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Economics & Analytics

The Economic Impact of Virginia Coalfield Economic Development Authority in Southwest Virginia and Virginia

Prepared for Virginia Coalfield Economic Development
Authority
December 12, 2018

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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 on a daily basis 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

Virginia Coalfield Economic Development Authority (VCEDA) was created in 1988 by the General Assembly of Virginia to enhance and diversify the economic base of the Southwest Virginia coal-producing region. This authority covers the counties of Buchanan, Dickenson, Lee, Russell, Scott, Tazewell, and Wise, and the city of Norton (VCEDA region). Since its establishment, VCEDA has helped many businesses to locate and expand in the region, creating much-needed jobs.¹

This study analyzes the economic impact of VCEDA in Southwest Virginia and Virginia.² The source of economic impact is the businesses attracted and retained through VCEDA.³ As of October 2017, VCEDA has helped many businesses to locate and expand. Those jobs generate sustained economic impact in the region, by employing thousands of workers and generating business sales and revenue. The total economic impact of VCEDA also includes the economic ripple effects from the direct impact. The ripple impact, categorized as indirect and induced impacts, measures the secondary benefits of VCEDA-attracted businesses. For example, those businesses will purchase from many firms in the region and state as suppliers (indirect impact). In addition, workers of those businesses will spend some of their income in places where they live, benefiting businesses such as retail stores, restaurants, and healthcare facilities (induced impact).

The direct impact is estimated based on data provided by VCEDA. Ripple effects are estimated with IMPLAN Pro⁴ software, which is a model often used by economists to measure the economic impact of events.

In addition to economic impact of VCEDA in terms of total revenue and jobs, Chmura analyzes the effect of VCEDA in increasing economic diversity, reducing regional unemployment, and lowering payments from government assistance programs in the region.

Jobs Attracted by VCEDA

Since its establishment in 1988 to October 2018, VCEDA has initiated 291 business attraction and expansion projects. Those projects include bringing new businesses to the region and helping existing businesses to expand. In total, VCEDA's efforts helped attract a total of 23,052 jobs (Table 1). The total investment of

¹ In 2011 and 2015, Chmura Economics & Analytics analyzed the economic impact of VCEDA. The results of those analyses can be found in: *The Economic Impact of the Coal Industry in Virginia*, December 2011; and *The Economic Impact of the Coal Industry in Virginia*, January 2015.

² Southwest Virginia includes the following Virginia localities: counties of Buchanan, Dickenson, Lee, Russell, Scott, Tazewell, Washington, and Wise, and the cities of Bristol and Norton. This area is larger than the VCEDA region, but is consistent with the 2011 and 2015 Chmura studies.

³ The one-time economic impact of capital expenditures and investment is not included in this analysis. This approach is consistent with the methodologies utilized in the 2011 and 2015 Chmura studies.

⁴ *IMPLAN Professional* is an economic impact assessment modeling system developed by IMPLAN Group that is often used by economists to build models that estimate the impact of economic changes on local economies.

these projects reached \$2.8 billion.⁵ All localities in the VCEDA region benefited from the job creation effort by VCEDA, with each locality adding more than one thousand jobs.

Table 1: VCEDA Projects and Job Creation by Locality

Locality	Number of Projects	Number of Jobs
Buchanan	34	2,703
Dickenson	28	2,003
Lee	20	1,460
Russell	51	5,975
Scott	34	2,816
Tazewell	69	3,295
Wise/Norton	53	4,474
Various Locations ⁶	2	326
VCEDA Total	291	23,052

Source: VCEDA

In addition to supporting job creation in Southwest Virginia, VCEDA also helps diversify the regional economy, which lays the foundation for sustained economic growth in the future. Challenged with the declining coal mining industry, VCEDA has attracted jobs in a wide range of advanced manufacturing and professional and business industries, including Tempur-Pedic, CGI, and AT&T Wireless. As Table 2 shows, 11,865 of all VCEDA-attracted jobs were in manufacturing, and 7,700 were in professional and business services (such as call centers). Tourism industries also grew based on support from VCEDA with many jobs generated in the trade and leisure sectors. Those efforts have reduced the regional economic reliance on the coal industry.

⁵ Those projects do not include VCEDA investment in site development or utility construction not involving third-party businesses. VCEDA initiated several infrastructure development projects, such as extending water-sewer lines, without permanent jobs attached. Those projects are excluded in this study

⁶ Two projects involved businesses that set up multiple sites in VCEDA region, but they did not provide job numbers for each site.

Table 2: VCEDA Projects and Job Creation by Industry

Industry Sector	Number of Businesses	Number of Jobs
Construction	2	253
Education & Health	13	581
Finance, Insurance, & Real Estate	2	20
Government	7	886
Information	5	292
Leisure	26	278
Manufacturing	147	11,865
Natural Resources	5	104
Other Services	6	170
Professional & Business Services	58	7,700
Trade (Wholesale & Retail)	14	571
Transportation, Warehousing, & Utility	6	332
Total	291	23,052

Source: VCEDA

Economic Impact of VCEDA

The economic impact of VCEDA is measured as a 2018 value, as jobs brought to the region by VCEDA are assumed to be permanent jobs.⁷ The 23,052 jobs in the VCEDA region will also support other businesses in Southwest Virginia and throughout the state due to the multiplier effect. For example, when a manufacturing firm expands, the firm will purchase materials and supplies in the region to support its operations (indirect impact). In addition, retail venues and restaurants in the region also see increased sales when employees of this firm spend their wages in local communities (induced impact).

The total annual economic impact (direct, indirect, and induced) of VCEDA is estimated to be \$6.9 billion in 2018 that supports 37,311 jobs in Southwest Virginia (Table 3). In terms of direct impact, the total revenue (or sales) of all businesses attracted by VCEDA is estimated to be \$5.1 billion, with associated direct employment of 23,052 in 2018. An additional indirect impact of \$1.2 billion and 8,022 jobs benefit other Southwest Virginia businesses that support VCEDA-attracted businesses. The number of jobs supported from the induced impact is estimated to be 6,238 with associated annual spending of \$685.1 million. In terms of multipliers, each dollar of sales in VCEDA-attracted businesses can generate 36 cents in additional economic value for the region (output multiplier), while each job attracted by VCEDA can support an additional 0.62 jobs in the region (employment multiplier).

⁷ It is possible that some of these jobs may be lost due to the recession or other economic forces. However, firm-specific data are not available to confirm if such is the case.

Table 3: Annual Economic Impact of VCEDA (2018)

		Direct	Indirect	Induced	Total
Southwest Virginia	Spending (\$Million)	\$5,067.0	\$1,160.3	\$685.1	\$6,912.3
	Employment	23,052	8,022	6,238	37,311
Virginia	Spending (\$Million)	\$5,067.0	\$1,692.0	\$1,159.3	\$7,918.2
	Employment	23,052	10,124	10,577	43,753

Note: Numbers may not sum due to rounding

Source: Chmura Economics & Analytics and IMPLAN Pro 2016

The total annual economic impact (direct, indirect, and induced) of VCEDA in Virginia is larger than the Southwest Virginia regional impact, as more businesses outside the region will also benefit from the VCEDA-attracted businesses. The total impact is estimated to be \$7.9 billion that can support 43,753 jobs in Virginia in 2018.⁸ The direct impact in Virginia is the same as that in Southwest Virginia, estimated at \$5.1 billion and 23,052 jobs. Indirect impacts of \$1.7 billion and 10,124 jobs are expected to benefit other Virginia businesses. The number of jobs supported due to the induced impact is 10,577 with associated annual spending of \$1.2 billion in 2018. In terms of multipliers, each dollar of sales in VCEDA-attracted businesses can generate 56 cents in additional economic value for the state (output multiplier), while each job attracted by VCEDA can support an additional 0.90 jobs in Virginia (employment multiplier).

Other Benefits of VCEDA

In addition to the economic impact generated by VCEDA in terms of total revenue and jobs, Chmura also analyzed the effect of VCEDA in enhancing economic diversity, reducing unemployment, and lowering payments from government-assistance programs in the VCEDA region.

Impact of VCEDA on Economic Diversity

According to Virginia law, one of the key missions of VCEDA is to enhance and diversify the economic base of Virginia's coal-producing region. As mentioned earlier, VCEDA has attracted businesses in a wide range of industries to the region, especially those in the manufacturing and professional and business services sectors. Those efforts have helped diversify the regional economy.

To quantify the effect of VCEDA-attracted jobs on regional economic diversity, Chmura first constructed an industry diversity measure with employment data from 1990 to 2018. Chmura then computed the diversity measure of the regional economy, excluding jobs brought to the region by VCEDA.⁹ In doing so, Chmura chose the Hachman diversity index to measure the economic diversity of the region. This index utilizes Virginia industry structure as a benchmark. The value of the diversity index varies between 0% and

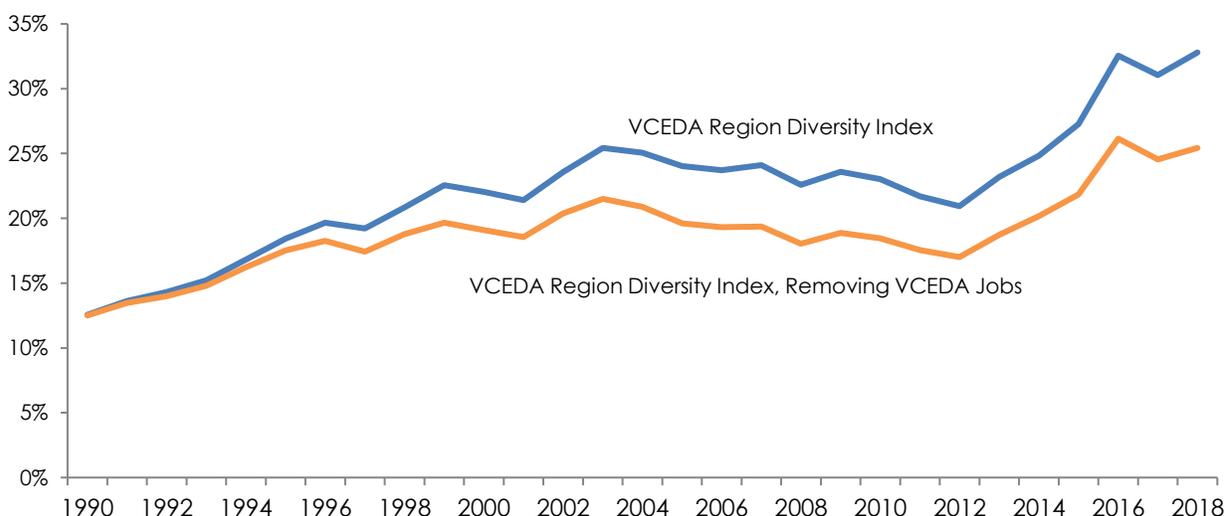
⁸ Please note that the Virginia impact is inclusive of the impact in Southwest Virginia.

⁹ This is the same methodology used in the previous Chmura studies, as well as the 2007 Virginia Tech Study: Economic Impact Analysis of the Virginia Coalfield Economic Development Authority. This historic analysis of economic diversity excludes those projects without a date.

100%, with a higher value representing a more diversified regional economy.¹⁰ The Hachman diversity index is calculated as the inverse of the sum of the weighted location quotients of all industries in the region.¹¹

Chmura's analysis shows that VCEDA has helped diversify the regional economy significantly since 1990. In 2018, the diversity index of the region was 32.8%, which is a dramatic improvement from 12.6% in 1990 (Figure 1). Diversity in the regional economy has increased since VCEDA was established. The pace of diversification has accelerated since 2012. If jobs related to VCEDA were removed, however, the diversity index in 2018 would fall to 25.4%.¹² This number is still higher than the diversity measure in the 1990s and 2000s, showing that the regional economy is diversifying even without VCEDA-attracted jobs. Even so, the efforts by VCEDA have greatly accelerated diversification in the region.

Figure 1: Industry Diversity Index



Note: 2018 data represent the first two quarters
 Source: VCEDA, JobsEQ, and Chmura

Impact of VCEDA on Unemployment Reduction

VCEDA-attracted jobs also help to reduce unemployment in the region. To estimate the effect of VCEDA-attracted jobs in reducing the regional unemployment rate, Chmura calculated the regional

¹⁰ The Virginia Tech study uses percentage of employment shares in the top one, three, and five industries in the region as the diversity measure. Those indexes do not capture the full spectrum of economic diversity. For example, if VCEDA attracted a firm in a new industry that was not in the top 5, the diversity measure would not change by the Virginia Tech measure. However, the new firm would help to diversify the regional economy.

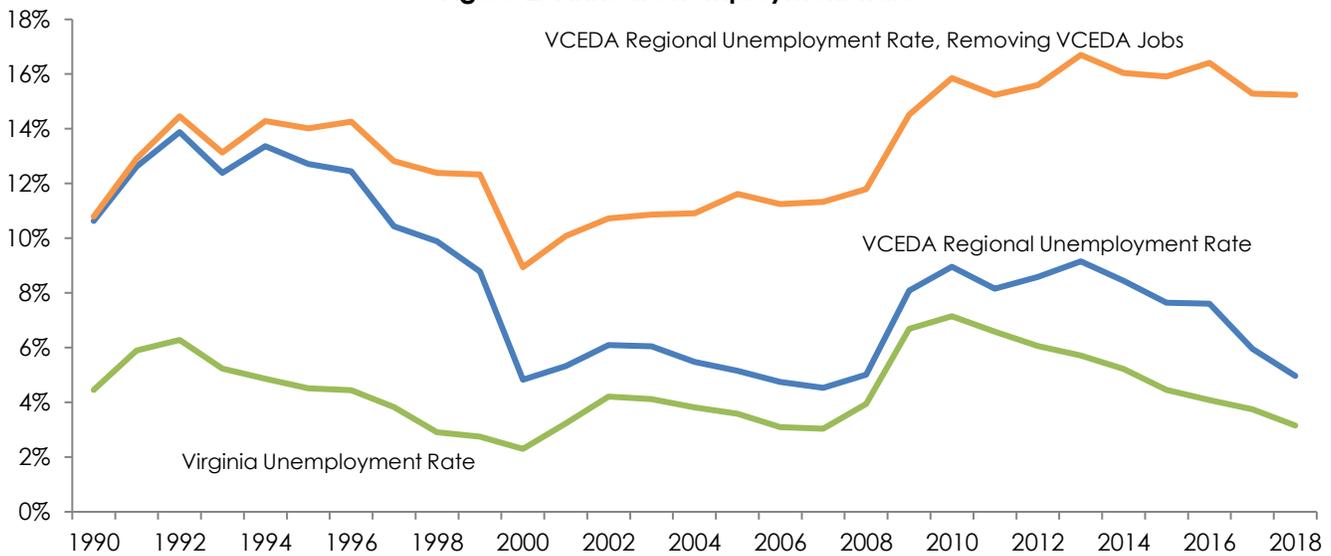
¹¹ Source: Economic Report to the Governor, State of Utah, by Hachman, 1995.

¹² In this analysis, Chmura assumed that VCEDA-attracted jobs have the same turnover rate as the industry average.

unemployment rate from 1990 to 2018, and the “would-be” unemployment rate of the region—removing jobs brought to the region by VCEDA.¹³

VCEDA has made considerable contributions in reducing the unemployment rate in the region (Figure 2). Based on the first eight months of data in 2018, the unemployment rate of the region was 5.0%, higher than the state average of 3.2%. In the 1990s, however, the region’s unemployment situation was much worse than the state average. For example, in 1990, shortly after VCEDA was established, the region’s unemployment rate was 10.6%, more than double the state average of 4.5%. The gap between the state and regional unemployment rates shrank drastically after 2000.

Figure 2: Annual Unemployment Rate



Note: 2018 data represent the first eight months
 Source: VCEDA, JobsEQ, and Chmura

Without jobs attracted to the region by VCEDA, the region’s unemployment rate would be much higher. For example, the estimate would put the 2018 unemployment rate at 15.3%, when jobs related to VCEDA were removed and added to regional unemployment.¹⁴ The effect of VCEDA in reducing regional unemployment became more significant especially after the recession of 2007-09. Without VCEDA-attracted jobs, the unemployment rate of the region would stay in the double digits from 2010 to 2018. However, the actual regional unemployment rate declined sharply, from 9.0% in 2010 to 5.0% in 2018.

Impact of VCEDA on Payment from Government Assistance Programs

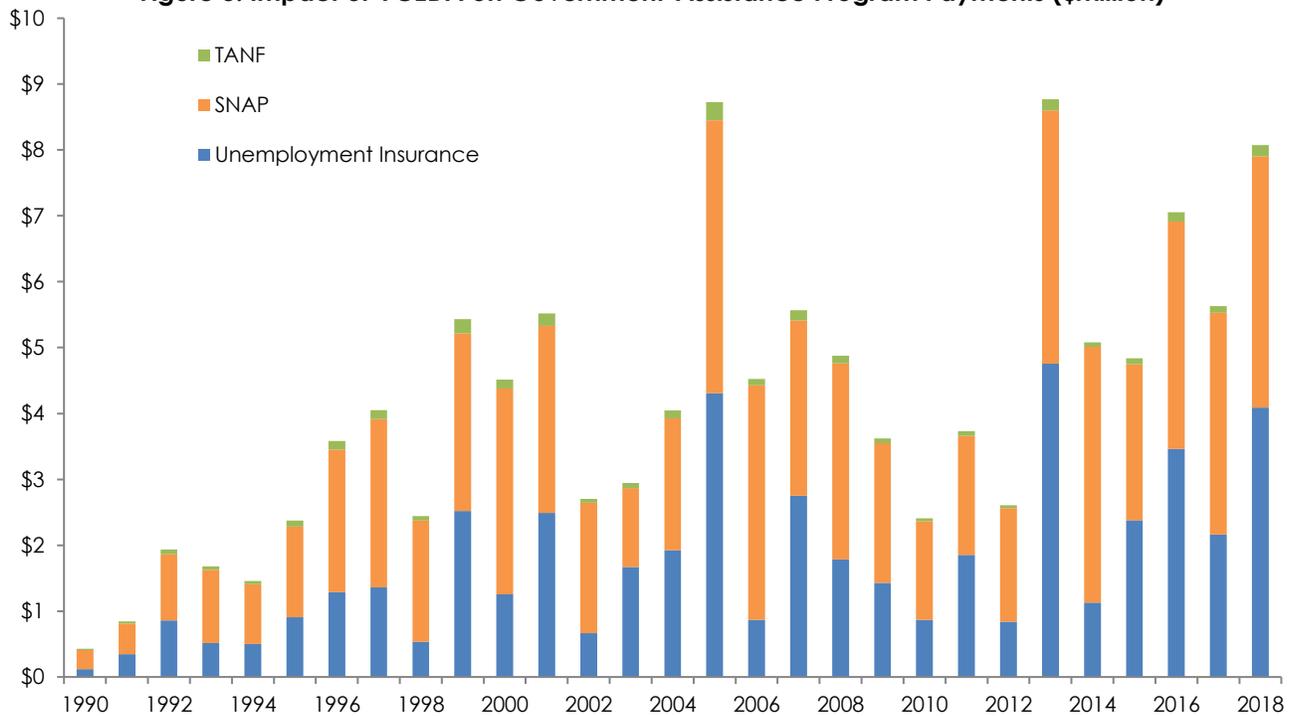
The jobs attracted by VCEDA will help residents earn wages and salaries. These jobs also can reduce payments from government-assistance programs to regional households. In this analysis, Chmura estimates

¹³ This is the same methodology used in the 2011 and 2015 Chmura studies, as well as in the 2007 Virginia Tech study.
¹⁴ In this estimate, Chmura took into consideration commuting and migration patterns, and did not add back estimated commuters and those who may move out of the region.

the effect of VCEDA on three types of government assistance programs: unemployment insurance (UI); Supplemental Nutrition Assistance Program (SNAP, formerly known as food stamps); and Temporary Assistance for Needy Families (TANF).¹⁵ In this exercise, Chmura takes a broad view of the impact of VCEDA on those programs and assumes that the number of VCEDA-attracted jobs will eventually reduce the number of unemployed individuals in the region.¹⁶

Figure 3 presents the potential increase in government-assistant program payments if VCEDA-attracted jobs are not available in the region. This only includes the impact for the state government of Virginia, as some of those jobs may be taken by residents in other states.

Figure 3: Impact of VCEDA on Government-Assistance Program Payments (\$Million)



Source: Virginia Department of Social Services & Chmura

For unemployment insurance programs, Chmura uses the following methodology. In 2018, for example, VCEDA was involved in various projects that brought 1,008 jobs to the region. Based on commuting patterns, it is estimated that 91% of those jobs would be taken by Virginia residents, resulting in 915 jobs for

¹⁵ SNAP and TANF are two popular programs for low-income families. These families can also benefit from programs such as housing assistance or Medicaid. Chmura did not include housing assistance due to the relatively small size of the program. Working-age adults are not eligible for the Medicaid program during the study period. As a result, the effect would be negligible.

¹⁶ It is possible that some VCEDA-attracted jobs will be filled by currently unemployed individuals, and some will be filled by people switching jobs from other businesses in the region. When those jobs are taken by job-switchers, it will set off a chain reaction as the businesses losing workers will look to replace the individuals who leave. The result is that unemployment in VCEDA region will eventually be reduced.

Virginians. If those workers were unemployed, they could apply for Virginia unemployment benefits. The latest data indicate that the average benefit is \$308.40 per week for a duration of 15.1 weeks.¹⁷ As a result, VCEDA-attracted jobs would save the state government \$4.3 million in 2018. From 1989 to 2018, VCEDA-attracted jobs would have saved Virginia \$49.9 million in cumulative unemployment insurance payments.

Low-income households are eligible for SNAP and TANF assistance programs, which is based on household income. The average annual wages for VCEDA-attracted jobs from 2014 to 2018 is about \$33,500¹⁸ while the current federal poverty line for a family of four is \$25,100.¹⁹ It is conceivable that for individuals receiving government assistance such as SNAP or TANF, VCEDA-attracted jobs will help them exit those two programs.

For the SNAP program, the challenge is to estimate how many Virginia residents might be able to leave the program due to new job opportunities created by VCEDA. Not every Virginia resident, even if they are unemployed, receives SNAP benefits—because they may live in a household where household income exceeds SNAP income criteria. Data from the United States Department of Agriculture indicate that in 2016, 89% of the country's unemployed participated in the SNAP program.²⁰ Using this as an assumption, of the 915 unemployed Virginia residents gaining new jobs due VCEDA in 2018, it is estimated that 814 individuals can leave the SNAP program.

The latest data from the Virginia Department of Social Services indicate that qualified households received a monthly payment of \$253.70 per month from the SNAP program in 2017,²¹ for a duration of 25.3 months.²² As a result, with VCEDA-attracted jobs in 2018, the state government could save \$3.9 million from reduced SNAP payments. From 1989 to 2018, VCEDA-attracted jobs would have saved Virginia \$66.9 million in SNAP program payments.

Fewer families receive TANF benefits when compared to SNAP, as the qualifying criteria for the TANF program are stricter. According to 2016 data from the Virginia Department of Social Services, a monthly average of 23,504 households received TANF benefits, compared with 391,523 households receiving SNAP benefits. Using this as a guide, Chmura estimated that for newly employed Virginia residents due to VCEDA-attracted jobs in 2018, an estimated 49 can leave the TANF program. The latest data indicate that

¹⁷ Those are the latest Virginia state average payment and duration amounts, based on the first nine months of 2018 data. Source: Bureau of Labor Statistics, <http://www.oui.doleta.gov/unemploy/claimssum.asp>.

¹⁸ Source: Chmura's calculation based on data from VCEDA.

¹⁹ Source: U.S. Department of Health and Human Services, <https://aspe.hhs.gov/poverty-guidelines>. The federal poverty line is published once a year.

²⁰ Source: Characteristics of Supplemental Nutrition Assistance Program Households: Fiscal Year 2016. U.S. Department of Agriculture, available at: <https://www.fns.usda.gov/snap/characteristics-supplemental-nutrition-assistance-program-households-fiscal-year-2016>.

²¹ Source: SNAP Case Load & Expenditures, Virginia Department of Social Services, available at: http://www.dss.virginia.gov/geninfo/annual_report/benefits/index.html?pagelD=1.

²² Source: Dynamics of Economic Well-Being: Participation in Government Programs, 2009-2012: Who Gets Assistance, U.S. Census, 2015. <https://www.census.gov/newsroom/press-releases/2015/cb15-97.html>.

in 2016, households in the TANF program received an average monthly cash payment of \$259.70,²³ for a duration of 14.2 months.²⁴ As a result, with jobs attracted by VCEDA, the state government could save \$0.2 million in 2018. From 1989 to 2018, VCEDA-attracted jobs would have saved Virginia \$3.1 million in SNAP program payments.

In summary, VCEDA-attracted jobs are estimated to have saved the Virginia government \$4.0 million per year from reduced payments of three government assistance programs. Total savings are \$119.9 million from 1989 to 2018.

²³ TANF Case Load & Payments, Virginia Department of Social Services, available at: http://www.dss.virginia.gov/geninfo/annual_report/benefits/index.html?pageID=3.

²⁴ Source: Dynamics of Economic Well-Being: Participation in Government Programs, 2009-2012: Who Gets Assistance, U.S. Census, 2015. <https://www.census.gov/newsroom/press-releases/2015/cb15-97.html>.

Appendix 1: Impact Study Glossary

IMPLAN Professional is an economic impact assessment modeling system. It allows the user to build economic models to estimate the impact of economic changes in states, counties, or communities. It was created in the 1970s by the Forestry Service and is widely used by economists to estimate the impact of specific event on the overall economy.

Input-Output Analysis—an examination of business-business and business-consumer economic relationships capturing all monetary transactions in a given period, allowing one to calculate the effects of a change in an economic activity on the entire economy (impact analysis).

Direct Impact—economic activity generated by a project or operation. For construction, this represents activity of the contractor; for operations, this represents activity by tenants of the property.

Overhead—construction inputs not provided by the contractor.

Indirect Impact—secondary economic activity that is generated by a project or operation. An example might be a new office building generating demand for parking garages.

Induced (Household) Impact—economic activity generated by household income resulting from the direct and indirect impact.

Multiplier—the cumulative impacts of a unit change in economic activity on the entire economy.