state. The number of farms decreased from 2012 to 2017 in the state of Virginia (-6.1%) and Region 1 (-10.7%), while total farmland acreage decreased 6.1% in Virginia and 13.6% in Region 1.<sup>10</sup> Total livestock sales in Region 1 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.<sup>11</sup>

Food and beverage manufacturing is a natural extension to the agriculture industry that would bring jobs with various skill levels. One specific industry within food and beverage manufacturing, animal slaughtering and processing, is explored due to a lack of facilities. Farmers have stated their need for such a facility since cattle are currently shipped to the Midwest for slaughtering and processing. Food and beverage manufacturing, in general, is also explored as a target industry.

Food and beverage manufacturers in GO VA Region 1 pay an annual average wage of \$48,657, which is higher than the average wage (\$42,307) in the labor shed. 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. GO VA Region 1 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

<sup>&</sup>lt;sup>9</sup> 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.

<sup>&</sup>lt;sup>10</sup> Source: Census of Agriculture (2012 & 2017)

<sup>11</sup> Ibid.

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 \$38,030. This is slightly above the regional average wage. 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, 51 workers typically require short-term on-the-job training, and another 35 employees require moderate-term on-the-job training. Seven workers (bakers, industrial machinery mechanics, and butchers and meat cutters) require long-term training and another seven employees (supervisors, managers, and scientists) typically do not require on-the-job training.

Three of the top five 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 one of the top occupations: slaughterers and meat packers (44 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. This is defined as regional workers with skills similar to the specified occupation who are 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.

#### **Animal Slaughtering and Processing**

The labor force of GO VA Region 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.<sup>12</sup> Among the top 10 occupations typically required in this industry, Region 1 has ample supply for seven occupations. Though the region 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).

Detailed analyses may be found in the appendix.

<sup>&</sup>lt;sup>12</sup> County Business Patterns from the U.S. Census indicate about 60% of establishments in this industry have 19 or fewer employees.

### **Energy and Minerals**

As noted earlier, the energy cluster has a location quotient of 3.18 indicating that employment in GO VA Region 1 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 \$74,723 in the first quarter of 2021—nearly double the average wage in Region 1.

Unfortunately, 55.0% 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.<sup>13</sup> 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. The COVID-19 pandemic has only exacerbated the current supply chain issues with rare earth elements, especially in global markets, and such projects could provide a much-needed boon for the coal mining industry.<sup>14</sup> GO Virginia Region 1 has also funded several energy-related projects, including InvestSWVA's Project Oasis; InvestSWVA's Project Energizer; InvestSWVA's Project Innovation; and Appalachian Voices' Energy Storage & Electrification Manufacturing Jobs.<sup>15</sup>

Wind and solar projects have been considered in the region and would diversify the energy cluster away from its dependence on the coal industry.<sup>16</sup> Both industries pay well in the nation. During the first quarter of 2021, the national annual average wage in solar electric power generation was \$105,083 and wind electric power generation employees earned an annual average \$104,885. The former includes occupations such as solar photovoltaic installers, electrical engineers, general and operations managers, and electricians. The latter industry employs similar occupations (except for solar photovoltaic installers), as well as occupations such as civil engineers, wind turbine service technicians, construction managers, machinists, and mechanical engineers.

Hydroelectric power (hydroelectric) is another clean source of energy and diversification. Dominion Energy currently has two hydroelectric facilitices in Virginia; one located in Louisa County and one in Bath County. Combined, they power approximately 750,250 homes.<sup>17</sup> Nationally, hydroelectric power generation provides an annual average wage of \$126,454.

Detailed analyses may be found in the appendix.

<sup>&</sup>lt;sup>13</sup> Source: https://vtnews.vt.edu/articles/2016/03/research-rareearth.html.

<sup>&</sup>lt;sup>14</sup> Source: https://www.npr.org/2020/07/17/892195748/covid-19-pandemic-highlights-u-s-reliance-on-chinas-rare-earth-metals.

<sup>&</sup>lt;sup>15</sup> For a full list of projects and descriptions, see https://www.goswva.org/projects-2

<sup>&</sup>lt;sup>16</sup> Source: http://www.richmond.com/business/southwest-virginia-from-coal-power-to-wind-power/article\_87431ec9-a7fb-533f-afaa-09fbfb3f10dd.html.

<sup>&</sup>lt;sup>17</sup> Source: https://www.dominionenergy.com/projects-and-facilities/hydroelectric-power-facilities-and-projects.

## Information & Emerging Technology

The 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 the average occupation wage of GO VA Region 1, at \$72,200. With 2,490 people in the region working in computer and math occupations, the location quotient (LQ) for the occupation is 0.61, meaning that workers with these skills have a concentration roughly half that found in the nation, on average. The LQ for the labor shed is a bit higher at 0.74. Consequently, attracting firms that need computer and math talent is an aspirational strategy.

Occupation Snapshot of Computer and Mathematical Occupations, Four Quarters Ending
with 2021Q1

		GO Virginia Region 1			GO Virginia	Region	1 Labor Shed
soc	Occupation	Employment	LQ	Annual Mean Wage <sup>1</sup>	Employment	LQ	Annual Mean Wage <sup>1</sup>
15-1211	Computer Systems Analysts	296	0.58	\$72,400	1,656	0.79	\$79,500
15-1212	Information Security Analysts	146	1.23	\$83,300	659	1.35	\$84,100
15-1221	Computer and Information Research Scientists	18	0.70	\$101,100	95	0.88	\$110,900
15-1231	Computer Network Support Specialists	111	0.70	\$63,000	578	0.88	\$63,100
15-1232	Computer User Support Specialists	320	0.57	\$44,200	1,659	0.72	\$49,700
15-1241	Computer Network Architects	83	0.59	\$87,000	452	0.78	\$88,600
15-1244	Network and Computer Systems Administrators	264	0.89	\$63,700	1,173	0.97	\$71,200
15-1245	Database Administrators and Architects	100	0.86	\$77,800	465	0.97	\$82,700
15-1251	Computer Programmers	79	0.50	\$63,500	437	0.67	\$71,900
15-1256	Software Developers and Software Quality Assurance Analysts and Testers	0	0.00	n/a	3,427	0.64	\$93,200
15-1257	Web Developers and Digital Interface Designers	86	0.55	\$60,300	409	0.64	\$59,600
15-1299	Computer Occupations, All Other	147	0.43	\$71,700	807	0.57	\$77,500
15-2011	Actuaries	7	0.36	\$92,300	43	0.51	\$103,200
15-2021	Mathematicians	3	1.27	\$84,900	17	1.74	\$93,500
15-2031	Operations Research Analysts	82	0.99	\$75,100	364	1.07	\$77,100
15-2041	Statisticians	16	0.45	\$72,200	90	0.64	\$78,700
15-2098	Data Scientists and Mathematical Science Occupations, All Other	31	0.60	\$71,400	174	0.81	\$79,900
15-0000	Computer and Mathematical Occupations	2,490	0.61	\$72,200	12,505	0.74	\$77,700

#### Source: JobsEQ®

Employment data as of 2021Q1. Demand data reflect place-of-work employment; retirements reflect place-of-residence data.

1. Wage data are as of 2020 and represent the average for all covered employment.

If a new IT firm requiring 25 new employees were to be established in GO VA Region 1, it would find a sufficient number of applicants with the required skills. The following table illustrates this, and the potential candidate-to-opening ratio in the column below highlights in green all occupations where there are at

least 50 employees in the region for every 1 the expanding firm is expected to hire. This 50:1 ratio is used by expanding firms and site selectors as a baseline to ensure skilled workers can be hired in the region.

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

- Computer Systems Design (Cybersecurity)
- Data Center

Detailed analyses 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.

It is important to note that the GO Virginia State Board authorized the use of \$14.66M in statewide competitive funds to respond to the unprecedented economic conditions facing Virginia due to the immediate and long-term effects of the coronavirus on regional economies. This initiative focused resources on economic resilience and recovery while staying true to the GO Virginia mission. The Economic Resilience and Recovery (ERR) program established relaxed match guidelines which include a 2:1 match requirement and no local match required. The ERR program will expire on June 30, 2022 unless extended by the GO Virginia State Board. It is anticipated that GO Virginia match guidelines will resume with a 1:1 match and local match requirement.

The four target industries of the GO Virginia Region One Council align well with the strategic funders who support the region of Southwest Virginia. 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, state dollars offered through these funders cannot be used as match for GO Virginia projects, with the exception of the Tobacco Region Revitalization Commission (TRRC), TRRC is the only eligible state monies for GO Virginia match; however, enacted by the General Assembly of Virginia, this bill has a sunset provision through July 1, 2022.

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 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 of the region.

## **Region One Growth Strategies**

As the Region One Council canvassed the region for input on the update of the plan, the foundation strategies of the growth and diversification plan were affirmed and therefore will remain relatively the same. Additionally, the plan development benefitted from four years of experience with what projects were prioritized and funded at the state level. Thus, the 2021 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 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 education attainment and health metrics have not changed significantly in the past four 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 Southwest Virginia 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 postgraduate 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.

#### 2021 Strategies for Talent Development

- Strategy 1: Align education and training programs with needs and expectations of target industries; strengthen communication between educational providers and targeted 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 on 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 these strategies above. Most notably, is the Ignite Internship initiative implemented by strategic partner, United Way of Southwest Virginia. For more details on this project and others addressing the talent pipeline, please see the appendix "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
- Initiatives which promote the next generation of leaders and entrepreneurs

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 Virginia 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 Virginia 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 Virginia Economic Development Partnership (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.

### 2021 Strategies for Sites & 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

- 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 (RIFAs) 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 & Infrastructu	re 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**

In 2019, Virginia Economic Development Partnership (VEDP) partnered with stakeholders across the Commonwealth to evaluate the readiness of over 460 industrial sites, including 21 sites within GO Virginia Region One. Sites were characterized by Virginia Business Ready Sites tiers, with Tier 4 and 5 sites able to accommodate a medium industrial user within 12-18 months. Characterized sites received a summary of site attributes, a site readiness Tier, and next steps and cost estimates to advance Tier level.

The characterization produced a report for each site that includes 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

In August 2020, VEDP collaborated with GO Virginia to host the Sites and Infrastructure Forum. The site characterization study process was shared with regional stakeholders and allowed local and regional economic developers to have 1:1 meeting with VEDP staff to discuss sites within their jurisdictions. Since the 2019 Growth and Diversification Plan update, the GO Virginia Region One Council has approved two projects related to the VBRSP; these include Wildwood Commerce Park and Project Intersection. Summaries of these projects can be found in the appendix.

Currently, three full sites or industrial parks within GO Virginia Region 1 are characterized as Tier 4: Wildwood Commerce Park, Bluestone Regional Business and Technology Center, and Pathway Park. Additionally, individual lots of Progress Park have been characterized as Tier 4: Lots 1 and 24. In November 2021, the Blue Star-AGI manufacturing facility announced it would locate on Lot 24.

The following map displays the 26 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. The final report is available at <a href="https://www.vedp.org/vbrsp">https://www.vedp.org/vbrsp</a>.

It is advised that GO Virginia sites projects have 25+ contiguous acres.

### **VEDP Site Characterization Map**

### Site Characterization in GO Virginia Region 1

- VBRSP Tiers 4-5 VBRSP Tier 1-3 Uncharacterized Site
- <25 contiguous, developable acres</li>
- 25-99 contiguous, developable acres
- 100-499 contiguous, developable acres
- 500+ contiguous, developable acres



- 1 Leatherwood Site
- 2 Wythe County Progress Park
- **3** Constitutional Oaks Industrial Park
- 4 Russel County Industrial Complex
- **5 Former Brick Plant**
- 6 Wildwood II
- 7 Lonesome Pine Business and Technology Park
- 8 Community Boulevard Site
- 9 Project Intersection
- 10 Wildwood Commerce Park
- 11 Spraker Site
- **12 Richwood Properties**
- 13 Southern Gap Business Park
- 14 Oak Center for Business and Industry

- **15 Riverside Development**
- 16 Exist 24 Chestnut Hills Site
- 17 Bluestone Regional Business & Technology Center
- 18 Oak Park Lot 5
- **19 Pathway Park**
- 20 I-81 Davis Site
- 21 Hull Property
- 22 I-81 Molloy Site
- 23 I-81 Campbell Site
- 24 Exit 22 Property
- 25 Scott County Regional Business and Technology Park
- 26 Winter Site

<sup>&</sup>lt;sup>1</sup> As listed in VirginiaScan on 12/9/2021

# Innovation & Scale Up Support

Build an ecosystem to encourage innovation and to support the creation and expansion of new, emerging and existing businesses. 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 Research<sup>18</sup> 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. Small businesses are defined here, as in prior reports, as those with fewer than 20 employees.

While new business formation has declined in the region, the associated job creation has increased. The new business formation rate (the proportion of startups relative to all active firms) has tracked in-line with the state formation rate in 2010, but it has since risen above the state average. Jobs created by small companies contributed to 40.2% of total job creation in GO Virginia Region One in 2020, above their average contributions in Virginia (37.4%). The 2020 percentage contribution is an increase from 38.3% in 2019 and 35.9% in 2010. While there are many factors that could influence these data, including statistical volatility due to how the data are collected, a number of efforts are underway in GO Virginia Region One aimed at encouraging small business start-ups. 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 Region Once Council has also invested in these efforts through the Region Entrepreneurship Initiative (REI) Enhanced Capacity Building project, which led to the implementation project currently underway with The University of Virginia's College at Wise's SWVA Startup. This project will have an Ecosystem Builder that will support scale up activities and build a culture of entrepreneurship and innovation, which leads to the creation of high-growth companies.

TEConomy Partners' update on growth and scalability of entrepreneurship in Region One indicates the region's position in entrepreneurial development in the targeted industries listed below. See appendix for the complete TEConomy update.

Industry Cluster	Economic Development Position in Region	Regional Position in New Business Formation Relative to State Average
Agriculture & Food Processing	Mid-sized, Emerging Strength	Mixed
Energy, Natural Resources, & Finished Products	Large, Declining Specialization	Above
Information Technology & Communications Services	Small, Emerging Opportunity	Above
Manufacturing	Large, Declining Specialization	Below

<sup>18</sup> Source: Who Creates Jobs? Small vs. Large vs. Young, found at <u>http://www.nber.org/papers/w16300.pdf.</u>

TECONOMY

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

### 2021 Strategies for Innovation and Scale Up Support

- Strategy 1: Develop approach to addressing the TEConomy Partners 2021 entrepreneurial trends update. 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 Region One 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	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 Southwest Virginia.

As the COVID-19 pandemic has drawn attention to domestic pharmaceutical manufacturing and biotech companies, and with the proximity of the biotech cluster in Charlottesville,<sup>19</sup> biotech industries such as pharmaceutical and medicine manufacturing or medical equipment and supplies manufacturing may be expected to grow in the future and warrant further exploration in a later update.

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.

<sup>&</sup>lt;sup>19</sup> https://cvillebiohub.org/

# **REGION ONE PROJECTS OVERVIEW**

# GO Virginia Region One Implementation Activity

Since the Region One Growth & Diversification Plan was released in August 2017, the Region One Council has successfully awarded 21 GO Virginia Per Capita grants, totaling \$3,449,502. Of the 21 projects, seven implementation projects have been awarded \$2,421,098 and 14 enhanced capacity building projects have been awarded \$1,028,404. These projects have leveraged over \$4.1 million in non-state investment, with the exception of Tobacco Region Revitalization Commission monies. The projects have utilized a total of \$321,842 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.

The GO Virginia State Board authorized the use of \$14.66M in statewide competitive funds to respond to the unprecedented economic conditions facing Virginia due to the immediate and long-term effects of the coronavirus on regional economies. This initiative focused resources on economic resilience and recovery while staying true to the GO Virginia mission. Region One has a total of three Economic Resilience and Recovery (ERR) projects that were funded, totaling \$268,496. These three projects have leveraged \$138,076 in non-state investment and have utilized a total of \$50,000 in local match.

Region One is the lead on one Competitive ERR project and has the collaboration from Regions 2, 3, 4, 5, 6, 7, 8, and 9. This project is being executive by GENEDGE and was funded in the amount of \$2,950,000, with \$1,475,000 in leveraged funding.

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.

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 75 regional businesses are engaged in at least one approved grant project.

The following tables list the Per Capita, Competitive, ERR, and Competitive ERR grant awards for Region One projects. Complete summaries for each project may be found in the appendix under Region One Approved Projects. Applications and supporting documents for each project can be found on the Region One website at www.goswva.org.

	Region One Per Capita Grant Awards						
Project	Description	Industry Target	GO VA Funds	Leveraged Funds	Local Funds		
<b>Ignite Internships</b> United Way of Southwest Virginia	<b>Collaborative/Implementation</b> Talent Development	Advanced Manufacturing Information & Emerging Technologies Energy & Minerals Food/Beverage Manufacturing	\$250,000	\$618,482	\$50,000		
SWVA Hub Link Southwest Virginia Technology Council	Hub Link st Virginia av CouncilEnhanced Capacity Building Talent DevelopmentInformation & Emerging Technologies		\$27,547.20	\$27,637.21	\$0		
Coal to Graphene Market Study Virginia Tech	Enhanced Capacity Building Talent Development Innovation & Scale Up Support	hanced Capacity Building Talent Development Innovation & Scale Up Support		\$25,000	\$25,000		
Smart Farming at the Center for Workforce and Innovation for Appalachia Mountain Empire Community College	<b>Collaborative/Implementation</b> Talent Development	Information & Emerging Technologies Food/Beverage Manufacturing	\$310,372	\$380,500	\$62,500		
Lonesome Pine RIFA Coordinator LENOWISCO Planning District Commission	Enhanced Capacity Building Sites & Infrastructure	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	Enhanced Capacity Building Talent Development Sites & Infrastructure Innovation & Scale Up Support	Advanced Manufacturing Information & Emerging Technologies Energy & Minerals	\$70,947	\$70,947	\$0		
<b>Project Oasis</b> InvestSWVA	Enhanced Capacity Building Innovation & Scale Up Support	Advanced Manufacturing Information & Emerging Technologies Energy & Minerals	\$50,000	\$50,000	\$O		
Regional Entrepreneurship Initiative The University of Virginia's College at Wise/Opportunity SWVA	Enhanced Capacity Building Innovation & Scale Up Support	Advanced Manufacturing Information & Emerging Technologies Energy & Minerals Food/Beverage Manufacturing	\$80,000	\$40,000	\$0		
SWVA Agribusiness Opportunities Project Manager Virginia Tech: Virginia Cooperative Extension	Enhanced Capacity Building Innovation & Scale Up Support	Food/Beverage Manufacturing	\$100,000	\$100,000	\$24,000		
<b>Project Energizer</b> LENOWISCO Planning District Commission	Enhanced Capacity Building Sites & Infrastructure Innovation & Scale Up Support	Information & Emerging Technologies Energy & Minerals	\$50,000	\$50,000	\$0		
<b>Project Innovation</b> LENOWISCO Planning District Commission	Enhanced Capacity Building Innovation & Scale Up Support	Information & Emerging Technologies Energy & Minerals	\$100,000	\$150,000	\$0		
<b>Project Intersection</b> LENOWISCO Planning District Commission	Collaborative/Implementation Sites & Infrastructure	Advanced Manufacturing Information & Emerging Technologies	\$485,000	\$1,417,000	\$0		
Digital Workforce Development William King Museum of Art	Collaborative/Implementation Talent Development	Information & Emerging Technologies	\$70,910	\$75,735	\$0		
Ignite Tech Talent Phase I Discovery United Way of Southwest Virginia	Enhanced Capacity Building Talent Development	Information & Emerging Technologies	\$251,960	\$251,961	\$0		

Wildwood Natural Gas Extension Crossroads Economic Development Authority	Collaborative/Implementation Sites & Infrastructure	Advanced Manufacturing	\$527,600	\$320,684	\$110,342
Energy Storage & Electrification Manufacturing Jobs Appalachian Voices	Collaborative/Implementation Innovation & Scale Up Support	Advanced Manufacturing Energy & Minerals	\$486,366	\$245,000	\$O
<b>Project Fuse</b> Lonesome Pine Regional Industrial Facilities Authority	Enhanced Capacity Building Innovation & Scale Up Support	Information & Emerging Technologies	\$70,000	\$35,000	\$0
Project Thoroughbred InvestSWVA	Enhanced Capacity Building Innovation & Scale Up Support	Food/Beverage Manufacturing	\$100,000	\$100,000	\$O
SWVA Startup The University of Virginia's College at Wise	<b>Collaborative/Implementation</b> Innovation & Scale Up Support	Advanced Manufacturing Information & Emerging Technologies Energy & Minerals Food/Beverage Manufacturing	\$290,850	\$145,425	\$0
GROWTH: The Business of Agriculture in SWVA Emory & Henry College	Enhanced Capacity Building Innovation & Scale Up Support	Food/Beverage Manufacturing	\$52,950	\$26,500	\$0
Project Veer InvestSWVA	Enhanced Capacity Building Innovation & Scale Up Support	Energy & Minerals	\$49,750	\$24,875	\$0

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

	Region One Economic Resilience & Recovery Grant Awards						
Project	Description	Industry Target	GO VA Funds	Leveraged Funds	Local Funds		
<b>Perseverance</b> Virginia's Industrial Advancement Alliance	Fast Access Innovation & Scale Up Support	Advanced Manufacturing Cale Up Support		\$52,500	\$50,000		
Farmer Pipeline: Maintaining the Supply Chain by Growing Farmers Appalachian Sustainable Development	Fast Access Innovation & Scale Up Support	Food/Beverage Manufacturing	\$99,996	\$51,076	\$0		
COVID-19 Business Continuity & Resiliency Appalachian Council for Innovation	Fast Access Innovation & Scale Up Support	Advanced Manufacturing Information & Emerging Technologies Energy & Minerals Food/Beverage Manufacturing	\$68,500	\$34,500	\$0		

Region One Competitive Economic Resilience & Recovery Grant Awards								
Project	Project Collaborating Regions Industry Target GO VA Funds Leveraged							
Retooling Virginia's Manufacturers for Strategic Industries GENEDGE	<b>Regions 1, 2, 3, 4, 5, 6, 7, 8, &amp; 9</b> (Region 1 Primary)	Advanced Manufacturing	\$2,950,000	\$1,475,000	\$O			

# GO Virginia Region One Target Industry Investments

\*Some project impact multiple targeted industries.

Project Name	Project Type	Advanced Manufacturing	Agriculture and Food & Beverage Manufacturing	Energy and Minerals	Information Technology
Appalachian Council for Innovation: COVID-19 Business Continuity & Resiliency	ERR – Fast Access	x	x	x	x
Appalachian Sustainable Development: Farmer Pipeline	ERR – Fast Access		x		
Appalachian Voices: Energy Storage & Electrification Manufacturing Jobs	Implementation	x		x	
Appalachian Voices: Solar Playbook	ECB			x	
Blue Ridge Crossroads Economic Development Authority: Wildwood Natural Gas Extension	Implementation	x	x	x	x
Emory & Henry College: GROW(TH) The Business of Agriculture in Southwest Virginia	ECB		x		
GENEDGE: Retooling Virginia's Manufacturers to Strategic Industries	ERR – Statewide Competitive	x	x		
InvestSWVA: Project Oasis	ECB			x	
InvestSWVA: Project Thoroughbred	ECB		x		
InvestSWVA: Project Veer	ECB			x	
LENOWISCO Planning District Commission: Lonesome Pine Regional Facilities Authority (RIFA) Coordinator	ECB	x	x	x	x
LENOWISCO Planning District Commission: Project Energizer	ECB			x	
LENOWISCO Planning District Commission: Project Innovation	ECB			x	
Lonesome Pine RIFA: Project Fuse	ECB	x	x	x	x

Lonesome Pine RIFA: Project Intersection	Implementation	x	x	x	x
Mountain Empire Community College: Smart Farming at the Center for Workforce & Innovation of Appalachia	Implementation		x		x
Southwest Virginia Technology Council	ECB				x
The University of Virginia's College at Wise/Opportunity SWVA: Regional Ecosystem Initiative (REI)	ECB	x	x	x	x
The University of Virginia's College at Wise: SWVA Startup	Implementation	x	x	x	x
United Way of Southwest Virginia: Ignite Tech Talent	Implementation	x	x	x	x
United Way of Southwest Virginia: Ignite Tech Talent Phase 1 Discovery	ECB				x
Virginia's Industrial Advancement Alliance: Perseverance	ERR-Fast Access	x			
Virginia Tech: Coal to Graphene Market Study	ECB			x	
Virginia Tech Virginia Cooperative Extension: SWVA Agriculture Opportunities Project Manager	ECB		x		
William King Museum of Art: Digital Workforce Development	Implementation				x

# GO Virginia Region One Investments

The graphs below display the GO Virginia Region One Council investments since 2017.









# **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. While GO Virginia does not have a designated workgroup for energy and minerals, support staff actively engages with the Southwest Virginia Research and Development Authority.

One of the initial program challenges faced by Region One was 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. Since 2019, the project pipeline in Region One has been adequate, with an increase in sites and infrastructure investments and innovation and scale up support activities. Region One will continue work to generate project ideas and help facilitate development, incubating them to the point of application.

The GO Virginia Region One Council convenes three sub-committees on a regular basis centered on Talent Development, Economic Development & Infrastructure, and Entrepreneurship, Innovation & Small Business. It is the goal of the Council to continue to organize these groups and engage their expertise in project development and implementation.

Support staff actively engages with regional stakeholders to generate project ideas. This has 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.

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, 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 Appalachia for the Region One Council and stakeholders to learn more about the revitalization opportunities 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.

### Strengthen Working Groups

- Assist working groups in moving projects forward.
- 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, childcare, and health care.

### 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 Apply for GO Virginia 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 four 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 Virginia Department of Housing and Community Development (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. DHCD has the ability to administratively approve Enhanced Capacity Building (ECB) projects, which are projects requesting \$100,000 or less.

Guidelines for applying for GO Virginia funding from both the per capita and competitive funds may be found at <u>www.goswva.org</u>. 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 <u>www.govirginia.org</u> 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 metrics, 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 that challenges are addressed as early as possible.

# **APPENDIX**

# **Table of Contents**

APPENDIX 1: Quantitative Data Analysis: CHMURA ECONOMICS & ANALYTICS5	6
Background5	7
Labor Shed	8
Economic Landscape6	0
Demographics6	50
Drivers of Growth: Industry Structure	0
Occupations9	2
Background5	7
Education9	5
Gaps10	)2
Potential GO VA Region 1 Industry Target11	1
Appendix 1: Labor Shed13	6
Appendix 2: Cluster Definitions13	9
Appendix 3: Regional Variations by Planning District14	13
Appendix 4: Transferable Jobs from Coal Mining15	52
APPENDIX 2: Economic Impact of COVID-19 In GO VA Region 1: CHMURA ECONOMICS & ANALYTICS15	55
APPENDIX 3: Region One High School Graduation Rates (2021)17	'3
APPENDIX 4: TEConomy Partners & Region One Entrepreneurial Trends	4
Update on Entrepreneurial Trends: Phase I of Analysis of Startup Activity & Firm Dynamics17	4
Update on Entrepreneurial Trends: Phase II of Broader Innovation Ecosystem Measures	0
APPENDIX 5: List of Strategic Plans Reviewed	34
APPENDIX 6: Regional Funding Sources	7
APPENDIX 7: GO Virginia Regional Partners	'3
APPENDIX 8: Region One Approved Projects19	8
APPENDIX 9: Region One Community Survey Results	)9
APPENDIX 10: GO Virginia Working Project Guidance	7
APPENDIX 11: HUBZone Map	0
APPENDIX 12: Virginia Opportunity Zones Map22	21

# 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 Region 1, located in the most southwest corner of the state, is mainly rural and has historically had the weakest economic growth of all the GO VA regions in the state. Prior to the COVID-19 pandemic, employment declined 0.9% in the four quarters ending with the first quarter of 2020. By comparison, employment grew 1.0% in the state and 1.1% in the nation. Region 1 lost an estimated 11,584 jobs, equivalent to 8.5% of the regional

workforce, at the height of the pandemic in the first quarter of 2020.1

The Appalachian Mountains run through many of the 13 counties and three cities that comprise the region. The beauty and rural amenities of the region also bring the challenges of a sparsely populated area and mountains that can present navigational difficulties to residents seeking 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 \$82,951 in the four quarters ending with the first quarter of 2021, coal mining pays more than double the regional average wage of \$37,461.<sup>2</sup> Regulatory and environmental concerns, cheaper energy alternatives such as natural gas, and the declining cost of both solar and wind power have led to a weakening coal industry. Since the fourth quarter of 2013, there has been a loss of 2,239 coal mining jobs in the region, down from 4,108. The region's coal mining industry saw a modest employment gain of 127 jobs between the fourth quarter of 2016 and the second quarter of 2019, but employment has since declined. An estimated 1,869 people worked in the coal mining industry in Region 1 in the first quarter of 2021.

Manufacturing, another high-paying sector at \$46,848 in the first quarter of 2021, 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 Region 1, 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 stood at 16,994 prior to the pandemic (the first quarter of 2020) but fell to 15,338 as of the first quarter of 2021.

<sup>&</sup>lt;sup>1</sup> Source: Economic Impact of COVID-19 in GO Virginia Region One, prepared by Chmura Economics & Analytics May 14, 2021. <sup>2</sup> DHCD has shared a regional average wage of \$35,571 with Region 1, to be the salary threshold for applications on future GO Virginia projects. As average wages change over time, this report will use the latest available data, and discuss differences between estimates as relevant.

No other major industry sectors have added enough jobs to replace those lost over the past year and decade in GO VA Region 1. Like many rural areas across the nation, the relatively small number of firms leads to a lack of alternative opportunities if workers are displaced due to firm relocations, closings, or layoffs. Often, these workers 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 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**

GO VA Region 1 borders four states that provide job opportunities for residents of the region. From an economic development perspective, the adjoining counties are home to firms that GO VA Region 1 should consider as cluster and supply chain assets. For example, both 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 Region 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 Region 1 to warrant inclusion in the GO VA Region 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 Region 1 labor shed includes six additional Virginia localities. Including Virginia and other states, the 12 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 GO VA Region 1. The City of Salem was added because it is in the center of Roanoke County, which met the 600-commuter threshold.<sup>3</sup>

Employment in the Region 1 labor shed fared better than employment in Region 1 in the last year, declining 6.1% over the four quarters ending with the first quarter of 2021. The labor shed is slightly less dependent on coal mining (0.5% percent of total employment versus 1.5% in Region 1) and manufacturing (11.5% vs 12.0% in Region 1).

Commuting patterns by occupation reveal which workers are drawn into Region 1 for work, as well as which workers may be commuting out of the region for employment. While opportunities exist outside the region, these workers may be interested in employment opportunities closer to home which would provide a shorter commute. The largest net loss is in transportation and material moving occupations--such as labor and material movers, drivers, and packers and packagers-- followed by production occupations, which are primarily found in manufacturing. Also notable, more than 1,000 workers in healthcare practitioners and technical occupations leave the region for work each day. GO VA Region 1 also attracts workers, with the greatest numbers of net positive commuters in business and financial operations and management occupations.

soc	Occupation Description	Commute Into Region 1	Commute Out of Region 1	Net
53-0000	Transportation and Material Moving Occupations	1,485	2,682	-1,197
51-0000	Production Occupations	1,164	2,222	-1,058
35-0000	Food Preparation and Serving Related Occupations	1,493	2,330	-837
49-0000	Installation, Maintenance, and Repair Occupations	497	1,178	-681
37-0000	Building and Grounds Cleaning and Maintenance Occupations	360	950	-589
47-0000	Construction and Extraction Occupations	694	1,255	-561
43-0000	Office and Administrative Support Occupations	2,274	2,824	-550
29-0000	Healthcare Practitioners and Technical Occupations	1,108	1,636	-528
31-0000	Healthcare Support Occupations	825	1,326	-501
45-0000	Farming, Fishing, and Forestry Occupations	50	124	-73
39-0000	Personal Care and Service Occupations	383	407	-24
19-0000	Life, Physical, and Social Science Occupations	246	165	81
23-0000	Legal Occupations	151	65	86
17-0000	Architecture and Engineering Occupations	443	291	152
33-0000	Protective Service Occupations	644	458	185
21-0000	Community and Social Service Occupations	573	342	231
25-0000	Educational Instruction and Library Occupations	1,329	1,058	271
15-0000	Computer and Mathematical Occupations	634	297	336
41-0000	Sales and Related Occupations	3,076	2,707	370

### Net Commuting by Occupation Group in GO Virginia Region 1

<sup>&</sup>lt;sup>3</sup> A detailed explanation of the methodology used to create the GO VA Region 1 labor shed is in Appendix 1.

soc	Occupation Description	Commute Into Region 1	Commute Out of Region 1	Net
27-0000	Arts, Design, Entertainment, Sports, and Media	555	171	385
11-0000	Management Occupations	1,742	1,134	607
13-0000	Business and Financial Operations Occupations	1,281	673	609

#### Net Commuting by Occupation Group in GO Virginia Region 1

Source: Chmura's JobsEQ, data as of 2021Q1

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

# **ECONOMIC LANDSCAPE**

Employment in GO VA Region 1 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, an encouraging sign for manufacturing is that employment has stabilized over the last few years (prior to the pandemic). Employment is another important driver in the region—the energy cluster (particularly coal mining)—has lost nearly 4,000 jobs since 2012.

In GO VA Region 1, both the manufacturing sector and energy cluster pay a higher average wage than all other industries. 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 Region 1 depict a rural area that is struggling to grow. Compared to the population of GO VA Region 1, the Region 1 labor shed's population is more than three times larger and has generally higher educational attainment.

### Population

A total of 375,761 people lived in GO VA Region 1 in 2020 according to the Census Bureau, and the population has suffered an annual average decrease of 0.7% since 2010. Looking ahead, **projections in JobsEQ anticipate the region will contract an annual average 0.8% per year between 2021 and 2031—a loss of 28,950 people**. This projected population loss has increased from previous reports as county-level population data are revised. Ongoing efforts in GO Virginia Region 1 to attract and retain population may also shift this projection.

The larger GO VA Region 1 labor shed was home to 1.28 million people in 2020, with an average annual population decrease of -0.2% since 2010. Population in the labor shed is projected to decline an average 0.2% per year through 2031 for a loss of 22,489 residents. Population growth in the state of Virginia and the

nation are both expected to increase an annual average of 0.5% and 0.6%, respectively, over the same period.

The age cohorts in Region 1 are skewed toward a lower percentage of younger individuals when compared to both the region's labor shed and the state. To some extent, this is due to the presence of Virginia Tech, East Tennessee State University, Radford University, and other schools in the labor shed, but also presumably because some of the younger residents leave the region for better job opportunities. In GO VA Region 1, 18.7% of the population is aged 18 to 34 years, compared with 22.1% in the labor shed and 23.5% in the state. In contrast, 21.3% of the population in Region 1 is 65 years and older compared with 19.5% in the labor shed and 15.0% in Virginia.



## Population by Age Cohort, 2015-2019

The population in GO VA Region 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 Region 1 is white according to the 2015-2019 American Community Survey (ACS), compared with 90.2% in the labor shed and 67.6% in the state.

Demographic Summary <sup>1</sup>									
		Percent			Value				
		Region 1			Region 1				
	GO VA	Labor		GO VA	Labor				
	Region 1	Shed	Virginia	Region 1	Shed	Virginia			
Demographics									
Population <sup>3</sup>	_	—	—	375,761	1,278,144	8,590,563			
Population Annual Average Growth <sup>3</sup>	-0.7%	-0.2%	0.7%	-2,603	-2,172	56,656			
Median Age <sup>2</sup>	_	—		45.3	42.2	38.2			
Under 18 Years	19.0%	19.3%	22.1%	72,846	248,237	1,865,699			
18 to 24 Years	7.3%	10.2%	9.6%	27,826	130,587	811,878			
25 to 34 Years	11.4%	11.9%	13.9%	43,465	153,183	1,174,091			
35 to 44 Years	11.9%	11.6%	13.0%	45,344	149,197	1,100,460			
45 to 54 Years	13.8%	13.4%	13.5%	52,770	172,195	1,139,236			
55 to 64 Years	15.3%	14.1%	12.9%	58,653	180,691	1,091,153			
65 to 74 Years	12.3%	11.3%	9.0%	47,226	144,538	756,712			
75 Years and Over	9.0%	8.2%	6.1%	34,506	105,243	515,234			
Race: White	95.0%	90.2%	67.6%	363,355	1,157,436	5,717,617			
Race: Black or African American	2.8%	5.5%	19.2%	10,684	70,596	1,621,592			
Race: American Indian and Alaska									
Native	0.2%	0.2%	0.3%	791	2,844	23,873			
Race: Asian	0.5%	1.5%	6.4%	1,777	19,605	541,133			
Race: Native Hawaiian and Other									
Pacific Islander	0.0%	0.0%	0.1%	125	621	6,179			
Race: Some Other Race	0.3%	0.7%	2.6%	1,110	8,500	223,794			
Race: Two or More Races	1.3%	1.9%	3.8%	4,794	24,269	320,275			
Hispanic or Latinx (of any race)	1.9%	3.0%	9.4%	7,088	38,502	792,001			

Source: JobsEQ®

1. ACS 2015-2019, 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 2020, annual average growth rate since 2010

### **Labor Force Participation**

The labor force participation rate in GO VA Region 1 is relatively low when compared to the state. This is 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. According to the American Community Survey of 2015-2019, the labor force participation rate of the civilian population aged 16 and older in Region 1 was 49.1%, compared with 54.2% in the labor shed and 65.2% in the state.

The percentage of the population with a disability in Region 1 is more than double that of the state, at 21.3% for individuals aged 18-64, according to the ACS 2015-2019. Additionally, only 28.8% of individuals with disabilities in Region 1 participate in the labor force, compared to 45.0% in the state.

Demographic Summary <sup>1</sup>									
		Percent			Value				
	Region 1			Region 1					
	GO VA	Labor		GO VA	Labor				
	Region 1	Shed	Virginia	Region 1	Shed	Virginia			
Economic									
Labor Force Participation Rate and									
Size (civilian population age 16 years									
and older)	49.1%	54.2%	65.2%	156,352	576,773	4,356,868			
Armed Forces Labor Force	0.0%	0.1%	1.8%	128	779	120,385			
Veterans, Aged 18-64	4.2%	4.8%	8.1%	9,532	37,969	420,632			
Mean Commute Time (minutes)				25.1	23.1	28.7			
Commute via Public Transportation	0.4%	1.0%	4.4%	557	5,280	184,534			
Union Membership <sup>3</sup>	5.1%	3.9%	4.1%	_					
Social									
Disconnected Youth <sup>2</sup>	2.3%	1.7%	1.5%	379	1,217	6,725			
Children in Single-Parent Families									
(% of all children)	35.7%	36.1%	31.0%	23,433	82,185	549,076			
With a Disability, Age 18-64	21.3%	16.9%	9.5%	46,564	130,526	486,156			
With a Disability, Age 18-64, Labor									
Force Participation Rate and Size	28.8%	31.9%	45.0%	13,427	41,696	218,843			
Foreign Born	1.3%	3.1%	12.4%	5,112	39,924	1,051,559			
Speak English Less Than Very Well									
(population age 5 years and older)	0.6%	1.4%	5.9%	2,261	17,319	471,645			

1. ACS 2015-2019, unless noted otherwise

2. Disconnected Youth are individuals aged 16-19 years old 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 GO VA Region 1 falls short of that in both the labor shed and state. In Region 1, 14.5% of the population does not have a high school diploma, compared with 12.0% in the labor shed and 8.7% in the state. Similarly, a high school diploma is the highest educational attainment level for 35.8% of Region 1 residents compared with 32.6% in the labor shed and 22.9% in Virginia. At the other end of the spectrum, only 11.3% of Region 1 residents possess a bachelor's degree and another 6.1% have postgraduate degrees. This is compared with 15.2% and 9.4%, respectively, in the labor shed and 23.6%

and 17.1%, respectively, in the state. The region has a higher proportion of residents with their highest educational attainment being an associate degree (10.7%) than the labor shed (10.0%) and state (8.3%).



Educational Attainment, Population Aged 25-64 2015-2019

Schools across Region 1 have outperformed the state average for Standards of Learning (SOL) pass rates. Nearly all school divisions in the region have higher pass rates in math, as shown in the table below, while some cities and counties saw pass rates below the state average in reading and science. Green shading represents a pass rate higher than the state average while red shading shows a pass rate lower than the state average. GO VA Region 1 exceeds the state average pass rate for all three subjects.

•		•	•	•	
School Division	Reading	Writing*	History & Social Science*	Math	Science
Bland County	80%	N/A	N/A	62%	75%
Bristol City	70%	N/A	N/A	58%	58%
Buchanan County	64%	N/A	N/A	52%	50%
Carroll County	70%	N/A	N/A	60%	59%
Dickenson County	66%	N/A	N/A	59%	60%
Galax City	68%	N/A	N/A	54%	48%
Grayson County	76%	N/A	N/A	68%	72%
Lee County	69%	N/A	N/A	53%	52%
Norton City	85%	N/A	N/A	68%	76%
Russell County	73%	N/A	N/A	58%	67%

Standards of Learning Pass Rates by School Division and Subject, 2020-2021 School Year

64

Scott County	73%	N/A	N/A	66%	60%
Smyth County	63%	N/A	N/A	46%	54%
Tazewell County	78%	N/A	N/A	67%	68%
Washington County	78%	N/A	N/A	68%	65%
Wise County	79%	N/A	N/A	74%	69%
Wythe County	77%	N/A	N/A	67%	71%
Region 1 Average	73%	N/A	N/A	61%	63%
Virginia Average	69%	N/A	N/A	54%	59%

#### Standards of Learning Pass Rates by School Division and Subject, 2020-2021 School Year

Source: Virginia Department of Education

\* data for some subjects are not available for the 2020-2021 school year due to the COVID-19 pandemic

#### **Income and Poverty**

The relatively low per capita income and higher poverty level in Region 1 reflects a lack of employment opportunities in the region relative to other areas in the state. Per capita income is \$23,469 in the region according to ACS, 2015-2019 compared to \$26,748 in the labor shed and \$39,278 in Virginia. During the same period, 19.2% of all people in Region 1 were below the poverty level compared with 18.0% in the labor shed and 10.6% in the state. Similarly, 16.4% of households in Region 1 received Supplemental Nutrition Assistance Program (SNAP), or food stamps, compared with 14.6% in the labor shed and 8.2% in the state. Poverty increased in the region in 2019, rising to 19.2% from 18.3% in 2017. The poverty rate can be expected to rise in 2020 due to the pandemic.<sup>4</sup>

Demographic Summary <sup>1</sup>								
		Percent			Value			
	GO VA	Region 1		GO VA	Region 1			
	Region 1	Labor Shed	Virginia	Region 1	Labor Shed	Virginia		
Economic								
Median Household Income <sup>2</sup>	_	—	_	\$40,904	\$46,389	\$74,222		
Per Capita Income	_	-	_	\$23,469	\$26,748	\$39,278		
Poverty Level (of all people)	19.2%	18.0%	10.6%	70,777	222,495	865,691		
Households Receiving Food Stamps/SNAP	16.4%	14.6%	8.2%	25,241	76,531	259,639		
1. ACS 2015-2019, 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 Research<sup>5</sup> 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

<sup>&</sup>lt;sup>4</sup> Source: https://www.census.gov/content/dam/Census/library/publications/2021/demo/p60-273.pdf.

<sup>&</sup>lt;sup>5</sup> Source: Who Creates Jobs? Small vs. Large vs. Young, found at <u>http://www.nber.org/papers/w16300.pdf.</u>

higher rates of job destruction due to failures and exit. Small businesses are defined here, as in prior reports, as those with fewer than 20 employees.

While new business formation has declined in the region, the associated job creation has increased. The new business formation rate (the proportion of startups relative to all active firms) has tracked in-line with the state formation rate in 2010, but it has since risen above the state average. Jobs created by small companies contributed to 40.2% of total job creation in GO VA Region 1 in 2020, above their average contributions in Virginia (37.4%). The 2020 percentage contribution is an increase from 38.3% in 2019 and 35.9% in 2010. Localities with the highest contributions from small companies are Dickenson (60.5%) and Buchanan (59.1%). Localities with the lowest contributions from small companies include Norton (21.9%), Grayson (28.4%), and Bristol (30.7%).

While there are many factors that could influence these data, including statistical volatility due to how the data are collected, a number of efforts are underway in GO Virginia Region 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." Additional efforts around entrepreneurship include the Regional Entrepreneurial Investment (REI) Plan recently completed by Opportunity SWVA and the University of Virginia's College at Wise. The plan, completed by Chapman and Company, identifies how Region 1 can capitalize on entrepreneurial opportunities in the region. UVA Wise was recently awarded GO Virginia and Tobacco Region Revitalization Commission (TRRC) grants to implement the strategy in Region 1, including developing an accelerator—SWVA Startup—and hiring an Ecosystem Builder.<sup>6</sup>

Between 2007 and 2017, there were hundreds of startups formed in GO VA Region 1. 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 Region 1 traded sector startups founded in 2012, 88 firms (53%) were still in existence in 2017.<sup>7</sup>

GO VA Region 1: Average Quarterly Small Firm (0-19 Employees) Job Creation									
	2000 Average	2010 Average	2019 Average	2020 Average	2000 as a % of Total	2010 as a % of Total	2019 as a % of Total	2020 as a % of Total	
US	2,402,402	1,918,314	2,050,417		36.4%	29.7%	32.5%		
Virginia	55,826	47,672	49,842	45,569	33.5%	34.6%	34.3%	37.4%	
Region 1	2,561	1,890	1,672	1,577	41.6%	35.9%	38.3%	40.2%	

<sup>&</sup>lt;sup>6</sup> The full application and reports can be found on the GO VA Region 1 website at <u>https://www.goswva.org/projects-2.</u>

<sup>&</sup>lt;sup>7</sup> Source: Regional Entrepreneurial Assessment Project, Teconomy Partners LLC, December 2018

GO VA Region 1: Average Quarterly Small Firm (0-19 Employees) Job Creation										
	2000 Average	2010 Average	2019 Average	2020 Average	2000 as a % of Total	2010 as a % of Total	2019 as a % of Total	2020 as a % of Total		
Bland	32	20	14	15	50.6%	41.5%	29.8%	50.0%		
Buchanan	179	113	99	90	50.9%	37.8%	34.8%	59.1%		
Carroll	161	128	132	121	50.8%	52.8%	56.5%	57.6%		
Dickenson	81	69	54	58	48.8%	50.5%	51.1%	60.5%		
Grayson	74	76	60	54	56.9%	74.6%	31.8%	28.4%		
Lee	119	79	73	71	53.6%	39.3%	56.9%	49.3%		
Russell	151	100	97	90	45.9%	37.1%	42.5%	45.8%		
Scott	87	58	52	56	35.5%	34.9%	30.5%	45.7%		
Smyth	190	164	131	120	33.4%	42.7%	36.6%	33.9%		
Tazewell	302	223	193	176	44.3%	35.3%	37.4%	38.7%		
Washington	405	312	273	292	43.9%	40.0%	39.1%	40.5%		
Wise	250	173	119	116	43.6%	28.8%	37.6%	39.6%		
Wythe	221	166	183	132	48.4%	37.8%	43.0%	38.5%		
Bristol city	166	108	107	121	24.6%	16.9%	26.8%	30.7%		
Galax city	93	60	47	46	34.9%	32.7%	32.2%	36.4%		
Norton city	52	43	40	22	26.8%	28.9%	32.3%	21.9%		
Source: US Ce	Source: US Census Bureau, LEHD, QWI									

In 2020, jobs created by young companies (5 years old or less) contributed 22.5% of total job creation in Region 1. This represents a slight decrease from 24.7% in 2019, and from 22.7% in 2010. In comparison, the percent contribution of job creation for young firms in Virginia slightly increased from 25.0% in 2019 to 25.5% in 2020. The areas with the highest percentage of job creation contributions from young companies are Carroll (29.8%), Smyth (28.1%), and Dickenson (27.4%).

GO VA Region 1: Average Quarterly Young Firms (5 Years Old or Less) Job Creation										
	2000 Average	2010 Average	2019 Average	2020 Average	2000 as a % of Total	2010 as a % of Total	2019 as a % of Total	2020 as a % of Total		
US	1,989,300	1,375,270	1,558,215		30.1%	21.3%	24.7%			
Virginia	48,743	34,852	36,342	31,038	29.3%	25.3%	25.0%	25.5%		
Region 1	1,798	1,197	1,077	881	29.2%	22.7%	24.7%	22.5%		
Bland	17	14	6	0	26.7%	30.3%	11.5%	0.0%		
Buchanan	93	51	40	40	26.4%	16.9%	14.1%	26.1%		
Carroll	97	98	77	63	30.8%	40.4%	33.0%	29.8%		
Dickenson	80	34	26	26	48.0%	25.1%	24.7%	27.4%		
Grayson	64	46	34	25	49.6%	44.5%	18.0%	12.9%		

GO VA Region 1: Average Quarterly Young Firms (5 Years Old or Less) Job Creation										
	2000 Average	2010 Average	2019 Average	2020 Average	2000 as a % of Total	2010 as a % of Total	2019 as a % of Total	2020 as a % of Total		
Lee	79	58	36	36	35.6%	29.0%	28.4%	24.7%		
Russell	96	52	56	41	29.3%	19.5%	24.3%	20.7%		
Scott	67	34	33	24	27.4%	20.2%	19.0%	19.8%		
Smyth	159	104	82	100	27.9%	27.0%	22.9%	28.1%		
Tazewell	184	131	154	100	27.0%	20.7%	29.9%	22.1%		
Washington	263	163	199	165	28.6%	20.8%	28.5%	22.9%		
Wise	207	105	66	71	36.1%	17.5%	20.8%	24.1%		
Wythe	169	84	116	80	37.0%	19.1%	27.1%	23.2%		
Bristol City	131	142	90	74	19.5%	22.2%	22.7%	18.6%		
Galax City	52	35	35	25	19.6%	19.3%	23.9%	19.4%		
Norton City	39	47	29	16	20.1%	31.6%	23.2%	15.9%		
Source: US Censu	ıs Bureau, LEHD,	QWI								

### Wage Differentials by Cluster and Region

The annual average wage in GO VA Region 1 was \$43,200 for all occupations in 2020 for the 128,169 people employed in the region. Thirty-four percent of the workers—or 43,908 people—in Region 1 are employed in occupations that paid above-average wages in 2020.

There are significant differences within the target sectors of the percentage of people earning aboveaverage wages. For example, about 29.5% of workers in food and beverage manufacturing are employed in occupations that pay wages above the regional average, compared with about 62.9% of workers in the energy cluster. These preliminary baseline measures are summarized in the table below.

Cluster Employment for Four Quarters Ending 2021 Quarter 1							
	Occupations		Percent of Occupations				
	With Above-	Total - All	Paying Above-Average				
Cluster	Average Wages	Occupations	Wages				
Energy	2,122	3,373	62.9%				
Food and Beverage Manufacturing	430	1,459	29.5%				
Advanced Manufacturing	4,701	15,167	31.0%				
Information Technology	812	884	91.9%				
TotalAll Occupations	43,908	128,169	34.3%				
Source: JobsEQ							
Note: wages are as of 2020							

The three cities and 13 counties in Region 1 have a wide range of employment and wages. The largest county—Washington County—has nearly 10 times the employment (20,101) as the smallest locality— Bland County (2,277), highlighting the wide range of employment within the region. Buchanan County has the highest average annual wage (\$47,010) in the region, mostly due to its high concentration of mining. The lowest average annual wage is \$28,312 in Grayson County. The annual average wage in 14 of the counties and cities in the region is less than that of Region 1 as a whole (shaded red in the table below).

Four Quarters Ending with 2021Q1								
Region	Employment	Average Annual Wages per Worker						
Washington County, Virginia	20,101	\$38,632						
Tazewell County, Virginia	14,577	\$35,932						
Smyth County, Virginia	12,167	\$37,615						
Wythe County, Virginia	11,680	\$37,884						
Wise County, Virginia	11,625	\$37,181						
Bristol City, Virginia	9,407	\$38,009						
Russell County, Virginia	7,269	\$40,037						
Carroll County, Virginia	6,811	\$31,688						
Buchanan County, Virginia	5,910	\$47,010						
Galax City, Virginia	5,491	\$34,392						
Scott County, Virginia	5,423	\$33,593						
Lee County, Virginia	4,847	\$33,791						
Grayson County, Virginia	3,827	\$28,312						
Dickenson County, Virginia	3,529	\$40,865						
Norton City, Virginia	3,225	\$41,867						
Bland County, Virginia	2,277	\$45,652						
GO VA Region 1	128,169	\$43,200						
Source: JobsEQ								

# **Drivers of Growth: Industry Structure**

### Employment

Similar to the nation, GO VA Region 1 experienced a sharp decline in employment due to the COVID-19 pandemic. In the four quarters ending with the second quarter of 2020, employment was down 10.0% from a year earlier in the region compared with a 10.2% loss in the labor shed and 9.8% in the state over the same period.



Source: JobsEQ®. Data as of 2021Q1. The shaded areas of the graph represent national recessi

Overall employment in Region 1 has been declining since the start of the Great Recession. Between 2017 and 2019 (prior to the pandemic), overall employment in the region declined 1.3%, to 137,138 workers. In 2020, as the COVID-19 pandemic disrupted all aspects of the global economy, employment in Region 1 declined sharply. Overall

employment in the region declined by 5.4% to 129,461 workers over the year ending 2020Q4. As of the first quarter of 2021, overall employment dropped by 8,626 workers (or 6.3%) since the start of the pandemic in 2020Q1. Employment has fallen to 128,169 as of the first quarter of 2021.



### Since the start of the GO

Virginia initiative in spring 2017, there have been several business closings resulting in lost jobs in Region 1. The following six closures reported by the Virginia Economic Development Partnership combine for a loss of 1,315 jobs in the region:

• Komatsu Mining Corp. in Tazewell County closed in March 2021, eliminating 128 jobs

ource: JobsEO®. Data as of 202101. The shaded areas of the graph represent national recess
- Utility Trailer Manufacturing Co. closed in June 2020, eliminating 470 jobs in Washington County
- Sykes Enterprises laid off 197 Buchanan County workers in September 2019
- 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
- Titan Wheel Corp. in Smyth County closed in December 2017, eliminating 40 jobs

However, there have been several announcements in 2021. In October 2021, medical glove manufacturers Blue Star NBR, LLC and American Glove Innovations (AGI) announced plans to invest \$714 million in a manufacturing facility in Wythe County. The investment is expected to create 2,500 jobs.<sup>8</sup> In the LENOWISCO Planning District, Internet provider Earthlink announced a plan to open a customer support center in Norton. The center is expected to add 285 jobs to the region.<sup>9</sup> In the Cumberland Plateau Planning District, Pure Salmon is expected to add about 230 jobs to farm fish for sale worldwide.<sup>10</sup>

Employment in the GO VA Region 1 labor shed also remains below its previous peak level prior to the Great Recession, and has fallen further due to the pandemic. Employment peaked at 600,412 in the second quarter of 2007 in the labor shed, dropping by 72,880 jobs (or 12.14%) to 527,532 as of the first quarter of 2021. The labor shed's motor vehicle electrical and electronic equipment manufacturing industry is poised to expand as TORC Robotics announced plans to build a new facility at the Virginia Tech Corporate Research Center in Montgomery County. The investment of \$8.5 million will create 350 new jobs.<sup>11</sup>

# **Industry Mix**

The decline in Region 1 employment over the last decade is mainly driven by a secular decline in manufacturing jobs due largely to productivity growth and offshoring. Manufacturers shed 10,785 employees between 2002 and 2020. The construction sector and coal mining industry have shed over 4,257 and 3,263 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. Additionally, the COVID-19 pandemic caused disruptions as manufacturing plants had to shut down due to social distancing.

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 Region 1 since 2002 except for the following:

<sup>&</sup>lt;sup>8</sup> Source: <u>https://www.virginiabusiness.com/article/joint-venture-bringing-2500-jobs-to-wythe-county/</u>

<sup>&</sup>lt;sup>9</sup> Source: <u>https://www.wihl.com/news/local/earthlink-bringing-285-jobs-to-southwest-virginia/</u>

<sup>&</sup>lt;sup>10</sup> Source: <u>https://www.bdtonline.com/news/fish-farm-on-the-horizon-tazewell-county-s-project-jonah-finally-coming-to-fruition/article\_ce145a6c-0e83-11eb-ad07-e7c6ed884e84.html</u>

<sup>&</sup>lt;sup>11</sup> Source: <u>https://www.wdbj7.com/2020/08/26/torc-robotics-to-expand-in-montgomery-co-creating-350-new-jobs/.</u>

health care and social assistance; administrative and support and waste management and remediation services; public administration; and management of companies and enterprises.

The decline in manufacturing is particularly unfavorable 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 Region 1 provided 12.0% of all employment in the four quarters ending 2021Q1 compared with 11.5% in the labor shed and 6.2% in the state. However, the value added by manufacturing is so large that this sector makes up 19.7% of GO VA Region 1's gross domestic product (GDP).

	Industry Mix, 2021Q1 Region 1 Labor Shed Virginia													
		Region	1	Labor Sh	ed	Virginia	à							
NAICS	Industry	Employment	GDP <sup>1</sup>	Employment	<b>GDP</b> <sup>1</sup>	Employment	<b>GDP</b> <sup>1</sup>							
11	Agriculture, Forestry, Fishing and Hunting	3.3%	0.9%	1.4%	0.4%	0.8%	0.3%							
21	Mining, Quarrying, and Oil and Gas Extraction	2.2%	7.3%	0.8%	2.1%	0.1%	0.2%							
22	Utilities	0.8%	2.4%	0.6%	1.7%	0.5%	1.6%							
23	Construction	5.1%	4.2%	5.4%	4.2%	6.2%	4.2%							
31	Manufacturing	12.0%	19.7%	11.5%	18.4%	6.2%	8.4%							
42	Wholesale Trade	2.2%	3.5%	2.7%	4.9%	2.7%	4.3%							
44	Retail Trade	14.3%	9.5%	12.8%	8.1%	10.2%	5.0%							
48	Transportation and Warehousing	3.4%	3.9%	3.9%	4.0%	4.4%	3.2%							
51	Information	1.2%	1.4%	1.0%	1.6%	1.8%	3.7%							
52	Finance and Insurance	1.9%	2.4%	2.9%	3.8%	3.7%	5.8%							
53	Real Estate and Rental and Leasing	0.7%	5.9%	1.1%	9.0%	1.6%	14.2%							
54	Professional, Scientific, and Technical Services	3.0%	3.0%	4.0%	4.1%	12.0%	13.8%							
55	Management of Companies and Enterprises	1.1%	1.1%	1.8%	1.7%	2.0%	2.6%							
56	Administrative and Support and Waste Management and Remediation Services	5.2%	3.4%	5.6%	3.1%	6.4%	3.7%							
61	Educational Services	7.8%	5.9%	9.4%	7.6%	8.6%	5.5%							
62	Health Care and Social Assistance	15.1%	11.3%	16.8%	14.9%	12.6%	7.4%							
71	Arts, Entertainment, and Recreation	1.0%	0.6%	1.1%	0.6%	1.6%	0.8%							
72	Accommodation and Food Services	7.4%	3.0%	7.9%	3.0%	6.8%	2.1%							
81         Other Services (except Public Administration)         4.2%         2.4%         4.3%         2.2%         4.8%         2.2%														
92	92         Public Administration         7.8%         7.4%         4.8%         4.2%         6.5%         7.1%													
Source <sup>1</sup> Data j	: JobsEQ for GDP are from 2020													

## **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 Region 1 has struggled over the last few decades but has stabilized since the Great Recession ended. In the first quarter of 2017, manufacturers employed 16,948 people in the region and added jobs throughout the period ending with the fourth quarter of 2019 (prior to the pandemic). Since then, the COVID-19 pandemic disrupted all aspects of the global economy. As of the first quarter of 2021, manufacturing employment in the region is 15,338, a 9.7% decline since the start of the pandemic in 2020Q1.



#### Employment for GO Virginia Region 1, Four-Quarter Moving Average

As shown in the following table, 13 of the 21 manufacturing industries in GO VA Region 1 lost jobs over the last five years. The largest job losses were in machinery manufacturing, with a decrease of 1,075 jobs, followed by transportation equipment which declined by 720 jobs. The industries in this table are at the three-digit NAICS code level.

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

- Beverage and Tobacco Product Manufacturing (+118 jobs)
- Food Manufacturing (+110)

Even though manufacturing jobs in GO VA Region 1 are expected to decline by 2,509 due to net contractions in employment, 12,127 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.<sup>12</sup>

<sup>&</sup>lt;sup>12</sup> 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-fags.htm#Why Change.

	Industry Snapshot, Manufacturing in GO VA Region 1 Current Historical Forecast													
			Current			Histo	orical			Forecast				
		Four Qu	arters End 2021Q1	ing with	Total Change over the Last 5 Years	Average Employm	Annual % Ch ient 2016Q1-	ange in 2021Q1	Over ti	ne Next 10 '	<b>'</b> ears			
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	533	\$42,169	0.38	110	4.7%	3.4%	1.0%	626	-23	-0.4%			
312	Beverage and Tobacco Product	946	\$54,929	4.00	118	2.7%	3.4%	-0.5%	1,101	-40	-0.4%			
313	Textile Mills	373	\$40,531	4.56	-197	-8.1%	-4.8%	-1.3%	369	-83	-2.5%			
314	Textile Product Mills	130	\$22,110	1.46	46	9.3%	5.9%	0.0%	125	-29	-2.5%			
315	Apparel	375	\$23,002	4.17	-4	-0.2%	-5.9%	-1.4%	313	-163	-5.5%			
316	Leather and Allied Product	16	\$23,715	0.67	10	21.8%	7.1%	0.9%	16	-3	-2.3%			
321	Wood Product	1,282	\$35,454	3.58	49	0.8%	0.2%	0.0%	1,255	-271	-2.3%			
322	Paper	37	\$36,446	0.12	-14	-6.2%	0.7%	-0.6%	35	-7	-2.0%			
323	Printing and Related Support Activities	83 \$27,874 0.25			-64	-10.8%	-7.2%	0.4%	74	-28	-4.0%			
324	Petroleum and Coal Products	112	\$68,531	1.19	-1	-0.2%	1.9%	-0.4%	92	-29	-2.9%			
325	Chemical	794	\$53,175	1.07	-139	-3.2%	1.0%	-4.0%	731	-90	-1.2%			
326	Plastics and Rubber Products	1,397	\$55,581	2.33	9	0.1%	-1.9% -0.3%		1,366	-241	-1.9%			
327	Nonmetallic Mineral Product	703	\$39,885	2.04	-129	-3.3%	1.0%	-1.5%	633	-199	-3.3%			
331	Primary Metal	175	\$50 <i>,</i> 968	0.59	28	3.6%	-0.6%	-1.2%	168	-21	-1.3%			
332	Fabricated Metal Product	1,008	\$43,042	0.84	-436	-6.9%	-2.1%	-2.5%	968	-140	-1.5%			
333	Machinery	1,310	\$51,446	1.45	-1,075	-11.3%	-6.2%	3.3%	1,194	-196	-1.6%			
334	Computer and Electronic Product	292	\$53,074	0.32	-9	-0.6%	0.1%	-0.6%	246	-33	-1.2%			
335	Electrical Equipment, Appliance, and Component	1,131	\$53,732	3.44	-79	-1.3%	-1.7%	-7.7%	1,032	-221	-2.1%			
336	Transportation Equipment	2.13	-720	-4.2%	-4.6%	-3.0%	2,747	-412	-1.5%					
337	Furniture and Related Product	1,337	\$34,566	4.18	-218	-3.0%	-3.3%	-4.4%	1,282	-236	-1.9%			
339	Miscellaneous	330	\$35,130	0.61	17	1.0%	-1.4%	-3.5%	314	-46	-1.5%			
31	Manufacturing	15,338	\$46,848	1.44	-2,698	-3.2%	-1.6%	-0.6%	14,636	-2,509	-1.8%			
	Total - All Industries	128,169	\$37,461	1.00	-14,082	-2.1%	-1.4%	-0.5%	132,073	-13,575	-1.1%			
Source: J	obsEQ® Data as of 2021C	21												

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

- Chemical Manufacturing (+545)
- Food Manufacturing (+445)
- Beverage and Tobacco Product Manufacturing (+297)
- Nonmetallic Mineral Product Manufacturing (+129)
- Textile Product Mills Manufacturing (+105)

While manufacturing jobs in the labor shed are expected to decline by 6,386 due to net contractions in employment, 53,370 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.<sup>13</sup>

# **Industry Clusters**

Clusters represent a geographic concentration of interrelated industries. When clusters possess a location quotient (LQ)<sup>14</sup> 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 clusters<sup>15</sup> shown in the table and graphic below, GO VA Region 1 has a competitive advantage in eight of them, while the labor shed has a competitive advantage in six clusters. **Clusters** with a competitive advantage are highlighted in green in the table below. The cluster with the largest LQ is energy (3.18), followed by textile/leather manufacturing (3.14), wood/paper manufacturing (2.79), and agricultural (2.09) in Region 1.<sup>16</sup> Not all clusters that have a competitive advantage in Region 1 have a competitive advantage in the Region 1 labor shed and vice versa. For example, the LQ of the agricultural cluster is 2.09 in the region but only 0.97 in the labor shed.

<sup>13</sup> Ibid.

$$LQ = \frac{Employment\_in\_industry\_I\_in\_area\_J/}{U.S.\_employment\_in\_industry\_I/} Total\_employment\_in\_area\_J} / Total\_U.S.\_employment$$

<sup>15</sup> Definitions of industry clusters can be found in Appendix 2.

<sup>&</sup>lt;sup>14</sup> 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.

<sup>&</sup>lt;sup>16</sup> 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 2021Q1													
		GO VA Region 1		GO VA	Region 1 Labor She	d							
Industry Group	Average Annual Employment Forecast Rate (%) 2021Q1-2031Q1	Average Wages	Location Quotient	Average Annual Employment Forecast Rate (%) 2021Q1-2031Q1	Average Wages	Location Quotient							
Textile/Leather Mfg.	-3.7	\$23,756	3.14	-3.0	\$35,152	2.12							
Food Mfg.	-0.4	\$49,170	0.96	-0.5	\$43,684	0.70							
Agricultural	-2.3	\$10,688	2.09	-1.7	\$15,866	0.97							
Chemical	-1.9	\$45,307	2.02	-0.9	\$71,706	3.48							
Wood/Paper	-2.2	\$31,355	2.79	-1.8	\$39,649	1.58							
Electric/Electronics Mfg.	-1.9	\$50,305	1.10	-1.2	\$55,220	1.31							
Media	-1.4	\$27,074	0.59	-1.5	\$40,000	0.52							
Auto/Auto-related Mfg.	-1.4	\$36,031	1.86	-0.6	\$43,020	1.44							
Machinery Mfg.	-1.5	\$47,260	0.96	-1.1	\$50,528	0.77							
Metal & Product Mfg.	-1.5	\$45,249	0.93	-0.9	\$55,267	1.15							
Energy	-2.7	\$74,723	3.18	-2.3	\$74,869	1.42							
Retail	-1.8	\$29,921	1.16	-1.2	\$35,490	1.09							
Professional Svc.	-0.7	\$41,691	0.61	-0.1	\$50,151	0.75							
Consumer Svc.	-0.7	\$20,284	0.81	-0.2	\$22,155	0.90							
Education	-1.2	\$32,260	0.96	-0.5	\$40,166	1.12							
Financial Services	-1.5	\$48,291	0.46	-0.5	\$61,714	0.67							
Construction	-1.2	\$39,414	0.89	-0.6	\$46,472	0.92							
Freight Tran.	-1.7	\$49,439	0.86	-0.9	\$52,788	0.97							
Utilities	-1.2	\$39,902	1.60	-0.7	\$44,783	1.17							
Public Admin.	-1.4	\$42,424	1.56	-0.9	\$46,095	0.96							
Health	0.3	\$40,410	1.01	0.4	\$56,114	1.13							
Source: JobsEQ®													



Industry Clusters for GO Virginia Region 1 as of 2021Q1

Industry Clusters for GO Virginia Region 1 Labor Shed as of 2021Q1



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 region's economy. This cluster pays a higher wage (\$74,723 in Region 1 and \$74,869 in the 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 7,422 in the second quarter of 2012 in Region 1 before falling to 4,016 in the first quarter of 2017. The cluster has seen a slower decline since, down to 3,847 jobs in 2020Q1, but dropping to 3,397 as of 2021Q1 due to the pandemic. The Region 1 labor shed shows a similar trend. Energy cluster employment peaked at 14,645 in the first quarter of 2009 and fell by 8,379 jobs to 6,266 in the first quarter of 2021.

However, following the introduction of plans by Dominion Energy for the construction of a hydroelectric pump project in Southwest Virginia,<sup>17,18</sup> 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 (eight jobs at the end of 2015) and increased to 77 by the fourth quarter of the same year. It has since declined, but leveled off at 18 as of the first quarter of 2021. Nearly all of this growth in hydroelectric power generation has been concentrated within Carroll County, home to the Byllesby-Buck hydroelectric power plants, with some additional growth due to the Fries hydroelectric plant in Grayson County.



<sup>&</sup>lt;sup>17</sup> Source: https://www.dominionenergy.com/about-us/making-energy/renewables/water/powering-southwest-virginia.

<sup>&</sup>lt;sup>18</sup> Source: http://www.bdtonline.com/news/hydroelectric-pump-project-may-energize-tazewell-county-economy/article\_0b8a4fd8-a4b9-11e7-ba86-a3f067f6c26a.html.

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

## 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 nearly 19.0 million short tons of coal in 2012. The total tonnage decreased to 12.3 million in 2019, just 38% of the 1999 production level. From 1999 to 2019, Virginia's coal production averaged a 4.7% decline per year. As a comparison, national coal production decreased 2.2% per year during the same time period.<sup>19</sup> 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 by 2019 has declined to 1.7%.



In Virginia, the price of coal for electric power has consistently been at least 50% more than the national price; although in 2020, the price declined to 45% more than the national price. The price difference is driven by geographical features—most Appalachian coal must be accessed via underground mines on relatively thin seams, compared with the relatively easier task of obtaining coal from surface mines on thicker seams in the west.<sup>20</sup> 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. In 2020, coal price for electric power was \$52.94 per ton in

<sup>&</sup>lt;sup>19</sup> Source: Annual Coal Reports, U.S. Department of Energy, Energy Information Administration.

<sup>&</sup>lt;sup>20</sup> Source: <u>https://vept.energy.vt.edu/coal.html</u>

Virginia compared to \$36.52 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.



Virginia Coal Price (\$/Ton)

### Coal Employment and Wages in Virginia and Region One

Coal mines employ 55% 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 (94%) falls within Region 1. Similar to the energy cluster, the coal mining industry added jobs during the Great Recession. However, the region's coal mining employment fell steadily from a 10-year peak of 4,821 workers in the third quarter of 2012 to 2,315 in the fourth quarter of 2016. Following a modest recovery in 2017, employment remained flat through 2019. Due to the pandemic, employment stood at 1,869 in the first quarter of 2021, down 61% from employment in 2012. The GO VA Region 1 labor shed shows an even more severe decline of nearly 70% from the post-recession peak of 8,351 in the second quarter of 2012 to 2,522 workers in the first quarter of 2021.



The decline in coal mining employment over the past five years has largely occurred at underground mines. Five years ago, underground mines employed 1,261 workers compared to 2,339 people working at surface mines in Region 1. Underground mining employment has decreased at an annual average rate of 8.9% for the past five years while surface minaing employment has decreased at a rate of 5.8% 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 both the region and labor shed.<sup>21</sup>

As shown in the table below, with an average annual wage of \$82,951, coal mining pays a much higher wage than the average for the region. 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.

	te durate Considert, Cool Ministratic CONA Design 4												
			Indu	stry Snapsho	ot, Coal Mii	ning in GO \	/A Region 1						
			Current			Hist	orical			Forecast			
		Four Q	Four Quarters Ending with 2021Q1 Change: Last 5 Years Hours 2016Q1-2021Q1					Over t	he Next 10 \	/ears			
NAICS	Industry	Avg. Annual Location Empl Wages 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	1,077	\$68,171	69.60	-379	-5.8%	-8.4%	-8.5%	926	-374	-4.2%		
212112	Bituminous Coal Underground Mining	792 \$83,115 44.80		-469	-8.9%	-11.7%	-8.4%	674	-288	-4.4%			
212113	2113         Anthracite Mining         0         n/a         0.00			0.00	-25	n/a	n/a	-1.1%	0	0	-2.0%		
2121	Coal Mining	1,869 \$82,951 55.13			-872	-7.4% -10.2% -8.3%		-8.3%	1,601	-662	-4.3%		
	Total - All Industries	128,169	\$37,461	1.00	-14,082	-2.1%	-1.4%	-0.5%	132,073	-13,575	-1.1%		

Source: JobsEQ<sup>®</sup> Data as of 2021Q1

Looking ahead, the U.S. Department of Energy (DOE) is establishing the Carbon, Ore, Rare Earth and Critical Minerals (CORE-CM) initiative in energy communities such as parts of GO Virginia Region 1. The initiative is designed to secure a supply of rare earth elements and critical minerals from carbon-rich areas across the nation and create high-paying jobs in growing energy industries. These materials are used in the manufacturing of clean energy technologies such as wind turbines, solar panels, batteries, and magnets. Virginia Polytechnic Institute and State University has been awarded funding to advance this initiative in the Appalachian Basin (Central) region, which includes Virginia.<sup>22</sup>

<sup>&</sup>lt;sup>21</sup> Additional information on mine closures can be found at https://www.eia.gov/coal/annual/

<sup>&</sup>lt;sup>22</sup> Source: <u>https://netl.doe.gov/node/11045.</u>

## **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, 3.0% of regional workers were employed in the coal industry, but that fell to 1.5% in 2020. In 2018, coal industry employment ranked 14th out of the 20 major industry sectors.



### Wage Trend

### In Region 1, the coal industry's wages

are much higher than the overall regional wage. In 2020, the annual average regional wage was \$36,825, less than half the annual average wage for the regional coal industry. Meanwhile, the annual average wage of Virginia's coal industry was \$80,168, as compared with the \$63,096 state average wage. With 1.5% of regional employment, the coal industry accounted for 3.3% of total wages and salaries of the region in 2020.



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

Not only is the coal industry wage higher than the regional average, but it has been growing faster. From 2001 to 2020, the annual average wage of the Region 1 coal industry has grown an average of 3.0% per year in nominal terms. This is faster than the 2.2% growth of the regional average wage and on par with the 3.0% growth in the statewide average wage. Wages in the coal industry declined 2.5% over 2020.

Looking ahead, employment at coal mines is expected to continue to decline at an annual average pace of 1.7% over the next decade.

## **Coal Worker Migration**

In 2019, 333 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 Kentucky (97), followed by West Virginia (86), and Maryland (22).

Some of the workers in this industry took jobs in other sectors that same year. Nearly 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 nextmost-popular industry to move into was construction (180), followed by manufacturing (76), and administrative and support and waste management and remediation services (74).



Destination State 2019



# Destination Sector 2019

## **Unemployment Rate**

The unemployment rate in GO VA Region 1 reflects its relatively weak economy when compared to both its labor shed and the state of Virginia. The unemployment rate in Region 1 has been higher than the rate



in both the labor shed and the state since at least 1990. As of July 2021, the seasonally adjusted GO VA Region 1 unemployment rate was 4.5% compared to 4.4% in the labor shed and 4.1% in the state.

## **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 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 Region 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 Region 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,<sup>23</sup> and business taxes.

The top 20 GDP-producing industries in the Region 1 labor shed produce 45.9% of total GDP in the region and provide compensation for residents as well as taxes for localities. Five of those industries export their



goods and services outside the region. Two of the top 20 industries are in manufacturing. The non-manufacturing export industries among the top 20 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

<sup>&</sup>lt;sup>23</sup> 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.

## average (\$37,461) and labor shed's average (\$45,014).24

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

	Тој	o 20 Indus	tries by O	Gross Dom	O VA Regio	gion 1 and the Region 1 Labor Shed							
		Cur	rent (Fou	ur Quarter	s Ending	with 2021	LQ1)	Emp	loyment	Forecast	Over the	Next 10	(ears
		GDP (N as of 2	1illion, 2020)	Employ	yment	Average Wa	e Annual ages	Total A Separa	pprox. ations	Total G Dem	irowth and	Avg. A Gro (Pere	unnual wth cent)
NAICS	Industry	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed
6221	General Medical and Surgical Hospitals	\$190	\$3,201	3180	29540	\$42,107	\$68,308	2290	21838	-329	-1563	-1.1%	-0.5%
6111	Elementary and Secondary Schools	\$448	\$1,950	7562	27550	\$33,888	\$40,744	6442	24358	-1107	-2135	-1.6%	-0.8%
3252	Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	\$57	\$1,781	320	6689	\$46,705	\$95,721	293	6337	-38	-339	-1.3%	-0.5%
6211	Offices of Physicians	\$306	\$1,732	2581	13400	\$78,163	\$91,962	2015	10743	-60	420	-0.2%	0.3%
6113	Colleges, Universities, and Professional Schools	\$113	\$1,591	1417	17219	\$46,830	\$53,493	1203	15063	-136	-662	-1.0%	-0.4%
5313	Activities Related to Real Estate	\$177	\$1,512	200	1533	\$35,913	\$44,709	183	1457	-29	-114	-1.5%	-0.8%
5312	Offices of Real Estate Agents and Brokers	\$222	\$1,483	211	1271	\$43,513	\$48,546	185	1144	-29	-108	-1.5%	-0.9%
7225	Restaurants and Other Eating Places	\$241	\$1,152	8208	36556	\$16,105	\$16,836	13329	60918	-462	-166	-0.6%	0.0%
5311	Lessors of Real Estate	\$137	\$1,105	245	1492	\$27,710	\$39,593	230	1453	-36	-115	-1.6%	-0.8%
5511	Management of Companies and Enterprises	\$116	\$863	1351	9486	\$65,037	\$73,820	1169	8460	-102	-148	-0.8%	-0.2%
9221	Justice, Public Order, and Safety Activities	\$435	\$846	5292	9635	\$46,216	\$50,135	4439	8279	-807	-1045	-1.6%	-1.1%
2121	Coal Mining	\$593	\$737	1869	2522	\$82,951	\$81,237	1601	2162	-662	-890	-4.3%	-4.3%
3121	Beverage Manufacturing	\$452	\$716	946	1913	\$54,943	\$48,244	1106	2254	-40	-50	-0.4%	-0.3%
5221	Depository Credit Intermediation	\$133	\$679	1393	5479	\$46,463	\$57,736	1228	4970	-227	-614	-1.8%	-1.2%
4411	Automobile Dealers	\$82	\$667	898	5934	\$44,907	\$56,098	963	6586	-136	-517	-1.6%	-0.9%

<sup>&</sup>lt;sup>24</sup> These industries all also pay average wages above the wage provided by DHCD (\$35,571).

9211	Executive, Legislative, and Other General Government Support	\$144	\$659	2406	9516	\$34,667	\$40,264	2173	8838	-220	-357	-1.0%	-0.4%
4523	General Merchandise Stores, including Warehouse Clubs and Supercenters	\$216	\$619	4336	12419	\$25,345	\$25,869	5553	16287	-773	-1690	-1.9%	-1.5%
2211	Electric Power Generation, Transmission and Distribution	\$166	\$567	338	1363	\$65,668	\$84,665	258	1085	-85	-255	-2.9%	-2.1%
4451	Grocery Stores	\$141	\$524	3924	12705	\$19,355	\$21,118	5288	17596	-640	-1441	-1.8%	-1.2%
2382	Building Equipment Contractors	\$69	\$504	1014	6900	\$42,646	\$50,169	996	7004	-96	-217	-1.0%	-0.3%
Source: J	obsEQ®												

Growth in GDP in 2020 was negative for both GO VA Region 1 and the labor shed (5.1% and 4.2%, respectively) as the pandemic disrupted all aspects of the global economy. Thirteen of the industries mentioned above experienced negative GDP growth in Region 1, most notably resin, synthetic rubber, and artificial synthetic and fiber filaments manufacturing, by 28.0%. Management of companies and enterprises in Region 1 predominantly comprises corporate, subsidiary, and regional managing offices, with most workers in customer service, finance, computer, and assistant positions. In the labor shed, 14 industries showed negative GDP growth. Meanwhile, GDP in automobile dealers and beverage manufacturing increased by 1.4% and 3.8%, 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 in Region 1 as many of the large schools, including Virginia Tech, Radford University, and East Tennessee State University, are located on the outskirts of the region. Two other key industries, 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 GO VA Region 1.

Many of the top 20 industries by employment are expected to decline over the next 10 years, as shown in the table below. In Region 1, only individual and family services has a positive growth forecast. However, most of the top industries are expected to need to hire at least 1,000 workers to replace workers retiring or changing jobs.

	Top 20 Industries by Employment in GO VA Region 1 and the Region 1 Labor Shed Current Current													
		(Four Qu	Cur Iarters En	rent ding with	2021Q1)		Foreca	ast Over th	ne Next 10	) Years				
		Emplo	yment	Average Wa	e Annual Iges	Total Se	parations	Total G Dem	browth nand	Avg. A Growth	Annual (Percent)			
NAICS	Industry	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed			
7225	Restaurants and Other Eating Places	8,208	36,556	\$16,105	\$16,836	13329	60918	-462	-166	-0.6%	0.0%			
6221	General Medical and Surgical Hospitals	3,180	29,540	\$42,107	\$68,308	2290	21838	-329	-1563	-1.1%	-0.5%			
6111	Elementary and Secondary Schools	7,562	27,550	\$33,888	\$40,744	6442	24358	-1107	-2135	-1.6%	-0.8%			
6113	Colleges, Universities, and Professional Schools	1,417	17,219	\$46,830	\$53,493	1203	15063	-136	-662	-1.0%	-0.4%			
6211	Offices of Physicians	2,581	13,400	\$78,163	\$91,962	2015	10743	-60	420	-0.2%	0.3%			
4451	Grocery Stores	3,924	12,705	\$19,355	\$21,118	5288	17596	-640	-1441	-1.8%	-1.2%			
4523	General Merchandise Stores, including Warehouse Clubs and Supercenters	4,336	4,336 12,419		\$25,869	5553	16287	-773	-1690	-1.9%	-1.5%			
9221	Justice, Public Order, and Safety Activities	5,292	9,635	\$46,216	\$50,135	4439	8279	-807	-1045	-1.6%	-1.1%			
9211	Executive, Legislative, and Other General Government Support	2,406	9,516	\$34,667	\$40,264	2173	8838	-220	-357	-1.0%	-0.4%			
5511	Management of Companies and Enterprises	1,351	9,486	\$65,037	\$73,820	1169	8460	-102	-148	-0.8%	-0.2%			
6241	Individual and Family Services	3,937	9,116	\$25,787	\$26,139	5413	12717	1103	2892	2.5%	2.8%			
5613	Employment Services	1,194	7,940	\$32,779	\$29,866	1315	8962	-111	-373	-1.0%	-0.5%			
5614	Business Support Services	2,278	7,757	\$32,285	\$32,796	2562	9062	-62	402	-0.3%	0.5%			
6231	Nursing Care Facilities (Skilled Nursing Facilities)	2,153	7,497	\$33,084	\$37,209	2056	7352	-316	-730	-1.6%	-1.0%			
8131	Religious Organizations	1,419	7,246	\$17,312	\$18,856	1490	7799	-114	-228	-0.8%	-0.3%			
2382	Building Equipment Contractors	1,014	6,900	\$42,646	\$50,169	996	7004	-96	-217	-1.0%	-0.3%			
5617	Services to Buildings and Dwellings	1,357	6,782	\$21,735	\$25,609	1608	8188	-38	71	-0.3%	0.1%			
3252	Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	320	6,689	\$46,705	\$95,721	293	6337	-38	-339	-1.3%	-0.5%			
4411	Automobile Dealers	898	5,934	\$44,907	\$56,098	963	6586	-136	-517	-1.6%	-0.9%			
4441	Building Material and Supplies Dealers	7136	-216	-561	-1.6%	-1.0%								
Source:	JobsEO®													

The region's competitive advantage in manufacturing is highlighted when the top industries are sorted by location quotient (LQ).<sup>25</sup> Twelve of the industries with the largest LQ in the labor shed are in 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 most of the top 20 LQ industries,

<sup>&</sup>lt;sup>25</sup> 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.

separations demand is high in many of these industries. Economic development efforts can be devoted toward attraction and retention of these key manufacturing companies.

	Top 20 Industries by Location Quotient in GO VA Region 1 and the Region 1 Labor Shed         Current (Four Quarters Ending with 2021Q1)       Employment Forecast Over the Next 10 Years													
		Curr	rent (Foເ	ur Quarte	rs Ending	g with 202	1Q1)	Emplo	oyment l	Forecast (	Over the	Next 10	Years	
		Loca Quot	tion tient	Emplo	yment	Average Wa	e Annual ges	To Separa	tal ations	Total G Dem	Browth Dand	Avg. A Gro (Perc	nnual wth cent)	
NAICS	Industry	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed	
3252	Resin, Synthetic Rubber, and Artificial Synthetic Fibers and Filaments Manufacturing	4.06	20.60	320	6,689	\$46,705	\$95,721	293	6,337	-38	-339	-1.3%	-0.5%	
2121	Coal Mining	55.13	18.08	1869	2,522	\$82,951	\$81,237	1601	2,162	-662	-890	-4.3%	-4.3%	
3259	Other Chemical Product and Preparation Manufacturing	5.28	10.25	363	2,901	\$41,105	\$58,527	330	2,744	-45	-141	-1.3%	-0.5%	
3151	Apparel Knitting Mills	6.49	8.85	45	255	\$23,973	\$33,428	40	234	-20	-104	-5.8%	-5.1%	
3353	Electrical Equipment Manufacturing	6.63	7.62	783	3,705	\$51,552	\$55,884	718	3,467	-107	-377	-1.5%	-1.1%	
3133	Textile and Fabric Finishing and Fabric Coating Mills	0.11	5.12	2	476	\$34,811	\$54,377	2	476	-1	-89	-3.4%	-2.1%	
3272	Glass and Glass Product Manufacturing	4.6	4.37	319	1,247	\$29,425	\$49,155	288	1,173	-87	-262	-3.1%	-2.3%	
3351	Electric Lighting Equipment Manufacturing	6.85	3.80	243	554	\$45,556	\$52,479	195	451	-103	-226	-5.4%	-5.1%	
3362	Motor Vehicle Body and Trailer Manufacturing	14.34	3.79	1822	1,982	\$30,783	\$31,985	1789	1,942	-307	-340	-1.8%	-1.9%	
3352	Household Appliance Manufacturing	1.35	3.75	74	843	\$44,185	\$50,684	72	849	-9	-62	-1.3%	-0.8%	
3379	Other Furniture Related Product Manufacturing	12.27	3.64	359	438	\$38,109	\$37,024	349	431	-76	-87	-2.4%	-2.2%	
3361	Motor Vehicle Manufacturing	N/A	3.43	#N/A	2,690	N/A	\$52,773	#N/A	2,883	#N/A	7	#N/A	0.0%	
3365	Railroad Rolling Stock Manufacturing	N/A	3.23	#N/A	253	N/A	\$65,152	#N/A	222	#N/A	-66	#N/A	-3.0%	
3325	Hardware Manufacturing	0	3.12	0	261	n/a	\$74,504	0	249	0	-38	-3.3%	-1.6%	
3262	Rubber Product Manufacturing	2.07	3.01	224	1,344	\$54,238	\$55,189	226	1,375	-26	-122	-1.2%	-0.9%	
3131	Fiber, Yarn, and Thread Mills	9.14	2.62	184	218	\$20,547	\$22,343	179	212	-42	-49	-2.6%	-2.5%	
1110	Crop Production (Proprietors)	4.42	2.53	1211	2,848	\$5,737	\$6,552	854	2,056	-239	-444	-2.2%	-1.7%	
3132	Fabric Mills	\$35,352	187	413	-40	-79	-2.4%	-2.1%						
4869	Other Pipeline Transportation	0	2.50	0	74	n/a	\$79,725	0	73	0	9	-0.8%	1.1%	
8122	Death Care Services	3.01	2.47	402	1,357	\$29,985	\$37,540	426	1,476	-78	-199	-2.1%	-1.6%	
Source: J	lobsEQ®													

## **Building on the Region's Export Industries**

The key drivers in GO VA Region 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 Region 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 utility patents assigned within GO VA Region 1 in recent years was highest in 2014 at 52, and declined to 46 in 2015 and 22 in 2019. In contrast, patents in Virginia have increased almost 180% between 2014 and 2020. Patents in GO VA Region 1 were issued over this time period for a variety of technologies including storing or distributing gases or liquids; general physical or chemical processes or apparatus; treatment of water; and electric power generation, conversion, or distribution.



Source: PatentsView 2021, Chmura

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 six SBIR awards between 2010 and 2020 in Region 1, mostly related to aquaculture and water treatment:

- Scaling Tornadic One Pass<sup>™</sup> Wastewater Treatment Technology to Conserve Natural Resources 2020
- 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 in Region 1 and its labor shed. Transportation and material moving occupations make up the third-largest group of occupations in both Region 1 and its labor shed. Production occupations, which reflect the manufacturing and coal mining presence, rank fourth in Region 1 and sixth in the Region 1 labor shed.

Over the next 10 years beginning with the first quarter of 2021, the fastest-growing occupation group in Region 1 is expected to be healthcare support occupations with a 0.9% annual average rate of growth. The occupation groups with the largest projected employment growth over this period are healthcare support (+642 jobs) and community and social service (136). Over the same period, the highest separation demand (due to retirements and workers moving from one occupation to another) is expected in sales (18,987), food preparation and serving related (16,166), and office and administration support (15,124). Within the labor shed, the occupation groups forecast to have the highest demand due to growth are healthcare support (+2,702 jobs); community and social service (+589); and computer and mathematical (+498). For the labor shed, the occupation groups forecast to have the highest separation demand are food preparation and service (72,163 jobs); sales and related (71,612); office and administrative support (70,674); and transportation and material moving (54,012).

	Occupation Mix in GO VA Region 1 and the Region 1 Labor Shed														
		Curre	nt (Four	Quarters	Ending v	vith 2021	lQ1)		Forecas	t Over th	e Next	10 Years			
		Employ	ment	Average Wa	Annual ges	Unempl Ra	oyment te	Total A Separ Dem	pprox. ation and	Total G Dem	irowth and	Avg. A Grov (Perc	nnual wth ænt)		
soc	Occupation Title	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed		
11	Management	9,214	33,483	\$79,900	\$94,100	2.7%	3.1%	7,469	27,411	-1,261	-1,772	-1.5%	-0.5%		
13	Business and Financial Operations	5,546	24,477	\$61,600	\$66,200	3.8%	3.6%	5,085	22,926	-456	-691	-0.9%	-0.3%		
15	Computer and Mathematical	2,490	12,505	\$72,200	\$77,700	2.7%	2.6%	1,780	9,298	-91	498	-0.4%	0.4%		
17	Architecture and Engineering	1,795	7,872	\$76,000	\$80,200	3.6%	3.1%	1,316	5,960	-214	-409	-1.3%	-0.5%		
19	Life, Physical, and Social Science	774	1,795 7,872 774 4,311		\$75,900	4.2%	4.4%	660	3,901	-82	-177	-1.1%	-0.4%		
21	Community and Social Service	3,141	10,370	\$40,700	\$43,900	2.5%	2.4%	3,370	11,251	136	589	0.4%	0.6%		
23	Legal	920	3,393	\$76,500	\$84,100	2.5%	2.5%	588	2,251	-96	-159	-1.1%	-0.5%		
25	Education, Training, and Library	7,041	31,059	\$51,300	\$55,200	6.7%	6.2%	5,902	26,713	-790	-1,291	-1.2%	-0.4%		

27	Arts, Design, Entertainment, Sports, and Media	1,527	6,733	\$49,100	\$50,300	10.1%	9.6%	1,575	7,216	-159	-372	-1.1%	-0.6%
29	Healthcare Practitioners and												
25	Technical	7,313	39,655	\$69,400	\$75,900	2.8%	2.6%	4,116	22,485	-390	-251	-0.5%	-0.1%
31	Healthcare Support	6,748	25,255	\$25,000	\$27,700	5.7%	5.7%	8,707	32,110	642	2,702	0.9%	1.0%
33	Protective Service	4,306	11,747	\$40,200	\$40,300	4.6%	5.2%	3,741	11,370	-603	-901	-1.5%	-0.8%
35	Food Preparation and Serving Related	9,694	42,412	\$22,200	\$22,800	15.3%	15.5%	16,166	72,163	-555	-316	-0.6%	-0.1%
37	Building and Grounds Cleaning and Maintenance	3,468	15,260	\$25,400	\$27,500	9.2%	9.2%	4,369	19,709	-213	-231	-0.6%	-0.2%
39	Personal Care and Service	2,661	11,320	\$28,600	\$28,600	13.8%	14.0%	3,922	17,110	-108	8	-0.4%	0.0%
41	Sales and Related	13,929	52,624	\$34,700	\$37,100	9.6%	9.2%	18,987	71,612	-2,305	-5,859	-1.8%	-1.2%
43	Office and Administrative Support	14,129	64,243	\$33,800	\$36,200	6.1%	6.1%	15,124	70,674	-2,245	-7,065	-1.7%	-1.2%
45	Farming, Fishing, and Forestry	618	1,368	\$36,400	\$33,900	8.3%	8.3%	903	2,050	-116	-190	-2.1%	-1.5%
47	Construction and Extraction	6,878	23,658	\$41,400	\$41,700	8.9%	8.8%	7,198	25,430	-946	-1,595	-1.5%	-0.7%
49	Installation, Maintenance, and Repair	5,070	21,988	\$44,300	\$46,600	5.7%	5.8%	4,613	20,758	-598	-1,211	-1.2%	-0.6%
51	Production	10,070	39,569	\$35,900	\$39,800	7.7%	7.6%	10,472	42,703	-1,824	-4,760	-2.0%	-1.3%
53	Transportation and Material Moving	10,837	44,233	\$33,700	\$35,000	8.7%	8.9%	12,759	54,012	-1,301	-2,635	-1.3%	-0.6%
Source	: JobsEQ®												
Averag	e wages represent all coverea	l employme	nt as of 2	020									

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 4,636 team assemblers will be needed in the labor shed, along with 2,174 first-line supervisors of production and operating workers, and 1,749 chemical equipment operators and tenders. During this same period, the labor shed is forecast to demand a large number of workers in manufacturing occupations paying significantly above-average wages. These occupations include industrial machinery mechanics (1,363 jobs); sales representatives, wholesale and manufacturing, except technical and scientific products (891 jobs); general and operations managers (713 jobs); and production workers, all other (852 jobs).

	Top 20 Manufacturing Occupations by Employment in GO VA Region 1 and the Region 1 Labor Shed														
		(Four Qu	Cur arters Er	rrent nding with	2021Q1)		Fore	cast Over	the Next	10 Years					
		Employ	ment	Averag W	e Annual ages	Total Se Der	eparation nand	Total Der	Growth nand	Total	Demand				
soc	Title	Labor           Region 1         Shed         Region 1		Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed					
51-2092	Team Assemblers	1,603	5,433	\$31,400	\$36,500	1,615	5,728	-443	-1,091	1,172	4,636				
51-1011	First-Line Supervisors of Production and Operating Workers	569	2,411	\$59,400	\$64,400	541	2,362	-78	-189	463	2,174				
51-9011	Chemical Equipment Operators and Tenders	92	1,638	\$48,700	\$53,200	99	1,827	-11	-78	88	1,749				
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	403	1,617	\$30,500	\$32,900	521	2,156	-53	-125	468	2,030				
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	351	1,528	\$34,100	\$40,100	371	1,680	-104	-354	268	1,326				

	Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and										
51-2028	Finishers	308	1,360	\$34,600	\$35,500	327	1,495	-42	-101	285	1,394
51-4121	Welders, Cutters, Solderers, and Brazers	491	1,297	\$38,700	\$40,100	510	1,377	-54	-87	456	1,290
49-9041	Industrial Machinery Mechanics	304	1,294	\$48,500	\$57,100	280	1,232	10	132	290	1,363
51-9111	Packaging and Filling Machine Operators and Tenders	268	1,126	\$36,000	\$33,900	299	1,269	-20	-62	279	1,206
43-5071	Shipping, Receiving, and Inventory Clerks	261	1,054	\$34,100	\$35,100	229	951	-58	-184	171	768
51-4041	Machinists	279	1,052	\$41,300	\$44,600	270	1,040	-23	-42	247	997
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	303	991	\$70,200	\$68,600	293	982	-41	-92	252	891
49-9071	Maintenance and Repair Workers, General	225	969	\$41,000	\$42,700	204	903	-29	-71	175	832
11-1021	General and Operations Managers	238	958	\$106,400	\$108,300	192	795	-33	-83	159	713
17-2112	Industrial Engineers	219	917	\$82,800	\$88,000	146	627	-8	20	138	648
53-3032	Heavy and Tractor-Trailer Truck Drivers	231	897	\$40,800	\$42,800	236	950	-46	-123	190	826
53-7051	Industrial Truck and Tractor Operators	240	830	\$33,000	\$37,300	254	900	-31	-64	223	836
51-9199	Production Workers, All Other	125	817	\$36,500	\$43,300	134	907	-17	-55	118	852
51-4072	Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	228	760	\$35,800	\$35,000	223	762	-48	-125	176	638
43-9061	Office Clerks, General	212	759	\$29,300	\$31,700	225	829	-48	-136	178	694
Source: Jo Average v	bbsEQ® vages represent all covered employn	nent as of 20	20								

Over the next 10 years beginning with the first quarter of 2021, employment is expected to decline among 18 of the top 20 occupations supporting the energy sector in GO VA Region 1 and the labor shed. However, significant demand is still forecast for many occupations paying above-average wages due to separations. Wages for electrical power-line installers and repairers (\$71,300), first-line supervisors of construction and extraction workers (\$64,200), and continuous mining machine operators (\$54,300) are well above the regional average wage.

	Top 20 Energ	y Occupatio	ns by Emp	oloyment i	in GO VA Re	gion 1 and	the Regi	on 1 Laboi	Shed		
		(Four Qu	Cur Jarters En	rent ding with	2021Q1)		Forecas	t Over the	Next 1	0 Years	
		Employ	ment	Averag W	ge Annual /ages	Total Separation         Total Growth           Demand         Demand			emand		
soc	Title	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed
47-2073	Operating Engineers and Other Construction Equipment Operators	259	400	\$40,600	\$40,700	253	397	-73	-102	180	294

47-5041	Continuous Mining Machine Operators	238	341	\$52,400	\$54,300	245	353	-78	-108	168	245
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	179	262	\$64,500	\$64,200	163	242	-42	-54	121	188
47-5022	Excavating and Loading Machine and Dragline Operators, Surface Mining	164	241	\$40.200	\$42,900	165	246	-46	-61	119	185
47 5022	Electrical Power-Line	104	241	<u>, , , , , , , , , , , , , , , , , , , </u>	\$ <del>4</del> 2,500	105	240	40	01	115	105
49-9051	Installers and Repairers Heavy and Tractor-Trailer	73	239	\$65,000	Ş71,300	52	176	-22	-55	30	121
53-3032	Truck Drivers	131	217	\$43,000	\$43,600	137	233	-19	-23	119	210
47-5098	Underground Mining Machine Operators and Extraction Workers, All Other	159	215	\$47,600	\$46,500	169	231	-50	-63	120	168
49-9041	Industrial Machinery Mechanics	121	206	\$48,600	\$58,100	95	165	-31	-45	65	120
47-2111	Electricians	107	168	\$55,600	\$53,900	104	167	-34	-45	70	121
47-5044	Loading and Moving Machine Operators, Underground Mining	108	157	\$44,200	\$47,000	102	150	-44	-64	58	86
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	72	148	\$74,500	\$80,400	56	120	-19	-31	37	89
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	92	129	\$55,400	\$53,600	78	110	-27	-35	51	75
47-5043	Roof Bolters, Mining	82	124	\$61,300	\$59,000	87	132	-30	-46	57	87
11-1021	General and Operations Managers	58	120	\$109,000	\$108,000	46	97	-10	-15	36	82
49-9071	Maintenance and Repair Workers, General	65	106	\$43,300	\$43,500	53	90	-19	-25	35	65
43-4051	Customer Service Representatives	25	98	\$38,700	\$42,500	27	112	-8	-27	19	86
47-5013	Service Unit Operators, Oil and Gas	58	91	\$41,500	\$42,100	85	132	4	6	89	138
47-5071	Roustabouts, Oil and Gas	58	91	\$33,300	\$36,600	79	125	6	9	85	134
43-9061	Office Clerks, General	44	88	\$32,500	\$35,000	47	95	-10	-18	37	78
51-8013	Power Plant Operators	16	86	\$60,400	\$73,500	12	69	-6	-23	6	46
Source: Jo Average v	bsEQ® vages represent all covered	d employment	as of 2020								

# Education

Postsecondary education in GO VA Region 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 in Johnson City, Tennessee; and Radford University in Radford, Virginia. Schools within the core region account for 2.1% of the region's awards of postgraduate degrees, 4.7% of the region's bachelor's degrees, 29.9% of the region's associate degrees, and 45.0% of region's certificates.



Within the labor shed, the number of awards has not changed significantly over the last 10 years. The total number of awards was greater than 27,000 in the 2019-2020 school year. 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 four-year degree, the number of associate degrees awarded in the region has declined slightly over the past 10 years.



# GO VA Region 1 Labor Shed Awards by Level Over Time

Virginia Tech, East Tennessee State University, Radford University, and King University award 85% of the bachelor's degrees in the labor shed. The community colleges in the list of the top higher education

institutions below awarded 82% of the certificates and 91% of the associate degrees in the labor shed. The seven schools in the core region are italicized.

	Certificates	Associates	Bachelor's	Postgraduates	Total
Virginia Polytechnic Institute					
and State University	0	55	7,136	2,353	9,544
East Tennessee State University	0	0	2,646	1,102	3,748
Radford University	20	31	1,935	499	2,485
Northeast State Community College	324	991	0	0	1,315
Virginia Western Community College	355	661	0	0	1,016
King University	0	9	568	212	789
Surry Community College	265	510	0	0	775
New River Community College	241	493	0	0	734
Mountain Empire Community College	444	273	0	0	717
Wytheville Community College	386	322	0	0	708
Virginia Highlands Community College	351	257	0	0	608
Southwest Virginia Community College	259	255	0	0	514
Concord University	0	0	374	134	508
Edward Via College of					
Osteopathic Medicine	0	0	0	503	503
Roanoke College	0	0	479	0	479
University of Pikeville	0	44	207	196	447
Emory & Henry College	0	0	259	114	373
American National University	233	54	28	21	336
Bluefield State College	2	126	182	0	310
Bluefield College	0	12	169	127	308
Hollins University	0	0	196	67	263
The University of Virginia's					
College at Wise	0	0	237	0	237
Appalachian School of Law	0	0	0	97	97
American National University-Pikeville	42	30	2	0	74
Mercer County					
Technical Education Center	72	0	0	0	72
Appalachian College of Pharmacy	0	0	0	71	71
Ross Medical Education					
Center-Johnson City	68	0	0	0	68
Jenny Lea Academy of Cosmetology	66	0	0	0	66
Paul Mitchell the School-Roanoke	34	0	0	0	34
Bristol School of Hair Design	26	0	0	0	26
Appalachian Beauty School	20	0	0	0	20
Total	3,208	4,123	14,418	5,496	27,245

### Postsecondary Awards by School, 2019-2020 Academic Year

Source: JobsEQ<sup>®</sup>. Awards data as of the 2019-2020 academic year

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

	Certificates	Associates	Bachelor's	Postgraduates	Total
Health Professions and Related Programs	1,223	977	1,357	1,730	5,287
Business, Management, Marketing, And Related Support Services	183	309	2,667	494	3,653
Liberal Arts and Sciences, General Studies and Humanities	486	1,832	293	10	2,621
Engineering	16	33	1,533	620	2,202
Education	15	33	382	712	1,142
Social Sciences	1	69	1,070	104	1,244
Biological and Biomedical Sciences	0		1,037	222	1,259
Computer and Information Sciences and Support Services	74	118	514	248	954
Psychology	0		720	76	796
Family and Consumer Sciences/Human Sciences	134	34	579	31	778
All Programs	3,749	4,152	14,018	5,224	27,143
Sourco: John EO®					

### **Postsecondary Awards Related to Key Clusters**

Source: JobsEQ

Data as of 2020

Note: Figures may not sum due to rounding.

### **Certificates and Associate 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 two years to complete) and associate degrees awarded within GO VA Region 1 that are directly applicable to the four target industries. Three of these titles can be achieved through certification alone (though 13 of the 37 construction trades certificates require more than two years but less than four years to complete).

Certificates and Associate Degrees Awarded in GO VA Region 1								
Program Title	Total Certificates	Associate Degrees	Advanced Manufacturing	Food and Beverage	Energy and Minerals	IT		
Computer and Information Sciences, General	41	105				•		
Construction Trades, General	29				•			
Electrician	91	18			•			
Environmental Control Technologies/Technicians, Other	4	7	•		•			
Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician	66	7		•				

Industrial Production Technologies/Technicians, Other	12	6	•	•	•	
Industrial Technology/Technician	0	70	•	•		
Manufacturing Engineering Technology/Technician	27	25	•	•	•	
Precision Metal Working, Other	26	25	•			
Welding Technology/Welder	231		•		•	

Source: JobsEQ®

Awards data as of the 2019-2020 academic year, related occupation data as of 2021Q1 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 10 internships by occupation posted online in Region 1 within the last year, as of September 21, 2021.

SOC	Occupation	Total Ads
21-1014.00	Mental Health Counselors	52
21-1093.00	Social and Human Service Assistants	48
17-2112.00	Industrial Engineers	40
11-9033.00	Education Administrators, Postsecondary	39
21-1023.00	Mental Health and Substance Abuse Social Workers	35
13-2011.00	Accountants and Auditors	33
13-1071.00	Human Resources Specialists	30
53-7065.00	Stockers and Order Fillers	29
19-3033.00	Clinical and Counseling Psychologists	25
29-2011.00	Medical and Clinical Laboratory Technologists	25

### Internships in GO VA Region 1

Source: JobsEQ® RTI, data as of September 21, 2021, based on keyword searches for online ads mentioning internships

The table below shows the top 10 employers that offered internships in GO VA Region 1 and surrounding counties in the last year ending September 21, 2021.<sup>26</sup> Volvo Group was the major provider of internships in the region, posting 66 online jobs such as logistics engineers and financial analysts. As one of the largest businesses in the labor shed, Volvo Group maintains a significant workforce through internship programs. These internships are mostly located in Dublin (Pulaski County), where residents in the labor shed and in counties east of the core region can take advantage of these work opportunities.

#### Employers in GO VA Region 1<sup>22</sup>

Employer Name	Number of Ads
Volvo Group	66
BAE Systems	36

<sup>&</sup>lt;sup>26</sup> Job ads from employers in neighboring counties may be captured as zip codes cross county borders and ads may contain imprecise location information. Those ads are included here as they may still represent internship opportunities for Region 1 residents.

## Employers in GO VA Region 1<sup>22</sup>

Employer Name	Number of Ads
Department of Veterans Affairs	36
Virginia Tech	30
Carilion Clinic	29
Strategic Therapy Associates Inc	26
Advance Auto Parts	23
Hugh Chatham Memorial Hospital	22
Eastern Tennessee State University	21
Neptune Retail Solutions	21

Source: JobsEQ RTI

### **Apprenticeships**

Apprenticeships within Region 1 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 GO VA Region 1 as of September 21, 2021.

Occupation	Sponsor	Address	City	State	Zip Code
Cosmetologist	First Impression Salon & Spa	151 Gate City Highway	Bristol	VA	24201
Cosmetologist	Signature Salon, LLC	719 Commonwealth Ave. Ste. 4	Bristol	VA	24201
Nail Technician	A&K Nails	3124 Lee Hwy. Suite 3	Bristol	VA	24201
Optician Dispensing	SAMS Club Optical & Optometry Center	13249 Lee Hwy.	Bristol	VA	24202
Optician Dispensing	Weberling, Douglas R. OD	1701 Euclid Avenue, Suite D	Bristol	VA	24201
Barber	Repass Barber Shop	141 Center Street	North Tazewell	VA	26630
Barber	Vineys Different Styles & More	1645 Riverside Drive / P.O. Box 387	N. Tazewell	VA	24630
Cosmetologist	Crystal's Kut N Edge	P.O. Box 932	Pounding Mill	VA	24637
Cosmetologist	Elite Medical and Day Spa, LLC	110 Huffard Drive	Bluefield	VA	24605
Cosmetologist	Vision Salon & Beauty Bar	2835 Fincastle Turnpike	N. Tazewell	VA	24630
Esthetician	Misty's Bronze & Beauty	801 South College Ave.	Bluefield	VA	24605
Nail Technician	Southern Belle	101 Suffolk Ave.	Richlands	VA	24641
Optician Dispensing	National Vision, Inc.	4001 College Avenue	Bluefield	VA	24605
Environmental Control Syst. Instal/Services (HVAC)	HCE Systems, Inc.	440 Hawthorne Ave.	Norton	VA	24273
Child Care Development Specialist	Kids Central Inc. Head Start	PO BOX 661	Norton	VA	24273
Chimney Sweep	WISE CORRECTIONAL CENTER UNIT #18				
Cosmetologist	Cuttin Up Hair Salon	318 Cloverleaf Square #C2	Big Stone Gap	VA	24219
Cosmetologist	Genesis Hair Unisex Salon	P.O. BOX 2328 / 202 Norton Road	Wise	VA	24293
Cosmetologist	HairVolution, LLC	746 Park Avenue N.W. / PO BOX 38	Norton	VA	24273

### Registered Apprenticeship Sponsors, GO Virginia Region 1

Occupation	Sponsor	Address	City	State	Zip Code
Cosmetologist	MANE on Park Avenue, LLC	605 Park Avenue	Norton	VA	24273
Cosmetologist	Studio 413 Hair Salon	10614 Indian Creek Road	Pound	VA	24279
Heating & Air Conditioning Mechanic & Installer	Buchanan Electric, Inc.	P.O. Box 654	Norton	VA	24273
Heating & Air Conditioning Mechanic & Installer	Wise County Public Schools / Career & Tech Center	628 Lake Street NE	Wise	VA	24293
Nail Technician	Genesis Hair Unisex Salon	P.O. BOX 2328 / 202 Norton Road	Wise	VA	24293
Nail Technician	HairVolution, LLC	746 Park Avenue N.W. / PO BOX 38	Norton	VA	24273
Optician Dispensing	Walmart Super Center Vision Center, 1302	780 Commonwealth Drive, Plaza Shopping C	Norton	VA	24273
Teacher Aide I	Kids Central Inc. Head Start	PO BOX 661	Norton	VA	24273
Teacher Preschool	Kids Central Inc. Head Start	PO BOX 661	Norton	VA	24273
Automotive Generator-Starter Rep	Komatsu Mining Corp Group	811 Boone Trail Road	Duffield	VA	24244
Construction Equipment Mechanic	Komatsu Mining Corp Group	811 Boone Trail Road	Duffield	VA	24244
Electric Motor Repairer	Komatsu Mining Corp Group	811 Boone Trail Road	Duffield	VA	24244
Electrician Maintenance	Komatsu Mining Corp Group	811 Boone Trail Road	Duffield	VA	24244
Machinist (Alternate Title: Precision Machinist)	Komatsu Mining Corp Group	811 Boone Trail Road	Duffield	VA	24244
Maint Mechanic (Any Ind) (Alternate Title: Industrial Maintenance Mechanic)	Komatsu Mining Corp Group	811 Boone Trail Road	Duffield	VA	24244
Optician Dispensing	Repko Family Vision Center	241 Gateway Plaza suite 106	Gate City	VA	24251
Welder, Combination	Komatsu Mining Corp Group	811 Boone Trail Road	Duffield	VA	24244
Automotive Generator-Starter Rep	Komatsu Mining Corp Group	811 Boone Trail Road	Duffield	VA	24244
Cosmetologist	Dudes & Dolls Salon	264 East Main Street	Lebanon	VA	24266
Cosmetologist	Renew Salon & Spa	P.O. Box 1897 / 22A West Main Street	Lebanon	VA	24266
Cosmetologist	RKT Hair Studio Academy of Hair Design	P.O. Box 3314, 764 West Main Street	Lebanon	VA	24266
Barber	Anderson Barbershop	611 East Main Street	Abingdon	VA	24210
Computer Programmer	Wize Solutions	851 French Moore Jr. Blvd., Suite 187	Abingdon	VA	24210
Cosmetologist	Hair Studio	100 West Laurel	Damascus	VA	24236
Cosmetologist	Mane Street Salon	301 East Main Street	Abingdon	VA	24210
Maint. Mechanic (Any Ind) (Alternate Title: Industrial Maintenance Mechanic)	AGC North America	18370 Oak Park Drive	Abingdon	VA	24210
Optician Dispensing	Eye Physicians of Southwest Virginia	328 A Cummings Street	Abingdon	VA	24210
Optician Dispensing	Walmart Vision Center 0154	16032 Fifteen Mile Blvd	Abingdon	VA	24210
Barber	Downtown Barbershop	651 North Main Street	Marion	VA	24354
Barber	Mabry at Downtown Barbershop	109 Farmview Road	Marion	VA	24354

Occupation	Sponsor	Address	City	State	Zip Code
Maint. Mechanic (Any Ind) (Alternate Title: Industrial Maintenance Mechanic)	ZF Group	222 Mountain Empire Road	Atkins	VA	24311
Nail Technician	Nails on Main	370 East Main Street	Abingdon	VA	24210
Optician Dispensing	Envision Eye Care	1020 Terrace Drive	Marion	VA	24354
Drafter, Mechanical	ABB	171 Industry Drive	Bland	VA	24315
Engineering Technicians	ABB	171 Industry Drive	Bland	VA	24315
Warehouse Logistics and Materials Handler	ABB	171 Industry Drive	Bland	VA	24315
Water Treatment Plant Operator	BLAND CORRECTIONAL CENTER				
Barber	Third Street Barbershop	315 East Monroe and Third Street	Wytheville	VA	24382
Cosmetologist	Anders Evolution Salon	60 West Main Street	Wytheville	VA	24382
Cosmetologist	Turning Heads Salon	665 East Main Street	Wytheville	VA	24382
Heating & Air Conditioning Mechanic & Installer	Wythe Sheet Metal, Inc.	735 East Lexington Street	Wytheville	VA	24382
Optician Dispensing	Wythe Eye Associates	530 West Ridge Road	Wytheville	VA	24382
Assistant Compliance Officer	Liddle Tykes CDC	59 Melrose Lane	Galax	VA	24333
Child Care Development Specialist	Liddle Tykes CDC	59 Melrose Lane	Galax	VA	24333
Cosmetologist	DB Barbershop and Salon, LLC	225 South Main Street	Galax	VA	24333
Cosmetologist	The Hair Gallery	29 Melrose Lane / Hwy. 58	Galax	VA	24333
Nail Technician	Nail Lounge & Spa	1063 E. Stuart Drive	Galax	VA	24333
Nail Technician	Rayzors Salon Spa & Tanning	34 Deer Haven Drive	Galax	VA	24333
Cosmetologist	Salon Luxe	227 North Main Street	Hillsville	VA	24343
Silkscreen Cutter	Vanguard Furniture	564 Industrial Park Road	Hillsville	VA	24343
Upholsterer	Vanguard Furniture	564 Industrial Park Road	Hillsville	VA	24343

Source: Virginia Department of Labor and Industry, accessed September 2021

The most popular apprenticeships were for cosmetologists (20 sponsors) and optician dispensing (nine sponsors). 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 Region 1. Current demand is based on Real-Time Intelligence (RTI) gathered and analyzed by Chmura from online job postings in the second quarter of 2021. 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, retail salespersons and heavy and tractor-trailer truck

drivers top the list of jobs posted online in GO VA Region 1.<sup>27</sup> Fifteen of the top 20 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 industryrecognized credential, associate degree, etc.) are heavy and tractor-trailer truck drivers, registered nurses, licenses practical and licensed vocational nurses, nursing assistants, and mental health counselors.

GO VA Region 1 Job Postings for Top 20 Occupations				
soc	Occupation	Education	Total Job Postings	
41-2031.00	Retail Salespersons	Less than high school	2,409	
53-3032.00	Heavy and Tractor-Trailer Truck Drivers	Two-year certificate or degree	2,392	
29-1141.00	Registered Nurses	Bachelor's degree	1,534	
41-1011.00	First-Line Supervisors of Retail Sales Workers	Less than high school	1,156	
35-3023.00	Fast Food and Counter Workers	Less than high school	1,148	
53-7065.00	Stockers and Order Fillers	Less than high school	1,053	
35-1012.00	First-Line Supervisors of Food Preparation and Serving Workers	Less than high school	1,007	
21-1093.00	Social and Human Service Assistants	Less than high school	779	
43-4051.00	Customer Service Representatives	Less than high school	703	
37-2011.00	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	Less than high school	678	
29-2061.00	Licensed Practical and Licensed Vocational Nurses	Postsecondary non-degree award	513	
41-2011.00	Cashiers	Less than high school	481	
35-2021.00	Food Preparation Workers	Less than high school	420	
53-3031.00	Driver/Sales Workers	High school diploma or equivalent	409	
49-9071.00	Maintenance and Repair Workers, General	Less than high school	407	
31-1131.00	Nursing Assistants	Postsecondary non-degree award	384	
43-6013.00	Medical Secretaries and Administrative Assistants	High school diploma or equivalent	357	
21-1014.00	Mental Health Counselors	Bachelor's degree	332	
53-3033.00	Light Truck Drivers	High school diploma or equivalent	331	
43-6014.00	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	High school diploma or equivalent	306	
41-2031.00	Retail Salespersons	Less than high school	2,409	
Source: JobsEQ <sup>®</sup> . Data reflect online job postings for the 365-day period ending 9/26/2021				

<sup>&</sup>lt;sup>27</sup> 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.

Similarly, certifications requested in the text of online job postings primarily support the healthcare sector. Healthcare skills were the most-requested skills in job ads over the second quarter of 2021. Besides a driver's license, Basic Life Support tops the list of the top 25 certifications requested (303), with Registered Nurse (278 postings), and Certification in Cardiopulmonary Resuscitation (257 postings) right behind. Class A Commercial Driver's License (CDL-A) had 188 postings, and a general CDL appeared in 76 posts. Additional certifications not in the healthcare sector include Licensed Clinical Social Worker (92), Secret Clearance (35), and HAZMAT (29).

Certificate Name	Total Ads	
Driver's License	553	
Basic Life Support (BLS)	323	
Registered Nurse (RN)	266	
Certification in Cardiopulmonary Resuscitation (CPR)	228	
Class A Commercial Driver's License (CDL-A)	189	
Advanced Cardiac Life Support Certification (ACLS)	151	
Licensed Practical Nurse (LPN)	110	
Certified Nursing Assistant (CNA)	104	
Commercial Driver's License (CDL)	93	
First Aid Certification	81	
Pediatric Advanced Life Support (PALS)	78	
Licensed Clinical Social Worker (LCSW)	72	
Licensed Professional Counselor (LPC)	70	
Secret Clearance	39	
The American Registry of Radiologic Technologists (ARRT) Certification	34	
Certified Public Accountant (CPA)	26	
HAZMAT	24	
Medical Assistant Certification (MA)	23	
Board Certified Behavior Analyst (BCBA)	22	
Medical Technologist (MT)	22	
ServSafe Food Protection Manager Certification	21	
OSHA 10	19	

### GO VA Region 1 Openings by Certification, 2021Q2

Source:

JobsEQ®

### GO VA Region 1 Openings by Certification, 2021Q2

Certificate Name	Total Ads
EPA Universal Certification	18
Cisco Certified Network Associate (CCNA)	16
Forklift Certified	16

### **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 Region 1 is projected to decline at an average annual rate of 1.1% over the next 10 years, occupations typically requiring a two-year degree or certificate are expected to decline at a slower rate (0.9% per year) and those requiring a postgraduate degree are expected to decline only 0.4% per year.28

#### -0.4% Postgraduate degree (\$96,500) Bachelor's degree (\$68,700) -0.8% 2-year degree or certificate (\$38,700) -0.9% Previous work experience, no award (\$48,900) -1.6%

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



The outlook at all training levels improves in the GO VA Region 1 labor shed. Though employment overall is projected to decline over the next 10 years, occupations that typically require a postgraduate degree are expected to grow at an average annual rate of 0.1% over this period. Occupations that typically require a two-year degree or certificate are projected to decline at an annual average rate of 0.3% and occupations requiring a bachelor's degree are projected to decline an annual 0.2% on average.

-0.4%

-0.2%

0.0

<sup>&</sup>lt;sup>28</sup> Estimates of employment data by occupation are current through 2021Q1. 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.

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





Further detail on the apparent long-term skills gap is based on the total annual demand created from growth in industries, retirements, and career transitions. 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, both demand and wages 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.<sup>29</sup> **The key sectors are advanced manufacturing, food and beverage 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 Region 1, the largest projected potential shortfalls are for cashiers; fast food and counter workers; and personal care aides. 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 450 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.

<sup>&</sup>lt;sup>29</sup> 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 Occupatio	n Gaps over 10 Years in	GO VA Regio	on 1: Occi	upations with To	tal Annua	al Demand	> 100
SOC	Title	Typical Education Need	Current Employment 202101	Relevant to Key Drivers	Avg. Annual Wages 2020	Annual Growth Demand	Annual Separation Demand	Total Annual Demand/ Potential Supply
41-2011	Cashiers	Less than high school	5 175	Dilvers	\$20,600	-113	898	785
35-3023	Fast Food and Counter Workers	Less than high school	3,834		\$19,200	-11	688	677
31-1122	Personal Care Aides	High school diploma or equivalent	2,705		\$21,300	51	399	450
41-2031	Retail Salespersons	Less than high school	3,392		\$30,400	-52	468	416
53-7065	Stockers and Order Fillers	High school diploma or equivalent	2,708		\$26,900	-38	341	303
43-4051	Customer Service Representatives	High school diploma or equivalent	2,361	•	\$29,500	-27	301	274
35-3031	Waiters and Waitresses	None	1,348		\$23,200	-11	250	239
43-9061	Office Clerks, General	High school diploma or equivalent	2,171	•	\$28,700	-40	244	204
11-9013	Farmers, Ranchers, and Other Agricultural Managers	High school diploma or equivalent	3,148		\$52,900	-81	284	203
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	Less than high school	1,639	•	\$29,800	-16	219	203
53-3032	Heavy and Tractor-Trailer Truck Drivers	Postsecondary non-degree award	2,090	•	\$41,400	-29	226	197
31-1131	Nursing Assistants	Postsecondary non-degree award	1,633		\$25,600	-12	177	165
37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	Less than high school	1,323		\$23,700	-12	168	156
41-1011	First-Line Supervisors of Retail Sales Workers	High school diploma or equivalent	1,556		\$38,800	-32	159	127
51-2092	Team Assemblers	High school diploma or equivalent	1,706	•	\$31,200	-53	179	126
31-1121	Home Health Aides	High school diploma or equivalent	910		\$21,300	17	108	125
11-1021	General and Operations Managers	Bachelor's degree	1,618	•	\$96,900	-14	136	122
47-2061	Construction Laborers	Less than high school	1,270		\$29,200	-13	135	122
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	High school diploma or equivalent	846		\$30,000	-7	125	119
35-2014	Cooks, Restaurant	Less than high school	740		\$27,300	8	107	116
37-3011	Landscaping and Groundskeeping Workers	None	855		\$26,000	0	111	110
35-2021	Food Preparation Workers	Less than high school	709		\$20,100	-10	116	106
37-2012	Maids and Housekeeping Cleaners	Less than high school	848		\$20,900	-9	110	101
43-3031	Bookkeeping, Accounting, and Auditing Clerks	Some college, no degree	1,132		\$33,000	-23	123	100
Source: Joi Occupatio	bsEQ® n wages are as of 2021Q1 and	represent the average for all c	overed employm	ient				

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 general and operations managers. 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 2021Q1	Avg. Annual Wages 2020	Total Annual Demand Over the Next 10 Years			
11-9013	Farmers, Ranchers, and Other Agricultural Managers	High school diploma or equivalent	3,148	\$52,900	203			
11-1021	General and Operations Managers	Bachelor's Degree	1,618	\$96,900	121			
43-1011	First-Line Supervisors of Office and Administrative Support Workers	High school diploma or equivalent	1,182	\$48,900	97			
29-1141	Registered Nurses	Bachelor's Degree	1,976	\$55,000	89			
41-3091	Sales Representatives of Services, Except Advertising, Insurance, Financial Services, and Travel	High school diploma or equivalent	615	\$52,300	71			
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	High school diploma or equivalent	841	\$69,400	71			
13-2011	Accountants and Auditors	Bachelor's Degree	900	\$60,900	70			
13-1198	Project Management Specialists and Business Operations Specialists, All Other	Bachelor's Degree	802	\$72,700	68			
25-2021	Elementary School Teachers, Except Special Education	Bachelor's Degree	1,219	\$64,500	67			
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	High school diploma or equivalent	773	\$59,700	65			
51-1011	First-Line Supervisors of Production and Operating Workers	High school diploma or equivalent	734	\$60,100	60			
15-1256	Software Developers and Software Quality Assurance Analysts and Testers	Bachelor's Degree	700	\$85,800	53			
49-9041	Industrial Machinery Mechanics	High school diploma or equivalent	598	\$47,800	52			
13-1111	Management Analysts	Bachelor's Degree	566	\$71,500	50			
13-1071	Human Resources Specialists	Bachelor's Degree	505	\$51,200	45			
25-2031	Secondary School Teachers, Except Special and Career/Technical Education	Bachelor's Degree	834	\$63,400	43			
11-9198	Personal Service Managers, All Other; Entertainment and Recreation Managers, Except Gambling; and Managers, All Other	Bachelor's Degree	780	\$83,600	42			
13-1161	Market Research Analysts and Marketing Specialists	Bachelor's Degree	390	\$58 <i>,</i> 800	41			
53-1047	First-Line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	High school diploma or equivalent	416	\$50,600	37			
47-2111	Electricians	High school diploma or equivalent	388	\$52,400	36			
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	High school diploma or equivalent	475	\$62,500	34			
13-1151	Training and Development Specialists	Bachelor's Degree	311	\$51,200	31			

	Top 30 Occupat	ions with Above-A	verage Wag	jes	
soc	Title	Typical Education Need For Entry	Current Employment 2021Q1	Avg. Annual Wages 2020	Total Annual Demand Over the Next 10 Years
25-2022	Middle School Teachers, Except Special and Career/Technical Education	Bachelor's Degree	558	\$56,400	31
11-3031	Financial Managers	Bachelor's Degree	381	\$102,800	29
11-9111	Medical and Health Services Managers	Bachelor's Degree	252	\$91,100	25
43-5061	Production, Planning, and Expediting Clerks	High school diploma or equivalent	268	\$45,200	24
25-2011	Preschool Teachers, Except Special Education	Associate degree	265	\$44,500	24
41-3021	Insurance Sales Agents	High school diploma or equivalent	275	\$56,500	23
11-9021	Construction Managers	Bachelor's Degree	374	\$96,500	23
25-3097	Tutors and Teachers and Instructors, All Other	Bachelor's Degree	220	\$49,500	23
Source: Jobs	5EQ <sup>®</sup>				

The table below presents the top 30 occupations, based on total annual demand projected, 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.<sup>30</sup> Seventeen of the top 30 occupations are attainable with less than an associate degree, including heavy and tractor-trailer truck drivers; maintenance and repair workers; sales representatives; electricians; and operating engineers. The remaining 13 occupations typically require at least a bachelor's degree, including general and operations managers; software developers; computer systems analysts; and industrial engineers.

	GO VA Region 1 Top 30 Occup	ations Supporting Key [	Drivers with A	bove-Average Wa	iges
soc	Title	Typical Education Need For Entry	Current Employment 2021Q1	Avg. Annual Wages 2020	Total Annual Demand Over the Next 10 Years
53-3032	Heavy and Tractor-Trailer Truck Drivers	Postsecondary non- degree award	2,090	\$41,400	1,954
11-1021	General and Operations Managers	Bachelor's degree	1,618	\$96,900	1,208
49-9071	Maintenance and Repair Workers, General	High school diploma or equivalent	1,021	\$39,400	836
41-3091	Sales Representatives of Services, Except Advertising, Insurance, Financial Services, and Travel	High school diploma or equivalent	615	\$52,300	711
13-2011	Accountants and Auditors	Bachelor's degree	900	\$60,900	704
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	High school diploma or equivalent	841	\$69,400	708
13-1198	Project Management Specialists and Business Operations Specialists, All Other	Bachelor's degree	802	\$72,700	683
47-2073	Operating Engineers and Other Construction Equipment Operators	High school diploma or equivalent	765	\$41,500	685

<sup>&</sup>lt;sup>30</sup> Occupation wages are as of 2020 and are considered separately from industry wages due to differences in collection and time period.

	GO VA Region 1 Top 30 Occupa	ations Supporting Key I	Drivers with A	bove-Average Wa	ges
soc	Title	Typical Education Need For Entry	Current Employment 2021Q1	Avg. Annual Wages 2020	Total Annual Demand Over the Next 10 Years
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	High school diploma or equivalent	773	\$59,700	651
51-1011	First-Line Supervisors of Production and Operating Workers	High school diploma or equivalent	734	\$60,100	600
51-4121	Welders, Cutters, Solderers, and Brazers	High school diploma or equivalent	611	\$38,800	564
15-1256	Software Developers and Software Quality Assurance Analysts and Testers	Bachelor's degree	700	\$85,800	532
49-9041	Industrial Machinery Mechanics	High school diploma or equivalent	598	\$47,800	520
13-1111	Management Analysts	Bachelor's degree	566	\$71,500	500
13-1071	Human Resources Specialists	Bachelor's degree	505	\$51,200	450
11-9198	Personal Service Managers, All Other; Entertainment and Recreation Managers, Except Gambling; and Managers, All Other	Bachelor's degree	780	\$83,600	422
13-1161	Market Research Analysts and Marketing Specialists	Bachelor's degree	390	\$58,800	413
47-2111	Electricians	High school diploma or equivalent	388	\$52,400	359
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	High school diploma or equivalent	475	\$62,500	343
51-4041	Machinists	High school diploma or equivalent	324	\$41,000	285
43-5061	Production, Planning, and Expediting Clerks	High school diploma or equivalent	268	\$45,200	240
15-1232	Computer User Support Specialists	Some college, no degree	320	\$44,200	226
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	High school diploma or equivalent	278	\$52,600	199
13-1023	Purchasing Agents, Except Wholesale, Retail, and Farm Products	Bachelor's degree	260	\$52,500	189
15-1211	Computer Systems Analysts	Bachelor's degree	296	\$72,400	172
47-5041	Continuous Mining Machine Operators	None	242	\$52,200	173
47-5022	Excavating and Loading Machine and Dragline Operators, Surface Mining	High school diploma or equivalent	212	\$39,300	168
17-2112	Industrial Engineers	Bachelor's degree	258	\$83,500	161
15-1244	Network and Computer Systems Administrators	Bachelor's degree	264	\$63,700	145
11-3021	Computer and Information Systems Managers	Bachelor's degree	207	\$117,300	146
Source: Jobs	5EO®				

# POTENTIAL GO VA REGION 1 INDUSTRY TARGETS

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

		Key Targets for GO VA	Region 1	
	Advanced Manufacturing	Food and Beverage Manufacturing	Energy and Minerals	Information Technology
Location Quotient	1.44	0.96	3.18	0.60
Average Annual Wage	\$46,848	\$48,657	\$74,723	\$72,000
Employment	15,338	1,477	3,397	2,351
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 & C	ìhmura			

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 \$663.5 million in GO VA Region 1 in 2019, an increase of \$68.8 million since 2015, 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 of an area, 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, tourism is not included in the target industries of GO Virginia Region 1. 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 GO VA Region 1 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.

Prior to the pandemic, advanced manufacturing experienced an increase in employment by 2.0% from 16,681 in 2017 to 17,020 in 2019 and an increase in average annual wages from \$42,552 to \$44,214 over the same time period. For food and beverage manufacturing, average annual wages increased by 6.4% from \$41,860 to \$44,519, while employment grew by 5.1% from 1,393 to 1,465. For the energy and minerals industry in GO VA Region 1, employment decreased by 3.8% from 4,039 to 3,888 and average annual wages increased by 4.7% from \$74,510 to \$77,985. For those working in IT in Region 1, employment increased by 1.3% to reach 2,451 in 2019.

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 Region 1 shows that traded sectors experienced a greater impact due to the pandemic. Employment decreased for both local (-4.47%) and traded (-8.11%) sectors; however, total wages increased in 2020 the local sectors by 0.55%, but decreased by 5.90% in traded sectors. The decline in total wages is tied to the loss of more than 3,400 jobs in traded sectors over this period.

	Employment in GO VA Region 1 by Traded/Local Sectors								
Sector Employment 2019 Employment 2020 # Change in Employment % Change Employment									
Local	94,543	90,320	-4,223	-4.47%					
Traded	42,595	39,140	-3,455	-8.11%					
Total	137,138	129,461	-7,678	-5.60%					

	Total Wages in GO VA Region 1 by Traded/Local Sectors								
Sector Total Wages 2019 Total Wages 2020 \$ Change in Total Wages % Change in Total Wag									
Local	\$2,968,421,888	\$2,984,661,045	\$16,239,158	0.55%					
Traded	\$1,719,338,888	\$1,617,898,470	-\$101,440,418	-5.90%					
Total	\$4,865,287,476	\$4,767,346,534	-\$97,940,942	-2.01%					

The following manufacturing industries in Region 1 localities have weathered the pandemic relatively well, adding at least 50 employees over the year ending with the first quarter of 2021:

- All Other Plastics Product Manufacturing (+96 employees)
- Upholstered Household Furniture Manufacturing (+83)
- Other Aircraft Parts and Auxiliary Equipment Manufacturing (+72)
- Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing (+65)
- Fruit and Vegetable Canning Manufacturing (+59)

# 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). Prior to 2017, each of these industries except transportation equipment manufacturing in the region. Between 2017 and 2019, employment in chemical manufacturing and transportation equipment manufacturing has grown. As the COVID-19 pandemic has drawn attention to domestic pharmaceutical manufacturing and biotech companies, and with the proximity of the biotech cluster in Charlottesville,<sup>31</sup> biotech industries such as pharmaceutical and medicine manufacturing or medical equipment and supplies manufacturing may be expected to grow in the future and warrant further exploration in a later update.

	Illustrative Advanced Ma	anufacturing	Industries, Fou	r Quarters End	ing 2021Q1		
			GO VA Region 1 GO V		GO V	A Region 1 Labor Shed	
NAICS	Manufacturing	Empl	Avg. Annual Wages	Location Quotient	Empl	Avg. Annual Wages	Location Quotient
325	Chemical	794	\$53,175	1.07	11,756	\$85,402	3.86
336	Transportation Equipment	2,975	\$45,982	2.13	8,060	\$64,588	1.40
326	Plastics and Rubber Products	1,397	\$55,581	2.33	4,512	\$53,157	1.83
335	Electrical Equipment, Appliance, and Components	1,131	\$53,732	3.44	5,452	\$57,973	4.02
Source: Jol	bsEQ®						<u>.</u>

Between 2017Q1 and 2021Q1, employment in chemical manufacturing in GO VA Region 1 has decreased by 9.4% and average annual wages have increased by 8.2%. For transportation equipment, employment decreased by 18.3% and average annual wages increased by 10.7%. For plastics and rubber products, employment decreased by 0.7% while wages increased by 10.8%. Employment in electrical equipment, appliance, and components increased by 1.9%, while average annual wages increased by 7.2%.

# **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 Region 1 has a few occupations with low potential candidates

<sup>&</sup>lt;sup>31</sup> <u>https://cvillebiohub.org/</u>

(shaded in red in the table below). Among the top 10 occupations typically required in this industry, Region 1 has ample supply for five occupations. The lowest ratio of potential candidates to openings is for chemists, followed by chemical equipment operators and tenders, chemical plant and system operators, and chemical technicians. However, there is ample supply for all of the top 10 occupations in the GO VA Region 1 labor shed.

		v	Vhat-If Rep	oort for Chem	ical Manuf	acturing (10	0 workers)			
SOC	Title	New Employer Demand	Region 1 Empl <sup>1</sup>	Region 1 Labor Shed Employment <sup>1</sup>	Region 1 Unempl <sup>1</sup>	Labor Shed Unempl <sup>1</sup>	Region 1 Avg Wage <sup>2</sup>	Region 1 Employment Extended	Region 1 Ratio	Labor Shed Ratio
	Chemical Equipment Operators and									
51-9011	Tenders	10	151	1,465	9	95	\$48,800	113	16	156
	Packaging and Filling Machine Operators and									
51-9111	Tenders	8	368	1,351	29	105	\$35,300	5,844	50	182
	Mixing and Blending Machine Setters, Operators, and									
51-9023	Tenders	5	141	621	8	35	\$37,800	375	30	131
19-2031	Chemists	4	35	383	2	22	\$98,700	116	9	101
	First-Line Supervisors of Production and Operating									
51-1011	Workers	4	785	2,832	34	127	\$60,100	990	205	740
	Inspectors, Testers, Sorters, Samplers, and									
51-9061	Weighers	4	524	1,984	36	140	\$34,000	1,687	140	531
54 0004	Chemical Plant and System						450.400			
51-8091	Operators Chemical	3	53	416	2	14	\$60,100	369	18	143
19-4031	Technicians	3	49	522	4	45	\$48,200	55	18	189
49-9041	Industrial Machinery Mechanics	3	643	1,998	20	62	\$47,800	2,459	221	687

	General									
	and									
	Operations									
11-1021	Managers	2	1,641	6,574	82	326	\$96,900	6,657	862	3,450
Source: Job	osEQ									
<sup>1</sup> Occupatio	on employment	and unemplo	yment are pla	ace-of-residence	data. Data as	of 2021Q1 unle	ess noted othe	erwise.		
<sup>2</sup> Occupatio	on wages are as	of 2020 and 1	represent the	average for all co	overed emplo	yment.				
Note: Emp	loyment extend	led refers to I	regional work	ers with skills sim	ilar to the spe	ecified occupati	on and who a	re currently or p	reviously emp	ployed
in an occup	pation with wag	es no more t	han 10% high	er than the avera	ge wage of th	e specified occu	upation.			

Most of the occupations with the highest average wages typically require postsecondary education and are potentially undersupplied with lower candidate-to-opening ratios. In particular, chemists, chemical technicians, and chemical engineers typically require an associate or bachelor's degree and have low ratios in GO VA Region 1. However, there is ample supply in the Region 1 labor shed, and, as shown in the table that follows, higher education institutions in the region conferred 293 awards to graduates in the 2019-2020 academic year in programs that would enable them to fill these positions.

Regional Postsecondary Programs	s for Chemical Manufacturing-R	elated Occupations					
	Annual Awards - GO VA Region 1 Labor Shed						
	Certificates and		Postgraduate				
Title/School	Two-year Degrees	Four-year Degrees	Degrees				
40.0501 Chemistry, General							
Virginia Polytechnic Institute and State University	0	37	29				
University of Pikeville	0	3	0				
Roanoke College	0	6	0				
Radford University	0	19	0				
King University	0	1	0				
Hollins University	0	2	0				
Emory & Henry College	0	4	0				
East Tennessee State University	0	27	17				
Concord University	0	6	0				
Bluefield College	0	1	0				
41.0301 Chemical Technology/Technician							
Northeast State Community College	11	0	0				
14.0701 Chemical Engineering							
Virginia Polytechnic Institute and State University	0	110	20				
Total							
Total	11	216	66				

## **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 Region 1 has a sufficient supply of potential candidates for the top occupations. Among the top 10 occupations typically required in this industry, Region 1 has ample supply for nine occupations. The lowest ratio of potential candidates to openings is for aircraft structure, surfaces, rigging, and systems assemblers. However, as shown in the table below, there is a larger potential candidate-to-opening ratio for all of the top 10 occupations in the Region 1 labor shed.

	What-If Report for Transportation and Equipment Manufacturing (100 workers)												
soc	Title	New Employer Demand	Region 1 Empl <sup>1</sup>	Labor Shed Empl <sup>1</sup>	Region 1 Unempl <sup>1</sup>	Labor Shed Unempl <sup>1</sup>	Region 1 Avg Wage <sup>2</sup>	Region 1 Employment Extended	Region 1 Ratio	Labor Shed Ratio			
51-2092	Team Assemblers	17	1,831	5,606	246	757	\$31,200	717	122	374			
54.00004	Inspectors, Testers, Sorters, Samplers, and		524	4 00 4	26	110	624.000	4.607	110	524			
51-9061	Weigners	4	524	1,984	36	140	\$34,000	1,687	140	531			
51-4121	Solderers, and Brazers	4	636	1,670	59	159	\$38,800	5,368	174	457			
51-1011	First-Line Supervisors of Production and Operating Workers	3	785	2 832	34	127	\$60,100	990	273	986			
51-1011		5	785	2,052	54	127	,000,100	550	275	580			
17-2112	Industrial Engineers	3	228	1,070	6	28	\$83,500	408	78	366			
51-4041	Machinists	3	355	1,190	22	77	\$41,000	1,348	126	422			
51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	2	34	65	6	12	\$46,800	0	20	38			
51-2099	Assemblers and Fabricators, All Other	2	292	922	37	119	\$31,100	1,831	165	520			
	Coating, Painting, and Spraying Machine												
51-9124	Tenders	2	230	632	14	40	\$34,400	3,250	122	336			
51 0161	Computer Numerically Controlled Tool	2	127	402	10	21	\$41.700	262	74	217			
71-9101		<u>۲</u>	121	402	10	51	\$41,700	502	/4	217			

Source: JobsEQ

<sup>1</sup>Occupation employment and unemployment are place-of-residence data. Data as of 2021Q1 unless noted otherwise.

<sup>2</sup>Occupation wages are as of 2020 and represent the average for all covered employment.

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

Three 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 industrial engineers, first-line supervisors, and aircraft structure, surfaces, rigging, and systems assemblers. However, there is ample supply in the Region 1 labor shed, and, as shown in the table that follows, higher education institutions in

the region graduated over 1,200 people in the 2019-2020 academic year with awards related to these positions.

Regional Postsecondary Programs for Transportation Equipment Manufacturing Related Occupations									
	Annual Aw	ards - GO VA Region 1	Labor Shed						
	Certificates and		Postgraduate						
Title/School	Two-year Degrees	Four-year Degrees	Degrees						
47.0608 Aircraft Powerplant Technology/Technician									
Northeast State Community College	25	0	0						
14.3501 Industrial Engineering									
Virginia Polytechnic Institute and State University	0	184	51						
15.1503 Packaging Science									
Virginia Polytechnic Institute and State University	0	35	0						
48.0503 Machine Shop Technology/Assistant									
Northeast State Community College	12	0	0						
Surry Community College	8	0	0						
14.0201 Aerospace, Aeronautical and Astronautical/Space Engineer	ing								
Virginia Polytechnic Institute and State University	0	138	49						
14.1001 Electrical and Electronics Engineering									
Virginia Polytechnic Institute and State University	0	133	92						
14.1901 Mechanical Engineering									
Virginia Polytechnic Institute and State University	0	407	81						
Total									
Total	45	897	273						

#### Plastics and Rubber Products Manufacturing

GO VA Region 1 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, Region 1 has ample supply for six occupations. The lowest ratio of potential candidates to openings is for tire builders; extruding and drawing machine setters, operators, and tenders; and molding, coremaking, and casting 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 Region 1 labor shed.

What-If Report for Plastics and Rubber Products Manufacturing (100 workers)											
soc	Title	New Employer Demand	Region 1 Empl <sup>1</sup>	Labor Shed Empl <sup>1</sup>	Region 1 Unempl <sup>1</sup>	Labor Shed Unempl <sup>1</sup>	Region 1 Avg Wage <sup>2</sup>	Region 1 Empl Extended	Region 1 Ratio	Labor Shed Ratio	
	Molding, Coremaking,										
	Setters Operators and										
	Tenders, Metal and										
51-4072	Plastic	11	266	743	11	32	\$35,700	671	25	70	
51-2092	Team Assemblers	8	1,831	5,606	246	757	\$31,200	717	260	795	
	Extruding and Drawing Machine Setters,										
51-4021	Metal and Plastic	5	111	344	8	27	\$37 500	65	24	74	
	First-Line Supervisors of						<i></i>				
	Production and										
51-1011	Operating Workers	5	785	2,832	34	127	\$60,100	990	164	592	
	Inspectors, Testers, Sorters, Samplers, and										
51-9061	Weighers	5	524	1,984	36	140	\$34,000	1,687	112	425	
	Laborers and Freight, Stock, and Material										
53-7062	Movers, Hand	4	2,081	8,153	218	855	\$29,800	7	575	2,252	
53-7064	Packers and Packagers, Hand	4	380	1,638	49	215	\$24,800	3,721	107	463	
	Extruding, Forming, Pressing, and Compacting Machine Setters										
51-9041	Operators, and Tenders	3	76	305	2	8	\$40,800	2,377	26	104	
	Industrial Machinery										
49-9041	Mechanics	3	643	1,998	20	62	\$47,800	2,459	221	687	
51-9197	Tire Builders	3	43	206	4	20	\$38,800	0	16	75	

Source: JobsEQ

<sup>1</sup>Occupation employment and unemployment are place-of-residence data. Data as of 2021Q1 unless noted otherwise.

<sup>2</sup>Occupation wages are as of 2020 and represent the average for all covered employment.

Note: Employment extended refers to regional workers with skills similar to the specified occupation and who are 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. Two of the top 10 occupations—first-line supervisors of production and operating workers and industrial machinery mechanics—pay above-average wages, with no postsecondary education typically required, but typically require moderate-term on-the-job training.

# Electrical Equipment, Appliance, and Component Manufacturing

GO VA Region 1 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 and the 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, Region 1 has ample supply for seven occupations. The lowest ratio of potential candidates to openings is for coil winders, tapers, and finishers; electrical and electronic equipment assemblers; and electrical engineers. However, as shown in the table below, there is an ample supply of potential candidates relative to expected demand for nine of the top 10 occupations in the Region 1 labor shed, and ample candidates for coil winders, tapers, and finishers when considering workers in related occupations with similar skills (employment extended).

	What-If Report for Electrical Equipment, Appliance, and Component Manufacturing (100 workers)												
soc	Title	New Employer Demand	Region 1 Empl <sup>1</sup>	Labor Shed Empl <sup>1</sup>	Region 1 Unempl <sup>1</sup>	Labor Shed Unempl <sup>1</sup>	Region 1 Avg Wage <sup>2</sup>	Region 1 Empl Extended	Region 1 Ratio	Labor Shed Ratio			
	Electrical, Electronic, and Electromechanical												
	Assemblers, Except												
51-2028	and Finishers	19	326	1,253	14	55	\$34,600	64	18	69			
51-2092	Team Assemblers	8	1,831	5,606	246	757	\$31,200	717	260	795			
51-2021	Coil Winders, Tapers, and Finishers	4	34	145	1	6	\$32,700	1,036	9	38			
17-2071	Electrical Engineers	4	112	589	2	8	\$80,600	620	28	149			
	First-Line Supervisors of Production and												
51-1011	Operating Workers	3	785	2,832	34	127	\$60,100	990	273	986			
17-2112	Industrial Engineers	3	228	1,070	6	28	\$83,500	408	78	366			
	Inspectors, Testers, Sorters, Samplers, and												
51-9061	Weighers	3	524	1,984	36	140	\$34,000	1,687	187	708			
51-4041	Machinists	3	355	1,190	22	77	\$41,000	1,348	126	422			
17-2141	Mechanical Engineers	3	189	802	7	28	\$88,200	306	65	277			
	Electrical and Electronic Engineering												
17-3023	Technicians	2	128	472	7	27	\$58,900	806	68	250			

Source: JobsEQ

<sup>1</sup>Occupation employment and unemployment are place-of-residence data. Data as of 2021Q1 unless noted otherwise.

<sup>2</sup>Occupation wages are as of 2020 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 typically require a high school diploma or less for entry. Four of the top 10 occupations pay above-average wages, including electrical engineers; mechanical engineers; and electrical and electronic engineering technologists and technicians. 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 GO VA Region 1. Twenty percent of the state's farms are in Region 1, with sales of cattle and calves exceeding \$240 million and total crop sales at \$57.4 million.<sup>32</sup> As Virginia's cattle sales total \$680 million, Region 1 makes up 35.4% of Virginia's cattle sales.

Agriculture in GO VA Region 1											
	Region 1 Total in 2012	Region 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	e (2012 & 2017)										

Both the number of farms and the total farmland acreage decreased in GO VA Region 1 and across the state. The number of farms decreased from 2012 to 2017 in the state of Virginia (-6.1%) and Region 1 (-10.7%), while total farmland acreage decreased 6.1% in Virginia and 13.6% in Region 1.<sup>33</sup> Total livestock sales in Region 1 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.<sup>34</sup>

Food and beverage manufacturing is a natural extension to the agriculture industry that would bring jobs with various skill levels. One specific industry within food and beverage manufacturing, animal slaughtering and processing, is explored due to a lack of facilities. Farmers have stated their need for such a facility since cattle are currently shipped 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 Region 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.<sup>35</sup> Among the top 10 occupations typically required in this industry, Region 1 has ample supply for seven occupations. Though the region 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

<sup>&</sup>lt;sup>32</sup> 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.

<sup>&</sup>lt;sup>33</sup> Source: Census of Agriculture (2012 & 2017)

<sup>&</sup>lt;sup>34</sup> Ibid.

<sup>&</sup>lt;sup>35</sup> County Business Patterns from the U.S. Census indicate about 60% of establishments in this industry have 19 or fewer employees.

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)													
soc	Title	New Employer Demand	Region 1 Empl <sup>1</sup>	Labor Shed Empl <sup>1</sup>	Region 1 Unempl <sup>1</sup>	Labor Shed Unempl <sup>1</sup>	Region 1 Avg Wage <sup>2</sup>	Region 1 Empl Extended	Region 1 Candidate/ Opening Ratio	Labor Shed Candidate/ Opening Ratio			
51-3022	Meat, Poultry, and Fish Cutters and Trimmers	4	78	393	5	21	\$26,200	2,709	21	103			
51-3023	Slaughterers and Meat Packers	3	17	169	1	8	\$25,800	678	6	59			
53-7062	Laborers and Freight, Stock, and Material Movers, Hand	2	2,081	8,153	218	855	\$29,800	7	1,149	4,504			
51-3021	Butchers and Meat Cutters	1	147	446	7	20	\$34,500	2,496	154	466			
51-1011	First-Line Supervisors of Production and	1	785	2,832	34	127	\$60,100	990	820	2,959			
51-3099	Food Processing Workers, All Other	1	32	143	3	12	\$27,800	0	34	155			
51-9198	Helpers Production Workers	1	255	899	37	133	\$29,300	3,591	292	1,032			
49-9041	Industrial Machinery Mechanics	1	643	1,998	20	62	\$47,800	2,459	663	2,060			
53-7051	Industrial Truck and Tractor Operators	1	611	2,044	54	184	\$34,400	3,725	665	2,227			
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	1	524	1,984	36	140	\$34,000	1,687	561	2,124			

Source: JobsEQ

<sup>1</sup>Occupation employment and unemployment are place-of-residence data. Data as of 2021Q1 unless noted otherwise.

<sup>2</sup>Occupation wages are as of 2020 and represent the average for all covered employment.

Note: Employment extended refers to regional workers with skills similar to the specified occupation and who are 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 (\$60,100); and industrial machinery mechanics (\$47,800).

## Food and Beverage Manufacturing

Food and beverage manufacturers in GO VA Region 1 pay an annual average wage of \$48,657, which is higher than the average wage (\$42,307) in the labor shed. 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. GO VA Region 1 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 \$38,030. This is slightly above the regional average wage. 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, 51 workers typically require short-term on-the-job training, and another 35 employees require moderate-term on-the-job training. Seven workers (bakers, industrial machinery mechanics, and butchers and meat cutters) require long-term training and another seven employees (supervisors, managers, and scientists) typically do not require on-the-job training.

Three of the top five 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 one of the top occupations: slaughterers and meat packers (44 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. This is defined as regional workers with skills similar to the specified occupation who are 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 Food & Beverage Manufacturing, GO VA Region 1														
			Emplo	oyment	Unemp	loyment	Avg \	Wage	Empl E	ktended	Une Exte	empl nded	Pote Candi Openin	ntial date/ g Ratio
soc	Title	New Empl Demand	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed
51- 9111	Packaging and Filling Machine Operators and Tenders	9	368	1,351	29	105	\$35,300	\$33,300	5,844	18,408	604	1,990	44	162
51- 3092	Food Batchmakers	7	92	350	4	17	\$31,900	\$34,100	600	5,141	83	539	14	52
51- 3022	Meat, Poultry, and Fish Cutters and Trimmers	7	78	393	5	21	\$26,200	\$28,200	2,709	10,083	401	1,527	12	59
53- 7062	Laborers and Freight, Stock, and Material Movers, Hand	6	2,081	8,153	218	855	\$29,800	\$31,300	7	35	1	7	383	1,501
51- 3011	Bakers	4	135	517	12	47	\$26,000	\$28,500	5,075	21,107	587	2,581	37	141
53- 7064	Packers and Packagers, Hand	4	380	1,638	49	215	\$24,800	\$24,500	3,721	12,952	397	1,431	107	463
51- 3023	Slaughterers and Meat Packers	4	17	169	1	8	\$25,800	\$28,100	678	1,717	128	355	4	44
51- 1011	First-Line Supervisors of Production and Operating Workers	3	785	2,832	34	127	\$60,100	\$64,600	990	3,477	46	172	273	986
51- 9198	Helpers Production Workers	3	255	899	37	133	\$29,300	\$29,800	3,591	12,628	395	1,400	97	344
53- 7051	Industrial Truck and Tractor Operators	3	611	2,044	54	184	\$34,400	\$37,400	3,725	14,379	326	1,283	222	742
37- 2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	2	1,646	6,068	162	592	\$23,700	\$25,700	6,380	21,216	809	2,597	904	3,330
51- 3099	Food Processing Workers, All Other	2	32	143	3	12	\$27,800	\$28,700	0	0	0	0	17	77
49- 9071	Maintenance and Repair Workers, General	2	1,178	4,325	78	289	\$39,400	\$40,300	355	2,351	10	152	628	2,307
49- 9041	Industrial Machinery Mechanics	2	643	1,998	20	62	\$47,800	\$55,100	2,459	9,039	160	598	332	1,030
41- 2031	Retail Salespersons	2	3,504	13,570	486	1,849	\$30,400	\$28,900	1,097	3,384	204	687	1,995	7,710
41- 4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	2	800	3,169	38	150	\$69,400	\$66,600	90	368	5	17	419	1,660
51- 9012	Separating, Filtering, Clarifying,	2	67	202	5	13	\$38,600	\$41,400	543	1,957	44	127	36	108

	Precipitating, and Still Machine Setters, Operators, and Tenders													
43- 5071	Shipping, Receiving, and Inventory Clerks	2	659	2,492	49	193	\$33,500	\$34,200	4,893	16,836	409	1,436	354	1,342
35- 3011	Bartenders	1	258	1,057	99	392	\$21,700	\$23,900	64	68	11	27	356	1,449
43- 3031	Bookkeeping, Accounting, and Auditing Clerks	1	1,201	4,725	57	224	\$33,000	\$44,100	1,115	4,890	82	304	1,258	4,948

Source: JobsEQ

<sup>1</sup>Occupation employment and unemployment are place-of-residence data. Data as of 2021Q1 unless noted otherwise.

<sup>2</sup>Occupation wages are as of 2020 and represent the average for all covered employment.

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

# **Energy and Minerals**

As noted earlier, the energy cluster has a location quotient of 3.18 indicating that employment in GO VA Region 1 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 \$74,723 in the first quarter of 2021—nearly double the average wage in Region 1.

Unfortunately, 55.0% 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.<sup>36</sup> 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. The COVID-19 pandemic has only exacerbated the current supply chain issues with rare earth elements, especially in global markets, and such projects could provide a much-needed boon for the coal mining industry.<sup>37</sup> GO Virginia Region 1 has also funded several energy-related projects, including InvestSWVA's Project Oasis; InvestSWVA's Project Energizer; InvestSWVA's Project Innovation; and Appalachian Voices' Energy Storage & Electrification Manufacturing Jobs.<sup>38</sup>

Wind and solar projects have been considered in the region and would diversify the energy cluster away from its dependence on the coal industry.<sup>39</sup> Both industries pay well in the nation. During the first quarter of 2021, the national annual average wage in solar electric power generation was \$105,083 and wind electric power generation employees earned an annual average \$104,885. The former includes occupations such as solar photovoltaic installers, electrical engineers, general and operations managers, and electricians. The latter industry employs similar occupations (except for solar photovoltaic installers), as well as occupations such as civil engineers, wind turbine service technicians, construction managers, machinists, and mechanical engineers.

Hydroelectric power (hydroelectric) is another clean source of energy and diversification. Dominion Energy currently has two hydroelectric facilitices in Virginia; one located in Louisa County and one in Bath County. Combined, they power approximately 750,250 homes.<sup>40</sup> Nationally, hydroelectric power generation provides an annual average wage of \$126,454.

<sup>&</sup>lt;sup>36</sup> Source: https://vtnews.vt.edu/articles/2016/03/research-rareearth.html.

<sup>&</sup>lt;sup>37</sup> Source: https://www.npr.org/2020/07/17/892195748/covid-19-pandemic-highlights-u-s-reliance-on-chinas-rare-earth-metals.

<sup>&</sup>lt;sup>38</sup> For a full list of projects and descriptions, see https://www.goswva.org/projects-2

<sup>&</sup>lt;sup>39</sup> Source: http://www.richmond.com/business/southwest-virginia-from-coal-power-to-wind-power/article\_87431ec9-a7fb-533f-afaa-09fbfb3f10dd.html.

<sup>&</sup>lt;sup>40</sup> Source: https://www.dominionenergy.com/projects-and-facilities/hydroelectric-power-facilities-and-projects.

	Industry Snapshot of Energy in GO Virginia Region 1 and the Region 1 Labor Shed, 2021Q1													
			C	urrent		Employment Forecast Over Next 10 Years								
		Employ	ment	Average A	nnual Wages	Total Se	paration	Total Grow	vth Demand	Avg. Annu (Pere	al Growth cent)			
NAICS	Industry	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed	Region 1	Labor Shed			
211120	Crude Petroleum	20	11	126110	10/160	22	22	0	12	2 20/	2 20/			
211120	EXTRACTION	50	44	120110	104100	25	55	-9	-15	-3.3%	-3.3%			
211130	Natural Gas Extraction Bituminous Coal and	130	276	99395	92364	99	210	-39	-86	-3.5%	-3.7%			
212111	Lignite Surface Mining	1077	1265	68171	66871	926	1092	-374	-434	-4.2%	-4.1%			
212112	Underground Mining	792	1257	83115	76964	674	1070	-288	-456	-4.4%	-4.4%			
212113	Anthracite Mining	0	0	n/a	n/a	0	0	0	0	-2.0%	-2.0%			
242244	Dimension Stone	20	20	274.00	07040	20				1.00/	4.404			
212311	Crushed and Broken	28	28	2/166	27212	29	29	-3	-3	-1.0%	-1.1%			
212312	Limestone Mining and Quarrying	273	531	45924	48865	273	537	-27	-45	-1.0%	-0.9%			
	Crushed and Broken													
212313	Quarrying	23	44	29821	36768	25	46	0	0	0.1%	0.0%			
	Other Crushed and													
212319	and Quarrying	29	45	36506	39947	29	48	-1	-1	-0.4%	-0.3%			
	Construction Sand and													
212321	Gravel Mining Drilling Oil and Gas	15	96	30444	45153	15	101	-1	-2	-0.6%	-0.2%			
213111	Wells	129	132	73612	73749	144	147	16	16	1.2%	1.2%			
213112	Support Activities for Oil	147	188	52533	54800	163	209	18	25	1.2%	1.2%			
213112	Support Activities for	147	100	52555	54000	105	205	10	23	1.270	1.270			
213113	Coal Mining	96	340	57293	50228	107	379	13	44	1.3%	1.2%			
	Nonmetallic Minerals													
213115	(except Fuels) Mining	67	67	49442	49551	74	75	9	9	1.3%	1.3%			
221111	Generation	18	268	57758	104184	15	225	-3	-34	-1.5%	-1.3%			
	Fossil Fuel Electric													
221112	Power Generation Biomass Electric Power	20	75	82784	90053	14	50	-9	-34	-5.7%	-5.9%			
221117	Generation	7	7	55590	56802	6	6	-1	-1	-1.2%	-1.2%			
	Electric Bulk Power													
221121	Control	93	93	68805	68745	69	69	-27	-27	-3.4%	-3.4%			
221122	Electric Power	199	909	63694	78562	154	723	-45	-159	-2.5%	-1 9%			
221122	Natural Cao Distribution	100	227	50004	70302	134	100	14	155	2.570	2.10			
221210	Natural Gas Distribution	53	237	59823	/3492	42	196	-14	-45	-3.1%	-2.1%			
324110	Petroleum Refineries	34	34	62307	62252	28	28	-8	-8	-2.5%	-2.5%			
	and Block													
324121	Manufacturing	1	55	17459	62319	0	49	0	-6	-3.7%	-1.1%			
	Coating Materials													
324122	Manufacturing	0	0	n/a	n/a	0	0	0	0	-3.7%	-3.2%			
	All Other Petroleum and Coal Products													
324199	Manufacturing	77	77	71741	71716	64	64	-21	-21	-3.0%	-3.0%			
486210	Pipeline Transportation of Natural Gas	59	111	77375	94425	50	93	-11	-21	-2.0%	-2.0%			
	Pipeline Transportation				51125	50			21	2.070	2.070			
486910	of Refined Petroleum Products	0	74	n/a	7973/	0	73	0	9	-0.8%	1 1%			
		0	/4	n/ d	75754	0	/3	0		0.070	1.170			
source: Jo	มระนุข													

# Information Technology

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 the average occupation wage of GO VA Region 1, at \$72,200. With 2,490 people in the region working in computer and math occupations, the location quotient (LQ) for the occupation is 0.61, meaning that workers with these skills have a concentration roughly half that found in the nation, on average. The LQ for the labor shed is a bit higher at 0.74. Consequently, attracting firms that need computer and math talent is an aspirational strategy.

	Occupation Snapshot of Computer and Mathematical Occupations, Four Quarters Ending with 2021Q1											
		GO	Virginia	Region 1	GO Virgini	a Regio	n 1 Labor Shed					
soc	Occupation	Employment	LQ	Annual Mean Wage <sup>1</sup>	Employment	LQ	Annual Mean Wage <sup>1</sup>					
15-1211	Computer Systems Analysts	296	0.58	\$72,400	1,656	0.79	\$79,500					
15-1212	Information Security Analysts	146	1.23	\$83,300	659	1.35	\$84,100					
15-1221	Computer and Information Research Scientists	18	0.70	\$101,100	95	0.88	\$110,900					
15-1231	Computer Network Support Specialists	111	0.70	\$63,000	578	0.88	\$63,100					
15-1232	Computer User Support Specialists	320	0.57	\$44,200	1,659	0.72	\$49,700					
15-1241	Computer Network Architects	83	0.59	\$87,000	452	0.78	\$88,600					
15-1244	Network and Computer Systems Administrators	264	0.89	\$63,700	1,173	0.97	\$71,200					
15-1245	Database Administrators and Architects	100	0.86	\$77,800	465	0.97	\$82,700					
15-1251	Computer Programmers	79	0.50	\$63,500	437	0.67	\$71,900					
15-1256	Software Developers and Software Quality Assurance Analysts and Testers	0	0.00	n/a	3,427	0.64	\$93,200					
15-1257	Web Developers and Digital Interface Designers	86	0.55	\$60,300	409	0.64	\$59,600					
15-1299	Computer Occupations, All Other	147	0.43	\$71,700	807	0.57	\$77,500					
15-2011	Actuaries	7	0.36	\$92,300	43	0.51	\$103,200					
15-2021	Mathematicians	3	1.27	\$84,900	17	1.74	\$93,500					
15-2031	Operations Research Analysts	82	0.99	\$75,100	364	1.07	\$77,100					
15-2041	Statisticians	16	0.45	\$72,200	90	0.64	\$78,700					
15-2098	Data Scientists and Mathematical Science Occupations, All Other	31	0.60	\$71,400	174	0.81	\$79,900					
15-0000	Computer and Mathematical Occupations	2,490	0.61	\$72,200	12,505	0.74	\$77,700					

Source: JobsEQ®

Employment data as of 2021Q1. Demand data reflect place-of-work employment; retirements reflect place-of-residence data.

#### 1. Wage data are as of 2020 and represent the average for all covered employment.

If a new IT firm requiring 25 new employees were to be established in GO VA Region 1, it would find a sufficient number of applicants with the required skills. The following table illustrates this, and the potential candidate-to-opening ratio in the column below highlights in green all occupations where there are at

least 50 employees in the region for every 1 the expanding firm is expected to hire. This 50:1 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 Computer Systems Design and Related Services (NAICS 5415) - GO Virginia Region 1											
SOC	Title	New Employer Demand	Empl (Place of Residence) <sup>1</sup>	Unempl <sup>1</sup>	Regional Avg Wage <sup>2</sup>	National Avg Wage <sup>2</sup>	Empl Extended	Unempl Extended	Potential Candidates per Opening			
15- 1256	Software Developers and Software Quality Assurance Analysts and											
15- 1211	Testers Computer Systems Analysts	6	266	6	\$85,800	\$114,300	974	23	103			
15- 1232	Computer User Support Specialists	2	310	14	\$44,200	\$57,000	178	16	162			
11- 3021	Computer and Information Systems Managers	1	176	4	\$117,300	\$161,700	560	13	180			
15- 1241	Computer Network Architects	1	59	1	\$87,000	\$119,200	1,423	34	60			
15- 1231	Computer Network Support Specialists	1	88	4	\$63,000	\$71,000	0	0	92			
15- 1299	Computer Occupations, All Other	1	117	5	\$71,700	\$96,700	2,018	67	122			
15- 1251	Computer Programmers	1	56	2	\$63,500	\$95,600	520	15	57			
43- 4051	Customer Service Representatives	1	2,392	205	\$29,500	\$38,500	2,195	219	2,597			
11- 1021	General and Operations Managers	1	1,641	82	\$96,900	\$125,700	6,657	212	1,724			
15- 1212	Information Security Analysts	1	117	1	\$83,300	\$107,600	1,428	37	119			
13- 1111	Management Analysts	1	528	22	\$71,500	\$97,600	1,736	82	550			
13- 1161	Market Research Analysts and Marketing Specialists	1	345	15	\$58,800	\$74,000	1,397	64	361			
15- 1244	Network and Computer Systems Administrators	1	239	4	\$63,700	\$89,500	148	5	243			
43- 9061	Office Clerks, General	1	2,353	189	\$28,700	\$37,800	2,155	153	2,542			
13- 1198	Project Management Specialists and	1	810	20	\$72,700	\$84,300	588	24	830			

	Business Operations Specialists, All Other								
41- 3091	Sales Representatives of Services, Except Advertising, Insurance, Financial Services, and Travel	1	589	44	\$52,300	\$70,500	0	0	632
15- 1257	Web Developers and Digital Interface Designers	1	52	2	\$60,300	\$85,500	21	2	54

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 15-1212). The computers systems design and related services industry employs the second-largest share of information security analysts (27.3%).

Within the Region 1 labor shed, computer systems design firms employed 5,341 people in the first quarter of 2021 with an annual average wage of \$68,253. This represents a rather large increase in wages since the last version of this report was prepared in the fourth quarter of 2018 (\$61,518).

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

W	What-If Report for Computer Systems Design and Related Services (NAICS 5415) - GO Virginia Region 1 Labor Shed									
soc	Title	New Employer Demand	Empl (Place of Residence) <sup>1</sup>	Unempl <sup>1</sup>	Regional Avg Wage <sup>2</sup>	National Avg Wage <sup>2</sup>	Empl Extended	Unempl Extended	Potential Candidates per Opening	
15-	Software									
1256	Developers and									
	Software Quality									
	Assurance Analysts									
	and Testers	43	2,942	74	\$93,200	\$114,300	5,830	137	70	
15-	Computer Systems									
1211	Analysts	15	1,495	32	\$79,500	\$99,000	6,987	169	102	
15-	Computer User									
1232	Support Specialists	14	1,539	66	\$49,700	\$57,000	758	67	115	
11-	Computer and									
3021	Information									
-	Systems Managers	10	997	23	\$126,500	\$161,700	3,211	74	102	
15-	Computer									
1299	Occupations, All				4	4				
	Other	8	740	32	Ş77,500	\$96,700	3,057	168	96	
15-	Computer	_	222	10	474.000	405 000	6.064			
1251	Programmers	/	389	12	\$71,900	\$95,600	6,061	161	57	
13-	Project									
1198	Ivianagement									
	Specialists and									
	Business									
	Specialists All									
	Other	7	3 5 5 1	86	\$70,800	\$84 300	3 002	105	520	
41-	Sales	,	5,551	00	<i>970,000</i>		5,002	105	520	
3091	Representatives of									
5051	Services, Except									
	Advertising.									
	Insurance, Financial									
	Services, and Travel	7	2,428	177	\$59,300	\$70,500	0	0	372	
11-	General and									
1021	Operations									
	Managers	6	6,574	326	\$100,000	\$125,700	21,159	822	1,150	

1244         Computer systems         0         19         571,200         588,500         2,021         4.8         183           43-         Customer Service         0         9,484         808         532,000         518,500         9,360         943         2,058           151         Computer Network         4         403         4         588,600         5119,200         7,328         170         102           1231         Support Specialitis         4         534         2.4         583,400         571,000         0         0         139           1311         Analysis         4         2,165         86         583,400         597,000         1,429         446         553           1321         Security Analysts         3         5,73         6         584,400         507,600         7,811         191         193           1318         Analysts and	15-	Network and								
Administratory         6         1.079         19         57.1.200         589.500         2.021         48         183           450:         Representatives         5         9.481         908         \$52.900         \$58.500         9.360         944         2.058           1241         Architects         4         4         403         4         \$88.600         \$119.000         7.228         1.70         102           1241         Architects         4         4.03         4         \$58.500         \$71.000         0         0         139           124         Management         4         5.34         2.4         \$63.100         \$71.000         0         0         139           135         Management         3         5.73         6         \$584.100         \$107.600         7.811         191         193           136         Market Research         3         1.582         68         \$50.100         \$74.000         \$6.655         2.85         \$50           133         Market Research         3         8.31         16         \$579.600         \$87.400         \$.8,82         \$14         12         126         \$133.304         \$2,474         1	1244	Computer Systems								
4.1- bits         Lustonic Properties Notes         5         9,484         808         \$32,900         \$38,500         9,360         9,42         2,058           135         Computer Network         4         403         4         \$88,600         \$119,200         7,328         170         1021           131         Analysters         4         534         24         \$563,100         \$71,000         0         0         339           133         Managers         4         2,165         86         \$83,000         \$97,600         7,811         191         193           134         Managers         4         2,165         86         \$84,00         \$107,600         7,811         191         193           134         Market Reseach         - <td></td> <td>Administrators</td> <td>6</td> <td>1,079</td> <td>19</td> <td>\$71,200</td> <td>\$89,500</td> <td>2,021</td> <td>48</td> <td>183</td>		Administrators	6	1,079	19	\$71,200	\$89,500	2,021	48	183
15.         Participation of the second	43-	Customer Service	E	0.484	000	\$22,000	628 E00	0.260	0.40	2.059
124         Architects         4         403         4         586,600         \$119,200         7,328         170         102           123         Support Network         4         534         724         553,000         572,000         0         0         0         139           133         Management         4         2,265         86         583,000         \$97,600         11,429         446         563           1212         Security Analysts         3         573         6         584,100         \$107,600         7,811         191         193           1313         Market Research         3         573         6         \$58,100         \$17,600         7,811         191         193           363         Gref Cefrek,         9         713         \$31,500         \$37,800         8,382         616         32,111           3701         Into Fore Designers         3         363         16         \$59,600         \$81,700         2,838         97         1,790           3031         Accounting, and         2         3,470         110         \$67,200         \$81,700         2,838         97         1,790           3031         Accounting, and<	4031	Computer Network	5	9,404	808	\$52,900	\$38,500	9,300	949	2,056
15- 1231         Computer Network Speciality         4         534         24         553,00         571,000         0         0         139           13- 131         Anagement Information         4         2,165         86         \$583,400         \$597,600         11,429         446         563           13- 132         Information         3         573         6         \$84,100         \$7,811         191         193           13- 135         Information         3         573         6         \$84,100         \$574,000         6,658         285         550           333         Marketing         3         1,582         68         560,100         \$74,000         6,658         285         550           343         Office Clerks, 9061 General         3         8,921         713         \$31,500         \$37,800         8,382         616         3,211           351         Diptial         1         10         \$67,200         \$81,700         2,838         97         1,790           303         Accounting, and Accounting, and Accountin	1241	Architects	4	403	4	\$88,600	\$119,200	7,328	170	102
1233         Support Specialities         4         534         Array end         571,000         0         0         0         1319           1313         Margement         Analysts         4         2,165         86         \$83,400         \$97,600         11,429         446         \$533           1311         Analysts         3         573         6         \$84,100         \$107,600         7,811         191         193           1313         Market Research         3         1,582         68         \$60,100         \$74,000         6,658         285         \$550           361         General         3         8,922         713         \$31,500         \$37,800         8,382         616         3,211           135         Web Developers         3         363         16         \$59,600         \$87,800         8,382         616         3,211           136         Accountants and         2         3,470         10         \$67,200         \$81,700         2,838         97         1,700           137         Accountants and         2         4,725         2,24         \$36,400         \$44,100         4,800         304         2,474           138 <td>15-</td> <td>Computer Network</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	15-	Computer Network								
13- IIII IIII Analysts         4 2,165         26 86         583,400         597,600         11,429         446         563           15- IIIII IIII Analysts         1         573         6         584,100         7,811         191         193           13- IIII III Analysts and Marketing         573         6         584,100         574,000         6.658         285         550           0ffec Clerks, Specialists         3         1,582         68         560,100         574,000         6.658         285         550           13- Socialists         3         1,582         68         560,100         574,000         6.658         285         550           13- Socialists         3         8,921         713         531,500         537,800         8,382         616         3,211           13- Socialists         2         3,470         110         567,200         581,700         2,838         97         3,799           13- Socialists         2         4,725         224         536,400         544,100         4,890         304         2,474           14- Socialists         2         409         5         582,700         5101,100         8,186         98         207	1231	Support Specialists	4	534	24	\$63,100	\$71,000	0	0	139
111         Analysis         4         2,105         36         583,400         597,600         11,129         446         563           1212         Security Analysis         3         573         6         \$84,100         \$107,600         7,811         191         193           Marker Research                 193           Marker Research              573         6         \$84,100         \$57,400         7,811         191         193           Marker Research             574.000         6,658         285         550           General         3         8,921         713         \$31,500         \$37,800         8,382         616         3,211           137         adcountarus and            3,470         110         \$67,200         \$81,700         2,838         97         1,790           43         Bookkeeping             3,470         110         \$67,200         \$61,100         \$4,800         3,04         2,474 <tr< td=""><td>13-</td><td>Management</td><td></td><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td></tr<>	13-	Management				1				
12 111         Interframe         3         573         6         \$84,100         \$107,600         7,811         191         193           13- 13- 14         Marker Research Marketing         3         1,582         68         \$60,100         \$74,000         6,658         285         550           43- 056         Office Clerks         3         8,921         713         \$31,500         \$37,800         8,382         616         3,211           15- 060         General         3         8,921         713         \$31,500         \$37,800         8,382         616         3,211           13- 15- 040         Digital Accounting and Accounting and Account	1111	Analysts	4	2,165	86	\$83,400	\$97,600	11,429	446	563
13- 1161         Mathef Research Analytis and Marketing         2         3/3         0         0         001/00         3/3/100         7/21         2/2 <td>1212</td> <td>Security Analysts</td> <td>3</td> <td>573</td> <td>6</td> <td>\$84 100</td> <td>\$107 600</td> <td>7 811</td> <td>191</td> <td>193</td>	1212	Security Analysts	3	573	6	\$84 100	\$107 600	7 811	191	193
1191         Analysis and Specialists         3         1,582         68         \$\$0,00         \$\$74,000         6,658         285         550           9061         General         3         8,921         713         \$\$31,500         \$\$37,800         8,382         616         3,211           125         Web Developers and Digital         3         363         15         \$\$59,600         \$\$37,800         8,382         616         3,211           13-         Accountants and Hordrace Designers         3         363         15         \$\$59,600         \$\$81,700         2,838         97         1,790           43-         Accountants and Accountarits, and Accountar	13-	Market Research	5	575	0	<del>70</del> 4,100	9107,000	7,011	131	195
Marketing Specialists         3         1.582         68         \$50,00         \$74,000         6,658         285         550           43- 0061         General         3         8,921         713         \$31,500         \$37,800         8,322         616         3,211           15- 1257         and Digital interface Designers         3         363         16         \$59,600         \$81,700         2,838         97         1,790           43- 2011         Bookkeeping, 304         2         3,470         110         \$67,200         \$81,700         2,838         97         1,790           43- 2011         Bookkeeping, Additors and Accintrig Clerks         2         4,725         224         \$36,400         \$41,100         4,890         304         2,474           15- Database         Accounting, and Accintreg Clerks         2         4,725         224         \$36,400         \$510,100         8,186         198         207           11- 1245         Administrators and Accintrest actions         2         1.540         44         \$113,800         \$151,500         5,140         157         949           13- Human Resources         2         2.020         119         \$57,500         \$69,400         8,399	1161	Analysts and								
Specialists         3         1.582         68         550.00         574.000         6.688         285         550           9051         General         3         8.921         713         \$31,500         \$37,800         8,382         6.16         3,211           125         Web Developers         3         363         16         \$559,600         \$81,700         2,838         97         1,790           13-         Accountants and Auditors         2         3,470         110         \$67,200         \$81,700         2,838         97         1,790           43-         Bookkeeping, Accounting, and Auditors and Auditor and Audito		Marketing								
43- 0661         Office Clerk, meterface Designers         3         8,921         713         \$31,500         \$37,800         8,382         616         3,211           135         web Developers         3         363         16         \$59,600         \$58,500         871         42         126           134         Accountants and Auditors         2         3,470         110         \$67,200         \$81,700         2,838         97         1,790           3031         Accounting, and Auditors Clerks         2         4,725         224         \$36,400         \$4,890         304         2,474           15- 04abase         Database         2         409         5         \$82,700         \$101,100         8,186         198         207           11- 0201         Financial Managers         2         1,854         44         \$113,800         \$151,500         5,140         157         949           13- 1425         Administrators and Architects         2         2,020         119         \$57,500         \$69,400         8,399         338         1,069           13- 101         Specialists         2         2,020         119         \$57,500         \$69,400         8,399         338         1,06		Specialists	3	1,582	68	\$60,100	\$74,000	6,658	285	550
3001         Userieral         3         6,321         713         531,500         537,500         6,382         616         5,111           125         Web Developers         and Digital	43-	Office Clerks,	2	0.021	71.0	¢21 500	¢27.000	0.202	616	2 211
13- 1257         and Digital interface Designers         3         363         16         \$59,600         \$87.0         87.1         4.2         126.           2011         Auditors         2         3.470         110         \$67,200         \$81,700         2.838         97         1,790           3031         Accounting, and Auditory Clerks         2         4,725         224         \$36,400         \$44,100         4,890         304         2,474           1245         Administrators and Architects         2         409         5         \$82,700         \$101,100         8,186         198         207           11- 3031         Financial Managers         2         409         5         \$82,700         \$101,100         8,186         198         207           11- 3031         Financial Managers         2         1,854         44         \$113,800         \$151,500         5,140         157         949           13-         Huma Resources         2         2,020         119         \$57,500         \$69,400         8,399         338         1,069           101         Marketing         2         3,352         89         \$96,400         \$124,000         9,264         3,46         1,7	9061	General Web Dovelopers	3	8,921	/13	\$31,500	\$37,800	8,382	616	3,211
Interface Designers         3         363         16         \$\$9,600         \$\$85,500         871         42         126           13- 101         Accountants and Accounting, and Auditor's         2         3,470         110         \$67,200         \$\$81,700         2,838         97         1,790           43- 301         Bookkeeping, Auditor (Stress at Architects         2         4,725         224         \$\$6,400         \$\$44,100         4,890         304         \$2,474           1265         Database         4         4         \$\$10,100         8,186         198         207           11- 3031         Financial Managers         2         1,854         44         \$\$113,800         \$\$151,500         5,140         157         949           13- 3031         Human Resources         2         2,020         119         \$\$57,500         \$\$69,400         8,399         338         1,069           1071         Specialitis         2         543         21         \$\$12,010         \$\$154,500         10,717         463         282           104         Managers, All Other         2         3,352         89         \$96,400         \$\$124,000         9,264         3,465         1,721 <t< td=""><td>1257</td><td>and Digital</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	1257	and Digital								
13:         Accountants and Auditors         2         3,470         110         \$67,200         \$81,700         2,838         97         1,790           43:         Bookkeeping, Accounting, and Auditing Clerks         2         4,725         224         \$36,00         \$44,100         4,890         304         2,474           15:         Database         4,725         224         \$36,00         \$44,100         8,186         198         207           14:         Stabase         2         409         5         \$82,700         \$101,100         8,186         198         207           10:1         Financial Managers         2         1,854         44         \$113,800         \$151,500         5,140         157         949           13:         Human Resources         1         1,069         8,399         338         1,069           11:         Marketing         2         2,020         119         \$57,500         \$69,400         8,399         338         1,069           11:         Personal Service         9         3,352         89         \$96,400         \$124,000         9,264         346         1,721           11:         Personal Service         3,352	1237	Interface Designers	3	363	16	\$59,600	\$85,500	871	42	126
2011         Auditors         2         3,470         110         \$67,200         \$81,700         2,838         97         1,790           3031         Accounting, and Auditing Cierks         2         4,725         224         \$36,400         \$44,100         4,890         304         2,474           15-         Database         2         4,725         224         \$36,400         \$44,100         4,890         304         2,474           1245         Addinistrators and Architects         2         409         5         \$\$2,700         \$\$101,100         8,186         198         207           11-         Markitets         2         409         5         \$\$2,700         \$\$101,100         8,186         198         207           11-         Marketing         2         2,020         119         \$\$75,500         \$\$69,400         8,399         338         1,069           11-         Marketing         2         5,43         21         \$\$120,100         \$\$154,500         10,717         463         282           9198         Managers, All         Maragers, All         Maragers, All         Maragers, All         1,721         463         464         1,721           11-<	13-	Accountants and								
43- 3011         Bookkeeping, Auditing Cierks         2         4,725         224         \$36,400         \$44,100         4,890         304         2,474           15- 124         Database Administrators and Architects         2         4,725         224         \$36,400         \$44,100         4,890         304         2,474           15- 1245         Database Administrators and Architects         2         409         5         \$582,700         \$101,100         8,186         198         207           101         Financial Managers         2         1,854         44         \$113,800         \$151,500         \$,140         157         949           1071         Specialists         2         2,020         119         \$57,500         \$69,400         8,399         338         1,069           1011         Managers         2         543         21         \$120,100         \$154,500         10,717         463         282           110         Personal Service         2         543         21         \$120,100         \$154,500         10,717         463         282           110         Managers, All Other         2         3,352         89         \$96,400         \$124,000         9,264 <td< td=""><td>2011</td><td>Auditors</td><td>2</td><td>3,470</td><td>110</td><td>\$67,200</td><td>\$81,700</td><td>2,838</td><td>97</td><td>1,790</td></td<>	2011	Auditors	2	3,470	110	\$67,200	\$81,700	2,838	97	1,790
3031         Accounting, and Auting Clerks         2         4,725         224         \$\$6,400         \$\$4,100         4,890         304         2,474           15- 1245         Database Architects         2         409         5         \$\$82,700         \$101,100         8,186         198         207           11- 3011         Financial Managers         2         409         5         \$\$82,700         \$101,100         8,186         198         207           13- 1071         Specialists         2         2,020         119         \$57,500         \$69,400         8,399         338         1,069           11- 2021         Managers         2         543         21         \$120,100         \$154,500         10,717         463         282           11- 2021         Managers, All         2         543         21         \$120,100         \$154,500         10,717         463         282           11- 2021         Managers, All         4         \$120,100         \$154,500         10,717         463         282           11- 2022         Sales Managers         2         3,352         89         \$96,400         \$124,000         9,264         346         1,721           11- 2022	43-	Bookkeeping,								
Auditing Lerks         2         4,725         224         536,400         544,100         4,890         304         2,874           1245         Administrators and Architexts         2         4,725         224         536,400         544,100         4,890         304         2,874           131         Financial Managers         2         1,854         44         \$113,800         \$151,500         5,140         157         949           133         Human Resources         2         2,020         119         \$57,500         \$69,400         8,399         338         1,069           1021         Managers         2         2,020         119         \$57,500         \$69,400         8,399         338         1,069           1021         Managers, All         0         10,717         463         282           11-         Marketing         2         543         21         \$120,100         \$154,500         10,717         463         282           11-         Personal Service         3,352         89         \$96,400         \$124,000         9,264         346         1,721           11-         Sales Managers         2         893         33         \$117,300	3031	Accounting, and	2	4 725	224	¢26.400	¢44.400	4 900	204	2 474
1.3-5       Outcode Architects       2       409       5       \$\$82,700       \$101,100       8,186       198       207         11- 3031       Financial Managers       2       1,854       44       \$113,800       \$151,500       5,140       157       949         13       Human Resources       2       2,020       119       \$57,500       \$69,400       8,399       338       1,069         11- 3021       Managers, 2       543       21       \$120,100       \$154,500       10,717       463       282         11- 9198       Managers, All Other; Entertainment and Recreation       A       5120,100       \$154,500       10,717       463       282         11- 2022       Sales Managers       2       3,352       89       \$96,400       \$124,000       9,264       346       1,721         11- 2022       Sales Managers       2       893       33       \$117,300       \$147,600       5,421       170       463         4011       Representatives, Wholesale and Manufacturing, Technical and Scientific Products       2       915       44       \$78,700       \$99,700       4,246       191       479         43       Secretaries and Managers, All Other       2       915	15	Auditing Clerks	Z	4,725	224	\$36,400	\$44,100	4,890	304	2,474
Architects         2         409         5         \$82,700         \$101,100         8,186         198         207           11- 3031         Financial Managers         2         1,854         44         \$113,800         \$151,500         5,140         157         949           13- 1071         Specialists         2         2,020         119         \$57,500         \$69,400         8,399         338         1,069           11- 1071         Marketing 2021         Marketing 2         2         543         21         \$120,100         \$154,500         10,717         463         282           9198         Managers, All Other; Entertainment and Recreation Managers, All Other         2         3,352         89         \$96,400         \$124,000         9,264         346         1,721           11- 2022         Sales Managers         2         893         33         \$117,300         \$147,600         5,421         170         463           41- 4011         Representatives, Wholesale and Manufacturing, Technical and Scientific Products         2         915         44         \$78,700         \$99,700         4,246         191         479           43         Secretaries and Golt4         Administrative Assistants, Except Legal, Medical, and Engineering	1245	Administrators and								
11- 3031         Financial Managers         2         1,854         44         \$113,800         \$151,500         5,140         157         949           13- 1071         Specialists         2         2,020         119         \$57,500         \$69,400         8,399         338         1,069           11- 2021         Maragers         2         543         21         \$120,100         \$154,500         10,717         463         282           11- 2021         Managers, All Other;         Personal Service         3,352         89         \$96,400         \$124,000         9,264         346         1,721           9198         Managers, All Other         2         3,352         89         \$96,400         \$124,000         9,264         346         1,721           11- 2022         Sales         Managers, All Other         2         3,352         89         \$96,400         \$147,600         5,421         170         463           411         Sales         Managers         2         893         33         \$117,300         \$147,600         5,421         170         463           6014         Administrative, Manufacturing, Technical and Executive         2         915         44         \$78,700		Architects	2	409	5	\$82,700	\$101,100	8,186	198	207
3031         Financial Managers         2         1,854         44         \$113,800         \$151,500         5,140         157         949           13-         Human Resources         2         2,020         119         557,500         \$69,400         8,399         338         1,069           11-         Marketing         2         2,020         119         \$57,500         \$69,400         8,399         338         1,069           11-         Marketing         2         543         21         \$120,100         \$154,500         10,717         463         282           11-         Personal Service         2         543         21         \$120,100         \$154,500         10,717         463         282           0ther;         Entertainment and Recreation         2         3,352         89         \$96,400         \$124,000         9,264         346         1,721           11-         Sales Managers         2         893         33         \$117,300         \$147,600         5,421         170         463           2022         Sales Managers         2         915         44         \$78,700         \$99,700         4,246         191         479           43-<	11-									
13-         Human Resources         2         2,020         119         \$\$57,500         \$\$69,400         8,399         338         1,069           11-         Marketing         2         543         21         \$120,100         \$154,500         10,717         463         282           11-         Personal Service         2         543         21         \$120,100         \$154,500         10,717         463         282           9198         Managers, All Other;         0         1         1         Personal Service         1         1         282           9198         Managers, Skcept Gambling; and Managers, All Other         2         3,352         89         \$96,400         \$124,000         9,264         346         1,721           11-         2022         Sales Managers         2         893         33         \$117,300         \$147,600         5,421         170         463           41-         Sales         1         Sales         1         1 <t< td=""><td>3031</td><td>Financial Managers</td><td>2</td><td>1,854</td><td>44</td><td>\$113,800</td><td>\$151,500</td><td>5,140</td><td>157</td><td>949</td></t<>	3031	Financial Managers	2	1,854	44	\$113,800	\$151,500	5,140	157	949
1011         Appendix         2         2,020         119         557,500         369,400         8,399         338         1,069           2021         Managers         2         543         21         \$120,100         \$154,500         10,717         463         282           11-         Personal Service	13-	Human Resources	2	2.020	110	¢57.500	¢60.400	0.200	220	1.000
11- 2021         Managers Managers, All Other; Entertainment and Recreation         2         543         21         \$120,100         \$154,500         10,717         463         282           11- 9198         Managers, All Other; Entertainment and Recreation         Imagers, All Managers, Except Gambling; and Managers, All Other         Imagers, Except Gambling; and Managers, 2         89         \$96,400         \$124,000         9,264         346         1,721           11- 2022         Sales Managers         2         893         33         \$117,300         \$147,600         5,421         170         463           4011         Representatives, Wholesale and Scientific Products         2         915         44         \$78,700         \$99,700         4,246         191         479           45         Scientific Products         2         915         44         \$78,700         \$99,700         4,246         191         479           45         Scientific Products         2         915         44         \$78,700         \$99,700         4,246         191         479           45         Scientific Products         2         915         44         \$78,700         \$99,700         4,246         191         479           45         Scientific Products <td>10/1</td> <td>Specialists</td> <td>2</td> <td>2,020</td> <td>119</td> <td>\$57,500</td> <td>\$69,400</td> <td>8,399</td> <td>338</td> <td>1,069</td>	10/1	Specialists	2	2,020	119	\$57,500	\$69,400	8,399	338	1,069
11- 9198         Personal Service Managers, All Other; Entertainment and Recreation Managers, Except Gambling; and Managers         1 <th1< th=""> <th1< th="">         1</th1<></th1<>	2021	Managers	2	543	21	\$120.100	\$154.500	10.717	463	282
9198         Managers, All Other; Entertainment and Recreation Managers, Except Gambling; and Managers, All Other         2         3,352         89         \$96,400         \$124,000         9,264         346         1,721           11- 2022         Sales         Managers, All Other         2         3,352         89         \$96,400         \$124,000         9,264         346         1,721           11- 2022         Sales Managers         2         893         33         \$117,300         \$147,600         5,421         170         463           41- 4011         Representatives, Wholesale and Manufacturing, Technical and Scientific Products         2         915         44         \$78,700         \$99,700         4,246         191         479           43- 6014         Administrative Assistants, Except Legal, Medical, and Executive         2         915         44         \$78,700         \$99,700         4,246         191         479           43- 6014         Administrative Assistants, Except Legal, Medical, and Executive         2         5,085         240         \$35,400         \$40,400         11,576         875         2,662           11- 9041         Engineering Managers         1         476         12         \$135,100         \$158,100         2,941         85         4	11-	Personal Service				+	+			
Other; Entertainment and Recretation Managers, Except Gambing; and Managers, All Other         2         3,352         89         \$96,400         \$124,000         9,264         346         1,721           11- 2022         Sales Managers         2         893         33         \$117,300         \$147,600         5,421         170         463           41- 2022         Sales Managers         2         893         33         \$117,300         \$147,600         5,421         170         463           41- 2022         Sales Managers         2         893         33         \$117,300         \$147,600         5,421         170         463           41- 4011         Representatives, Wholesale and Manufacturing, Technical and Scientific Products         2         915         44         \$78,700         \$99,700         4,246         191         479           43- 6014         Secretaries and Administrative Assistants, Except Legal, Medical, and Executive         2         5,085         240         \$35,400         \$40,400         11,576         875         2,662           11- 9041         Engineering Managers         1         476         12         \$135,100         \$14,851         488           11- 1011         Chief Executives         1         1,215         2	9198	Managers, All								
Entertainment and Recreation Managers, Except Gambling; and Managers, All Other23,35289\$96,400\$124,0009,2643461,72111- 2022Sales Sales Managers289333\$117,300\$147,6005,42117046341- 4011Sales Representatives, Wholesale and Manufacturing, Technical and Eagling4578,700\$99,7004,24619147943- 6014Sceretaries and Administrative Managers147612\$35,400\$40,40011,5768752,66211- Managers147612\$135,100\$158,1002,9418548811- 1011Chief Executives11,21525\$153,800\$197,8003,261701,24015- 122Information Research Scientifis1862\$110,900\$130,9001,7364188		Other;								
Necreation         Necreation         Necreation         Necreation         Necreation           Managers, Except Gambling; and         2         3,352         89         \$96,400         \$124,000         9,264         346         1,721           11- 2022         Sales Managers         2         893         33         \$117,300         \$147,600         5,421         170         463           41- 4011         Representatives, Wholesale and Manufacturing, Technical and Scientific Products         2         915         44         \$78,700         \$99,700         4,246         191         479           43- 6014         Administrative Assistants, Except Legal, Medical, and Managers         2         915         44         \$78,700         \$99,700         4,246         191         479           45- 6014         Administrative Assistants, Except Legal, Medical, and Managers         2         915         240         \$35,400         \$40,400         11,576         875         2,662           11- 1011         Chief Executive         2         5,085         240         \$35,400         \$40,400         11,576         875         2,662           11- 1011         Chief Executives         1         476         12         \$135,100         \$158,100         2,941		Entertainment and								
Managers, Lucqui       Managers, All Other       2       3,352       89       \$96,400       \$124,000       9,264       346       1,721         11-       2022       Sales Managers       2       893       33       \$117,300       \$147,600       5,421       170       463         41-       Sales       Representatives,              463         4011       Representatives,                 463         4011       Representatives,                     463         4011       Representatives,		Recreation Managers Except								
Managers, All Other         2         3,352         89         \$96,400         \$124,000         9,264         346         1,721           11- 2022         Sales Managers         2         893         33         \$117,300         \$147,600         5,421         170         463           41- 4011         Representatives, Wholesale and Manufacturing, Technical and         -         -         -         -         -         -         -         463           5cientific Products         2         915         44         \$78,700         \$99,700         4,246         191         479           43- 6014         Administrative Assistants, Except Legal, Medical, and Engineering         - <td></td> <td>Gambling: and</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>		Gambling: and								
11- 2022         Sales Managers         2         893         33         \$117,300         \$147,600         5,421         170         463           41- 4011         Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products         2         915         44         \$78,700         \$99,700         4,246         191         479           43- 6014         Administrative Assistants, Except Legal, Medical, and Executive         2         5,085         240         \$35,400         \$40,400         11,576         875         2,662           11- 9041         Engineering Managers         1         476         12         \$135,100         \$158,100         2,941         85         488           11- 1011         Chief Executives         1         1,215         25         \$153,800         \$197,800         3,261         70         1,240           15- 1221         Information Research Scientists         1         86         2         \$110,900         \$130,900         1,736         41         88		Managers, All Other	2	3,352	89	\$96,400	\$124,000	9,264	346	1,721
2022         Sales Managers         2         893         33         \$117,300         \$147,600         5,421         170         463           41-         Sales         Representatives, Wholesale and Manufacturing, Technical and Scientific Products         1 <t< td=""><td>11-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>	11-									
41- A011Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products291544\$78,700\$99,7004,24619147943- 6014Secretaries and Administrative Legal, Medical, and Executive291544\$78,700\$99,7004,24619147943- 6014Secretaries and Legal, Medical, and Engineering Managers11	2022	Sales Managers	2	893	33	\$117,300	\$147,600	5,421	170	463
4011Representatives, Wholesale and Manufacturing, Technical and Scientific Products291544\$78,700\$99,7004,24619147943-Secretaries and 6014Administrative Assistants, Except Legal, Medical, and Executive291544\$78,700\$99,7004,24619147943-Secretaries and Legal, Medical, and Executive25,085240\$35,400\$40,40011,5768752,66211-Architectural and Managers147612\$135,100\$158,1002,9418548811-Information Research Scientists1862\$110,900\$130,9001,7364188	41-	Sales								
Windesare and Manufacturing, Technical and Scientific Products       2       915       44       \$78,700       \$99,700       4,246       191       479         43- 6014       Secretaries and Administrative Assistants, Except Legal, Medical, and Executive       2       915       44       \$78,700       \$99,700       4,246       191       479         11- 9041       Architectural and Engineering Managers       2       5,085       240       \$35,400       \$40,400       11,576       875       2,662         11- 9041       Architectural and Engineering Managers       1       476       12       \$135,100       \$158,100       2,941       85       488         11- 1011       Chief Executives       1       1,215       25       \$153,800       \$197,800       3,261       70       1,240         15- 1221       Information Research Scientists       1       86       2       \$110,900       \$130,900       1,736       41       88	4011	Representatives,								
Technical and Scientific Products         2         915         44         \$78,700         \$99,700         4,246         191         479           43- 6014         Secretaries and Administrative Assistants, Except Legal, Medical, and Executive         -<		Manufacturing.								
Scientific Products         2         915         44         \$78,700         \$99,700         4,246         191         479           43- 6014         Secretaries and Administrative Assistants, Except Legal, Medical, and Executive         Image: Construct on the second		Technical and								
43- 6014Secretaries and Administrative Assistants, Except Legal, Medical, and Executive111 <td></td> <td>Scientific Products</td> <td>2</td> <td>915</td> <td>44</td> <td>\$78,700</td> <td>\$99,700</td> <td>4,246</td> <td>191</td> <td>479</td>		Scientific Products	2	915	44	\$78,700	\$99,700	4,246	191	479
6014       Administrative       Assistants, Except       Assistant, Except       Assistants, Except	43-	Secretaries and								
Assistants, Except Legal, Medical, and Executive       2       5,085       240       \$35,400       \$40,400       11,576       875       2,662         11-       Architectural and 9041       Engineering Managers       1       476       12       \$135,100       \$158,100       2,941       85       488         11-       Chief Executives       1       1,215       25       \$153,800       \$197,800       3,261       70       1,240         15-       Computer and Information Research Scientists       1       86       2       \$110,900       \$130,900       1,736       41       88	6014	Administrative								
Legal, Medical, and Executive         2         5,085         240         \$35,400         \$40,400         11,576         875         2,662           11-         Architectural and 9041         Engineering Managers         1         476         12         \$135,100         \$158,100         2,941         85         488           11-         1011         Chief Executives         1         1,215         25         \$153,800         \$197,800         3,261         70         1,240           15-         Computer and 167         Information Research Scientists         1         86         2         \$110,900         \$130,900         1,736         41         88		Assistants, Except								
11-       Architectural and       476       12       \$135,100       \$158,100       2,941       85       488         11-       Managers       1       476       12       \$135,100       \$158,100       2,941       85       488         11-       1011       Chief Executives       1       1,215       25       \$153,800       \$197,800       3,261       70       1,240         15-       Computer and       1       86       2       \$110,900       \$130,900       1,736       41       88		Executive	2	5,085	240	\$35,400	\$40,400	11,576	875	2,662
9041         Engineering Managers         1         476         12         \$135,100         \$158,100         2,941         85         488           11- 1011         Chief Executives         1         1,215         25         \$153,800         \$197,800         3,261         70         1,240           15- 1221         Computer and Information Research Scientists         1         86         2         \$110,900         \$130,900         1,736         41         88	11-	Architectural and		.,			,	,		
Managers         1         476         12         \$135,100         \$158,100         2,941         85         488           11- 1011         Chief Executives         1         1,215         25         \$153,800         \$197,800         3,261         70         1,240           15- 1221         Computer and Information Research Scientists         1         86         2         \$110,900         \$130,900         1,736         41         88	9041	Engineering								
11-       11-       1       1,215       25       \$153,800       \$197,800       3,261       70       1,240         15-       Computer and       1       1,215       25       \$110,900       \$197,800       3,261       70       1,240         15-       Information       86       2       \$110,900       \$130,900       1,736       41       88		Managers	1	476	12	\$135,100	\$158,100	2,941	85	488
1011         Chief Executives         1         1,215         25         \$153,800         \$197,800         3,261         70         1,240           15-         Computer and         Information         Research Scientists         1         86         2         \$110,900         \$130,900         1,736         41         88	11-	Chief Fund dia s		1 345	25	Ć452.000	6107.000	2.264	70	1.2.40
1221     Information       Research Scientists     1       86     2       \$110,900     \$130,900       1,736     41	1011	Computer and	1	1,215	25	\$153,800	\$197,800	3,261	/0	1,240
Research Scientists 1 86 2 \$110,900 \$130,900 1,736 41 88	1221	Information								
		Research Scientists	1	86	2	\$110,900	\$130,900	1,736	41	88

17-	Computer								
2061	Hardware								
	Engineers	1	90	2	\$102,900	\$126,100	1,142	36	92
49-	Computer,								
2011	and Office Machine								
	Repairers	1	255	14	\$37,300	\$43,800	12	0	269
43-	· ·								
9021	Data Entry Keyers	1	341	20	\$32,900	\$35,900	2,253	156	361
15-	Data Scientists and								
2098	Mathematical								
	Occupations All								
	Other	1	158	2	\$79,900	\$103,900	0	0	160
17-	Electrical and								
3023	Electronic								
	Engineering								
	Technologists and	1	472	27	\$58.800	\$68,300	3 542	178	499
17-	reennicians	-	472	27	\$30,000	\$00,500	5,572	170	455
2071	Electrical Engineers	1	589	8	\$94,100	\$106,000	3,461	101	598
17-	Electronics								
2072	Engineers, Except	1	272	л	\$94,900	\$112 200	2 1 9 5	95	276
17-	computer	1	212	4	\$94,900	\$112,500	3,185	65	270
2199	Engineers, All Other	1	408	11	\$99,600	\$107,100	11,304	328	419
43-	Executive								
6011	Secretaries and								
	Executive								
	Assistants	1	1.264	44	\$53.000	\$65.200	14.609	706	1.308
11-		_			+/	+ • • • / = • • •	,		
3013	Facilities Managers	1	869	35	\$88,700	\$108,100	14,180	554	904
13-	Financial and								
2098	Investment								
	Risk Specialists, and								
	Financial								
	Specialists, All								
	Other	1	1,133	31	\$72,000	\$96,600	11,939	435	1,164
41-	First-Line								
1012	Retail Sales								
	Workers	1	1,192	33	\$85,100	\$90,100	10,474	420	1,226
43-	First-Line								
1011	Supervisors of								
	Office and								
	Support Workers	1	5,176	171	\$50,900	\$62,000	6,793	512	5.348
27-		-	0,270	-/-	<i></i>	<i>q</i> 02,000	0,.00		0,010
1024	Graphic Designers	1	583	52	\$45,900	\$58,400	132	9	635
11-	Human Resources	1	470	15	¢104.000	¢124.000	10 252	616	407
23-	Wanagers	T	472	15	\$104,900	\$134,000	18,352	010	487
1011	Lawyers	1	1,714	14	\$110,200	\$148,900	161	4	1,728
13-									
1081	Logisticians	1	527	17	\$71,100	\$79,800	5,234	183	545
2031	Research Analysts	1	316	5	\$77.100	\$92.300	24	3	320
43-	Production,	_		-	,,	,,		-	
5061	Planning, and								
	Expediting Clerks	1	1,092	54	\$46,300	\$52,000	2,414	110	1,146
27-	Public Relations	1	610	14	¢58 600	\$71.000	6 1 4 2	216	621
2021	specialists	T	010	14	000,000	006,± / ډ	0,145	540	031

13- 1023	Purchasing Agents, Except Wholesale,								
	Retail, and Farm								
	Products	1	991	43	\$58,400	\$72,400	2,219	92	1,034
41-									
9031	Sales Engineers	1	123	12	\$103,400	\$117,300	756	23	135
41-	Sales								
4012	Representatives,								
	Wholesale and								
	Manufacturing,								
	Except Technical								
	and Scientific								
	Products	1	3,169	150	\$66,600	\$73,500	368	17	3,319
27-									
3042	Technical Writers	1	127	6	\$69,500	\$78,600	646	34	133
13-	Training and								
1151	Development								
	Specialists	1	1,167	58	\$57,400	\$67,400	6,467	332	1,225
	Total Annual Payroll				\$15,863,000	\$19,578,000			

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 2020 and represent the average for all covered employment.

Data as of 2021Q1 unless noted otherwise

#### **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.<sup>41</sup> The site, which officially opened in April 2017, employs 40 people.<sup>42</sup> The broadband fiber in the area and low cost of living relative to Northern Virginia (where many data centers are clustered) make GO VA Region 1 attractive for additional data centers.

If a data center with 50 employees were to expand to GO VA Region 1, they would find sufficient applicants with the skills needed. The potential candidate-to-opening ratio column in the table below highlights in green all occupations where there are at least 50 employees in the region for every 1 the expanding firm is expected to hire. This 50:1 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) <sup>1</sup>	Unempl <sup>1</sup>	Regional Avg Wage <sup>2</sup>	National Avg Wage <sup>2</sup>	Empl Extended	Unempl Extended	Potential Candidates per Opening	
	Computer and									
	Information									
11-3021	Systems Managers	30	997	23	\$126,500	\$161,700	3,211	74	34	
	Network and									
	Computer Systems									
15-1244	Administrators	7	1,079	19	\$71,200	\$89,500	2,021	48	157	

<sup>&</sup>lt;sup>41</sup> Source: http://wjhl.com/2017/04/20/mineral-gap-to-build-65-million-data-center-in-wise-county-40-new-jobs/.

<sup>&</sup>lt;sup>42</sup> Source: http://www.datacenterdynamics.com/content-tracks/colo-cloud/dp-facilities-opens-65m-data-center-in-virginia/98188.fullarticle.

	Computer								
	Network								
15-1241	Architects	3	403	4	\$88,600	\$119,200	7,328	170	136
	Computer								
	Occupations, All								
15-1299	Other	2	740	32	\$77,500	\$96,700	3,057	168	386
	Computer User								
15-1232	Support Specialists	2	1,539	66	\$49,700	\$57,000	758	67	802
	Maintenance and								
	Repair Workers,								
49-9071	General	2	4,325	289	\$40,300	\$43,800	2,351	152	2,307
	Sales								
	Representatives of								
	Services, Except								
	Advertising,								
	Insurance,								
	Financial Services,								
41-3091	and Travel	2	2,428	177	\$59,300	\$70,500	0	0	1,303
	First-Line								
	Supervisors of								
	Office and								
	Administrative								
43-1011	Support Workers	1	5,176	171	\$50,900	\$62,000	6,793	512	5,348
	Marketing								
11-2021	Managers	1	543	21	\$120,100	\$154,500	10,717	463	564
	Total Annual								
	Payroll				\$5,184,000	\$6,588,000			

#### 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.

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 34 potential candidates per opening. However, as shown in the table that follows, higher education institutions in the region graduated 787 people in the 2019-2020 academic year with degrees that would enable them to fill these positions.

Regional Postsecondary Programs, Computer and Information Systems Managers					
	Annual Awards GO Virginia Region 1 Labor Shed				
Title/School	Certificates and Two-year Four-year Postgraduate Degrees Degrees Degrees				
11.0101 Computer and Information Sciences, General					
Virginia Polytechnic Institute and State University	0	311	77		
East Tennessee State University	0	74	15		
New River Community College	29	0	0		
Virginia Western Community College	27	0	0		
Bluefield State College	0	8	0		
Mountain Empire Community College	7	0	0		
Roanoke College	0	7	0		
Wytheville Community College	5	0	0		

Regional Postsecondary Programs, Computer and Information Systems Managers					
	Annual Awards GO Virginia Region 1 Labor Shed				
Title/School	Certificates and Two-year Degrees	Four-year Degrees	Postgraduate Degrees		
Virginia Highlands Community College	4	0	0		
Southwest Virginia Community College	1	0	0		
University of Pikeville	0	1	0		
11.0103 Information Technology					
Northeast State Community College	55	0	0		
King University	0	34	0		
Surry Community College	18	0	0		
American National University	0	0	5		
11.0202 Computer Programming, Specific Applications					
11.0401 Information Science/Studies					
Radford University	3	14	0		
Concord University	0	4	0		
Surry Community College	0	0	0		
11.0701 Computer Science					
Radford University	0	46	0		
The University of Virginia's College at Wise	0	11	0		
Roanoke College	0	1	0		
Virginia Western Community College	0	0	0		
11.1001 Network and System Administration/Administrator					
American National University	6	1	0		
Virginia Western Community College	0	0	0		
11.1003 Computer and Information Systems Security/Information Assurance					
Radford University	15	2	0		
American National University	0	0	0		
American National University-Pikeville	0	0	0		
Virginia Polytechnic Institute and State University	0	0	0		
Wytheville Community College	0	0	0		
52.1201 Management Information Systems, General					
The University of Virginia's College at Wise	0	6	0		
Bluefield College	0	0	0		
Total	170	520	97		
Source: JobsEQ® Data as of the 2019-2020 academic year	· · ·	· · · · · ·			

# **Appendix 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 region. In addition, some residents of GO VA Region 1 work for firms outside 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 of the GO VA Region 1 labor shed considers the mobility of the residents commuting into or out of the region. In addition to the 13 counties and three cities in Region 1, the following localities are used to define the Region 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 GO VA Region 1 (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 near the City of Roanoke.

Number of Residents Commuting to and from GO VA Region 1 with 600 or More Commuters, 202001			
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, 2021Q1				
Locality	Commuters			
Washington County, Virginia	17,367			
Smyth County, Virginia	10,402			
Tazewell County, Virginia	10,306			
Wise County, Virginia	10,145			
Wythe County, Virginia	9,504			
Russell County, Virginia	7,791			
Carroll County, Virginia	7,598			
Sullivan County, Tennessee	6,221			
Lee County, Virginia	5,414			
Grayson County, Virginia	5,075			
Buchanan County, Virginia	4,594			
Bristol City, Virginia	4,125			
Scott County, Virginia	3,913			
Dickenson County, Virginia	3,504			
Galax City, Virginia	1,868			
Mercer County, West Virginia	1,575			
Bland County, Virginia	1,570			
Norton City, Virginia	1,422			
Pulaski County, Virginia	710			
Montgomery County, Virginia 624				
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, 2021Q1				
Locality	Commuters			
Washington County, Virginia	16,620			
Tazewell County, Virginia	11,802			
Smyth County, Virginia	10,890			
Wise County, Virginia	10,333			
Wythe County, Virginia	9,771			
Russell County, Virginia	6,195			
Carroll County, Virginia	5,701			
Sullivan County, Tennessee	5,369			
Bristol City, Virginia	5,261			
Buchanan County, Virginia	5,072			
Galax City, Virginia	4,310			
Lee County, Virginia	4,248			
Scott County, Virginia	4,243			
Grayson County, Virginia	3,223			
Dickenson County, Virginia	3,073			
Norton City, Virginia	2,396			
Pulaski County, Virginia	1,526			
Bland County, Virginia	1,460			
Washington County, Tennessee	1,108			
Surry County, North Carolina	1,084			
Mercer County, West Virginia	1,005			
Montgomery County, Virginia	978			
City of Roanoke, Virginia	614			
Source: JobsEQ				



# **Appendix 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 3: Regional Variations by Planning District**

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

### LENOWISCO Planning District Commission (PDC 1)

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 1.5% employment over the next 10 years beginning with the first quarter of 2021.

		CURRENT			5-YEAR HIST	TORY		10-YEAR FOR	RECAST			
NAICS	Industry	Empl	Avg Ann Wages	LQ	Empl Change	Trend	Ann %	Total Demand	Exits	Transfers	Empl Growth	Ann % Growth
62	Health Care and Social Assistance	4,209	\$40,412	1.12	-564	· · · ·	-2.5%	4,021	1,955	2,021	45	0.1%
44	Retail Trade	3,759	\$25,908	1.44	-342	· .	-1.7%	3,702	1,980	2,504	-781	-2.3%
92	Public Administration	2,989	\$46,612	2.37	107		0.7%	1,915	1,048	1,428	-561	-2.1%
61	Educational Services	2,354	\$36,195	1.15	-484	<u> </u>	-3.7%	1,552	950	1,025	-423	-2.0%
72	Accommodation and Food Services	1,908	\$14,185	1.05	-183		-1.8%	2,722	1,293	1,628	-200	-1.1%
56	Administrative and Support and Waste Management and Remediation Services	1,846	\$25,892	1.17	628		8.7%	1,891	863	1,178	-150	-0.8%
31	Manufacturing	1,426	\$45,709	0.69	116		1.7%	1,006	486	832	-312	-2.4%
23	Construction	1,094	\$34,092	0.73	-200		-3.3%	817	354	634	-171	-1.7%
11	Agriculture, Forestry, Fishing and Hunting	1,012	\$7,921	2.82	-159		-2.9%	718	409	551	-242	-2.7%
81	Other Services (except Public Administration)	735	\$29,311	0.68	-142		-3.5%	669	353	422	-107	-1.6%
54	Professional, Scientific, and Technical Services	664	\$43,404	0.37	-152		-4.0%	398	191	324	-117	-1.9%
48	Transportation and Warehousing	607	\$49,175	0.49	-172		-4.9%	456	246	333	-124	-2.2%
42	Wholesale Trade	451	\$60,965	0.47	-125	<u> </u>	-4.8%	312	157	260	-105	-2.6%
52	Finance and Insurance	445	\$42,361	0.42	-85		-3.4%	292	141	233	-82	-2.0%
51	Information	416	\$36,909	0.84	-25	· · ·	-1.2%	285	130	232	-78	-2.0%
21	Mining, Quarrying, and Oil and Gas Extraction	293	\$68,748	3.26	-615		-20.3%	210	87	181	-58	-2.2%
22	Utilities	258	\$79,917	1.89	42		3.6%	140	73	130	-63	-2.8%
71	Arts, Entertainment, and Recreation	230	\$22,569	0.61	-86	$\frown$	-6.1%	309	142	175	-8	-0.4%
55	Management of Companies and Enterprises	202	\$72,491	0.52	-79		-6.4%	144	63	107	-26	-1.4%
53	Real Estate and Rental and Leasing	180	\$32,080	0.41	-30		-3.1%	126	74	89	-36	-2.2%
99	Unclassified	43	\$29,327	1.66	16	$\frown$	9.7%	40	19	26	-5	-1.3%
	Total - All Industries	25,120	\$36,354	1.00	-2,532	<u> </u>	-1.9%	21,758	10,835	14,527	-3,604	-1.5%
Source: Jol Data as of : Note: Figur	bsEQ® 2021Q1 se may not sum due to rounding.											

LENOWISCO, VA PDC, 2021Q1<sup>1</sup>

1. All data based upon a four-quarter moving average Exits and transfers are approximate estimates based upon occupation separation rates

Nearly all of the clusters in LENOWISCO are forecast to see declines in employment over the next 10 years beginning with the first quarter of 2021. The exception is the health care cluster where employment is

expected to grow an average 0.11% over the next 10 years. However, it pays an annual average wage lower than the average for the region.

Industry Clusters for LENOWISCO, VA PDC as of 2021Q1										
Industry Group	Average Annual Employment Forecast Rate (%) 2021Q1-2031Q1	Average Wages	LQ							
Agricultural	-2.67	\$3,775	2.43							
Wood/Paper	-2.82	\$34,129	3.82							
Media	-1.61	\$22,364	0.72							
Auto/Auto-related	-1.59	\$43,604	0.56							
Machinery Mfg.	-1.84	\$44,368	0.76							
Coal/Oil/Power	-2.62	\$63,457	2.48							
Retail	-2.34	\$29,610	1.18							
Professional Svc.	-1.21	\$35,539	0.72							
Consumer Svc.	-1.15	\$17,337	0.76							
Education	-1.86	\$34,567	1.03							
Construction	-1.83	\$34,421	0.79							
Freight Tran.	-2.55	\$54,377	0.71							
Utilities	-2.14	\$38,236	1.36							
Public Admin.	-2.06	\$45,884	2.37							
Health	0.11	\$40,834	1.12							
Source: JobsEQ® Data as of 2021Q1										

#### LENOWISCO, VA PDC, 2021Q1<sup>1</sup>

			CURRENT						5-YEAR HIS	STORY	10-YEAR FO	RECAST			
	SOC	Occupation	Empl	Mean Ann Wages <sup>2</sup>	LQ	Unempl	Unempl Rate	Online Job Ads <sup>3</sup>	Empl Change	Ann %	Total Demand	Exits	Transfers	Empl Growth	Ann % Growth
.dl	11-0000	Management Occupations	1,886	\$77,900	1.11	45	2.5%	46	-220	-2.2%	1,138	634	855	-351	-2.0%
.du	13-0000	Business and Financial Operations Occupations	1,065	\$60,400	0.72	33	3.5%	35	8	0.2%	807	276	671	-139	-1.4%
.du	15-0000	Computer and Mathematical Occupations	450	\$69,800	0.56	9	2.6%	28	0	0.0%	262	71	241	-49	-1.2%
alı,	17-0000	Architecture and Engineering Occupations	297	\$72,800	0.68	10	3.8%	14	-21	-1.4%	159	64	149	-54	-2.0%
.du	19-0000	Life, Physical, and Social Science Occupations	172	\$78,300	0.74	7	4.2%	6	-12	-1.4%	114	33	111	-29	-1.9%
.di	21-0000	Community and Social Service Occupations	707	\$39,900	1.56	14	2.2%	80	-18	-0.5%	759	240	505	14	0.2%
.di	23-0000	Legal Occupations	251	\$73,000	1.14	5	2.5%	2	-21	-1.6%	120	60	98	-38	-1.6%
alı,	25-0000	Educational Instruction and Library Occupations	1,648	\$50,600	1.18	94	6.0%	40	-295	-3.2%	1,079	616	725	-263	-1.7%
alı,	27-0000	Arts, Design, Entertainment, Sports, and Media Occupations	245	\$48,000	0.56	23	10.2%	14	-30	-2.3%	208	88	158	-38	-1.7%
d	29-0000	Healthcare Practitioners and Technical Occupations	1,531	\$70,800	1.02	43	2.6%	229	-183	-2.2%	685	373	464	-151	-1.0%
alı	31-0000	Healthcare Support Occupations	1,540	\$24,200	1.35	107	5.7%	59	-189	-2.3%	2,085	968	1,009	108	0.7%
alı,	33-0000	Protective Service Occupations	1,334	\$40,600	2.46	39	3.2%	21	-31	-0.5%	821	459	629	-267	-2.2%
alı,	35-0000	Food Preparation and Serving Related Occupations	2,038	\$22,000	1.13	418	14.9%	200	-180	-1.7%	3,111	1,379	1,940	-208	-1.1%
alı,	37-0000	Building and Grounds Cleaning and Maintenance Occupations	684	\$25,500	0.84	88	8.8%	40	-53	-1.5%	779	345	498	-64	-1.0%
alı,	39-0000	Personal Care and Service Occupations	491	\$28,000	0.79	87	13.5%	5	-47	-1.8%	668	311	396	-39	-0.8%
ц	41-0000	Sales and Related Occupations	2,712	\$33,300	1.13	292	9.4%	282	-268	-1.9%	3,076	1,490	2,155	-568	-2.3%
alı,	43-0000	Office and Administrative Support Occupations	3,091	\$33,100	0.96	214	6.0%	107	-3	0.0%	2,758	1,354	1,951	-547	-1.9%
alı,	45-0000	Farming, Fishing, and Forestry Occupations	112	\$38,500	0.66	13	7.8%	n/a	-18	-3.0%	123	37	117	-31	-3.2%
alı,	47-0000	Construction and Extraction Occupations	1,066	\$40,000	0.91	135	8.6%	23	-480	-7.2%	925	323	777	-174	-1.8%
alı,	49-0000	Installation, Maintenance, and Repair Occupations	917	\$44,000	0.95	66	5.4%	31	-243	-4.6%	651	255	557	-161	-1.9%
ц	51-0000	Production Occupations	1,057	\$35,500	0.72	117	7.0%	32	9	0.2%	846	376	709	-239	-2.5%
alı.	53-0000	Transportation and Material Moving Occupations	1,828	\$32,700	0.85	209	8.3%	163	-239	-2.4%	1,777	784	1,306	-313	-1.9%
		Total - All Occupations	25,120	\$42,700	1.00	2,070	7.1%	1,456	-2,532	-1.9%	22,953	10,538	16,018	-3,604	-1.5%

Source: JobsEQ®

Data as of 2021Q1 unless noted otherwise

Note: Figures may not sum due to rounding.

1. Data based on a four-quarter moving average unless noted otherwise.

2. Wage data are as of 2020 and represent the average for all Covered Employment

3. 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 Planning District Commission (PDC 2)

The retail sector employs the most people in Cumberland Plateau (Planning District Commission 2), followed by health care and educational services. Mining is the fifth-largest sector in terms of employment but has a very large LQ of 20.79; this is 20 times larger than any other LQ in this region. Based on its current mix of industries, the region is expected to shed an annual average 1.7% employment over the next 10 years beginning with the first quarter of 2021.

		CURRENT 5-YEAR HISTORY 10-YEAR F			10-YEAR FOR	FORECAST						
NAICS	Industry	Empl	Avg Ann Wages	LQ	Empl Change	Trend	Ann %	Total Demand	Exits	Transfers	Empl Growth	Ann % Growth
44	Retail Trade	4,680	\$26,649	1.44	-427	<u> </u>	-1.7%	4,520	2,448	3,096	-1,025	-2.4%
62	Health Care and Social Assistance	4,440	\$42,233	0.95	-336	<u> </u>	-1.4%	4,019	2,028	2,096	-105	-0.2%
61	Educational Services	2,834	\$33,259	1.11	-467	<u> </u>	-3.0%	1,954	1,157	1,249	-452	-1.7%
92	Public Administration	2,552	\$37,868	1.62	116		0.9%	1,689	902	1,229	-442	-1.9%
21	Mining, Quarrying, and Oil and Gas Extraction	2,324	\$76,443	20.79	-725	<u> </u>	-5.3%	1,416	662	1,378	-624	-3.1%
23	Construction	1,874	\$40,295	1.01	-328		-3.2%	1,429	609	1,092	-272	-1.6%
72	Accommodation and Food Services	1,869	\$15,559	0.82	-402		-3.8%	2,648	1,263	1,590	-206	-1.2%
31	Manufacturing	1,819	\$45,408	0.70	14	$\checkmark$	0.2%	1,324	625	1,071	-372	-2.3%
81	Other Services (except Public Administration)	1,620	\$28,493	1.21	-136		-1.6%	1,580	797	952	-168	-1.1%
54	Professional, Scientific, and Technical Services	1,564	\$48,045	0.70	-138	<u> </u>	-1.7%	1,199	479	814	-93	-0.6%
56	Administrative and Support and Waste Management and Remediation Services	1,147	\$37,581	0.58	-98	$\frown$	-1.6%	1,138	530	724	-116	-1.1%
48	Transportation and Warehousing	934	\$52,929	0.60	-409		-7.0%	682	376	509	-202	-2.4%
11	Agriculture, Forestry, Fishing and Hunting	799	\$11,963	1.79	-94	<b>~~</b>	-2.2%	519	316	425	-222	-3.2%
42	Wholesale Trade	686	\$49,115	0.57	-66	$\searrow$	-1.8%	499	242	401	-144	-2.3%
52	Finance and Insurance	681	\$46,486	0.51	-193		-4.9%	446	216	356	-127	-2.0%
51	Information	390	\$29,538	0.63	-32	$\frown$	-1.6%	287	125	222	-59	-1.6%
55	Management of Companies and Enterprises	332	\$65,119	0.68	-96		-5.0%	234	103	176	-44	-1.4%
53	Real Estate and Rental and Leasing	263	\$31,238	0.48	-21	·	-1.5%	180	107	129	-56	-2.4%
22	Utilities	251	\$49,940	1.48	-108		-6.9%	155	74	130	-49	-2.1%
71	Arts, Entertainment, and Recreation	162	\$38,060	0.34	-125	~~~.	-10.8%	214	99	123	-8	-0.5%
99	Unclassified	64	\$34,525	1.98	26	$\frown$	10.8%	55	28	38	-11	-1.9%
	Total - All Industries	31,286	\$39,535	1.00	-4,048		-2.4%	26,615	13,420	17,993	-4,799	-1.7%
0												

Cumberland Plateau, VA PDC, 2021Q1<sup>1</sup>

Data as of 2021Q1 Note: Figures may not sum due to rounding.

1. All data based upon a four-quarter moving average Exits and transfers are approximate estimates based upon occupation separation rates.

All of the clusters in Cumberland Plateau are forecast to see declines in employment over the next 10 years beginning with the first quarter of 2021. Even health care, a cluster that normally sees employment growth, is forecast to decline by 0.24% in the coming decade.

Industry Clusters for Cumberland Plateau, VA PDC as of 2021Q1									
Industry Group	Average Annual Employment Forecast Rate (%) 2021Q1- 2031Q1	Average Wages	LQ						
Textile/Leather	-3.12	\$22,068	1.95						
Agricultural	-3.16	\$8,908	1.56						
Wood/Paper	-3.14	\$31,997	0.95						
Media	-1.36	\$24,837	0.71						
Auto/Auto-related	-1.44	\$40,795	0.86						
Machinery Mfg.	-2.12	\$41,850	1.08						
Metal & Product Mfg.	-1.86	\$42,620	2.09						
Coal/Oil/Power	-3.10	\$80,817	9.43						
Retail	-2.43	\$29,598	1.20						
Professional Svc.	-0.94	\$44,950	0.64						
Consumer Svc.	-1.29	\$20,846	0.65						
Education	-1.44	\$31,261	1.11						
Financial Svc.	-2.04	\$44,636	0.51						
Construction	-1.60	\$40,085	1.00						
Freight Tran.	-2.49	\$53,771	0.97						
Utilities	-1.93	\$38,903	1.79						
Public Admin.	-1.89	\$37,789	1.63						
Health	-0.24	\$43,437	0.95						
Source: JobsEQ® Data as of 2021Q1									

Cumberland	Distance V/A	000101
Cumpenanu	Fidledu, VA	FDG, ZUZTQT

			CURRENT						5-YEAR HIS	TORY	10-YEAR FORECAST				
	SOC	Occupation	Empl	Mean Ann Wages <sup>2</sup>	LQ	Unempl	Unempl Rate	Online Job Ads <sup>3</sup>	Empl Change	Ann %	Total Demand	Exits	Transfers	Empl Growth	Ann % Growth
al.	11-0000	Management Occupations	2,150	\$82,200	1.02	63	3.3%	54	-195	-1.7%	1,325	662	1,030	-367	-1.9%
d	13-0000	Business and Financial Operations Occupations	1,505	\$60,600	0.81	55	4.3%	62	-58	-0.8%	1,191	395	964	-168	-1.2%
d	15-0000	Computer and Mathematical Occupations	842	\$73,200	0.84	19	3.0%	40	-77	-1.7%	587	136	470	-18	-0.2%
ah	17-0000	Architecture and Engineering Occupations	446	\$74,600	0.82	16	4.3%	3	-41	-1.7%	244	97	225	-78	-1.9%
ah	19-0000	Life, Physical, and Social Science Occupations	197	\$75,400	0.68	8	5.3%	7	-5	-0.5%	130	38	123	-30	-1.7%
ah	21-0000	Community and Social Service Occupations	700	\$42,200	1.24	19	3.2%	84	14	0.4%	723	237	493	-6	-0.1%
ali	23-0000	Legal Occupations	237	\$72,300	0.86	6	2.9%	3	-21	-1.7%	113	56	92	-35	-1.6%
alı	25-0000	Educational Instruction and Library Occupations	1,943	\$54,900	1.12	140	7.9%	33	-345	-3.2%	1,308	730	860	-283	-1.6%
ali	27-0000	Arts, Design, Entertainment, Sports, and Media Occupations	332	\$50,900	0.60	29	11.9%	31	-39	-2.2%	295	120	219	-43	-1.4%
d	29-0000	Healthcare Practitioners and Technical Occupations	1,826	\$69,800	0.98	62	3.3%	243	-138	-1.4%	795	438	558	-200	-1.2%
ah	31-0000	Healthcare Support Occupations	1,454	\$25,600	1.02	113	6.5%	62	-80	-1.1%	1,895	885	942	69	0.5%
ah	33-0000	Protective Service Occupations	1,086	\$42,300	1.61	47	4.2%	17	15	0.3%	715	381	530	-196	-2.0%
ah	35-0000	Food Preparation and Serving Related Occupations	1,985	\$22,600	0.88	443	16.3%	199	-420	-3.8%	3,009	1,345	1,875	-211	-1.1%
d	37-0000	Building and Grounds Cleaning and Maintenance Occupations	764	\$25,400	0.75	108	10.4%	45	-16	-0.4%	849	403	534	-88	-1.2%
alı	39-0000	Personal Care and Service Occupations	607	\$30,700	0.79	109	15.0%	6	-83	-2.5%	793	378	475	-59	-1.0%
ali	41-0000	Sales and Related Occupations	3,453	\$35,000	1.16	414	10.8%	284	-371	-2.0%	3,837	1,865	2,706	-734	-2.4%
d	43-0000	Office and Administrative Support Occupations	3,403	\$34,000	0.85	260	6.8%	142	-616	-3.3%	2,841	1,486	2,051	-696	-2.3%
ah	45-0000	Farming, Fishing, and Forestry Occupations	130	\$40,700	0.61	17	9.7%	1	-2	-0.2%	148	44	138	-34	-2.9%
ali	47-0000	Construction and Extraction Occupations	2,752	\$43,900	1.88	283	10.0%	22	-677	-4.3%	2,266	810	2,025	-569	-2.3%
d	49-0000	Installation, Maintenance, and Repair Occupations	1,407	\$44,600	1.17	100	6.3%	35	-253	-3.3%	974	398	835	-259	-2.0%
alı	51-0000	Production Occupations	1,482	\$35,600	0.82	153	8.3%	46	-142	-1.8%	1,179	505	998	-325	-2.4%
ah	53-0000	Transportation and Material Moving Occupations	2,585	\$34,700	0.96	302	9.6%	221	-500	-3.5%	2,436	1,067	1,839	-469	-2.0%
		Total - All Occupations	31,286	\$45,000	1.00	2,764	8.2%	1,640	-4,048	-2.4%	27,656	12,477	19,978	-4,799	-1.7%

Source: JobsEQ®

Data as of 2021Q1 unless noted otherwise

Note: Figures may not sum due to rounding.

1. Data based on a four-quarter moving average unless noted otherwise.

2. Wage data are as of 2020 and represent the average for all Covered Employment

3. 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 Planning District Commission (PDC 3)

The manufacturing sector employs the most people in Mount Rogers (Planning District Commission 3) followed by health care, retail trade, and accommodation and food services. Based on its current mix of industries, the region is expected to shed an annual average 0.7% employment over the next 10 years beginning with the first quarter 2021.

#### Mount Rogers, VA PDC, 2021Q1<sup>1</sup>

		CURRENT			5-YEAR HIST	TORY		10-YEAR FORECAST				
NAICS	Industry	Empl	Avg Ann Wages	LQ	Empl Change	Trend	Ann %	Total Demand	Exits	Transfers	Empl Growth	Ann % Growth
31	Manufacturing	12,093	\$47,199	2.03	-2,829	<u> </u>	-4.1%	9,796	4,284	7,338	-1,825	-1.6%
62	Health Care and Social Assistance	10,647	\$41,116	0.99	-625	$\sim\sim$	-1.1%	11,021	5,076	5,247	698	0.6%
44	Retail Trade	9,881	\$26,603	1.32	-386		-0.8%	10,987	5,431	6,869	-1,312	-1.4%
72	Accommodation and Food Services	5,751	\$17,228	1.10	-1,395		-4.3%	8,921	4,040	5,087	-205	-0.4%
61	Educational Services	4,772	\$35,386	0.82	-682	~~~~	-2.6%	3,790	2,024	2,186	-420	-0.9%
92	Public Administration	4,490	\$44,398	1.24	-90	~~~	-0.4%	3,609	1,673	2,280	-344	-0.8%
56	Administrative and Support and Waste Management and Remediation Services	3,654	\$28,971	0.81	373	$\sim \sim$	2.2%	4,058	1,756	2,398	-96	-0.3%
23	Construction	3,591	\$41,624	0.84	-255	<b></b>	-1.4%	3,147	1,216	2,180	-249	-0.7%
81	Other Services (except Public Administration)	3,064	\$25,603	1.00	-71	$\frown$	-0.5%	3,264	1,552	1,854	-143	-0.5%
48	Transportation and Warehousing	2,777	\$47,658	0.78	21	$\sim$	0.1%	2,598	1,203	1,628	-233	-0.9%
11	Agriculture, Forestry, Fishing and Hunting	2,406	\$14,238	2.35	-339	$\overline{}$	-2.6%	1,959	1,012	1,364	-416	-1.9%
42	Wholesale Trade	1,731	\$47,235	0.63	-311	<u> </u>	-3.2%	1,516	644	1,069	-197	-1.2%
54	Professional, Scientific, and Technical Services	1,666	\$52,752	0.32	-188	<b></b>	-2.1%	1,321	515	875	-69	-0.4%
52	Finance and Insurance	1,373	\$54,051	0.45	-151		-2.1%	1,082	459	756	-132	-1.0%
71	Arts, Entertainment, and Recreation	841	\$21,943	0.78	-381		-7.2%	1,197	531	656	10	0.1%
55	Management of Companies and Enterprises	817	\$63,163	0.73	-100	$\searrow$	-2.3%	687	265	455	-33	-0.4%
51	Information	736	\$41,554	0.52	-155		-3.8%	577	239	426	-88	-1.3%
53	Real Estate and Rental and Leasing	493	\$37,660	0.39	-107		-3.9%	412	213	256	-57	-1.2%
22	Utilities	453	\$59,422	1.16	-8	<b></b>	-0.4%	350	141	249	-40	-0.9%
99	Unclassified	288	\$27,259	3.87	233		39.4%	293	132	181	-20	-0.7%
21	Mining, Quarrying, and Oil and Gas Extraction	238	\$51,719	0.93	-54	<b>``</b>	-4.0%	240	78	163	-1	0.0%
	Total - All Industries	71,763	\$36,945	1.00	-7,501		-2.0%	70,105	32,159	43,119	-5,173	-0.7%

Source: JobsEQ®

Data as of 2021Q1

Note: Figures may not sum due to rounding.

1. All data based upon a four-quarter moving average

Exits and transfers are approximate estimates based upon occupation separation rates.

Most of the clusters in Mount Rogers are forecast to see declines in employment over the next 10 years beginning with the first quarter of 2021. The only exception is health care. In the health care cluster, employment is expected to grow an average 0.64% over the next 10 years. It pays an annual average wage lower than the average for the region.

Industry Clusters for Mount Rogers, VA PDC as of 2021Q1											
Industry Group	Average Annual Employment Forecast Rate (%) 2021Q1- 2031Q1	Average Wages	LQ								
Textile/Leather	-3.77	\$24,711	4.75								
Food Mfg.	-0.32	\$50,309	1.49								
Agricultural	-1.86	\$13,557	2.20								
Chemical	-1.84	\$50,212	3.39								
Wood/Paper	-1.83	\$34,089	3.24								
Electric/Electronics Mfg.	-1.84	\$50,892	1.79								
Auto/Auto-related	-1.33	\$35,221	2.75								
Machinery Mfg.	-1.11	\$49,991	0.97								
Metal & Product Mfg.	-1.05	\$46,283	0.74								
Coal/Oil/Power	-0.91	\$52,637	0.69								
Retail	-1.38	\$29,849	1.14								
Professional Svc.	-0.38	\$40,717	0.56								
Consumer Svc.	-0.37	\$21,830	0.89								
Education	-0.72	\$32,177	0.87								
Construction	-0.85	\$41,361	0.88								
Freight Tran.	-1.19	\$47,248	0.87								
Utilities	-0.66	\$40,023	1.61								
Public Admin.	-0.79	\$43,668	1.24								
Health	0.64	\$39,783	0.99								

#### Mount Rogers, VA PDC, 2021Q1<sup>1</sup>

			CURRENT						5-YEAR HIS	TORY	10-YEAR FORECAST				
	SOC	Occupation	Empl	Mean Ann Wages <sup>2</sup>	LQ	Unempl	Unempl Rate	Online Job Ads <sup>3</sup>	Empl Change	Ann %	Total Demand	Exits	Transfers	Empl Growth	Ann % Growth
d	41-0000	Sales and Related Occupations	7,765	\$35,000	1.13	725	9.1%	807	-764	-1.9%	9,769	4,414	6,359	-1,003	-1.4%
alı	43-0000	Office and Administrative Support Occupations	7,636	\$34,100	0.83	482	5.9%	323	-1,067	-2.6%	7,280	3,445	4,837	-1,002	-1.4%
ali	51-0000	Production Occupations	7,530	\$36,000	1.81	645	7.6%	226	-1,821	-4.2%	6,622	2,668	5,215	-1,261	-1.8%
alı	53-0000	Transportation and Material Moving Occupations	6,424	\$33,700	1.04	631	8.4%	589	-168	-0.5%	7,244	2,837	4,925	-519	-0.8%
d	35-0000	Food Preparation and Serving Related Occupations	5,671	\$22,100	1.10	1,022	15.0%	731	-1,182	-3.7%	9,491	3,934	5,694	-136	-0.2%
al.	11-0000	Management Occupations	5,178	\$79,700	1.07	133	2.6%	160	-455	-1.7%	3,745	1,783	2,505	-543	-1.1%
alı	29-0000	Healthcare Practitioners and Technical Occupations	3,956	\$68,600	0.92	119	2.7%	704	123	0.6%	2,245	1,012	1,272	-38	-0.1%
d	31-0000	Healthcare Support Occupations	3,754	\$25,100	1.15	213	5.4%	174	-141	-0.7%	5,369	2,384	2,519	465	1.2%
alı	25-0000	Educational Instruction and Library Occupations	3,450	\$49,700	0.87	253	6.5%	48	-558	-3.0%	2,725	1,364	1,606	-245	-0.7%
d	47-0000	Construction and Extraction Occupations	3,060	\$39,600	0.91	305	8.2%	60	-274	-1.7%	3,062	964	2,301	-203	-0.7%
alı	13-0000	Business and Financial Operations Occupations	2,976	\$62,500	0.70	107	3.7%	97	-29	-0.2%	2,631	802	1,977	-149	-0.5%
alı	49-0000	Installation, Maintenance, and Repair Occupations	2,746	\$44,200	0.99	179	5.5%	130	-305	-2.1%	2,390	834	1,733	-177	-0.7%
alı	37-0000	Building and Grounds Cleaning and Maintenance Occupations	2,020	\$25,500	0.87	222	8.9%	167	-238	-2.2%	2,528	1,110	1,479	-60	-0.3%
al.	33-0000	Protective Service Occupations	1,886	\$38,700	1.22	106	5.6%	60	69	0.7%	1,601	767	975	-141	-0.8%
d	21-0000	Community and Social Service Occupations	1,734	\$40,400	1.34	41	2.3%	269	-79	-0.9%	2,025	628	1,268	129	0.7%
alı,	39-0000	Personal Care and Service Occupations	1,564	\$28,000	0.89	235	13.5%	44	-218	-2.6%	2,353	1,042	1,321	-10	-0.1%
al.	15-0000	Computer and Mathematical Occupations	1,198	\$72,300	0.52	30	2.5%	57	-74	-1.2%	840	196	668	-24	-0.2%
alı,	17-0000	Architecture and Engineering Occupations	1,052	\$77,500	0.84	33	3.2%	28	-167	-2.9%	699	239	543	-83	-0.8%
ali	27-0000	Arts, Design, Entertainment, Sports, and Media Occupations	949	\$48,700	0.75	77	9.5%	29	-88	-1.8%	913	353	637	-77	-0.8%
alı,	23-0000	Legal Occupations	432	\$80,900	0.69	9	2.2%	5	-16	-0.7%	259	108	174	-23	-0.5%
alı	19-0000	Life, Physical, and Social Science Occupations	406	\$77,100	0.61	15	3.8%	17	-9	-0.5%	334	81	275	-22	-0.6%
alı	45-0000	Farming, Fishing, and Forestry Occupations	376	\$34,300	0.77	37	8.0%	1	-38	-1.9%	515	138	428	-52	-1.5%
		Total - All Occupations	71,763	\$42,600	1.00	5,620	7.2%	4,725	-7,501	-2.0%	74,640	31,101	48,712	-5,173	-0.7%

Source: JobsEQ®

Data as of 2021Q1 unless noted otherwise

Note: Figures may not sum due to rounding.

1. Data based on a four-quarter moving average unless noted otherwise.

2. Wage data are as of 2020 and represent the average for all Covered Employment

3. 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 4: Transferable Jobs from Coal Mining

The table on the following page shows potential occupations for which coal miners in the GO VA Region 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 Region 1 labor shed. The 10 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 10 people in the region. For example, operating engineers in Region 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 Region 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 10 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 1 Labor Shed												
		Cur	rent	Forecast Over t	he Next 10 Years							
soc	Title	Employment 2021Q1	Avg. Annual Wages 2020	Total Separations	Total Growth Demand							
51-1011	First-Line Supervisors of Production and Operating Workers	2,982	\$64,600	2,922	-236							
51-4121         Welders, Cutters, Solderers, and Brazers         1732         \$41,000         1,837         -118												
17-3023	Electrical and Electronic Engineering Technologists and Technicians	473	\$58,800	442	-35							
49-9043	Maintenance Workers, Machinery	426	\$51,800	380	-16							
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	205	\$41,500	212	-26							
51-8093	Petroleum Pump System Operators, Refinery Operators, and Gaugers	82	\$68,100	87	-6							
51-4051	Metal-Refining Furnace Operators and Tenders	52	\$43,700	60	-3							
51-4052	Pourers and Casters, Metal	27	\$40,500	30	-4							
Source: Jobs Note: occup	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 Pumpers (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 Pumpers (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 Pumpers (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 49-9043 (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 Pumpers (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 Tamping Equipment Operators (12)	51-8099 Plant and System Operators, All Other (73)	53-7021 Crane and Tower Operators (179)	51-1011 First- Line Supervisors of Production and Operating Workers (3077)	49-3043 Rail Car Repairers (155)	49-2093 Electrical and Electronics Installers and Repairers, Transportation Equipment (58)	49-9097 Signal and Track Switch Repairers (52)	33-9093 Transportation Security Screeners (76)	49-3021 Automotive Body and Related Repairers (704)	47-2044 Tile and Marble 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: Economic Impact of COVID-19 In GO Virginia Region One: CHMURA ECONOMICS & ANALYTICS

PREPARED FOR GO Virginia Region One



# May 14, 2021 ECONOMIC IMPACT OF COVID-19 IN GO VIRGINIA REGION ONE



## Contents

1.BACKGROUND	 	2

2. IMPACT ON REGION ONE	
INDUSTRIES AND GDP	4

2.1. STATE POLICIES4
2.2. COVID-19 IMPACT ON MAJOR
INDUSTRIES5
2.3. GROWTH INDUSTRIES DURING THE
PANDEMIC7

### 3. GO VIRGINIA REGION ONE PATH TO RECOVERY......9

3.1. FACTORS INFLUENCING RECOVERY 9 3.2. REGIONAL RECOVERY PATH .......10

4. OCCUPATIONAL IMPACT DURING COVID-19......12

4.1. MOST-IMPACTED OCCUPATIONS12
4.2. IMPACT ON TELEWORK
OCCUPATIONS13

5. OPPORTUNITY FOR GROWTH IN

RURA	AL ARE	AS	16
51	Rurai	POPULATION GROWTH	16

0.1. RORALT OF OLAHON OROWITHTO
5.2. ECONOMIC DEVELOPMENT
OPPORTUNITIES17

## 1. Background

The COVID-19 pandemic has impacted the national economy in a manner not experienced in modern times. Similarly, this pandemic affected GO Virginia Region One (or Region One) in Southwest Virginia.

GO Virginia is an initiative to foster private sector growth and job creation through state incentives for regional collaboration by businesses, educational institutions, and governments.<sup>1</sup> GO Virginia Region One includes 16 cities and counties in Southwest Virginia.<sup>2</sup> The main industries of the region, in terms of employment, are healthcare, retail trade, and manufacturing. Mining is traditionally an important sector in the regional economy as well, even though its total employment is behind several other industries.<sup>3</sup>

GO Virginia Region One is interested in understanding the economic impact of the COVID-19 pandemic on various industries in the area, as well as the projected recovery path. In addition, the organization is interested in an analysis of the occupational impact of the pandemic and growth opportunities for the region post-pandemic. Chmura Economics & Analytics (Chmura)<sup>4</sup> was contracted to complete this study.

Information about the pandemic's spread, government response, and effective treatments and prevention has evolved quickly. Among those, state policies have had profound impacts on the regional economies. Chmura performed thorough research of Virginia's pandemic-related policies, such as the stay-athome directives, state and regional reopening plans, and vaccination processes to evaluate their effects on GO Virginia Region One.<sup>5</sup>

Various federal policies have provided some relief to the economy. On March 27, 2020, the U.S. Congress passed—and the President signed into law—the Coronavirus Aid, Relief, and Economic Security (CARES) Act. The CARES Act temporarily expanded unemployment insurance benefits and provided a \$1,200 payment to eligible Americans. In addition, this law included the Paycheck Protection Program (PPP) that allocated \$349 billion in loans to small businesses to help them continue to pay their employees. <sup>6</sup> In late April, Congress passed—and the President signed—another law that injected \$310 billion to replenish the PPP program.<sup>7</sup> Those policies allowed many businesses

<sup>&</sup>lt;sup>1</sup> Source: GO Virginia website at: https://govirginia.org/about/.

<sup>&</sup>lt;sup>2</sup> GO Virginia Region One consists of the cities of Bristol, Galax, and Norton; and the counties of Bland, Buchanan, Carroll, Dickenson, Grayson, Lee, Russell, Scott, Smyth, Tazewell, Washington, Wise, and Wythe.

<sup>&</sup>lt;sup>3</sup> Source: Economic Overview Report, JobsEQ by Chmura.

<sup>&</sup>lt;sup>4</sup> Chmura provides economic software, consulting, and data so our clients can make informed decisions that benefit their communities. Chmura's PhD economists, data scientists, and strategic planners guide clients through their local labor market. Over the past 22 years, Chmura has served hundreds of clients nationwide with thoroughness, accuracy, and objectivity.

<sup>&</sup>lt;sup>5</sup> Section 2 provides a detailed description of state and regional policies.

<sup>&</sup>lt;sup>6</sup> Source: https://www.washingtonpost.com/business/2020/03/25/trump-senate-coronavirus-economic-stimulus-2-trillion/.

<sup>&</sup>lt;sup>7</sup> Source: https://www.marketwatch.com/story/house-set-to-pass-bill-that-replenishes-coronavirus-aid-program-for-small-businesses-2020-04-23.

to keep their employees, thus moderating the effects of the COVID-19 pandemic on the economy throughout 2020.

In December 2020, Congress passed—and the President signed into law—a new relief package providing several measures similar to the CARES Act passed in March 2020. This new package expanded unemployment insurance benefits and provided \$600 payments to eligible Americans. This package added \$285 billion to the Paycheck Protection Program to provide loans to small businesses.<sup>8</sup> In March 2021, President Biden signed a new COVID-19 relief package to provide more help to households and businesses, including expanded unemployment benefits and additional cash payments to eligible households.<sup>9</sup>

As national and regional economies start to recover, one determining factor of the recovery pace is the development of vaccines and effective treatments for COVID-19. In December 2020, both Pfizer-BioNTech and Moderna applied for and were granted emergency use authorizations for their vaccines, by the United States Food and Drug Administration (FDA).<sup>10</sup> In March 2021, a third vaccine developed by Johnson & Johnson was also approved by the FDA for emergency use.<sup>11</sup> In terms of vaccine distribution, Virginia adopted a phased approach. Phase 1A includes healthcare personnel and residents of long-term care facilities; Phase 1B includes seniors, adults with medical conditions, and frontline essential workers; and Phase 1C includes other essential workers.<sup>12</sup> Currently, Virginia is in Phase 1C of the vaccination plan.<sup>13</sup> Virginia expanded vaccine eligibility to all adult residents in May 2021.<sup>14</sup>

Chmura's analysis of the pandemic's impact on the regional economy and its recovery incorporates anticipated industry changes as well as the latest government policy actions. For this report, Chmura first analyzed the impact of COVID-19 on regional industries from the second through fourth quarters of 2020. During this period, the region was in different phases of restrictions and reopening, and many jobs were lost and recovered. Chmura also identified regional growth industries during the pandemic. Finally, employment recovery is projected for regional industries in 2021 and 2022. This assumes vaccines will become widely available to the public in the second quarter of 2021 and that new strains of the virus do not require new vaccines. Additional analysis addresses the impact of the pandemic on different occupations and post-pandemic growth opportunities.

<sup>&</sup>lt;sup>8</sup> Source: https://www.nytimes.com/2020/12/22/us/politics/second-stimulus-whats-included.html.

<sup>&</sup>lt;sup>9</sup> Source: https://www.washingtonpost.com/us-policy/2021/03/11/biden-sign-stimulus-covid-relief-congress-checks/.

<sup>&</sup>lt;sup>10</sup> Source: https://www.nytimes.com/interactive/2020/science/coronavirus-vaccine-tracker.html.

<sup>&</sup>lt;sup>11</sup> Source: https://www.fda.gov/news-events/press-announcements/fda-issues-emergency-use-authorization-third-covid-19-vaccine.

<sup>&</sup>lt;sup>12</sup> Source: https://www.vdh.virginia.gov/covid-19-vaccine/.

<sup>&</sup>lt;sup>13</sup> Source: https://www.vdh.virginia.gov/covid-19-vaccine/phase-by-health-district/.

<sup>&</sup>lt;sup>14</sup> Source: https://www.governor.virginia.gov/newsroom/all-releases/2021/april/headline-894153-en.html.

## 2. Impact on Region One Industries and GDP

### 2.1. State Policies

Chmura first estimated the potential impact of COVID-19 on the national labor market based on research of its impact on different industry sectors, recent releases of unemployment claims, and the latest news reports related to business closures and layoffs.

Next, Chmura incorporated information related to the COVID-19 impact that is specific to the state of Virginia and Region One. The most significant factors in this evaluation are the statewide stay-at-home order and reopening schedules. On March 12, 2020, Virginia Governor Ralph Northam declared a state of emergency to address the COVID-19 pandemic.<sup>15</sup> Throughout March, the governor ordered the closure of schools and placed restrictions on business and social gatherings. On March 23, 2020, Governor Northam issued Executive Order 53, closing all non-essential businesses.<sup>16</sup> On March 30, 2020, Governor Northam issued a statewide stay-at-home order, effective until June 10, 2020.<sup>17</sup> Under this order, only essential services (such as grocery stores and pharmacies) and critical infrastructure such as food suppliers or healthcare facilities were allowed to remain in operation. All schools, entertainment and recreation venues such as bars/nightclubs, gyms/fitness centers, theaters/performance venues, and amusement parks were to be closed.

As the spread of COVID-19 slowed, Virginia started its gradual reopening process. In early May 2020, Governor Northam outlined a three-phase plan to ease restrictions in Virginia. Phase One of reopening for the state began on May 15.<sup>18</sup> Phase Two of reopening in Virginia began on June 5 while all localities entered Phase Three of reopening on July 1.<sup>19</sup> Phase Three encouraged social distancing and teleworking, and individuals are required to wear face coverings in indoor public settings. All businesses continued to follow physical distancing guidelines, frequently cleaned and sanitized high-contact surfaces, and maintained enhanced workplace safety measures. Restaurant and beverage establishments were required to maintain six feet of distance between tables, fitness centers could open indoor areas at 75 percent occupancy, and recreation and entertainment venues may operate at 50 percent occupancy or a maximum of 1,000 persons.

GO Virginia Region One was in Phase Three of reopening throughout the summer and fall months of 2020. In late fall and early winter, infections surged in the state, and Virginia implemented a curfew policy. On December 10, 2020, Governor Northam established a modified stay-at-home order where individuals must remain at their place of residence from 12:00 AM to 5:00 AM, and the capacity of social gatherings was reduced.<sup>20</sup> As infections subsided and vaccination distribution began, Governor Northam announced on February 24, 2021 that the capacity limits for outdoor sports and entertainment would be lifted, as well as increasing social gathering limits from 10 to 25 individuals.

Of the measures stated above, the stay-at-home order issued in March 2020 had a significant impact on regional employment in the second quarter of 2020, while the phased reopening of businesses facilitated the economic recovery in the second half of the year. However, business restrictions implemented in December affected the regional economic recovery in the fourth quarter of 2020.

<sup>&</sup>lt;sup>15</sup> Source: https://www.governor.virginia.gov/media/governorvirginiagov/governor-of-virginia/pdf/eo/EO-51-Declaration-of-a-State-of-Emergency-Due-to-Novel-Coronavirus-(COVID-19).pdf.

<sup>&</sup>lt;sup>16</sup> Source: https://www.governor.virginia.gov/newsroom/all-releases/2020/march/headline-855292-en.html.

<sup>&</sup>lt;sup>17</sup> Source: https://www.governor.virginia.gov/media/governorvirginiagov/executive-actions/EO-55-Temporary-Stay-at-Home-Order-Due-to-Novel-Coronavirus-(COVID-19).pdf.

<sup>&</sup>lt;sup>18</sup> Source: https://www.governor.virginia.gov/newsroom/all-releases/2020/may/headline-856681-en.html.

<sup>&</sup>lt;sup>19</sup> Source: https://www.governor.virginia.gov/newsroom/all-releases/2020/june/headline-858266-en.html.

<sup>&</sup>lt;sup>20</sup> Source: https://www.governor.virginia.gov/newsroom/all-releases/2020/december/headline-886185-en.html.

### 2.2. COVID-19 Impact on Major Industries

As of the first quarter of 2020, total employment in GO Virginia Region One was 135,938.<sup>21</sup> Based on the two-digit industry level of the North American Industry Classification System (NAICS), the largest sector in the region was health care and social assistance, employing 20,500 workers. The next-largest sectors in the region were retail (18,115 workers), manufacturing (16,925), and accommodation and food services (11,211).

Table 2.1 summarizes the employment and GDP impact of the COVID-19 pandemic in Region One at the two-digit NAICS level. In this table, the first five industries represent the target industries for the region, which are:

- Manufacturing
- Professional, Scientific, and Technical Services
- Agriculture, Forestry, Fishing and Hunting
- Mining, Quarrying, and Oil and Gas Extraction
- Management of Companies and Enterprises

Chmura presents the COVID-19 impact for the second through fourth quarters of 2020, covering the initial decline and ensuing recovery of the regional economy. Available data indicate that in the second quarter of 2020, 11,584 jobs based in the region were lost, equivalent to 8.5% of the regional workforce in the first quarter of 2020. This represents a loss of \$242.9 million in regional GDP.

Two-Digit NAICS Industry	Q2 Job Change	Q2 GDP Impact (\$Million)	Q3 Job Change	Q3 GDP Impact (\$Million)	Q4 Job Change	Q4 GDP Impact (\$Million)
Manufacturing	-2,541	-\$66.5	-324	-\$25.4	330	\$10.6
Professional, Scientific, and Technical Services	-305	-\$5.4	-195	-\$4.6	107	\$2.2
Agriculture, Forestry, Fishing and Hunting	545	\$1.7	-41	\$0.0	-95	-\$0.7
Mining, Quarrying, and Oil and Gas Extraction	-667	-\$50.0	-39	-\$0.3	-31	-\$2.7
Management of Companies and Enterprises	-16	-\$0.3	-63	-\$1.3	7	\$0.1
Accommodation and Food Services	-3,089	-\$24.8	2,871	\$21.3	222	\$1.9
Health Care and Social Assistance	-1,465	-\$23.1	-216	-\$1.3	898	\$14.7
Administrative and Support and Waste Management and Remediation Services	-897	-\$10.2	-680	-\$9.2	363	\$4.7
Educational Services	-794	-\$11.8	-1,197	-\$16.8	-143	-\$2.1
Other Services (except Public Administration)	-540	-\$6.5	680	\$7.6	41	\$0.5
Arts, Entertainment, and Recreation	-460	-\$4.5	248	\$2.4	140	\$2.5
Construction	-418	-\$7.1	-44	-\$0.7	522	\$9.2
Information	-246	-\$3.8	-102	-\$2.7	32	\$0.5
Public Administration	-168	-\$2.4	806	\$17.0	-144	-\$2.9
Retail Trade	-161	-\$3.8	1,446	\$15.1	35	\$0.7
Transportation and Warehousing	-121	-\$2.7	-77	-\$2.1	340	\$5.4
Wholesale Trade	-109	-\$4.1	124	\$3.7	16	\$0.4

#### Table 2.1: Employment and GDP Impact from COVID-19 in GO Virginia Region One

<sup>21</sup> This employment number is based on the place of work, not the place of residence. This is the seasonally adjusted quarterly employment. Source: JobsEQ by Chmura.



Two-Digit NAICS Industry	Q2 Job Change	Q2 GDP Impact (\$Million)	Q3 Job Change	Q3 GDP Impact (\$Million)	Q4 Job Change	Q4 GDP Impact (\$Million)
Finance and Insurance	-94	-\$2.4	-93	-\$2.0	69	\$1.7
Real Estate and Rental and Leasing	-93	-\$20.1	-44	-\$6.1	35	\$5.6
Utilities	4	\$4.0	-75	-\$4.1	-2	-\$0.1
Unclassified	52	\$1.1	-27	-\$0.6	0	\$0.0
Total	-11,584	-\$242.9	2,956	-\$9.9	2,743	\$52.3

#### Table 2.1: Employment and GDP Impact from COVID-19 in GO Virginia Region One

Note: The first five industries in this table are the target industries for GO Virginia Region One

Source: Chmura and JobsEQ by Chmura

Not surprisingly, the industry impacted most in terms of employment is accommodation and food services, with a job loss of 3,089 in the second quarter of 2020, or 28% of the regional workforce. The health care and social assistance industry lost 1,465 jobs. Other regional industries such as administrative and support and waste management and remediation services, educational services, and other services (except public administration) also lost a significant number of jobs. On the other hand, some industries experienced limited impact in the second quarter of 2020, and industries such as utilities gained jobs in this quarter. Unlike most regions, the retail trade industry in Region One lost only a limited number of jobs in the second quarter of 2020. Industries such as grocery stores and general merchandise stores added jobs in the second and third quarters of 2020. For example, the largest grocery chain in the region, Food City, expanded its operations during that time frame.<sup>22</sup>

Of the five target industries in GO Virginia Region One, manufacturing lost 2,541 jobs in the second quarter of 2020, or 15% of the regional workforce in this industry. Mining lost 667 jobs, or 20% of the regional workforce. Professional, scientific, and technical services lost 305 jobs, or 7% of the regional workforce. The bright spot was the agriculture, forestry, fishing and hunting industry, which gained 545 jobs in the second quarter of 2020.

As the state and region entered different phases of reopening beginning in May, which continued over the summer and fall of 2020, GO Virginia Region One experienced a tepid economic recovery in the third quarter of 2020. Available data indicate that the region regained 2,956 jobs in this quarter, led by job gains in accommodation and food services, retail, public administration, and other services (except public administration). However, the educational services industry lost a significant number of jobs in this quarter, along with industries such as administrative and support and waste management and remediation services. Those job changes represent a loss of \$9.9 million in regional GDP during this quarter.<sup>23</sup>

For the five target industries in GO Virginia Region One, all of them lost jobs in the third quarter of 2020, led by the manufacturing industry (324 jobs lost) and followed by professional, scientific, and technical services (-195). Some industries, such as professional, scientific and technical services; and management of companies and enterprises avoided considerable job losses in the second quarter. But as the pandemic dragged on, the negative impact trickled down to those professional industries.

Upon entering the fourth quarter of 2020, there was a surge in COVID-19 infections across the country and Virginia. While regional employment recovery struggled in accommodation and food services; and retail trade industries, the regional

<sup>&</sup>lt;sup>23</sup> Please note that while preliminary regional data for the third quarter of 2020 are available via JobsEQ, they are estimates and are subject to revision.



<sup>&</sup>lt;sup>22</sup> Source: Bristol Herald Courier website, May 30, 2020. Found at https://heraldcourier.com/news/local/watch-now-food-city-distribution-center-works-to-keep-up-with-orders/article\_603d99c1-bd08-5227-acb7-f4830497647c.html.

economy added jobs in health care and social assistance, construction, administrative and support and waste management and remediation services, and transportation and warehousing. Chmura estimated that the regional economy added 2,743 jobs in the fourth quarter of 2020, for a GDP gain of \$52.3 million.

Of the five target industries in GO Virginia Region One, three are expected to add jobs in this quarter, led by manufacturing (330 job gains), professional, scientific, and technical services (+107); and management of companies and enterprises (+7). However, industries related to agriculture and mining lost some jobs in this quarter.

### 2.3. Growth Industries During the Pandemic

While COVID-19 negatively impacted a large number of regional industries in 2020, there were some industries that managed to expand their employment base despite the pandemic. In Table 2.2, Chmura identified industries that added jobs from the second to the fourth quarter of 2020, at the more detailed three-digit NAICS level.

Q2 Industries	Q2 Job Change	Q3 Industries	Q3 Job Change	Q4 Industries	Q4 Job Change
Animal Production and Aquaculture	385	Food Services and Drinking Places	2,770	Ambulatory Health Care Services	529
General Merchandise Stores	259	General Merchandise Stores	980	Social Assistance	378
Food and Beverage Stores	249	Transportation Equipment Manufacturing	893	Administrative and Support Services	363
Crop Production	200	Justice, Public Order, and Safety Activities	543	Heavy and Civil Engineering Construction	215
Building Material and Garden Equipment and Supplies Dealers	107	Personal and Laundry Services	485	Warehousing and Storage	212
Administration of Economic Programs	68	Motor Vehicle and Parts Dealers	262	Food Services and Drinking Places	181
Justice, Public Order, and Safety Activities	52	Clothing and Clothing Accessories Stores	256	Specialty Trade Contractors	174
Merchant Wholesalers, Nondurable Goods	26	Ambulatory Health Care Services	204	Construction of Buildings	133
Warehousing and Storage	18	Amusement, Gambling, and Recreation Industries	180	Professional, Scientific, and Technical Services	107
Pipeline Transportation	12	Construction of Buildings	139	Wood Product Manufacturing	88
Total	1,376	Total	6,712	Total	2,280

### Table 2.2: Growing Industries during COVID-19 in GO Virginia Region One

Source: Chmura and JobsEQ by Chmura

During the height of job losses in the second quarter of 2020, regional agriculture-related industries added jobs. For example, animal production and aquaculture added 385 jobs, while crop production added 200 jobs. The agriculture industry is less impacted by the pandemic initially as its operations are outdoors and it is easy to maintain social distancing. Food production is also classified as an essential industry and was not affected by the state stay-at-home orders. Some essential retail industries added jobs in this quarter, including food and beverage stores and general merchandise stores. Increased cleaning and the requirement of maintaining social distancing increased demand for workers in those industries.

In the third quarter of 2020, some of the regional key industries hit hardest by the pandemic experienced a quick recovery. As a result, industries with large job gains were in the food service, personal service, and leisure industry sectors. Examples were food services and drinking places (2,770 new jobs); personal and laundry services (+485); and amusement, gambling, and recreation industries (+180). Non-essential industries that were shutting down in April also registered strong job increases, including motor vehicle and parts dealers, and clothing and clothing accessories stores. In addition, transportation equipment manufacturing recovered many jobs lost in the second quarter. However, since many of those industries lost a



significant number of jobs in the second quarter, job gains in the third quarter of 2020 do not imply strong post-pandemic growth prospects for those industries.

In the fourth quarter of 2020, healthcare-related industries added a significant number of jobs, with ambulatory health care services adding 529 jobs and social assistance adding 378 jobs. Professional and business services industries also added many jobs, including administrative and support and waste management and remediation services (363 new jobs), and professional, scientific, and technical services (+107). Further, industries such as construction and warehousing added hundreds of jobs each. Growth in both construction and transportation is expected to continue, as research has found the pandemic may cause some permanent behavior changes in American consumers. For example, a McKinsey report found that the COVID-19 pandemic has accelerated the trend of consumers choosing e-commerce over traditional brick-and-mortar establishments.<sup>24</sup> That trend implies the demand for transportation and warehousing workers will sustain after the pandemic. While not included in Table 2.2, the packaging material manufacturing industries in the region generally maintained their workforce level during the pandemic. For example, regional employment in plastic packaging materials manufacturing (NAICS 3261) changed from 1,105 in the fourth quarter of 2019 to 1,062 one year later.<sup>25</sup> The packing industry benefited from the expansion of e-commerce during the pandemic and did not experience significant employment losses.

<sup>&</sup>lt;sup>25</sup> The region has a small paper packaging materials manufacturing industry (NAICS 3222). During the pandemic, employment in this industry changed from 38 in the fourth quarter of 2019 to 27 in the fourth quarter of 2020.



<sup>&</sup>lt;sup>24</sup> Source: McKinsey, found at https://www.mckinsey.com/business-functions/organization/our-insights/to-emerge-stronger-from-the-covid-19-crisiscompanies-should-start-reskilling-their-workforces

now#:~:text=To%20emerge%20stronger%20from%20the,start%20reskilling%20their%20workforces%20now&text=Adapting%20employees'%20skills% 20and%20roles,to%20building%20operating%2Dmodel%20resilience.

## 3. GO Virginia Region One Path to Recovery

### 3.1. Factors Influencing Recovery

To evaluate the recovery of different industries in GO Virginia Region One, Chmura conducted research using secondary studies and expert reports to understand the differing recovery paths for various industries. Implementation of vaccines and reaching herd immunity to COVID-19 are the determining factors in achieving a full economic recovery. Without medical intervention, social distancing policies will remain in place. Consumers will be cautious about traveling and visiting retail shops, food service establishments, and entertainment venues.

Before vaccines were ready for distribution, industries began recovering at different paces. In industries that require fewer person-to-person interactions, such as manufacturing and construction, jobs are easier to recover. Industries such as finance and insurance; and professional and business services can also expect relatively fast recoveries, as they are able to maintain their operations via remote work.<sup>26</sup> Employment in industries such as hospitality, food service, entertainment, and personal services will likely be on a slower recovery path without the wide availability of vaccines. Each of these industries involves close contact with customers.

Since the COVID-19 pandemic began, vaccine development has been on an accelerated schedule. The federal government has invested billions of dollars in this effort. In December 2020, both Pfizer-BioNTech and Moderna applied for an emergency use authorization for their vaccines, and were approved by the FDA. In March 2021, a third vaccine, developed by Johnson & Johnson, was also approved by the FDA for emergency use. In terms of vaccine distribution, Virginia adopted a phased approach, with Phase 1A covering healthcare personnel and residents of long-term care facilities; Phase 1B covering seniors, adults with medical conditions, and frontline essential workers; and Phase 1C covering other essential workers. Currently, Virginia is in Phase 1C of the vaccination plan and looks to expand eligibility to all adult residents on April 18, 2021.

From a long-term perspective, there will be some permanent changes in national and regional economies after the pandemic. Some studies predict the retail industry will be permanently changed. Based on a McKinsey report, the COVID-19 pandemic has accelerated the trend of consumers choosing e-commerce over traditional brick-and-mortar establishments.<sup>27</sup> Some of the behaviors that consumers have developed during the pandemic will persist, and this will affect retail and food service businesses in the future. On the other hand, the McKinsey report indicated there will be some long-term benefits for the manufacturing industry. Some manufacturing operations will be moving back to the United States, closer to consumer markets, at least in some capacity.

This recovery analysis assumes that the current pace of vaccinating residents will continue. Also included in this assumption is that variant strains of the virus will not require the manufacture of new vaccines that may possibly disrupt both vaccination efforts and the pace of economic recovery.

now#:~:text=To%20emerge%20stronger%20from%20the,start%20reskilling%20their%20workforces%20now&text=Adapting%20employees'%20skills% 20and%20roles,to%20building%20operating%2Dmodel%20resilience.



<sup>&</sup>lt;sup>26</sup> Source: https://www.inquirer.com/business/recovery-economy-zandi-moodys-virus-covid-19-jobs-prediction-20200423.html.

<sup>&</sup>lt;sup>27</sup> Source: McKinsey, at https://www.mckinsey.com/business-functions/organization/our-insights/to-emerge-stronger-from-the-covid-19-crisis-companiesshould-start-reskilling-their-workforces-

### 3.2. Regional Recovery Path

Figure 3.1 and Table 3.1 present the actual and projected employment recovery for GO Virginia Region One from 2020 to

2022. For overall regional employment, the lowest level was in the second quarter of 2020, at 91.0% of pre-pandemic levels of the fourth quarter of 2019. <sup>28</sup> Available data indicate that a significant number of jobs were added in the third quarter, led by accommodation and food services; and retail. Of those lost jobs, 24.0% were recovered in this quarter. Employment recovery continued in the fourth quarter of 2020, but slowed in the first quarter of 2021 as infections surged. It is estimated that 46.3% of lost jobs were recovered in the guarter of 2020, with regional employment reaching 130,053. Chmura



projects that the economic recovery will accelerate starting in the second quarter of 2021. The wide availability of vaccines will encourage confidence to travel and patronize consumer-related businesses. In addition, the Biden Administration's new relief plan will provide an extra boost for the economic recovery. By mid-year 2021, the region is projected to recover 66.0% of lost jobs due to the pandemic, with total employment reaching 132,481. The region is projected to recover all of the jobs lost during the pandemic by the second quarter of 2022.

Two-Digit NAICS Industry	2019Q4	2020Q2	2020Q4	2021Q2	2021Q4	2022Q2	2022Q4	%Change 2019Q4- 2022Q4
Accommodation and Food Services	11,277	8,123	11,216	11,212	11,241	11,235	11,196	-0.7%
Administrative and Support and Waste Management and Remediation Services	7,378	6,387	6,071	6,466	6,825	7,161	7,496	1.6%
Agriculture, Forestry, Fishing and Hunting	3,929	4,250	4,114	4,064	4,064	4,062	4,060	3.3%
Arts, Entertainment, and Recreation	1,703	1,120	1,508	1,583	1,652	1,714	1,770	3.9%
Construction	6,938	6,424	6,903	7,012	7,113	7,170	7,228	4.2%
Educational Services	11,121	10,246	8,906	9,471	10,071	10,582	11,093	-0.3%
Finance and Insurance	2,681	2,561	2,537	2,547	2,556	2,565	2,574	-4.0%
Health Care and Social Assistance	20,472	19,035	19,717	19,911	20,291	20,434	20,578	0.5%
Information	1,623	1,558	1,488	1,522	1,560	1,560	1,560	-3.9%
Management of Companies and Enterprises	1,402	1,343	1,286	1,306	1,356	1,360	1,364	-2.7%
Manufacturing	16,961	14,384	14,390	15,014	15,887	16,225	16,564	-2.3%
Mining, Quarrying, and Oil and Gas Extraction	3,316	2,616	2,545	2,703	3,035	3,051	3,067	-7.5%
Other Services (except Public Administration)	5,777	5,277	5,998	6,056	6,177	6,171	6,165	6.7%
Professional, Scientific, and Technical Services	4,071	3,807	3,719	3,806	3,859	3,877	3,895	-4.3%

#### Table 3.1: Projected Employment by Industry in GO Virginia Region One (2020-2022)

CHMURA

<sup>&</sup>lt;sup>28</sup> Please note that job losses started in March, during the first quarter of 2020.

Two-Digit NAICS Industry	2019Q4	2020Q2	2020Q4	2021Q2	2021Q4	2022Q2	2022Q4	%Change 2019Q4- 2022Q4
Public Administration	9,840	9,821	10,483	10,518	10,531	10,543	10,556	7.3%
Real Estate and Rental and Leasing	973	908	898	925	967	967	966	-0.7%
Retail Trade	18,526	17,955	19,436	19,389	19,306	19,270	19,279	4.1%
Transportation and Warehousing	4,219	4,208	4,471	4,520	4,523	4,527	4,530	7.4%
Unclassified	356	416	388	389	390	390	391	10.0%
Utilities	986	990	913	949	986	1,020	1,053	6.8%
Wholesale Trade	3,109	2,926	3,066	3,119	3,201	3,240	3,237	4.1%
Regional Total	136,659	124,354	130,053	132,481	135,590	137,123	138,619	1.4%

Table 3.1: Projected Employment by Industry in GO Virginia Region One (2020-2022)

Source: Chmura and JobsEQ by Chmura

Region One's recovery is slower than the national average. Chmura predicts that national employment will exceed its prepandemic level in the first quarter of 2022, but this analysis indicates a full recovery for Region One will not be achieved until the second quarter of 2022. One reason is that the regional recovery started slowly. The faster recovery experienced by some other regions in the nation in the second half of 2020 did not materialize in Region One. For example, the national economy recovered 40% of all jobs lost in the third quarter of 2020, while Region One only recovered 24%. In addition, national recovery was led by expansion in construction, transportation, and logistics. These industries do not have a strong presence in Region One, which may contribute to a slower recovery. However, it appears that the worst of the pandemic is over and that GO Virginia Region One is firmly on the path to recovery.



## 4. Occupational Impact During COVID-19

The COVID-19 pandemic has affected many occupations differently. When Virginia's stay-at-home order was in effect, nonessential businesses were ordered to close, and several jobs in retail and food services were lost, but occupations deemed essential were hardly impacted. Jobs that can be performed remotely, including many office positions, were also impacted to a lesser extent. On a positive note, the pandemic created growth opportunities for certain occupations, with an increased demand for delivery and transportation workers during the pandemic.

In this section, Chmura first analyzed the occupations impacted most by the COVID-19 pandemic. Chmura then highlighted the COVID-19 impact on occupations that can be performed remotely (telework occupations). To evaluate the occupational impact of COVID-19, Chmura utilized the estimated COVID-19 impact by industry, as analyzed in Section 2. Chmura then translated these industry impacts to occupational demand using the industry/occupation matrix for GO Virginia Region One.

### 4.1. Most-Impacted Occupations

Table 4.1 presents the top 20 occupations that were impacted most by the COVID-19 pandemic, based on the job changes in the second quarter of 2020. Many of these occupations were concentrated in industries that lost the most jobs due to COVID-19, such as accommodation and food services, manufacturing, and healthcare.

Q2 Job Change	Q3 Job Change	Q4 Job Change
-1,014	1,006	69
-450	425	36
-394	150	19
-259	-152	79
-231	229	18
-224	216	16
-190	4	57
-168	-1	99
-154	165	11
-152	-67	43
-148	411	18
-145	15	40
-144	7	5
-139	472	12
-126	-2	20
-126	37	5
-117	-51	137
-116	-48	72
-111	114	9
-109	-15	15
	Q2 Job Change           -1,014           -450           -394           -259           -231           -224           -190           -168           -152           -152           -148           -152           -148           -152           -148           -152           -148           -145           -145           -145           -145           -145           -146           -147           -148           -149           -148           -149           -149           -149           -149           -149           -140           -141           -111           -111           -109	Q2 Job Change         Q3 Job Change           -1,014         1,006           -450         425           -394         150           -259         -152           -224         216           -224         216           -190         4           -191         4           -192         -152           -193         -168           -194         -167           -154         -167           -155         -67           -154         411           -155         -67           -148         411           -154         -167           -155         -67           -144         7           -145         -151           -145         -151           -146         -126           -147         -22           -126         37           -1116         -48           -1117         -51           -1116         -48           -1111         114

#### Table 4.1: Twenty Occupations Impacted Most by COVID-19 in GO Virginia Region One

#### Table 4.1: Twenty Occupations Impacted Most by COVID-19 in GO Virginia Region One

Occupation (O*NET Six-Digit Occupation Level)	Q2 Job Change	Q3 Job Change	Q4 Job Change
Top 20 Total	-4,516	2,915	778

Source: Chmura and JobsEQ by Chmura

Many occupations related to Region One's restaurant businesses lost a large number of jobs during the pandemic. In the second quarter of 2020, the occupation of fast food and counter workers lost 1,014 jobs, followed by waiters and waitresses (-450). In addition, other occupations in food service lost a significant number of jobs, including restaurant cooks, fast food cooks, and first-line supervisors of food preparation and service workers. However, the majority of those jobs were recovered in the third quarter of 2020, without long-lasting effects on those workers. Similarly, some retail-related occupations, such as cashiers and retail salespersons, lost a significant number of jobs in the second quarter. However, many of those jobs were recovered in the third or fourth quarter.

Some top occupations impacted by the pandemic are manufacturing workers, including team assemblers (394 jobs lost in the second quarter of 2020); textile winding, twisting, and drawing out machine setters, operators, and tenders (-144); welders, cutters, solderers, and brazers (-126); and first-line supervisors of production and operating workers (-109). Those occupations experienced some recovery in the third and fourth quarters of 2020, but a large number of jobs in those occupations have yet to be recovered.

The top 20 list also includes business-related occupations such as customer service representatives, office clerks, and general and operations managers; health-related occupations such as registered nurses; and some maintenance and transportation workers. Those occupations experienced different degrees of recovery in the third and fourth quarters of 2020.

### 4.2. Impact on Telework Occupations

During the COVID-19 pandemic, to minimize workplace spread of the virus, many businesses allowed certain employees to work from home. This section focuses on the impact of COVID-19 on jobs that can be performed remotely, or telework occupations.

Academic research has a strong consensus on what type of jobs can be performed remotely. In a June 2020 analysis prepared by the Bureau of Labor Statistics, it was found that the following occupation groups include positions that allow for telework: management; business and financial; professional and related; and office and administrative support.<sup>29</sup> In a 2020 study published in the *Journal of Public Economics*, it was found that 37% of jobs in the United States can be performed at home. Using O\*NET standard occupational codes (SOC), this study found that the top occupational groups that could be managed from home included computer and mathematical (2-digit SOC code of 15); education, training, and library (25); legal (23); business and financial operations (13); management (11); arts, design, entertainment, sports, and media (27); office and administrative support (43); and architecture and engineering (17).<sup>30</sup>

<sup>&</sup>lt;sup>30</sup> Source: How Many Jobs Can Be Done at Home? Journal of Public Economics, September 2020. Available at: https://www.sciencedirect.com/science/article/pii/S0047272720300992.



<sup>&</sup>lt;sup>29</sup> Source: Ability to Work from Home: Evidence from Two Surveys and Implications for the Labor Market in the COVID-19 Pandemic, Monthly Labor Review, June 2020. Available at: https://www.jstor.org/stable/26931202?seq=4#metadata\_info\_tab\_contents.

In this analysis, Chmura used the telework definition developed by Chmura Economics & Analytics. The definition is consistent with academic literature and also considers the six-digit level of the O\*NET standard occupation code. The parameters for classifying telework occupations is discussed further in a pandemic-related blog post by Chmura.<sup>31</sup>

Table 4.2 presents the top 20 telework occupations that were impacted most by the COVID-19 pandemic, based on the job changes in the second quarter of 2020. Chmura includes all occupations that can be fully or partially performed remotely in this analysis. One example of a partial telework occupation is teachers. While many teaching jobs require face-to-face interaction with students, some can be done via online platforms. As a result, many teaching positions are classified as partial telework occupations.

Occupation (Six-Digit Occupation Level)	Q2 Job Change	Q3 Job Change	Q4 Job Change
Office Clerks, General	-190	4	57
General and Operations Managers	-145	15	40
Accountants and Auditors	-99	-49	17
Bookkeeping, Accounting, and Auditing Clerks	-97	-9	27
Receptionists and Information Clerks	-96	48	39
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	-92	-20	23
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	-84	-2	15
First-Line Supervisors of Office and Administrative Support Workers	-77	10	31
Personal Service Managers, All Other; Entertainment and Recreation Managers, Except Gambling; and Managers, All Other	-67	10	29
Sales Representatives of Services, Except Advertising, Insurance, Financial Services, and Travel	-67	-30	20
Substitute Teachers, Short-Term	-66	-103	-7
Secondary School Teachers, Except Special and Career/Technical Education	-60	-128	-11
Software Developers and Software Quality Assurance Analysts and Testers	-55	-38	13
Human Resources Specialists	-45	-6	11
Project Management Specialists and Business Operations Specialists, All Other	-43	-2	12
Bill and Account Collectors	-43	-38	12
Substance Abuse, Behavioral Disorder, and Mental Health Counselors	-38	4	35
Mechanical Engineers	-37	-9	3
Industrial Engineers	-36	-6	3
Market Research Analysts and Marketing Specialists	-34	-8	9
Top 20 Total	-1,473	-359	379

Table 4.2: Twenty	<b>Telework Occupations</b>	Impacted the Most b	y COVID-19 in GO	Virginia Region One
-------------------	-----------------------------	---------------------	------------------	---------------------

Source: Chmura and JobsEQ by Chmura

Not surprisingly, the telework occupations impacted the most in Region One are those related to business and office operations. Of the top 20 occupations in Table 4.2, thirteen are classified as business-related and/or office occupations. In

<sup>&</sup>lt;sup>31</sup> Source: Chmura Blog, available at: https://www.chmura.com/blog/2020/june/which-jobs-can-be-done-remotely-a-jobseq-analysis-of-remoteoccupations.



the second quarter of 2020, the occupation of office clerks lost 190 jobs, followed by general and operations managers (-145). In addition, other business occupations experienced sizable employment declines, including accountants and auditors; bookkeeping, accounting, and auditing clerks; receptionists and information clerks; and human resources specialists.

Some telework occupations impacted significantly by the pandemic are teachers, including substitute teachers (66 jobs lost in the second quarter of 2020); and secondary school teachers, except special and career/technical education (-60). In addition, several engineering-related occupations including software developers, mechanical engineers, and industrial engineers lost dozens of jobs.

Unlike occupations in food service and retail, reopening the state economy in the third quarter did not bring about a fast recovery for telework occupations. While restaurants recovered almost all lost jobs in the second half of 2020, many telework occupations continued to lose jobs, including teachers and accountants. Even for occupations which managed to add positions, the number of new jobs added in 2020 was only a fraction of total jobs lost. Workforce development organizations in Region One need to closely track job changes in those occupations during 2021. This will help to develop strategies in case some of those lost jobs become permanent.



## 5. Opportunity for Growth in Rural Areas

### 5.1. Rural Population Growth

COVID-19 has presented a unique opportunity for rural areas to grow their populations and attract highly skilled workers. GO Virginia Region One includes small metropolitan areas such as the Bristol metropolitan statistical area (MSA) and other rural counties. This region may benefit from attracting residents moving into the area—one trend initiated by COVID-19.

before Even the COVID-19 pandemic, the population trend of the past few years indicates a dispersal of populations from large metro areas to smaller metro areas and non-metro rural areas. For example, data from a Brookings Institution report indicated that from 2010 to 2015, population growth of major metro areas (those with a population over one million) averaged 1.0% per year. This is much higher than the 0.6% for other mid-sized or small metro areas. In contrast, the population in rural non-metro areas declined 0.1% per year. But that growth pattern has changed considerably in recent years. In the



past two years, population growth in mid-sized or small metro areas was slightly faster than in major metro areas, and population growth in non-metro areas turned positive.<sup>32</sup> As Figure 5.1 shows, major metro areas switched from net inmigration before 2015 to net out-migrations since then, while other metro areas saw a sharp increase in net in-migration. The large out-migration experienced by rural areas before 2015 has stopped, even though there were still small numbers of net out-migration.

The COVID-19 pandemic could accelerate such a trend for the foreseeable future. During the pandemic, there has been significant short-term migration in the country. A survey by Pew Research Center in June 2020 found that millions of Americans moved during the pandemic.<sup>33</sup> The survey found that the most important reason individuals moved was to reduce their risk of contracting the virus. Other reasons were to be with family and to alleviate financial hardship, including job loss and other money-related difficulties. In addition, the survey found that a higher percentage of adults with a bachelor's degree moved than those without one.<sup>34</sup> While the Pew survey did report geographic dispersion of COVID-19 migration, it is likely that densely populated large metropolitan areas and cities—especially those at the center of the pandemic—could become less attractive to movers, since avoiding virus infection is the most important reason to move.

Other reports suggest that some people who moved from larger cities to smaller cities or towns may stay there permanently. Gaining more space and avoiding large crowds is one reason, and high cost of living in major cities is another reason people

<sup>34</sup> Ibid.

<sup>&</sup>lt;sup>32</sup> Source: Brookings Institution website, https://www.brookings.edu/research/even-before-coronavirus-census-shows-u-s-cities-growth-was-stagnating/.

<sup>&</sup>lt;sup>33</sup> Source: Pew Research Center website at https://www.pewresearch.org/fact-tank/2020/07/06/about-a-fifth-of-u-s-adults-moved-due-to-covid-19-orknow-someone-who-did/.

may choose to move away from large cities permanently.<sup>35</sup> Finally, the widespread increase in remote work may also make those moves more permanent.<sup>36</sup> This remote work trend is especially strong for professional jobs that require a college education. The increase in remote work will allow skilled employees living in small metro or rural areas to access job opportunities in larger metro areas. This can either cause a temporary move during COVID-19 to become permanent, or can increase the appeal of small metro areas to post-COVID-19 college graduates entering the labor market.

GO Virginia Region One is well-positioned to attract highly educated individuals moving away from major metropolitan areas during and after the COVID-19 pandemic. First, the area has a low cost of living (COL). In the third quarter of 2020, the cost-of-living index for Region One was 89.2, which means it is 10.8% lower than the national average. In comparison, COL in nearby large metro areas was 97.7 for Charlotte, and 153.9 for Washington, DC. Combining this with the recent trend of migration away from larger metropolitan areas, the concerns about the long-lasting COVID-19 pandemic, and the anticipated wide adoption of telework by corporate America, there is an opportunity for Region One to attract highly skilled residents to Southwest Virginia.

Rural communities need to be prepared for new residents and develop strategies to attract them. High-quality internet is essential to compete for remote workers. In addition, investment in facilities such as co-working spaces for meetings and collaboration will make the area appealing to remote workers. Rural communities should also have a marketing plan that highlights the amenities and advantages of rural living—including outdoor recreation opportunities, low cost of living, quality of schools, and less traffic congestion.<sup>37</sup>

### 5.2. Economic Development Opportunities

From an economic development perspective, the COVID-19 pandemic also presents opportunities for various industries in rural areas.

COVID-19 will also bring about some changes in consumer behavior, indicating growth potential for certain industries. Based on a McKinsey report,<sup>38</sup> the pandemic has accelerated the trend of consumers choosing e-commerce over shopping at brick-and-mortar establishments. This will generate a need for logistics businesses such as warehousing and transportation. GO Virginia Region One is in the Interstate 81 (I-81) and I-77 corridor, with easy access to major metropolitan markets in North Carolina, Tennessee, and those on the East Coast. There is potential for locating distribution centers in the area to serve those markets. In addition, the region is located at the mid-point of highways linking coastal areas in the Southeast to the Midwest (via I-77), and southern states to the Northeast (via I-81). With growing e-commerce, there will be a strong need for businesses providing services to truckers along those corridors.

Rural tourism is a potential opportunity for Region One. Industry experts predict that there might be permanent behavior changes for consumers regarding travel after the pandemic. Regional travel and road trips will become more popular. Many consumers prefer destinations close to home that they can drive to, rather than fly to. Those trends suggest that rural tourism

now#:~:text=To%20emerge%20stronger%20from%20the,start%20reskilling%20their%20workforces%20now&text=Adapting%20employees'%20skills% 20and%20roles,to%20building%20operating%2Dmodel%20resilience.



<sup>&</sup>lt;sup>35</sup> Source: Washington Post website at https://www.washingtonpost.com/technology/2020/06/01/city-relocate-pandemic/.

<sup>&</sup>lt;sup>36</sup> Source: Gartner website at https://www.gartner.com/smarterwithgartner/9-future-of-work-trends-post-covid-19/.

<sup>&</sup>lt;sup>37</sup> Source: COVID-19 and Economic Opportunities for Rural America, Community Strategies for Attracting New Rural Residents, Rural Connections,

Utah State University. Available at: usu.edu/wrdc/files/news-publications/Albrecht-etal-RC-FA-WIN-2020.pdf.

<sup>&</sup>lt;sup>38</sup> Source: McKinsey, at https://www.mckinsey.com/business-functions/organization/our-insights/to-emerge-stronger-from-the-covid-19-crisis-companiesshould-start-reskilling-their-workforces-

destinations will become more popular.<sup>39</sup> There are many natural amenities in Region One, including mountains, rivers, and trails—making the region an excellent destination choice for drive-in visitors from surrounding states.

Advanced manufacturing is another area of growth for GO Virginia Region One. A McKinsey report indicated there will be some permanent benefits for these industries, as there will be some manufacturing capacities moving back to the United States to be close to consumer markets.<sup>40</sup> Of various advanced manufacturing industries, food manufacturing is promising for Region One. This was evidenced by the food production and supply industry being classified as essential during the pandemic. Also, the agricultural industry in Region One was one group that added jobs during the pandemic. Post-pandemic, it is expected that food supply and safety will continue to be very important for the United States.<sup>41</sup> More food will be produced and processed domestically.

Finally, with the potential relocation of new residents, especially teleworkers from large metropolitan areas, there are opportunities for regional consumer service-related businesses to grow. Many of those telework jobs are high-paying jobs. One study found that a quarter of individuals in the United States working from home during the pandemic made over \$100,000 a year.<sup>42</sup> That presents opportunities for rural towns to revitalize their "main streets" with the development of coffee shops, restaurants, and other consumer service businesses.

<sup>&</sup>lt;sup>42</sup> Source: Main Spotlight: How Rural Economies Can Leverage the Rise in Remote Work, available at <u>https://www.mainstreet.org/blogs/national-main-street-center/2020/06/18/covid-19-trend-series-rural-economies-great-opport.</u>



<sup>&</sup>lt;sup>39</sup> Source: Policy Implications of Coronavirus Crisis for Rural Development, available at: http://www.oecd.org/coronavirus/policy-responses/policyimplications-of-coronavirus-crisis-for-rural-development-6b9d189a/

<sup>&</sup>lt;sup>40</sup> Source: McKinsey, available at https://www.mckinsey.com/business-functions/organization/our-insights/to-emerge-stronger-from-the-covid-19-crisiscompanies-should-start-reskilling-their-workforces-

now#:~:text=To%20emerge%20stronger%20from%20the,start%20reskilling%20their%20workforces%20now&text=Adapting%20employees'%20skills% 20and%20roles,to%20building%20operating%2Dmodel%20resilience.

<sup>&</sup>lt;sup>41</sup> Source: Policy Implications of Coronavirus Crisis for Rural Development, available at http://www.oecd.org/coronavirus/policy-responses/policy-implications-of-coronavirus-crisis-for-rural-development-6b9d189a/.

Region One High School Graduation Rates (2021)						
Locality	Division Graduation Rate	On-Time State Graduation Rate	National Graduation Rate (2019)			
Bland County	98.5%					
Buchanan County	91.7%					
Carroll County	95.8%					
Dickenson County	90.1%					
Grayson County	99.2%					
Lee County	88.2%					
Russell County	90.3%					
Scott County	93.7%	0.20/	0.00/			
Smyth County	96.7%	93%	88%			
Tazewell County	92.3%					
Washington County	93.6%					
Wise County	98.4%					
Wythe County	93.7%					
Bristol City	86.1%					
Galax City	87.3%					
Norton City	96.8%					

## Appendix 3: Region One High School Graduation Rates (2021)

Source: Virginia Department of Education

Source: https://www.doe.virginia.gov/statistics\_reports/graduation\_completion/cohort\_reports/

### **Appendix 4: TEConomy Partners Region One Entrepreneurial Trends**

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 leader's priority actions to help strengthen the ecosystem. The following slides outline their assessment in Region One and recommended priority actions.

### Update on Entrepreneurial Trends: Phase I Analysis of Startup Activity & Firm Dynamics

## Data Sources used for Phase 1 Update of Entrepreneurial Trends of Startup Activity and Firm Dynamics in Your Region's Traded Industry Base

#### Two data sources used to provide a full depiction of entrepreneurial dynamics:

• The Quarterly Workforce Indicators (QWI) from U.S. Census is a longitudinal database with detailed data related to the job creation and other characteristics of firms, including by age groupings.

- Most Detailed Level of Geographic Coverage: County
- Coverage: Covers over 95% of U.S. private sector jobs (does not cover ag jobs, self-employment)
- Grouping of Employment by Age of Firms: 0-1 Years; 2-3 Years; 4-5 Years; 6-10 Years; 11+ Years
- Industry Coverage: 2-digit industry, which can define at a high-level traded industries
- But QWI does not track or provide information on individual firms
- All data is on a quarterly basis

• The Business Dynamics Research Consortium (BDRC) database is a time-series dataset that catalogues individual establishments by location, employment, sales, and industry from 1997 to 2017. The BDRC It is maintained by the University of Wisconsin

- Coverage: It compiles multiple data sets to track performance and growth for more than 144 million individual businesses across the United States.
- Provides extensive firm level data
- Able to identify firm by address
- Detailed industry coverage

### TECONOMY

- What is it? A more "static" look at where current traded industry jobs are found by different firm ages across all traded industries
- Why it matters? Makes the point that job retention activities with existing firms are an important component of a region's economic development strategy

Regional Employment Distribution by Age of Firm for Traded Industries



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

### Year-to-Year Job Change in Traded Industry Base by Age of Firm

- What is it? A more "dynamic" look at job changes by age of firm on a year-to-year basis in your region's traded industry base
- Why it matters? Reveals that the presence of new and younger firms in any year are a critical driver of job growth in a region -- even' as the previous slide shows' that they do not employ most workers in traded industries





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

## Employment Growth by Age of Firm over 2010-2020 Period

- What is it? Aggregates quarterly employment change from 2010/Q1 through 2020/Q2 for traded industries by age
- Why it matters? Offers a more consolidated view over a long period of time on sources of job growth by age of firm confirming the importance of new and younger firms for job growth at the region, state and national level





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

### BDRC Profile of Startup Activity and Business Formation Rates in Traded Industries

- What is it? Startups are all new non-branch firms in traded industries with their first recorded employment in a given year, while the Business Formation Rate compares the level of startups to the total number of all firms in traded industries.
- Why it matters? Together, the total number of Traded Industry Startups and Business Formation Rates allows a region to determine whether its startup activity is rising or declining, with the Business Formation Rates offering a normalized measure for a region to compare itself to other jurisdictions as well as within industries.



Note: 2018 excluded due to addition of a major source of firm data to underlying BDRC database that makes comparisons using 2018 not possible Source: Business Dynamics Research Consortium, Your-economy Time Series (YTS); TEConomy analysis.

### Year-by-Year New Business Formation Rates in Traded Industries

- What is it? Annual Business Formation Rates compares the level of startups to the total number of all firms in traded industries for region compared to state.
- Why it matters? Depicts the longer-term pattern of Business Formation Rates for the region in traded industries and how it has generally fallen over the past decade at both the region and state level.



Note: 2018 excluded due to addition of a major source of firm data to underlying BDRC database that makes comparisons using 2018 not possible Source: Business Dynamics Research Consortium, Your-economy Time Series (YTS); TEConomy analysis.

## Startup Density\* Across Region 1

- What is it? A mapping of where traded industry startups are located within a region over the 2018-2020 period based the specific geo-coordinates of the firm's address
- Why it matters? Reveals the areas within a region where startup activity is aggregating that can help inform how to advance place-based developments, such as incubators, accelerators, and co-working spaces, and other entrepreneurial services



Note: This map is based on geocoordinates of individual establishments, not an aggregation of establishment counts to a prescribed geography such as census tracts. The mapping software plots a visualization of startup spread by analyzing the clustering of coordinates in a multi-dimensional spatial context relative to each region. It is not possible to provide a numeric estimate of density (i.e. establishments per square mile) since calculation of spread is multi-dimensional and not fixed to a prescribed geographic boundary.

\*Startup density is relative to overall regional startup rates Source: Business Dynamics Research Consortium, Your-economy Time Series (YTS); TEConomy analysis.

### Profile of Startup Activity Within Key Regional Industry Clusters

- What is it? Tracks number of Startups and Business Formation Rates across a standardized set of Traded Industry Clusters for the region and statewide average in 2019 and 2020. The standardized clusters were informed by priority clusters set out across all GO VA regions (see separate handout for NAICS industries included in each Traded Industry Cluster).
- Why it matters? Allows a region to determine the trends and competitiveness of its startup activity across Traded Industry Clusters in the region with comparison to the statewide average business formation rate for each Traded Industry Cluster.

Major Traded Industry Cluster***	Startups, 2019	New Business Formation Rate, 2019		Startups,	New Business Formation Rate, 2020	
		Region	State	2020	Region	State
Agriculture & Food Processing	13	6.7%	4.1%	5	3.0%	5.5%
Business Services	15	2.1%	4.4%	26	4.2%	7.6%
Energy, Natural Resources, & Finished Products	6	2.3%	2.5%	11	5.1%	3.9%
Engineering, R&D, Testing & Technical Services	4	5.6%	4.2%	8	11.1%	7.4%
Financial & Insurance Services	7	3.6%	3.5%	8	2.9%	4.0%
Health Care Services	1	1.3%	4.2%	10	12.3%	15.8%
Information Technology & Communications Services	3	4.3%	3.6%	6	11.1%	8.0%
Life Sciences			2.7%	5	11.6%	6.1%
Manufacturing	1	0.3%	2.1%	7	2.7%	3.7%
Ship Building, Aerospace, & Defense			1.1%			0.9%
Transportation, Distribution and Logistics	8	1.9%	2.9%	22	5.9%	4.6%
All Other Traded Industries	7	1.3%	3.3%	18	3.9%	5.9%
Traded Industry Total	65	2.3%	3.6%	126	4.8%	6.2%

Source: Business Dynamics Research Consortium, Your-economy Time Series (YTS); TEConomy analysis.

9

## Additional Data Insights – Comparison of Region's New Business Formation and Overall Economic Performance of its Traded Industry Clusters

 What is it? The regional position in new business formation compares the region to the state for 2019 and 2020 for each of the Traded Industry Clusters, while the overall economic performance uses employment data from EMSI based on the Quarterly Census of Employment and Wages to track regional economic measures to provide a summary view – see next slide for how summary assessments were determined.

• Why it matters? Puts into context the performance of a region in its standardized Traded Industry Clusters in both entrepreneurial activity and overall economic performance.

Major Traded Industry Cluster	Regional Position in New Business Formation Relative to State Average*	Summary of Economic Development Position in Region, 2018-2020	Measures of Regional Economic Performance for overall Traded Industry Cluster			
			2020 Employment	2020 Location Quotient	Regional 2018-20 Percentage Job Growth	U.S. 2018-20Percentage Job Growth
Agriculture & Food Processing	Mixed	Mid-sized, Emerging Strength	2,033	0.83	3.2%	0.4%
Business Services	Below	Large, Emerging Strength	5,703	0.92	7.0%	0.3%
Energy, Natural Resources, & Finished Products	Above	Large, Declining Specialization	6,076	3.12	-8.3%	-3.3%
Engineering, R&D, Testing & Technical Services	Above	Small, Declining	486	0.33	-13.9%	3.8%
Financial & Insurance Services	Below	Small, Declining	493	0.20	-4.5%	0.0%
Health Care Services	Below	Mid-Sized, Declining	3,107	0.78	-2.5%	0.8%
Information Technology & Communications Services	Above	Small, Emerging Opportunity	704	0.28	4.7%	6.9%
Life Sciences	Mixed	Small, Emerging Opportunity	410	0.32	12.4%	4.6%
Manufacturing	Below	Large, Declining Specialization	11,806	1.97	-6.6%	-3.1%
Ship Building, Aerospace, & Defense	Below	Small, Emerging Strength	371	0.59	24.4%	4.7%
Transportation, Distribution and Logistics	Mixed	Mid-Sized, Declining	3,160	0.58	-4.7%	2.1%

\*See previous slide for data on new business formation by traded industry cluster

Source: Quarterly Census of Employment and Wages (QCEW) via Emsi; TEConomy analysis.
### Summary Assessment Typology

### Summary Assessment of Regional Position in New Business Formation

Summary Category	Comparison of Region to State Business Formation Rates for 2019 and 2020				
Above	Region higher in business formation rate than state in both 2019 and 2020				
On Par	Within 0.1-0.2 percentage points of state				
Mixed	Region higher in business formation rate than state in one year and lower in another year				
Below	Region lower in business formation rate than state				

TECONOMY

### Summary Assessment of Regional Economic Performance in Traded Industry Cluster

Summary Category by	Size of Traded Industry Cluster Employment Compared to Total Traded Industry Employment						
Size of Firm	Under 5%	Between 5% 15%	- Over 15%				
Large			✓				
Mid-Sized		~					
Small	✓						
Summary Category by	Regional Economic I	Measures					
Performance	Location Quotient Above 1.2	Positive Job Growth	Higher Job Growth Compared to National Average				
Current Strength	~	~	✓				
Growing Specialization	✓	~					
Declining Specialization	✓						
Emerging Strength		✓	~				
Emerging Opportunity		~					

Declining

11

#### Update on Entrepreneurial Trends: Phase II Analysis of Broader Innovation Ecosystem Measures

### Data Sources used for Phase 2 Update of Entrepreneurial Trends

- Academic R&D annual research expenditures from all sources by university reported by the National Science Foundation's Higher Education Research and Development Survey – no institutions in Region 1 report to HERD
- Patent Activity of Inventors Residing in Region annual patents generated by residents in the region from U.S. Patent & Trademark Office data collected by Derwent Innovation
- Venture Capital PitchBook database of private investor funding in emerging ventures, including pre-seed (accelerator and incubator funding), angel investor, seed and formal venture capital
- Federal Small Business Innovation Research (SBIR) Awards SBIR funding by federal agencies to small businesses in the region as reported from SBIR.gov maintained by the U.S. Small Business Administration
- SBA 7(a) Loan Activity Number of loans and loan amounts to small businesses in traded sector industries under SBA 7(a) financing vehicles as reported by the Small Business Administration

TECONOMY PARTNERS LLC

### Patents Invented in the Region

- What is it? Patents are a primary way in which inventors are able to protect their innovations in products from being replicated.
- Why it matters? By focusing on patents generated by residents we are able to more accurately gauge the region's capacity to generate technology innovations. The patent classes help identify specific areas of technology innovation taking place in a region.

Total Patents, 2010-20												
Region 1	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Patent Counts	21	26	18	37	38	26	22	26	25	22	23	284

Technology Class Area	Number of Patents, 2010-2020
magnets; inductances; transformers; selection of materials for their magnetic properties	32
mining or quarrying	14
acyclic or carbocyclic compounds	12
chairs (seats specially adapted for vehicles)	11
apparatus for physical training, gymnastics, swimming, climbing, or fencing; ball games	11
destructive distillation of carbonageous materials for production of gas, coke, tar, or similar materials	11
safety devices, transport, filling-up, rescue, ventilation, or draining in or of mines or tunnels	7
chemical or physical processes, e.g. catalysis, colloid chemistry; their relevant apparatus	6
aerials (microwave radiators for near-field therepeutic treatment)	5
electric switches; relays; selectors; emergency protective devices	5

Source: U.S. Patent & Trademark Office data from Derwent Innovation; TEConomy calculations.

- What is it? Venture capital represents equity investments made to emerging technology companies that offer high growth potential to generate sizable returns on that equity investment.
- Why it matters? Venture capital investments are a direct measure of innovation activity taking place in a region. Beyond the number of deals and investment taking place on an annual basis, it is important to also consider the stage at which investments are taking place to ensure a robust pipeline of emerging ventures being formed and gaining scale in a region.

### Venture Capital Activity

Region 1		2010	2011	2012 20	13 2014	2015	2016	2017	2018	2019	2020	Total
Deal Counts			1	2				1	1	1	2	8
Investment Tot	als (Millions)		\$0.2	\$0.2				\$0.5	\$0.0	\$1.9	\$10.0	\$12.8
Region 1	Pre-Seed	Angel	Seed	Early Stag	e Later Stage	Total						
Deal Counts	1	1	2	2	2	8						
Investment Totals (Mil)	\$0.1	\$0.5	\$4.9	\$7.2	\$0.2	\$12.8	3					

Source: PitchBook Data, Inc.; TEConomy calculations.

Federal Small Business Innovation Research (SBIR) Grants

Venture

Investments

Capital

- What is it? The federal Small Business Innovation Research (SBIR) program is a source of innovation funding for emerging technology companies. The SBIR program encourages small businesses to undertake technology commercialization by requiring federal agencies with extramural R&D budgets that exceed \$100 million to allocate 2.5 percent of their R&D budgets to the SBIR program. Each federal agency involved in the SBIR program then issues requests for proposals on topics reflecting their technology needs and interests, and competitively awards SBIR grants based on the technical merits and commercialization potential in a phased approach.
- Why it matters? SBIR awards are another direct measure of innovation activity taking place in a region by small businesses.

#### Small Business Innovation Research Awards

Region 1	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Award Counts	2			1	2					1	2	8
Award Amounts (Millions)	\$0.5			\$0.1	\$0.5					\$0.1	\$0.6	\$1.8

Source: www.SBIR.gov; TEConomy calculations.

- What is it? U.S. Small Business Administration (SBA) 7(a) loans are that federal agency's
  primary program for financial assistance to small businesses across the nation. These loans
  are typically issued by private lenders based on SBA guarantees of 75% to 85% with amounts
  not to exceed \$5 million. Small businesses must demonstrate good credit/mgmt./ability to
  repay. Proceeds can be used for a variety of purposes: startup costs, buying
  land/buildings/equipment, new construction, working capital, and seasonal lines of credit.
- Why it matters? SBA 7(a) loan activity is a measure of how active regional small businesses in traded sectors are in seeking to grow their operations. It also helps measures availability of capital to small businesses in the region since lending in the SBA 7(a) program often is through local lending sources.

#### Region 1: SBA 7(a) Loans and Loan Amounts, Cumulative Totals 2010-20

Industry Clusters	Co's Receiving Loans	Total No. of Loans	Total Loan Amounts (\$ Millions)	% of Total Loan Amounts
Total, All Traded Sector Industries	61	72	\$64.2	100%
Agriculture & Food Processing	5	7	\$3.7	5.8%
Business Services	2	3	\$0.1	0.2%
Energy, Natural Resources, & Finished Products	4	4	\$5.5	8.6%
Engineering, R&D, Testing & Technical Services	1	1	\$0.2	0.2%
Financial & Insurance Services	1	1	\$0.3	0.5%
Information Technology & Communications Services	1	1	\$0.1	0.1%
Life Sciences	2	3	\$0.9	1.4%
Manufacturing	6	7	\$3.3	5.1%
Transportation, Distribution and Logistics	10	12	\$1.3	2.0%
All Other Traded Sectors	29	33	\$48.9	76.2%

Source: TEConomy analysis of SBA loan data reports.

- What is it? By normalizing SBA 7(a) loans to traded sector small businesses by the number of traded sector establishments, it is possible to compare the level of lending activity in a region to that of the state and nation.
- Why it matters? High utilization of SBA 7(a) loans in a region suggests that the region has a growth-oriented traded sector small business base and/or good access to capital, while low utilization suggests a region's small businesses are not seeking to grow and/or are having trouble accessing capital.



Regional Utilization of SBA Loans vs. State & U.S. Totals

# Regional Use

of SBA Loans

Source: TEConomy analysis of SBA loan data reports.

### **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 second addition of the Growth and Diversification Plan published in 2019 included a review of eleven additional regional strategic plans or annual reports. In 2021, ten publications were reviewed in order to outline the commonalities of strengths, challenges, and opportunities among the region. Below is a listing of the strategic plans and publications reviewed for the 2021 Growth and Diversification Plan, which includes regional economic development strategic plans, annual reports, and publications within GO VA Region One.

		2017	2019	2021
Plan/Report	Website	Review	Review	Review
Region One Agricultural Action Plan (2019)	https://d24b79ed-2a7b-46a3-93bc- 4e4ce81c63cc.filesusr.com/ugd/1e2263_85			x
	dcf7898ed04e2abbc9109e4af1079d.pdf			
Appalachian Spring Strategic Plan (2014 Draft)		x		
Better Ecosystems for a Stronger Economy (2021)	https://d24b79ed-2a7b-46a3-93bc- 4e4ce81c63cc.filesusr.com/ugd/2fd65b_951 701050c3b4049aff569a881b29659.pdf			х
Blueprint for Entrepreneurial Growth and Economic Prosperity in Southwest Virginia (April 2012)	http://approject.org/resources/reports/#tab -blueprints	x		
Blueprint for Attracting and Sustaining Advanced Manufacturing in Southwest Virginia (April 2014)	http://approject.org/resources/reports/#tab -blueprints	х		
Cumberland Plateau PDC 2016 CEDS		x		
Cumberland Plateau PDC 2018 CEDS			x	
Cumberland Plateau PDC 2021 CEDS	https://www.cppdc.org/Reports/2021%20C EDS.pdf			x
e-Connectivity @ USDA Broadband Resources for Rural America	www.usda.gov/broadband		x	
Large-Scale Solar Development: A Playbook for Southwest Virginia	https://swvasolar.org/swva-solar-playbook/			x
LENOWISCO PDC 2015 CEDS		x		
LENOWISCO PDC 2020 CEDS	http://www.lenowisco.org/uploads/3/0/6/6 /30665363/2020_ceds.pdf			х
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		x		
Mount Rogers PDC 2018 CEDS	http://www.mrpdc.org/docs/MRPDC%2020 18%20CEDS%20Final.pdf		x	

Mount Rogers PDC SET – Stronger Economics Together (2016)	http://www.mrpdc.org/set.org/	х		
Mountain Association for Community Economic Development (MACED) Kentucky 2016-2020 Plan	http://www.maced.org/	х		
New River Mount Rogers Workforce		x		
New River Mount Rogers Workforce	https://ycwnewrivermtrogers.com/about-			
Development Board Strategic Plan (2017-2020)	us/strategic-plan/		х	
New River Mount Rogers Workforce	https://ycwnewrivermtrogers.com/about-			
Development Board Strategic Plan (2020-2024)	us/strategic-plan/			х
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/wp- content/uploads/2021/05/2021-SOAR- Blueprint.pdf	x		
Southwest Virginia Workforce Development Board - Local Strategic Plan (2016-2020)			x	
Southwest Virginia Workforce Development Board Local Strategic Plan (2020 – 2024)	https://vcwsouthwest.com/plan-policies- performance			х
Southwest Virginia Alliance For Manufacturing, Inc. 2017-2018 Strategic Plan		x		
Southwest Virginia Alliance For Manufacturing, Inc. 2018-2019 Strategic Plan			x	
Southwest Virginia Alliance for Manufacturing, Inc. Annual Report (2020-2021)	https://swvam.org/about/annual-reports/			x
SWVA Creative Economy Plan (Friends of SWVA)			x	
SWVA Cultural Heritage Foundation/Friends of SWVA Regional Impact Annual Report (2016)		x		
SWVA Cultural Heritage Foundation/Friends of SWVA Regional Impact Annual Report (2018- 2019)			x	
SWVA Cultural Heritage Foundation/Friends of	https://friendsofswva.org/about/annualrep			×
SWVA Regional Impact Annual Report (2020)	ort/			~
VA Rural Center – Partnership of the Center for				
Rural Virginia and the Council for Rural Virginia				
- Strategic Plan Assessment Report to the		х		
and Revitalization Commission (TIC)				
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 (2020)	https://www.vceda.us/wp- content/uploads/2021/03/VCEDA-2020- Annual-Report.pdf			x

VCEDA Annual Report (2018)	http://www.vaceda.org/wp- content/uploads/2019/03/Final-Annual- Report.pdf		х	
VCEDA Business Plan (2017)		х		
VCEDA Lead Generation Project Review - Sanford Holshouser (2014)		х		
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		х	
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 I	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.	<u>https://www.vdacs.vi</u> rginia.gov/agriculture <u>-afid-facility-</u> grants.shtml							
Cumberland Forest Community Fund	d								
Cumberland Forest Community Fund	Nature-based economic and community development projects that make tangible contributions toward local economies, community capacity, and environmental quality.	https://www.oxbowc enter.com/communit yfund							
Cumberland Plateau Regional Oppo	rtunity Program (CPROP)								
Cumberland Plateau Regional Opportunity Program	Reinvest program income revenues from the CPC Broadband project in economic development efforts in the four cities and twelve town of the Cumberland Platea Planning District Commission. Supports various public economic and community development activities that help to diversify the District economy.	https://www.cppdc.c om/	V						

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/fund ing-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.	<u>Power@eda/gov</u>	✓			
GO Virginia Region One (GO VA)						
Per Capita Competitive Economic Resilience & Recovery	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. Projects involving inter-regional collaboration. Projects must align with the industry targets and strategies in each collaborating region. Projects responding to the unprecedented economic conditions facing Virginia due to the near and long-term effects of the coronavirus on regional economies.	<u>www.goswva.org</u>				
Invest Appalachia						
Invest Appalachia	Supports economic diversification and market growth that is locally-rooted, inclusive, and sustainable, while increasing the region's overall capacity and investability.	https://www.investa ppalachia.org/				
Smyth County Foundation						
Smyth County Foundation	Identifies and supports qualified programs and projects that contribute to the improved physical, mental, and emotional health status of the citizens of Smyth County and the service area of the Smyth County Community Hospital.	<u>https://www.smythc</u> <u>cf.org/</u>	✓			
The Thompson Charitable Foundation	on					

The Thompson Charitable Foundation	Supports projects that seek to improve the quality of life for individuals and communities. Specifically supports non- profit organizations in the areas of health services and sciences, education, human services, and quality of life.	<u>https://thompsoncha</u> <u>ritable.org/</u>	✓
Twin County Community Foundation	า		
Twin County Community Foundation	Operates for the benefit of the counties of Carroll and Grayson, as well as the City of Galax. Assists qualified 501(c)3 organizations (or government entities) in projects that serve the local area in areas of health, general welfare, and education.	http://www.twincou ntycommunityfound ation.org/	✓
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.		V
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.	<u>http://www.rd.usda.</u> gov/contact-us/state- <u>offices/va</u>	✓
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.		$\checkmark$	
Rural Business Development Grants in Virginia	Competitive grant designed to support targeted technical assistance, training and other activities landing 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 Develop	ment 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.	<u>http://www.vaceda.</u> <u>org/</u>	√**	
Virginia Department of Agriculture and Consumer Services (VDACS)				
Virginia Food Access Investment Fund	Focuses on equity and justice in local food systems by investing in new or expanding food retailers that address food access issues in the Commonwealth	https://www.vdacs.vi rginia.gov/		
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.dked.com		
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.	ginia.gov		

Virginia Department of Energy (Virginia Energy)					
	Programs that prioritize sites based on				
Abandoned Mine Land Program	human, health, and safety and is charged		$\checkmark$		
	with reclaiming these sites.	https://www.dmme.			
	Work with local developers and leaders in	<u>virginia.gov/</u>	,		
Power Plus Grant	finding projects that create a positive and		$\checkmark$		
	economic community improvement.				
Virginia Economic Development Par	Virginia Economic Development Partnership (VEDP)				
	Virginia Economic Development				
	Partnership offers a range of incentives				
	and services to encourage business				
	expanding a husiness facility within the				
Virginia Economic Development	Commonwealth Incentives include				
Partnership	discretionary cash grants, infrastructure				
	development grants, tax credits and				
	exemptions, customized training,				
	technical support programs, and financing	<u>nttps://www.vedp.or</u>			
	assistance.	<u>g/</u>			
	Promote development and				
	characterization of sites to enhance				
	infrastructure and promote competitive				
Virginia Business Sites Ready Program	business environment. This program's				
(VBSRP)	goal is to identify, assess, and improve the				
	readiness of potential industrial sites,				
	which must contain a minimum of 100				
	contiguous, developable acres.				
Virginia Tobacco Region Revitalizatio	on Commission (TRRC)				
	Provides performance-based monetary				
Tabasaa Basian Onnortunity Fund	grants and loans to tobacco region				
	localities to assist in the creation of new				
(IROF)	new husiness attraction or existing				
	new business attraction of existing				
	business expansion.				
	business expansion. Provides access to capital in the tobacco				
	business expansion. Provides access to capital in the tobacco region while contributing to the				
Community & Business Lending (CBL)	business expansion. Provides access to capital in the tobacco region while contributing to the Commission's financial sustainability by				
Community & Business Lending (CBL)	business expansion. Provides access to capital in the tobacco region while contributing to the Commission's financial sustainability by providing low-interest loans to qualifying				
Community & Business Lending (CBL)	business expansion. Provides access to capital in the tobacco region while contributing to the Commission's financial sustainability by providing low-interest loans to qualifying applicants and projects.				
Community & Business Lending (CBL)	business expansion. Provides access to capital in the tobacco region while contributing to the Commission's financial sustainability by providing low-interest loans to qualifying applicants and projects. Provides tuition assistance to Community				
Community & Business Lending (CBL)	business expansion. Provides access to capital in the tobacco region while contributing to the Commission's financial sustainability by providing low-interest loans to qualifying applicants and projects. Provides tuition assistance to Community Colleges, the Higher Education Center in	https://www.revitaliz			
Community & Business Lending (CBL) Workforce Financial Aid	business expansion. Provides access to capital in the tobacco region while contributing to the Commission's financial sustainability by providing low-interest loans to qualifying applicants and projects. Provides tuition assistance to Community Colleges, the Higher Education Center in Southern and Southwest Virginia, along	https://www.revitaliz eva.org/			
Community & Business Lending (CBL) Workforce Financial Aid	business expansion. Provides access to capital in the tobacco region while contributing to the Commission's financial sustainability by providing low-interest loans to qualifying applicants and projects. Provides tuition assistance to Community Colleges, the Higher Education Center in Southern and Southwest Virginia, along with New College Institute, to serve	https://www.revitaliz eva.org/			
Community & Business Lending (CBL) Workforce Financial Aid	business expansion. Provides access to capital in the tobacco region while contributing to the Commission's financial sustainability by providing low-interest loans to qualifying applicants and projects. Provides tuition assistance to Community Colleges, the Higher Education Center in Southern and Southwest Virginia, along with New College Institute, to serve students residing in the tobacco region. Descinced to acsist projects of the	<u>https://www.revitaliz</u> <u>eva.org/</u>			
Community & Business Lending (CBL) Workforce Financial Aid	business expansion. Provides access to capital in the tobacco region while contributing to the Commission's financial sustainability by providing low-interest loans to qualifying applicants and projects. Provides tuition assistance to Community Colleges, the Higher Education Center in Southern and Southwest Virginia, along with New College Institute, to serve students residing in the tobacco region. Designed to assist residents of the tobacco region in obtaining loads of	<u>https://www.revitaliz</u> <u>eva.org/</u>			
Community & Business Lending (CBL) Workforce Financial Aid	business expansion. Provides access to capital in the tobacco region while contributing to the Commission's financial sustainability by providing low-interest loans to qualifying applicants and projects. Provides tuition assistance to Community Colleges, the Higher Education Center in Southern and Southwest Virginia, along with New College Institute, to serve students residing in the tobacco region. Designed to assist residents of the tobacco region in obtaining levels of education previously not promoted or	<u>https://www.revitaliz</u> <u>eva.org/</u>			
Community & Business Lending (CBL) Workforce Financial Aid	business expansion. Provides access to capital in the tobacco region while contributing to the Commission's financial sustainability by providing low-interest loans to qualifying applicants and projects. Provides tuition assistance to Community Colleges, the Higher Education Center in Southern and Southwest Virginia, along with New College Institute, to serve students residing in the tobacco region. Designed to assist residents of the tobacco region in obtaining levels of education previously not promoted, or available, in the region. Focuses on ways	<u>https://www.revitaliz</u> <u>eva.org/</u>			
Community & Business Lending (CBL) Workforce Financial Aid	business expansion. Provides access to capital in the tobacco region while contributing to the Commission's financial sustainability by providing low-interest loans to qualifying applicants and projects. Provides tuition assistance to Community Colleges, the Higher Education Center in Southern and Southwest Virginia, along with New College Institute, to serve students residing in the tobacco region. Designed to assist residents of the tobacco region in obtaining levels of education previously not promoted, or available, in the region. Focuses on ways to increase the education and skill levels	https://www.revitaliz eva.org/			
Community & Business Lending (CBL) Workforce Financial Aid Competitive Education Program	business expansion. Provides access to capital in the tobacco region while contributing to the Commission's financial sustainability by providing low-interest loans to qualifying applicants and projects. Provides tuition assistance to Community Colleges, the Higher Education Center in Southern and Southwest Virginia, along with New College Institute, to serve students residing in the tobacco region. Designed to assist residents of the tobacco region in obtaining levels of education previously not promoted, or available, in the region. Focuses on ways to increase the education and skill levels of the region's labor pools, as a method to	<u>https://www.revitaliz</u> <u>eva.org/</u>			
Community & Business Lending (CBL) Workforce Financial Aid Competitive Education Program	business expansion. Provides access to capital in the tobacco region while contributing to the Commission's financial sustainability by providing low-interest loans to qualifying applicants and projects. Provides tuition assistance to Community Colleges, the Higher Education Center in Southern and Southwest Virginia, along with New College Institute, to serve students residing in the tobacco region. Designed to assist residents of the tobacco region in obtaining levels of education previously not promoted, or available, in the region. Focuses on ways to increase the education and skill levels of the region's labor pools, as a method to attract and retain employers. Objectives	<u>https://www.revitaliz</u> <u>eva.org/</u>			
Community & Business Lending (CBL) Workforce Financial Aid Competitive Education Program	business expansion. Provides access to capital in the tobacco region while contributing to the Commission's financial sustainability by providing low-interest loans to qualifying applicants and projects. Provides tuition assistance to Community Colleges, the Higher Education Center in Southern and Southwest Virginia, along with New College Institute, to serve students residing in the tobacco region. Designed to assist residents of the tobacco region in obtaining levels of education previously not promoted, or available, in the region. Focuses on ways to increase the education and skill levels of the region's labor pools, as a method to attract and retain employers. Objectives for this funding are to enhance workforce	<u>https://www.revitaliz</u> <u>eva.org/</u>			
Community & Business Lending (CBL) Workforce Financial Aid Competitive Education Program	business expansion. Provides access to capital in the tobacco region while contributing to the Commission's financial sustainability by providing low-interest loans to qualifying applicants and projects. Provides tuition assistance to Community Colleges, the Higher Education Center in Southern and Southwest Virginia, along with New College Institute, to serve students residing in the tobacco region. Designed to assist residents of the tobacco region in obtaining levels of education previously not promoted, or available, in the region. Focuses on ways to increase the education and skill levels of the region's labor pools, as a method to attract and retain employers. Objectives for this funding are to enhance workforce readiness through support for proven	<u>https://www.revitaliz</u> <u>eva.org/</u>			
Community & Business Lending (CBL) Workforce Financial Aid Competitive Education Program	business expansion. Provides access to capital in the tobacco region while contributing to the Commission's financial sustainability by providing low-interest loans to qualifying applicants and projects. Provides tuition assistance to Community Colleges, the Higher Education Center in Southern and Southwest Virginia, along with New College Institute, to serve students residing in the tobacco region. Designed to assist residents of the tobacco region in obtaining levels of education previously not promoted, or available, in the region. Focuses on ways to increase the education and skill levels of the region's labor pools, as a method to attract and retain employers. Objectives for this funding are to enhance workforce readiness through support for proven and/or innovative programs, and to focus	<u>https://www.revitaliz</u> <u>eva.org/</u>			

	occupational demand with emphasis on post-secondary STEM-H and advanced manufacturing career skills.		
Talent Attraction Program (TAP)	Encourages recent graduates to live in Tobacco Region and work in targeted, hard-to-fill occupations in the Tobacco Region by providing up to \$12,000 annually in student loan repayment with a two-year commitment. Loan repayment awards may be renewed for another two years if eligible (maximum award of \$48,000).		
Southwest Virginia Program & Southern Virginia Program	Invests in projects promoting economic growth and development of the Southwest and Southern areas of the Commonwealth's Tobacco Region. Funding is made available to implement projects that advance Commission priorities and measurably expand the local and regional economy. Investment categories for the region programs are agribusiness, business development, sites and infrastructure, tourism, and broadband.		<b>√</b> ***
Wythe-Bland Foundation			
Wythe-Bland Foundation	Invests in projects that promote or improve the health and education of citizens and that directly serve citizens unable to afford basic and essential services in Wythe and Bland Counties.	http://www.wbfound ation.com/	~

\* 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.

\*\*\* Tobacco Region Revitalization Commission is eligible for GO Virginia match; however, enacted by the General Assembly of Virginia, this bill has a sunset provision through July 1, 2022.

### **Appendix 7: GO Virginia Regional Partners**

In order to demonstrate the region's supply of partners, organizations, and correlating initiatives, a list is included in this section of efforts that are operating at a regional level. These efforts are categorized by focus of specific strategies or industry targets; however, many organizations are working on multiple strategies and across multiple industry sectors.



- Wytheville Community College\*
   <u>https://www.wcc.vccs.edu/</u>
- Northeast State Technical Community College
   <u>https://www.northeaststate.edu/</u>
- New River Community College
   <u>https://www.nr.edu/</u>
- Southwest Virginia Higher Education Center
  - <u>https://www.swcenter.edu/</u>
- Southwest Virginia Workforce Development Board
  - https://vcwsouthwest.com/
- The New River/Mount Rogers Workforce Development Board
  - <u>https://vcwnewrivermtrogers.com/</u>
- United Way of Southwest Virginia
  - <u>https://unitedwayswva.org/</u>

### Innovation & Scale Up Support

- Opportunity SWVA
  - <u>http://www.opportunityswva.org/</u>
- People Incorporated
  - <u>https://www.peopleinc.net/</u>
- Small Business Development Centers
  - Mountain Empire Community College SBDC
    - <u>https://www.mecc.edu/sbdc/</u>
  - Southwest Virginia Community College SBDC
     <u>https://sw.edu/sbdc/</u>
  - Virginia Highlands Community College SBDC
    - <u>http://vhcc2.vhcc.edu/sbdc/</u>
    - Blueridge Crossroads SBDC
      - <u>https://brceda.org/</u>

### Virginia Community Capital

.

https://www.vacommunitycapital.org/

### Sites & Infrastructure

### Rural Industrial Facilities Authorities

- Lonesome Pine Regional Industrial Facilities Authority
  - Counties of Dickenson, Lee, Scott, Wise, and the City of Norton
  - <u>http://www.lenowisco.org/lonesome-pine-rifa.html</u>
- Cumberland Rural Industrial Facilities Authority
  - Counties of Buchanan, Tazewell, and Russell
  - Blue Ridge Crossroads Economic Development Authority
    - Counties of Carroll and Grayson, and the City of Galax
    - <u>https://brceda.org/</u>
- Virginia Economic Development Partnership
  - https://www.vedp.org/region/southwest-virginia-e-region

### **Advanced Manufacturing**

- Southwest Virginia Alliance for Manufacturing, Inc.
  - https://swvam.org/
- GENEDGE
  - https://genedge.org/

### Agriculture

- Appalachian Sustainable Development
  - https://www.asdevelop.org/
- Virginia Cooperative Extension
  - https://ext.vt.edu/

### Information Technology

- Appalachian Council for Innovation
  - https://inappalachia.com/appalachian-council-for-innovation/

### **Energy & Minerals**

- Southwest Virginia Energy Research & Development Authority
  - https://www.facebook.com/swvaenergy/?ref=page\_internal
- Virginia Department of Energy
  - https://dmme.virginia.gov/
- Solar Workgroup of Southwest Virginia
  - https://swvasolar.org/

### **Economic Development**

- Planning District Commissions
  - Cumberland Plateau Planning District Commission
    - https://www.cppdc.org/
  - LENOWISCO Planning District Commission
    - http://www.lenowisco.org/
  - Mount Rogers Planning District Commission
     https://www.mrpdc.org/
- Virginia Coalfield Economic Development Authority
  - https://www.vceda.us/
- Virginia's Industrial Advancement Alliance
  - http://viaalliance.org/
- InvestSWVA
  - https://www.investswva.org/

### **Creative Economy**

- Friends of Southwest Virginia
   https://friendsofswva.org/
- Virginia Tourism Corporation
  - https://www.virginia.org/

### Other Regional Initiatives

- •
- Appalachian Highlands https://appalachianhighlands.com/

### **Appendix 8: Region One Approved Projects**

With the collaboration of partners, GO Virginia Region One has funded 25 regional projects, many of which are connected to previously mentioned efforts. Region One has also participated in a Statewide Competitive project with Region Three, in which funding was awarded for the GO-TEC Phase II project. Since the 2019 release, the GO Virginia State Board authorized the use of \$14.66M in statewide competitive funds to respond to the unprecedented economic conditions facing Virginia due to the immediate and long-term effects of the coronavirus on regional economies. This initiative focused resources on economic resilience and recovery with staying true to the GO Virginia mission. Region One has funded a total of three Economic Resilience and Recovery (ERR) projects; these projects are reflected in the total number of projects funded by the GO Virginia State Board. Summaries of the funded projects are included in this section. Full applications of each project and completed analysis/reports can be found on the GO Virginia Region One website at www.goswva.org.

### Implementation (Per Capita) 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 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 funded \$99,406 in GO Virginia Region Two 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 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.

### William King Museum of Art: Digital Workforce Development

William King Museum of Art will expand and diversify their educational programming to fill a regional gap and offer training and certification in Adobe Certified (ACA) with instruction in aerial videography at the newly established Digital Art Lab. The Digital Lab contains state-of-the-art design software and 3-D fabrication tools. Programming will target high school students and adult learners including regional entrepreneurs. GO Virginia will specifically support the implementation of the programming for ACA certification, which includes training components in aerial videography.



This project was awarded \$70,910 in GO Virginia funds, which will cover expenses for salary and fringe benefits for a Digital Lab Technician for year one, Adobe Suite software, Rhino 6 Software, drones for aerial videography, and supplies. The total project match is \$75,735 provided by various sources.

### Lonesome Pine Regional Industrial Facilities Authority: Project Intersection

This project will develop and repurpose a former 188-acre mine site at the intersections of U.S. 23 and U.S. Alt 58 in Norton. Project Intersection will result in the development of a new regional industrial and technology site with four pad-ready sites with associated infrastructure, site-work, access roads, and amenities. The project is divided into three phases, of which GO Virginia will support Phase 3. This phase includes access to the pad ready sites and further development of Site#4 into pad ready status. The project will allow the site to be recertified from a Tier II to a Tier III.



The Lonesome Pine Regional Industrial Facilities Authority was awarded \$485,000 in GO Virginia funds, which will be used for construction and administration expenses. The total project match is \$1,417,000 provided by Abandoned Mine Lands (AML) Pilot Program.

### Blue Ridge Crossroads Economic Development Authority: Wildwood Natural Gas Extension



This project will provide gas access to a Virginia "Certified" Tier 4 site adjacent to Exit 19 on Interstate 77 in Carroll County. This natural gas service will allow the Blue Ridge Crossroads Economic Development Authority (BRCEDA) to competitively market the property for large scale advanced manufacturing projects. BRCEDA is partnering with Carrol and Grayson Counties, City of Galax, Mount Rogers Planning District

Commission, and the Tobacco Region Revitalization Commission (TRRC) to successfully complete the extension of the natural gas line.

BRCEDA was awarded \$527,600 in GO Virginia funds that will be used for contract services for Appalachian Natural Gas Distribution to design the natural gas line, obtain appropriate easements and/or permits, and construct the natural gas infrastructure. The project has a total match of \$320,684 provided by BRCEDA, TRRC, and Mount Rogers Planning District Commission.

### Appalachian Voices: Energy Storage & Electrification Manufacturing Jobs

The Energy Storage and Electrification Manufacturing Jobs project's goal is to create regional jobs in the energy storage and electrification manufacturing field and expand the local tax base by helping local manufacturers pivot their business while also working to attract an established national manufacturer to Region One. This implementation request is the result of Appalachian Voices' GO Virginia Region One

enhanced capacity building effort, Solar Playbook. The project involves two interconnected tracks. Track 1 is focused on providing targeted resources to four local manufacturers interested in expanding or pivoting to the energy storage and electrification fields. Track 2, which will be supported exclusively by match and leveraged funds, will identify and attract an energy storage and electrification company to locate to Region One.

Appalachian Voices was awarded \$486,366 in GO Virginia funding for contract services for a targeted technical analysis, SWOT analysis, Voice of Industry engagement process, and targeted technical assistance from GENEDGE. Funds will also support salary and fringe for staff, contract services for a project manager, and administrative fees for indirect expenses. The project has a total match of \$245,000 provided by the Cumberland Plateau Planning District Commission, Ascent Virginia, and business cost share.



### The University of Virginia's College at Wise: SWVA Startup

SWVA Startup is a coordinated effort of UVA Wise and Opportunity SWVA that seeks to ignite the spirit of entrepreneurship in Southwest Virginia, establishing entrepreneurship as a key economic development strategy in the region. It is designed to inspire collective action, impact policy, foster regional networks, promote diversity, build on the region's remarkable assets and seek new investment. In doing so, the project will coordinate the region's efforts to increase the rate of regional entrepreneurship, leverage existing programs and resources, and identify and address economic gaps. The effort will result in the launch of an accelerator program, development and distribution of programming with targets underrepresented individuals and the strengthening of community development capacity in support of small business and entrepreneurs through regional leadership development efforts.

The project was awarded \$290,850 in GO Virginia funds, which will be used to hire a regional ecosystem builder, administrative assistant, travel, office rental, equipment, prototype development, and administrative fees for indirect expenses. A total match of \$145,425 is committed from The University of Virginia's College at Wise Foundation, The University of Virginia's Strategic Investment Fund, AmeriCorps, and Tobacco Region Revitalization Commission.

### Enhanced Capacity Building (ECB) 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.

### InvestSWVA: Project Oasis

Project Oasis is a major initiative of InvestSWVA, a public-private partnership focused on driving economic sustainability in Region One around industry clusters. LENOWISCO Planning District Commission will work with InvestSWVA, Coalfield Strategies LLC, Virginia Department of Mines Minerals and Energy (DMME), and the Virginia Economic Development Partnership (VEDP) to locate the suitable sites within the region to attract data centers. This study will result in the development of tools that prioritize power and fiber network availability and the potential of mine pool water reclamation, a preliminary engineering feasibility and design, a market analysis, tenant research, and a concept design for possible data center sites.

This project was awarded \$50,000 in GO Virginia funds, which will be used for contract services related to site selection analysis, concept design, market analysis, and tenant research. A total match of \$50,000 is committed for the U.S. Department of Interior/U.S. Department of Energy.

### LENOWISCO Planning District Commission: Project Energizer

This project employs pumped storage hydro technology on a small, affordable scale and provides an opportunity for GO Virginia Region One to leverage its topography and be an innovator in renewable resources. The project seeks to answer two questions as it pertains to this small-scale, modular pumped storage hydropower technology that will lead to its potential application in Southwest Virginia. The first part is an identification of topographical attributes that are necessary to maximize the energy production of the technology and a review to determine locations in the region that can be used as a project site. Secondly, this project entails the testing of off-the-shelf components in this new pumped-storage application.

LENOWISCO was awarded \$50,000 in GO Virginia funding to procure contract services for location vetting, materials testing, analysis to be completed by Liberty University, and Department of Mines,

Minerals, and Energy hourly work to support location vetting. The project has a total match of \$50,000 in funds from Dominion Energy and the U.S. Department of Energy.

### The University of Virginia's College at Wise/Opportunity SWVA: Regional Entrepreneurship Initiative (REI)

Opportunity SWVA with UVA Wise will collaborate to develop the Launch SWVA Region One Strategy for Entrepreneurship and Innovation Investment. Opportunity SWVA is a coalition of 26 small business support and community development organizations, which is optimal for coordinating the region's entrepreneurial ecosystem. This Innovation and Investment plan will build upon the TEConomy report and develop an action plan to implement recommendations for Region One.

The project was awarded \$80,000 in GO Virginia funds, which will be utilized for consultant services and coordination of meetings. The total project match was \$40,000 provided through the Strategic Innovation Fund (SIF).

### Virginia Tech Virginia Cooperative Extension: SWVA Agricultural Opportunities Project Manager

This project will establish a regional project manager position focused on providing additional capacity to advance agribusiness opportunities in Region One. Partnering with Dickenson County, Grayson County, regional extension agents, education institutions, and other partners, the position will implement the recently completed Southwest Virginia Agricultural Action Plan, advance the core strategies in that plan and other related plans and specifically support work that grows the beef cattle, small grain, and craft beverage industries, among others.

Virginia Cooperative Extension was awarded \$100,000 in GO Virginia funding to support salary and benefits for the project manager over the two-year period. The project has a total match of \$100,000, provided by Dickenson County, Grayson County, and additional funding sources.

### United Way of Southwest Virginia: Ignite Tech Talent Phase 1 Discovery

With the ultimate goal to increase the number of graduates from high school, community college, and college ready to work in Information Technology (IT) jobs in Southwest Virginia, the Ignite Tech Talent initiative will develop and launch an ecosystem of IT talent through a foundational funnel model. GO Virginia will fund the first phase, which will be a one-year discovery phase that includes assessing capacity of schools to create pathways to careers, as well as student interest in IT careers. It will also baseline current employer activities and demand for specific skills, certifications and degrees for entry-level positions. After Phase I validation, Phase II implementation will develop IT internships for youth, community college students, and college students. It will also include necessary equipment needed to support IT curricula, resources for outreach, and professional development.

This project was awarded \$251,960 in GO Virginia funds, which will cover expenses for personnel, contract services, software for students and employers, administration, and programming for educational institutions. The total project match was \$251,961 provided through various sources.

### InvestSWVA: Project Thoroughbred

This is a regional agriculture growth strategy that builds on the area's rich history of growing small grains by capturing new value for Southwest Virginia's farmers through serving Virginia's growing craft beverage

industry. This project relies on significant partnerships between multiple parties to bring a \$2.5 million fully operational grain terminal to the area. The terminal will be the only facility of its kind for a 300-mile radius and will allow farmers to take advantage of better-margin specialty grains. In order to prepare for the opening of the terminal in the fall of 2022, InvestSWVA is seeking funding to build upstream farmer capacity by demonstrating the opportunity, executing variety trials to find the right crop mixes, and developing a land bank to help next generation farmers that will be attending Mountain Empire Community College's grain management program succeed.

InvestSWVA was awarded \$100,000 in GO Virginia funds that will be used for contract services for grain demonstration, variety trials, and land bank development, as well as supplies, rent/lease, and legal expenses. The project has a total match of \$100,000 provided by the Department of Mines, Minerals, and Energy.



### Lonesome Pine Regional Industrial Facilities Authority: Project Fuse

Project Fuse will develop a playbook for local economic developers to promote telework employment strategies in the Lonesome Pine RIFA territory, which includes Dickenson County, Lee County, City of Norton, Scott County, and Wise County. The Lonesome Pine RIFA will procure a consultant with economic development expertise and business relationships to develop an actional playbook that will provide strategic direction to economic developers as they assist current and prospective businesses explore teleworking as a way to maintain or grow their operations.

Lonesome Pine RIFA was awarded \$70,000 in GO Virginia funds, which will be used for contract services to procure a consultant and administrative fees for indirect expenses. The project has a total match of \$35,000 provided by the U.S. Economic Development Administration.

### Emory and Henry College: GROW(TH) The Business & Agriculture in SWVA

Emory and Henry College explore a partnership with Appalachian Sustainable Development, Southwest Virginia Cultural Center & Marketplace, Project Glade, and the Virginia Highlands Small Business Incubator to dedicate a space on campus to become an Innovation Hub for Agricultural Initiatives and support on-going ag-related entrepreneurship education. This project specifically requests funding to support a feasibility study to examine the possibilities through this partnership for enhancing profitability of the region's agricultural industry along existing value chains, be they in growing, distribution, manufacturing, or retail.

This project was awarded \$52,950 in GO Virginia funds, which will be used for contract services to procure a consultant to develop the feasibility study, hosting a conference, and a host website for sharing the study findings. The total project match was \$26,500 provided by Emory & Henry College.

### LENOWISCO Planning District Commission: Project Innovation

A project of the Southwest Virginia Energy Research & Development Authority, Project Innovation will commence the development of the Southwest Virginia Energy Park. The project entails two main planning activities to include location vetting for park activities and designing of Park governance for a startup and sustainability plan. This work will set the stage for the region to develop and implement the Park, attracting investment and new industries to the region.

This project was awarded \$100,000 in GO Virginia funds, which will be used to procure an administration team to determine the Park's governance model, assist with designing the Park, and develop a plan for a startup and long-term sustainability. The total project match was \$150,000 provided by the Economic Development Administration at the U.S. Department of Commerce.

### InvestSWVA: Project Veer

Project Veer will engage wind energy industry experts to perform a market analysis for Region One's manufacturers to participate in the onshore and offshore wind supply chain. The project will address both onshore and offshore wind supply chain needs, but will place a priority on the offshore wind industry. Give the pipeline of offshore wind projects spurring along the east coast, there is an opportunity for local companies to enter this market and for the region to create workforce to support the industry. This market analysis will serve as an economic development roadmap to assist the region in understanding the supply chain for renewable energy, where the gaps are, and how to close those gaps.

InvestSWVA was awarded \$49,750 in GO Virginia funds to contract with Xodus Group to complete the offshore and onshore wind analysis for Southwest Virginia's manufacturer's and will provide outreach stakeholder engagement facilitation. A total match of \$24,975 has been committed by Coalfield Strategies and Tobacco Region Revitalization Commission.

### **Statewide 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.

### Economic Resilience & Recovery (ERR) Projects

### Virginia's Industrial Advancement Alliance: Perseverance

Perseverance is an effort to assist manufacturing companies with reopening and continuing operations in a safe and efficient manner, while reducing the spread of COVID-19. Virginia's Industrial Advancement Alliance is proposing to assist small to midsize regional manufacturers by coordinating evaluation and diagnostic services to identify issues within their operations and recommend how to respond to new health and safety standards. The Manufacturing Technology Center (MTC) will provide expertise to conduct evaluations utilizing their E3 evaluation with the addition of a COVID-19 matrix. The project will complete 20 evaluations and reports with recommended solutions for the manufacturing companies.

The project was awarded \$100,000 in GO Virginia funds, which will cover expenses associated with utilizing MTC consultants to provide evaluation and diagnostic services to manufacturing employers. A total match of \$52,500 has ben committed to the project by various sources.

### Appalachian Sustainable Development: Farmer Pipeline: Maintaining the Supply Chain by Growing Farmers

In order to offset disruptions with market access, distribution, and the food supply chain caused by the COVID-19 pandemic, Appalachian Sustainable Development (ASD) is proposing to assist regional farmers by offering digital tools that may open up new market opportunities, increase product visibility, and enable the coordination of distribution and logistics. ASD will implement various agriculture online platforms to include a core platform to facilitate whole sale logistics at the Appalachian Harvest Food Hub, a training platform to provide education content to farmers, farmer efficiency technology to streamline productions processes and online marketplace to serve institutional buyers and direct-to-consumer sales, and project management software for metrics tracking, data collection, and accurate reporting. ASD will also conduct needs assessments to identify and connect critical suppliers of goods and services to reduce service and production disruptions.

ASD was awarded \$99,996 in GO Virginia funds, which will cover the digital training platforms, equipment, and project management. The project has a total match of \$51,076 provided by Appalachian Regional Commission.

### Appalachian Council for Innovation: COVID-19 Business Continuity & Resiliency

The Appalachian Council for Innovation (ACI) will partner with a number of regional partners to mitigate the economic impacts of COVID-19 and future disasters by assisting regional businesses with prevention

consulting on-site, consistent public messaging, education, development of best practices, and continuity/resilience assessment and gap analysis. The effort has the potential to decrease the financial burden on businesses, maintain and improve community health, and provide the business community with the tools necessary to respond to and recover from future events.

The project was awarded \$68,500 in GO Virginia funds, which will be used for salaries, travel, training, administration, program promotion, and contract services for the development of a COVID-19 Business Support Resources portal on the IN Appalachian web platform. The total match of \$34,500 is provided by ACI, GENEDGE, and the Cumberland Plateau Planning District Commission.

### Statewide Economic Resilience & Recovery (ERR) Projects

### GENEGE: Retooling Virginia's Manufacturers for Strategic Industries

GENEDGE will partner with the nine GO Virginia Regions and companies across the state to expand the capabilities of existing Virginia suppliers to develop sustainable revenues by providing strategically important products. GENEDGE is looking at a near term and mid-to-long term approach to address current critical shortages, placing emphasis on speed to supply. As part of this grant, GENEDGE will also implement mid-to-long-term approach that will emphasize building sustainability and resilience into the supply chain. The strategy is to develop a Virginia-based supply network that can provide sustainable impact and to build a planned capacity and response to be prepared to handle impacts of future recurrences.

GENEDGE was awarded \$2,950,000 in GO Virginia funds, which will cover program management, research, market research, and company services. The project has a total match of \$1,475,000 provided by various source.

### Appendix 9: Region One Community Survey Results

An online community survey was distributed in summer 2021 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 four weeks, 132 stakeholders responded to the survey, which included on average of 14 questions depending on responses. The majority of respondents are full-time employed residents of Region One. More than 84% 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 comments displayed are excerpts of responses received and not an exhaustive list.





# Q2: Are you currently considering re-locating out of the region?





# Q3: If you answered yes, please indicate the primary reason you are considering relocation.





Q4: What type of industries should economic developers attract to the region to add higher-paying jobs? (Select up to 3)





## Q5: How would you rate the following current economic conditions of the region?



### Q6: What key challenges do you feel your community must overcome to achieve economic advancement? (Select up to 3)





### Q7: What are the most important things that the Region 1 Council should consider to help the region address economic challenges? (Select up to 5)





## Q8: What are the most important tools and resources to build economic growth? (Select up to 3)





# Q9: What are the most effective ways to create more jobs, raise wages, and diversify the economy in the region? (Select up to 3)





### Q10: What is currently working at the state or regional level that needs to be continued, supported, and/or scaled to improve the regional economy?

- Support of small businesses and young entrepreneurs. Startup assistance for new businesses
- Technology industry growth. Opportunities for agribusinesses. Support for local food systems.
- Workforce development efforts to upskill current workforce. Developing the talent pipeline. Connecting workforce training programs to new and existing business needs
- Higher education, Community College Programs (G3, FastForward)
- Regional collaboration and communication, inclusivity, cooperation across jurisdictional boundaries
- Tourism, outdoor recreation infrastructure development, outdoor recreation business manufacturing support
- Last mile, affordable broadband
- Availability of project ready sites to compete and attract businesses to relocate or expand within the region
- · Funding opportunities made available to support local/regional initiatives. Federal and state funding opportunities.
- Availability of housing, childcare services, and health care
- Industry partners, support for non-profits, public-private partnerships



OTHER

### Q11: How had/has COVID-19 impacted your work?





# Q12: Did COVID-19 have an impact on your business?





# Q13: If a business owner, did you take advantage of any federal, state, or local COVID-19 assistance program?




# Q14: If you answered yes, please list what type of COVID-19 assistance programs.

- Small Business Administration Paycheck Protection Program (SBA PPP)
- Coronavirus Aid, Relief, and Economic Security Act (CARES Act)
- COVID-19 Economic Injury Disaster Loan (EIDL)
- Rebuild Virginia Grant Fund
- Livestock assistance programs
- Other local and state funding

### Appendix 10: 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 businessreadiness, 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 businessready 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 11: HUBZone Map



Source: <a href="https://maps.certify.sba.gov/hubzone/map#center=39.828200,-98.579500&zoom=5">https://maps.certify.sba.gov/hubzone/map#center=39.828200,-98.579500&zoom=5</a>

## Appendix 12: Virginia Opportunity Zones Map



Source: <u>https://www.dhcd.virginia.gov/opportunity-zones-oz</u>

# Appendix 13: Revision Log

Date	Name/Org.	<b>Revision Type</b>	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
October 5, 2021	K. Hunter/UVA Wise	Version 1 – 2021 GD Plan	Chmura update to quantitative data analysis
December 13, 2021	K. Hunter/UVA Wise	Version 2 – 2021 GD Plan	Incorporated Feedback from Regional Council
December 15, 2021	K. Hunter/UVA Wise	Version 3 – 2021 GD Plan	Original

Changes made to this document are captured in the chart below.









