



# THE IMPACT OF DATA CENTERS ON THE STATE AND LOCAL ECONOMIES OF VIRGINIA

March 2022

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## About the Northern Virginia Technology Council

The Northern Virginia Technology Council (NVTC) is the trade association representing the National Capital Region's technology community. As one of the nation's largest technology councils, NVTC serves companies from all sectors of the industry, from small business and startups to Fortune 100 technology companies, as well as service providers, academic institutions, and nonprofit organizations. Nearly 500 entities make up the NVTC membership and look to the organization as a resource for networking and educational opportunities, peer-to-peer communities, policy advocacy, industry promotion, fostering of strategic relationships, and branding of the region as a major technology center.

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# Executive Summary

Data centers are the major drivers of investment in Virginia. According to information from the Virginia Economic Development Partnership (VEDP), in 2021, 62% (\$6.8 billion) of all the new investment announced by VEDP was from new and expanding data centers.

The investment in data centers in Virginia is also driving investment in businesses in the data center supply chain. Some specific examples of new investment in Virginia associated with data centers include:

- Aggreko establishing its North American data center headquarters in Loudoun County
- Anord Mardix adding a second manufacturing plant in Henrico County
- Hanley Energy establishing its U.S. headquarters and manufacturing plant in Ashburn
- Munters Group investing \$36 million in a new manufacturing facility in Botetourt County.<sup>1</sup>

The concentration of data centers in Virginia spurred the construction of the subsea cable landing in Virginia Beach that serves the MAREA, BRUSA and Dunant cables. Confluence Networks also plans the construction of Confluence-1, a festoon cable connecting Virginia Beach to New Jersey, South Carolina and Florida.

Virginia now has data centers located throughout the state, from Wise County and Harrisonburg in the Valley and Western Virginia, to Mecklenburg County in Southern Virginia, to Henrico County and Virginia Beach in Central and Coastal Virginia, to Loudoun County in Northern Virginia, and other localities.

Northern Virginia has the largest data center market in the United States. As of 2021, the data center inventory in Northern Virginia exceeds that of the next 5 largest markets combined. The compound annual rate of growth in data centers in Northern Virginia from 2014 to 2021 was 25%. In comparison, Dallas-Fort Worth, the next fastest growing area, had compound annual growth rate of 10%. From 2018 to 2021, the total data center capacity in Northern Virginia more than doubled.

Between 2001 and 2020, the average private sector employee of a Virginia data center saw their gross income go up 70% faster than the average private sector employee in Virginia. We estimate that in 2021, data center employed 5,550 Virginians, not counting construction workers building data centers in the state. Approximately 88% (4,920) were working in Northern Virginia, while six percent (330) worked in Southern Virginia, five percent (250) worked in Central and Coastal Virginia, and one percent (50) worked in the Valley and Western Virginia. The accumulated capital investment in data centers across the state amounts to \$126 billion in 2021 dollars. Virginia data centers spent \$5.4 billion in 2021 for operational expenses, the majority of which goes for staffing and power.

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<sup>1</sup><https://roanoke.org/2021/03/25/munters-group-ab-to-invest-36-million-in-botetourt-county/>

In 2021, the data centers in Virginia directly provided approximately:

- 5,550 operational jobs and 10,230 construction and manufacturing jobs
- \$1.6 billion in associated employee pay and benefits
- \$7.5 billion in economic output

Taking into account the economic ripple effects generated by that direct impact, the total impact on Virginia from data centers in 2021 was approximately:

- 45,460 supported jobs
- \$3.6 billion in associated employee pay and benefits
- \$15.3 billion in economic output

For every job inside a Virginia data center, there are 4.1 additional jobs that are supported in the rest of the Virginia economy.

We estimate that in 2021, data centers were directly and indirectly responsible for generating \$174 million in state revenue and \$1 billion local tax revenue in Virginia.

In 2020, the local benefit to cost ratios associated with the industry were:

- Loudoun County - for every \$1.00 in county expenditures that data centers were responsible for generating, it provided approximately \$13.20 in tax revenue
- Prince William County - for every \$1.00 in county expenditures that data centers were responsible for generating, it provided approximately \$13.50 in tax revenue

Because of the way that the state of Virginia subsidizes local education budgets, without data centers in Loudoun and Prince William counties, the State of Virginia would have to reallocate \$90.5 million in State education funding away from other Virginia localities to provide \$73 million in additional funding to Loudoun County, and \$17.5 million in additional funding to Prince William County.

In 2019, The Joint Legislative Audit and Review Commission (JLARC) published an evaluation of Virginia's data center and manufacturing incentive programs. JLARC found:

- 90% of the data center investment made by the companies that received the sales and use tax exemption would not have occurred in the state of Virginia without the incentive
- In 2017, the State took in \$1.09 in state tax revenue from data center related activity for every \$1 of potential state tax revenue that was exempted from qualifying data centers
- In 2016, the data center incentive was revenue neutral - it generated \$1 in additional state tax revenue for every \$1 of potential state tax revenue that it exempted
- From 2013 through 2017, on average, the State recovered 75 cents in state tax revenue for every one dollar of potential tax revenue exempted from qualifying data centers

Over 30 states have some type of incentive to attract data centers to their states. In the last couple of years, Arizona, Connecticut, Idaho, Maryland, North Dakota, Pennsylvania, and Utah have all enacted or expanded sales and use tax incentives targeting data centers for economic development.

# Data Centers Drive Investment in Virginia

Data centers are the major drivers of investment in Virginia. Investment in the state comes in the form of the construction and operation of the data centers themselves, plus investments in Virginia made by businesses that supply and support data centers in the state.

According to information from the Virginia Economic Development Partnership (VEDP),<sup>2</sup> in 2021, 62% (\$6.8 billion) of all of the new investment announced by VEDP was from new and expanding data centers. In 2020, data centers accounted for 81% (\$7.9 billion) of all of the new investment that VEDP announced. As explained below, we estimate that the accumulated capital investment of data centers in Virginia amounts to \$126 billion in 2021 dollars employing 5,550 operational workers.

The investment in data centers in Virginia is also driving investment in businesses in the data center supply chain. Some specific examples of new investment in Virginia associated with data centers include the \$36 million investment by Munters Group in a new manufacturing facility in Botetourt County for 200 employees.<sup>3</sup> Munters is a global manufacturer of air treatment and climate control equipment, including data center cooling systems. A significant portion of the cost of building a data center goes to the equipment needed for cooling. Michael Gantert, the president of Data Centers at Munters, stated that, "A move to the Roanoke region will allow for the expansion that is needed for the Data Centers business in the U.S."<sup>4</sup>

Another example of recent data center supply chain investment in Virginia is Hanley Energy establishing its U.S. headquarters and manufacturing plant in Ashburn.<sup>5</sup> The Irish company provides energy-monitoring products and services for data centers. The new plant and headquarters will employ 170 new workers by the end of 2022. Additionally, Aggreko established its North American data center headquarters in Loudoun County. The British company produces temporary power generation and energy storage equipment for data centers. Mike Clemson, the head of Aggreko's North American Data Center Division, stated, "The choice to establish a presence in Loudoun was a natural one, as virtually all of our data center customers are present in the Data Center Alley. The opportunity for us to grow our data center business in Loudoun County is tremendous."<sup>6</sup>

In Henrico County in 2019, Anord Mardix, a global power distribution and management manufacturer, spent almost a million dollars and added 51 new jobs for a second manufacturing plant. The power switchgear produced in the company's two manufacturing facilities is used in data centers and other critical infrastructure businesses. Chairman of the Henrico County Board of Supervisors, Tyrone Nelson, said, "Anord Mardix's success supports Henrico's growing data center cluster as they supply critical power infrastructure to data centers and mission-critical facilities across the globe."<sup>7</sup>

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<sup>2</sup> <https://announcements.vedp.org/Announcements/>

<sup>3</sup> <https://roanoke.org/2021/03/25/munters-group-ab-to-invest-36-million-in-botetourt-county/>

<sup>4</sup> <https://www.munters.com/en-us/media/news/global-news/2021/munters-relocates-in-the-us-to-expand-data-center-business/>

<sup>5</sup> Dan Swinhoe, "Hanley Energy expands in Virginia, will base US headquarters in Loudoun County," May 25, 2021.

<sup>6</sup> LoudounNow, "Aggreko to Establish Data Center Division Headquarters in Loudoun," July 10, 2021.

<sup>7</sup> <https://www.governor.virginia.gov/newsroom/all-releases/2019/january/headline-837867-en.html>



The concentration of data centers in Virginia spurred the construction of the subsea cable landing in Virginia Beach that serves the MAREA cable going to Spain, the BRUSA cable going to Puerto Rico and Brazil, and Google's Dunant cable going to France. Confluence Networks also plans the construction of Confluence-1, a festoon cable connecting Virginia Beach to New Jersey, South Carolina, and Florida. These subsea cables enable very high-speed connections which businesses will increasingly need for the deployment of "Industry 4.0" technologies. The Globalinx and Telxius data centers in Virginia Beach offer collocated connections to the MAREA and BRUSA cables. The DP Facilities data center in Wise County takes advantage of the MidAtlantic Broadband Communities Corporation fiber connections to the MAREA subsea cable. The data centers in Northern Virginia and the cable landing station in Virginia Beach attracted Facebook to invest in its large data center in Henrico County, midway between the two locations. Additionally, QTS has connected its large data center and network access point in Henrico County to the subsea cables in Virginia Beach, offering very low latency connections to Europe and Brazil.

The technology companies that own and operate data centers have made commitments to use renewable energy for their operations. In general, they prefer to have the renewable energy that they purchase generated close to their facilities. That has created a strong demand for investments in renewable energy in Virginia. Dominion Energy is spending over nine billion dollars to build a wind farm off Virginia Beach which will create thousands of jobs in Hampton Roads. And the Solar Energy Industries Association reports that 3,444 megawatts (MW) of solar generation capacity has been installed in Virginia.<sup>8</sup> Using general industry averages of one million dollars of investment per MW, the data centers in Virginia have helped to create demand for \$3.4 billion of investment in solar energy projects in the state.

Virginia's data center tax incentive programs are investments in not only in data centers, but also in the manufacturing, energy, and service businesses that are associated with them. The incentive sends a clear signal to potential investors worldwide that the business climate in Virginia is friendly to the high-tech industry.

This report quantifies the significant contribution that data centers make to the state of Virginia and its localities, and it puts Virginia's data center incentive program into the national context of the competition to attract data centers.

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<sup>8</sup> <https://www.seia.org/state-solar-policy/virginia-solar>

# Economic Profile of Data Centers in Virginia

Virginia now has data centers located throughout the state, from Wise County and Harrisonburg in the Valley and Western Virginia, to Mecklenburg County in Southern Virginia, to Henrico County and Virginia Beach in Central and Coastal Virginia, to Loudoun County in Northern Virginia, and other localities. This report shows how data centers in every part of the state make an important economic contribution to employment and taxes in every region and to the state as a whole. We begin with an update on the remarkable data center market in Northern Virginia.

## The Northern Virginia Data Center Market in 2021

Northern Virginia has the largest data center market in the United States. As of 2021, by our calculations based on data from CBRE<sup>9</sup> and JLL<sup>10</sup>, the data center inventory in Northern Virginia exceeds that of the next 5 largest markets (Chicago, Dallas-Fort Worth, Silicon Valley, New York/Tri-State Area, and Phoenix) combined.

Northern Virginia's place at the top of the data center market is a relatively recent development. In 2016, Northern Virginia had just supplanted the New York market as the largest data center market in the United States. In 2017, the New York/Tri-State area had fallen to become the sixth largest data center market. A 2011 report on the data center market in the United States contains only one mention of Virginia in four pages, "Reston, VA has excess supply and new construction will be minimal for a few years."<sup>11</sup> The locations that were highlighted as important in the industry were Chicago, Silicon Valley, Southern California, Phoenix, New York, St. Louis, Washington State, Boston, Minneapolis, Denver, and Charlotte. Regarding what has become the second largest data center market, the report says, "Dallas has excess capacity and growth remains slow."

This illustrates the fluid nature of the data center market and the speed with which market conditions can change in the industry. Once-hot markets can cool off rapidly. In 2017, the data center market in Phoenix had enormous growth, but between the second half of 2018 and the first half of 2019, Phoenix saw net outflows of 26.5 MW worth of tenants, which is almost the same amount that Northern Virginia added in the same period.<sup>12</sup> The computer equipment in data centers is replaced on average every three to five years. Should circumstances warrant it, data center tenants can move from one location to another and leave significant vacancies in colocation data centers.

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<sup>9</sup> CBRE, Digital Infrastructure in 2021: The Search for Land, Space, Power and Connectivity, North America Data Center Trends Report, H1 2021.

<sup>10</sup> JLL, H1 2021 Data Center Outlook.

<sup>11</sup> ESD (Environmental Systems Design, Inc.), 2011 Data Center Technical Market Report. February 2011.

<sup>12</sup> CBRE, Large Supply Pipeline Sets Stage for Market Growth in 2019 North American Data Center Report H1 2019.

Figure 1: Relative Sizes of Largest Data Center Markets (megawatts of power capacity) - 2021 <sup>13</sup>

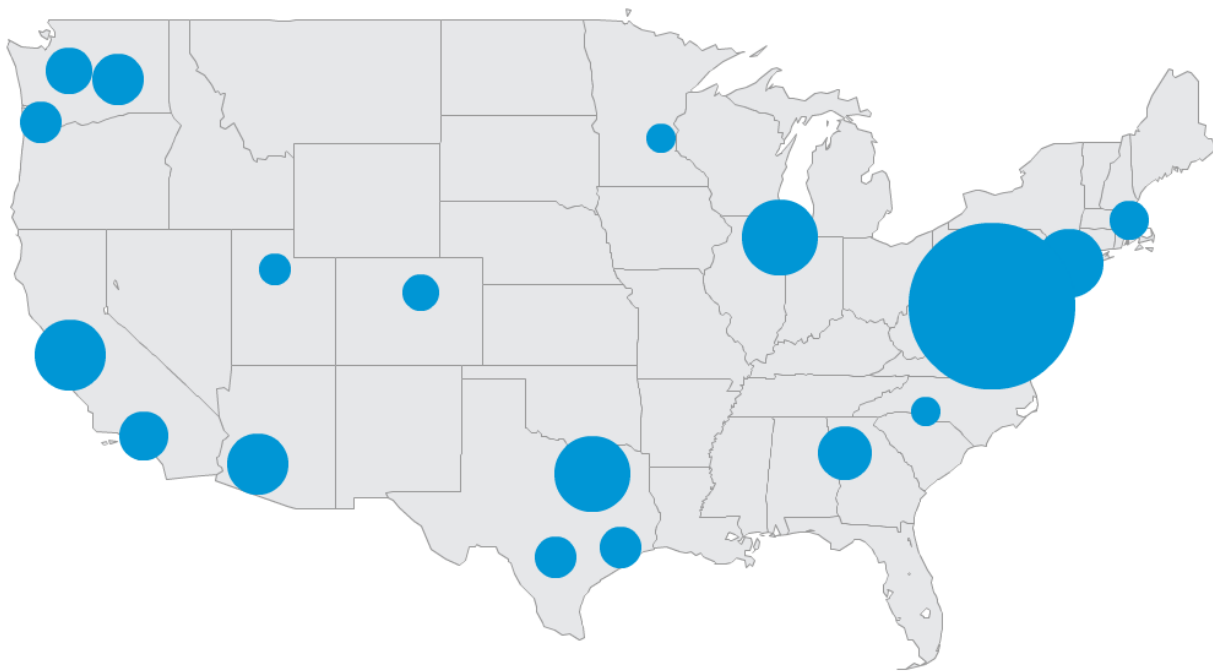


Figure 1 shows the 18 largest data center markets in the United States, as identified by CBRE and JLL. The area of each circle indicates the relative amount of power capacity in each market.

As large as the data center market in Northern Virginia is, the growth of data centers in Northern Virginia is even more impressive. We estimate that the compound annual rate of growth in data centers in Northern Virginia from 2014 to 2021 was 25%. <sup>14</sup> In comparison, Dallas-Fort Worth, a fast growing area, had a compound annual growth rate of 10%. <sup>15</sup> From 2018 to 2021, the total data center capacity in Northern Virginia more than doubled.

### Rapidly Rising Wages in Virginia Data Centers

One of the key characteristics of data centers is that they are extremely capital intensive. In other words, data centers employ a relatively small number of highly skilled and highly paid people to operate and maintain a large amount of expensive equipment. Therefore, it is useful to also look at trends in private sector average annual wages in the industry.

Between 2001 and 2020 the average annual private sector wage in the data processing and hosting industry in Virginia grew from \$61,117 to \$134,308 – a 120% increase. <sup>16</sup>

<sup>13</sup> Mangum Economics estimates based on 2021 data from CBRE and JLL.

<sup>14</sup> Mangum Economics estimates based on data from CBRE and JLL.

<sup>15</sup> Mangum Economics estimates based on data from CBRE and JLL.

<sup>16</sup> Data Source: U.S. Bureau of Labor Statistics.

In comparison, over the same period average private wages across all industries in Virginia went from \$36,525 to \$62,250 – an increase of 70%.<sup>17</sup> In other words, over the 19-year period, the average private sector employee of a Virginia data center saw their gross income go up 70% faster than the average private sector employee in Virginia.

This combination of growing investment and rapidly rising wages make data centers one of Virginia's highest performing industries and an important (and growing) contributor to a strong and robust state economy. Moreover, in a state such as Virginia where roughly two-thirds of state revenue comes from personal income tax, high growth/high wage industries such as data centers also play a disproportionate role in ensuring the health of the State's budget.

## **The Regional Distribution of Data Center Investment in Virginia**

As impressive as the data center market in Northern Virginia is, in this section, we describe how data center investment is distributed across the state. In this report the method that we use to identify data center investment is different than we have used for previous editions of this report for NVTTC. This time we use detailed information on the specific identity, exact location, and size of data centers in Virginia. Using a proprietary data center cost model that we built and validated based on information from various industry sources, we translate data center size information into estimates of employment, local capital investment, and operating costs. We have used this model in projects across the United States.

For the purpose of this report, we have divided the state of Virginia into four regions: Northern Virginia, Central and Coastal Virginia, The Valley and Western Virginia, and Southern Virginia. Figure 2 shows the way we have defined these regions by locality. To identify these four regions, we started with the eight regions identified by the Weldon Cooper Center Demographics Research Group that are based on "communities' shared demographic, social, economic, and geographic characteristics."<sup>18</sup> We then grouped the eight demographic regions into four regions of data center investment that have different catalysts for data center development. Data center development in Northern Virginia is motivated by the existing bulk of data center development in the area, as well as proximity to the federal government and tech companies in the area. Development in Central and Coastal Virginia is significantly due to proximity to the subsea cable landing station in Virginia Beach and to the major terrestrial fiber route running from Northern Virginia south to Raleigh, North Carolina. Data center development in Southern Virginia has the security advantages provided by distance from major population centers while still being centrally located on the East Coast of the United States. For the Valley and Western Virginia, data center development can continue to occur fostered by a robust fiber network and access to geothermally-cooled water.<sup>19</sup>

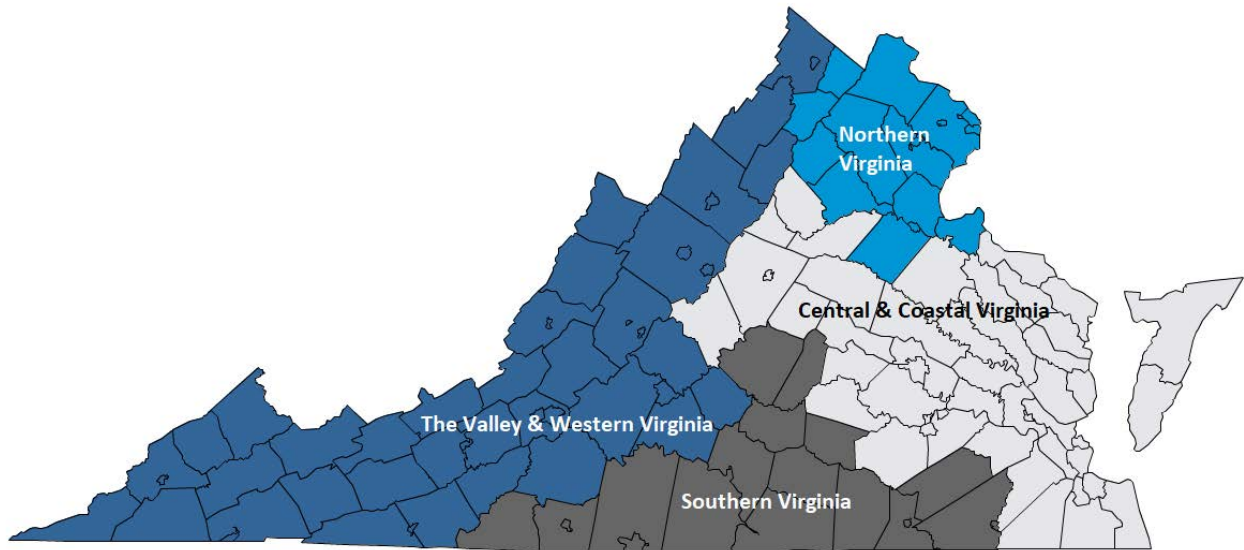
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<sup>17</sup> Data Source: U.S. Bureau of Labor Statistics.

<sup>18</sup> <https://demographics.coopercenter.org/virginia-regions>

<sup>19</sup> <https://www.investswva.org/project-oasis>

Figure 2: Four Sub-State Regions



We estimate that in 2021, 5,550 Virginians were employed in data centers, not counting construction workers building data centers in the state. Approximately 88% (4,920) worked in Northern Virginia, while six percent (330) worked in Southern Virginia, five percent (250) worked in Central and Coastal Virginia, and one per (50) worked in the Valley and Western Virginia. A review of job listings posted online by data center operators shows active job openings in all four regions of the state. Data center employment should continue to increase throughout the state into the future.

Additionally, we estimate that the accumulated capital investment in data centers across the state amounts to \$126 billion in 2021 dollars. We estimate that Virginia data centers spent \$5.4 billion in 2021 for operational expenses, the majority of which was spent for staffing and power.

# The Impact of Data Centers on Virginia State and Local Economies

The construction and ongoing operation of data centers in Virginia have large, broad effects across the state economy. In this section, we estimate the statewide economic impact that data centers have on Virginia, as well as in each of the four sub-state regions detailed earlier. To empirically evaluate the statewide and regional economic impact attributable to data centers, we employ a commonly used regional economic impact model called IMPLAN.<sup>20</sup>

Regional economic impact modeling measures the ripple effects that an expenditure generates as it makes its way through the economy. Spending by data centers in Virginia has a direct economic impact on the state and regional economy in terms of people hired as data center employees, employee pay and benefits, and economic activity in the region for utilities, construction, and equipment. That direct spending by the data centers creates the first ripple of economic activity.

As data center employees and businesses (like construction contractors for data centers, power companies that supply data centers, and data center equipment suppliers) spend the money that they were paid by data center companies, they create another indirect ripple of economic activity that is part of the second-round effects of data center activity.

In addition to the economic effects in the Virginia state and local economies of the data center-to-other business transactions, there are also the second-round economic effects associated with data center employee-to-business transactions that ripple through local economies. These effects occur when data center employees buy groceries; pay rent; go out for dinner, entertainment, or other recreation; pay for schooling in Virginia; or make other local purchases. Additionally, there are the second-round economic effects of business-to-business transactions between the direct vendors to data centers and their suppliers.

The total impact is simply the sum of the first round direct and second round impacts. These categories of impact are then further defined in terms of employment (the jobs that are created), labor income (the pay and benefits associated with those jobs), and economic output (the total amount of economic activity that is created in the economy).

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<sup>20</sup> IMPLAN is produced by IMPLAN Group, LLC.

There are many Virginia businesses that are part of the data center supply chain. To illustrate some of the types of companies located in Virginia that benefit from data centers in Virginia and that, in turn, generate economic activity in the state, in Table 1 we list a few different types of businesses in the Virginia data center supply chain. The list of businesses in Table 1 is not an endorsement, promotion, or commendation of them, and it is far from a complete list of companies. We only provide it to illustrate some of the types of businesses that are part of the second ripple effect of economic activity related to spending by data centers.

Table 1: Some Businesses Serving Virginia Data Centers

Company	Line of Business	Location
Aggreko North America	temporary power generation and storage products	Loudoun
Anord Mardix	power distribution and management products and services	Henrico
Compu Dynamics	design, construction, optimization, and maintenance	Sterling
Fulcrum Collaborations	facilities management cloud-based platform	Glen Allen
Hanley Energy	energy management services	Ashburn
Interglobix	data center and fiber interconnectivity consulting and marketing	Herndon
Metro Fiber Networks	carrier-neutral fiber connecting Virginia Beach to Henrico data centers	Yorktown
Munters	cooling and air treatment	Buena Vista (expanding to Daleville)
Power Distribution Incorporated	power transformation, distribution, and monitoring	Richmond
Rosendin Electric	design and construction services	Sterling
Submer	IT hardware immersion cooling	Ashburn
Technoguard	materials, cleaning, decontamination, and disaster recovery	Sterling
Timmons Group	site certification and development	Richmond
Windward Consulting	management consulting	Herndon

## Virginia Statewide

We estimate that in 2021 data centers in Virginia directly provided approximately:

- 5,550 operational jobs and 10,230 construction and manufacturing jobs
- \$1.6 billion in associated employee pay and benefits
- \$7.5 billion in economic output

Taking into account the economic ripple effects generated by that direct impact, we estimate that the total impact on Virginia from data centers in 2021 was approximately:

- 45,460 supported jobs
- \$3.6 billion in associated employee pay and benefits
- \$15.3 billion in economic output.

**For every job inside a Virginia data center, there are 4.1 additional jobs that are supported in the rest of the Virginia economy, not counting construction jobs.**

Table 2: Economic Impact of Data Centers in Virginia in 2021

Direct Effects	Jobs	Pay & Benefits	Economic Output
<b>Data Center Construction</b>	10,230	\$760,500,000	\$2,021,100,000
<b>Data Center Operation</b>	5,550	\$862,200,000	\$5,528,700,000
Supported Effects			
<b>Data Center Construction Supported</b>	6,680	\$411,300,000	\$1,314,600,000
<b>Data Center Operation Supported</b>	23,000	\$1,603,300,000	\$6,412,900,000
Total Impact			
<b>Construction Subtotal</b>	<b>16,910</b>	<b>\$1,171,800,000</b>	<b>\$3,335,700,000</b>
<b>Operation Subtotal</b>	<b>28,550</b>	<b>\$2,465,500,000</b>	<b>\$11,941,600,000</b>
<b>Total Economic Impact in Virginia</b>	<b>45,460</b>	<b>\$3,637,300,000</b>	<b>\$15,277,300,000</b>

Because of the large amount of data center development in Virginia over the last several years, parts of the data center construction and operations supply chains (illustrated in Table 1) have developed in the state. This is why data center development in one part of the state creates impacts in other parts of the state. In the following sections covering the four regions of the state, we show the local impacts of direct investment in a region from the construction and operation of data centers. We also show the impacts in each region caused by data center development in other regions.

So, for example, the 9,680 construction jobs building data centers in Northern Virginia supported 5,330 jobs in other industries in Northern Virginia, as well as supporting 380 jobs in Central and Coastal Virginia, 30 jobs in Southern Virginia, and 540 jobs in the Valley and Western Virginia. Likewise, the 4,920 operational jobs in Northern Virginia data centers supported 19,140 jobs in other industries in Northern Virginia, as well as supporting 1,030 in Central and Coastal Virginia, 20 jobs in Southern Virginia, and 60 jobs in the Valley and Western Virginia.



## Central and Coastal Virginia

We estimate that in 2021, data centers in Central and Coastal Virginia directly provided approximately:

- 250 operational jobs and 290 construction jobs
- \$41 million in associated employee pay and benefits
- \$289 million in economic output

Taking into account the economic ripple effects generated by that direct impact, we estimate that the total impact on Central and Coastal Virginia from data centers in 2021 was approximately:

- 3,640 supported jobs (including 1,650 supported data centers in other parts of the state)
- \$244 million in associated employee pay and benefits
- \$1.1 billion in economic output.

Table 3: Economic Impact of Data Centers on Central and Coastal Virginia in 2021

Direct Effects in Central & Coastal Virginia	Jobs	Pay & Benefits	Economic Output
<b>Data Center Construction</b>	290	\$18,100,000	\$53,400,000
<b>Data Center Operation</b>	250	\$23,000,000	\$236,000,000
<b>Construction-Supported Effects from Data Centers in...</b>			
<b>Central &amp; Coastal Virginia</b>	210	\$11,500,000	\$38,700,000
<b>Northern Virginia</b>	380	\$24,900,000	\$87,600,000
<b>Valley &amp; Western Virginia</b>	20	\$1,400,000	\$4,600,000
<b>Operation-Supported Effects from Data Centers in...</b>			
<b>Central &amp; Coastal Virginia</b>	1,240	\$76,700,000	\$339,200,000
<b>Northern Virginia</b>	1,030	\$75,800,000	\$291,000,000
<b>Southern Virginia</b>	200	\$11,600,000	\$44,000,000
<b>Valley &amp; Western Virginia</b>	20	\$1,000,000	\$4,000,000
<b>Central &amp; Coastal Virginia Impact</b>			
<b>Construction Subtotal</b>	<b>900</b>	<b>\$55,900,000</b>	<b>\$184,300,000</b>
<b>Operation Subtotal</b>	<b>2,740</b>	<b>\$188,100,000</b>	<b>\$914,200,000</b>
<b>Total Impact of Data Centers in Central &amp; Coastal Virginia</b>	<b>3,640</b>	<b>\$244,000,000</b>	<b>\$1,098,500,000</b>

### Investment Highlight - Community Action Grants

Meta (formerly dba Facebook) has a Community Action Grants program to fund non-profit projects that meet community needs by deploying technology to benefit the community, build stronger online and offline connections among people, and improve local science, technology, engineering, and mathematics education. In 2021, the program provided funding for eight projects including buying laptop computers for local 10th graders, funding Henrico County Public Library's WiFi lending program, buying video equipment for children with illnesses, and supporting a telehealth program for underserved students and families.

## Northern Virginia

We estimate that in 2021, data centers in Northern Virginia directly provided approximately:

- 4,920 operational jobs and 9,680 construction jobs
- \$1.5 billion in associated employee pay and benefits
- \$7 billion in economic output

Taking into account the economic ripple effects generated by that direct impact, we estimate that the total impact on Northern Virginia from data centers in 2021 was approximately:

- 39,230 supported jobs (including 160 supported data centers in other parts of the state)
- \$3.3 billion in associated employee pay and benefits
- \$13.5 billion in economic output

Table 4: Economic Impact of Data Centers on Northern Virginia in 2021

Direct Effects in Northern Virginia	Jobs	Pay & Benefits	Economic Output
<b>Data Center Construction</b>	9,680	\$733,800,000	\$1,931,700,000
<b>Data Center Operation</b>	4,920	\$802,000,000	\$5,066,700,000
<b>Construction-Supported Effects from Data Centers in...</b>			
<b>Northern Virginia</b>	5,330	\$340,800,000	\$1,063,100,000
<b>Central &amp; Coastal Virginia</b>	10	\$500,000	\$1,600,000
<b>Southern Virginia</b>	10	\$600,000	\$1,400,000
<b>Operation-Supported Effects from Data Centers in...</b>			
<b>Northern Virginia</b>	19,140	\$1,373,200,000	\$5,429,900,000
<b>Central &amp; Coastal Virginia</b>	40	\$3,300,000	\$8,500,000
<b>Southern Virginia</b>	80	\$5,400,000	\$16,900,000
<b>Valley &amp; Western Virginia</b>	20	\$1,500,000	\$4,200,000
<b>Northern Virginia Impact</b>			
Construction Subtotal	15,030	\$1,075,700,000	\$2,997,800,000
Operation Subtotal	24,200	\$2,185,400,000	\$10,526,200,000
<b>Total Impact of Data Centers in Northern Virginia</b>	<b>39,230</b>	<b>\$3,261,100,000</b>	<b>\$13,524,000,000</b>

### **Investment Highlight - The Northern Virginia Community College Programs**

Northern Virginia Community College (NOVA) has developed programs to help address the challenges that data centers in the Northern Virginia area have meeting their staffing needs. Amazon Web Services (AWS) has a paid apprenticeship program at the NOVA.<sup>21</sup> In December 2018, the program graduated its first students into full-time Associate Cloud Consultant jobs with AWS.

NOVA also has a 2-year Associate of Applied Science program to train Datacenter Operations Technicians.<sup>22</sup> The program includes lab training at a training data center that the State of Virginia built on the NOVA Loudoun Campus. The program started with 19 students in its very first year, and enrollment has increased significantly since then. Graduates quickly find jobs in Northern Virginia data centers and the companies that work for them.

### **Investment Highlight - New Data Center Expansions in Fairfax County**

Data center investment in Fairfax County has increased significantly in the past two years. Data centers in Fairfax County currently occupy 2.4 million square feet in 28 facilities. As of February 2022, the pipeline of new data center development includes 1.9 million square feet, with 375,000 square feet already under construction. Fairfax County has development opportunities available in both greenfield areas near Dulles International Airport and infill locations in Tysons Corner.



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<sup>21</sup> NOVA, "Amazon and Northern Virginia Community College Announce Graduation of the First Veteran Technical Apprenticeship Cohort on the East Coast," December 12, 2018.

<sup>22</sup> NOVA 2019-2020 Catalog, Engineering Technology: Data Center Operations Specialization, A.A.

## Southern Virginia

We estimate that in 2021, data centers in Southern Virginia directly provided approximately:

- 330 operational jobs and 260 construction jobs
- \$39 million in associated employee pay and benefits
- \$215 million in economic output

Taking into account the economic ripple effects generated by that direct impact, we estimate that the total impact on Southern Virginia from data centers in 2021 was approximately:

- 1,400 supported jobs (including 60 supported by data centers in other parts of the state)
- \$73 million in associated employee pay and benefits
- \$402 million in economic output

Table 5: Economic Impact of Data Centers on Southern Virginia in 2021

Direct Effects in Southern Virginia	Jobs	Pay & Benefits	Economic Output
<b>Data Center Construction</b>	260	\$8,600,000	\$36,000,000
<b>Data Center Operation</b>	330	\$30,400,000	\$178,900,000
<b>Construction-Supported Effects from Data Centers in...</b>			
<b>Southern Virginia</b>	110	\$4,400,000	\$17,000,000
<b>Central &amp; Coastal Virginia</b>	-	\$100,000	\$800,000
<b>Northern Virginia</b>	30	\$1,600,000	\$7,200,000
<b>Operation-Supported Effects from Data Centers in...</b>			
<b>Southern Virginia</b>	640	\$26,600,000	\$155,700,000
<b>Central &amp; Coastal Virginia</b>	10	\$300,000	\$1,800,000
<b>Northern Virginia</b>	20	\$800,000	\$4,200,000
<b>Valley &amp; Western Virginia</b>	-	\$100,000	\$500,000
<b>Southern Virginia Impact</b>			
Construction Subtotal	400	\$14,700,000	\$61,000,000
Operation Subtotal	1,000	\$58,200,000	\$341,100,000
<b>Total Impact of Data Centers in Southern Virginia</b>	<b>1,400</b>	<b>\$72,900,000</b>	<b>\$402,100,000</b>

### Investment Highlight - SOVA Innovation Hub

Mid-Atlantic Broadband Communities Corporation and Microsoft TechSpark are investing in Southern Virginia, in part, by jointly creating the SOVA Innovation Hub in South Boston to offer programs to inspire entrepreneurship and the pursuit of digital careers. The new building houses coworking, meeting, and training space. Training programs are offered for job seekers, educators, families, and businesses. The Hub has assisted a broad range of businesses, from the arts, to driver training, marketing, and organic horticulture.

Microsoft's Southern Virginia TechSpark is a civic program created to foster job creation and economic development in the area. In addition to the innovation hub, TechSpark has helped to create technology education and literacy programs in every high school in the region, "Girls Who Code" clubs in Halifax and Mecklenburg Counties, and the deployment of free public WiFi networks Boydton and Clarksville.<sup>23</sup>



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<sup>23</sup> Miranda Baines, "[Microsoft TechSpark Celebrates Third Anniversary](#)," Gazette-Virginian, December 1, 2020.

## Valley and Western Virginia

We estimate that in 2021, data centers in the Valley and Western Virginia directly provided approximately:

- 50 operational jobs
- \$7 million in associated employee pay and benefits
- \$47 million in economic output

Taking into account the economic ripple effects generated by that direct impact, we estimate that the total impact on the Valley and Western Virginia from data centers in 2021 was approximately:

- 1,190 supported jobs (including 950 supported by data centers in other parts of the state)
- \$59 million in associated employee pay and benefits
- \$253 million in economic output

Table 6: Economic Impact of Data Centers on the Valley and Western Virginia in 2021

Direct Effects in the Valley & Western Virginia	Jobs	Pay & Benefits	Economic Output
<b>Data Center Operation</b>	50	\$6,800,000	\$47,100,000
<b>Construction-Supported Effects from Data Centers in...</b>			
<b>Central Virginia</b>	20	\$600,000	\$1,900,000
<b>Northern Virginia</b>	540	\$23,900,000	\$87,100,000
<b>Southern Virginia</b>	20	\$1,000,000	\$3,600,000
<b>Operation-Supported Effects from Data Centers in...</b>			
<b>Valley &amp; Western Virginia</b>	190	\$8,700,000	\$40,000,000
<b>Central Virginia</b>	10	\$500,000	\$2,000,000
<b>Northern Virginia</b>	300	\$14,300,000	\$58,200,000
<b>Southern Virginia</b>	60	\$3,500,000	\$12,800,000
<b>Valley &amp; Western Virginia Impact</b>			
<b>Construction Subtotal</b>	<b>580</b>	<b>\$25,500,000</b>	<b>\$92,600,000</b>
<b>Operation Subtotal</b>	<b>610</b>	<b>\$33,800,000</b>	<b>\$160,100,000</b>
<b>Total Impact of Data Centers in the Valley &amp; Western Virginia</b>	<b>1,190</b>	<b>\$59,300,000</b>	<b>\$252,700,000</b>

### **Investment Highlight - Project Oasis and Mineral Gap**

Part of the InvestSWVA public-private partnership is Project Oasis – a program to attract data centers to Southwest Virginia. The program emphasizes the ability of the area to assist data centers locating in the area to achieve their sustainability goals by taking advantage of the region’s solar farms and availability for geothermal cooling.

The DP Facilities data center in Mineral Gap (Wise County) offers a high-security, 65,000 square foot facility in a reclaimed mine site with N+2 redundancy, 45 MW of power capacity, and an estimated power usage effectiveness of 1.2. The 22-acre site has room to expand by an additional 200,000 square feet. An on-site solar facility provides 3.5 MW of power for the data center. The \$4.6 million solar project is the first solar project in the state to be built on reclaimed mine land.



# Data Centers' Contribution to State and Local Government Budgets

Data centers pay millions of dollars in state and local taxes in Virginia, even though Virginia has a sales and use tax exemption on some equipment for data centers that are large enough to qualify for the exemption. All data centers (large and small) pay state employer withholding taxes. At the local level, both large and small data centers pay real estate taxes, tangible personal property taxes, business license taxes, and industrial utilities taxes. Additionally, many data centers still must pay state sales and use taxes on their purchases of data center equipment because they are not large enough to qualify for the Virginia data center incentive.

In addition to the taxes that data centers pay directly, the economic activity that they generate also results in additional tax collections. Data centers pay taxes directly to state and local governments. The employees and business suppliers that are paid directly by the data centers also pay taxes. All of these sources of tax revenue are included in the tax revenue estimates described in this report

## Statewide and Regional Tax Collections Associated with Data Centers

In addition to the taxes paid directly by data centers, local governments and the Commonwealth of Virginia collect tax revenue from the secondary indirect and induced economic activity that data centers generate. Table 7 shows our estimates of the taxes directly and indirectly generated by data centers statewide in Virginia and in each of the four sub-state regions in 2021 through that first round and second round economic activity.

**We estimate that in 2021, data centers were directly and indirectly responsible for generating \$174 million in state revenue and \$1 billion local tax revenue in Virginia.**

Table 7: Tax Revenue Directly and Indirectly Generated by Data Centers in Virginia in 2021

Region	Local Taxes Collected	State Taxes Collected
Central & Coastal Virginia	\$18,200,000	\$10,900,000
Northern Virginia	\$974,100,000	\$153,700,000
Southern Virginia	\$8,900,000	\$7,600,000
Valley & Western Virginia	\$2,200,000	\$2,000,000
<b>Virginia Statewide</b>	<b>\$1,003,400,000</b>	<b>\$174,200,000</b>



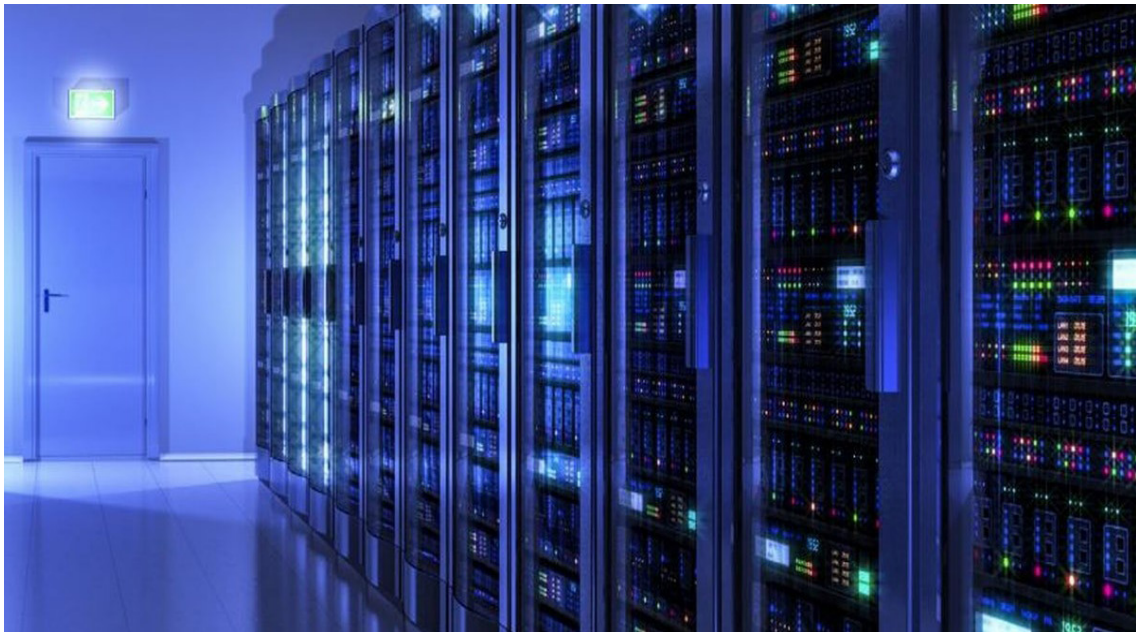
## Data Centers Contribute to Local Government Budgets

Data centers generate a large amount of property tax revenue for local governments without placing many demands on local government services. Additionally, the industry also places downward pressure on overall tax rates, thereby improving the locality's business climate and economic attractiveness.

### Data Centers' High Local Benefit to Cost Ratio

Data centers provide a high benefit to cost ratio in terms of the tax revenue they generate relative to the government services that they and their employees require. Loudoun and Prince William Counties are home to the most significant concentrations of data centers in Virginia. County staff in those localities were able to provide us with detailed data on the tax revenue generated by this industry in each locality from real and business personal property taxes.<sup>24</sup> As a result, we are able to use those data in combination with data from other sources to compute the benefit to cost ratio associated with data centers in each locality. If local fiscal data were available, similar stories could be told for Mecklenburg and Henrico Counties where there are larger data centers, and to a lesser degree in places like the Cities of Harrisonburg and Virginia Beach, and Albemarle, Culpeper, Fairfax, and Wise Counties which also have data centers.

To quantify the budgetary cost that data centers and their employees imposed on these localities in 2020,<sup>25</sup> we use data from the Virginia Department of Education on local elementary and secondary education expenditures per student, and data from the Virginia Auditor of Public Accounts on local non-education expenditures per county resident. This approach focuses on the largest costs that any business imposes on a local government – the costs associated with providing primary and secondary education, and other county services, to the employees of that business.



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<sup>24</sup> It should be noted that, of necessity, these estimates exclude BPOL and other local taxes that also apply to data centers. As a result, the revenue estimates provided almost certainly under-estimate the actual local tax revenues from data centers.

<sup>25</sup> 2020 was the most recent year that data was available for these calculations.

Table 8 details the calculations used to estimate the budgetary cost that data centers and their employees imposed on each of these two counties in 2020. As shown, we estimate those costs to be approximately \$37 million in Loudoun County, and \$5 million in Prince William County.

Table 8: Estimate of Total Budgetary Costs Imposed by Data Centers and Employees in 2020

	Loudoun County	Prince William County
<b>County Private Sector Data Center Employment<sup>26</sup></b>	3,500	500
Students per Employee <sup>27</sup>	0.51	0.73
Per Student County Education Expenditures <sup>28</sup>	\$11,161	\$5,502
<b>Total Education Costs<sup>29</sup></b>	<b>\$19,922,385</b>	<b>\$2,008,230</b>
County Residents per All Employees <sup>30</sup>	2.55	3.85
Per Resident Non-Education County Expenditures <sup>31</sup>	\$1,382	\$1,427
<b>Total Non-Education Costs<sup>32</sup></b>	<b>\$12,334,350</b>	<b>\$2,746,975</b>
<b>TOTAL COSTS<sup>33</sup></b>	<b>\$32,256,735</b>	<b>\$4,755,205</b>

<sup>26</sup> Data Source: Loudoun County Economic Development Authority and Prince William County Department of Economic Development.

<sup>27</sup> Data Source: Virginia Department of Education and U.S. Bureau of Labor Statistics. Derived by dividing total county elementary and secondary school enrollment in 2020 by total county employment in 2020.

<sup>28</sup> Data Source: Virginia Department of Education.

<sup>29</sup> Calculated as county private sector employment in data centers in 2020, times students per employee, times per student education expenditures.

<sup>30</sup> Data Source: 2020 Census and U.S. Bureau of Labor Statistics. Calculated by dividing total county population in 2020 by total county employment in 2020.

<sup>31</sup> Data Source: Virginia Auditor of Public Accounts and U.S. Census Bureau. Derived by dividing total county non-educational expenditures in 2020 by total county population in 2020.

<sup>32</sup> Derived as county private sector employment in data centers in 2020, times county residents per employee, times per resident non-education expenditures.

<sup>33</sup> Derived as the sum of total education costs and total non-education costs.

As shown in Table 9, combining the estimates of budgetary cost from Table 8 with data from each of the localities on the local revenue generated by data centers shows that in 2020 the benefit to cost ratio associated with the industry was:

- **13.2 in Loudoun County** — which means that for every \$1.00 in county expenditures that data centers were responsible for generating in 2020, it provided approximately \$13.20 in tax revenue.
- **13.5 in Prince William County** — which means that for every \$1.00 in county expenditures that data centers were responsible for generating in 2020, it provided approximately \$13.50 in tax revenue.

Table 9: Estimated Benefit/Cost Ratio Associated with Data Centers and Employees in 2020

Locality	Estimated Tax Revenue (Benefit)	Estimated Budgetary Cost	Benefit/Cost Ratio
Loudoun County	\$424,700,000	\$32,256,735	13.2
Prince William County	\$64,200,000	\$4,755,205	13.5



## Local Data Centers Reduce the Burden on the State Education Budget

Because of the way that the State of Virginia partially funds local education from State coffers, the tax revenue generated by data centers in some localities reduces the burden on the State education budget.

On average, the state of Virginia funds 55% of primary and secondary education expenditures, and localities are required to locally fund the remaining 45%.<sup>34</sup> But, that local funding percentage is adjusted up or down based on each locality's "ability to pay" as measured by Virginia's composite index formula that takes into account the locality's property tax base, adjusted gross income, and taxable retail sales. Of these three factors, property tax base receives the highest weight (50%) and, therefore, has the largest influence on the final calculation.<sup>35</sup>

The 2020 composite index for Loudoun County is 0.5450 and for Prince William County it is 0.3739.<sup>36</sup> When we recalculate those indices to take into account the loss of tax base implied by the loss in tax revenue that would have occurred if data centers had not existed in these localities, those indices fall to 0.5026 and 0.3609, respectively.

As shown in Table 10, according to our estimates, this means that in the absence of data centers in Loudoun and Prince William Counties, the State of Virginia would have to reallocate \$90.5 million in state education funding away from other Virginia localities to provide \$73 million in additional funding to Loudoun County, and \$17.5 million in additional funding to Prince William County.

Table 10: Estimated Additional Revenue Required to Compensate for Loss of the Data Centers in 2020

Locality	Revenue Loss	State Education Funding Off-Set	Additional Local Tax Revenue Required from Other Sources
Loudoun County	(\$424,700,000)	\$72,968,000	\$351,732,000
Prince William County	(\$64,200,000)	\$17,548,000	\$46,652,000
<b>Total</b>		\$90,516,000	

<sup>34</sup> In actuality, however, baseline local funding percentages are typically higher than 45% because of local initiatives.

<sup>35</sup> Virginia Department of Education. The actual formula weights each locality's property tax base by 0.5, adjusted gross income by 0.4, and taxable retail sales by 0.1. Each metric is then divided by school population and total population and those per capita figures are divided by the average across all localities to determine ability to pay. The per capita figures are then themselves weighted with each per capita school population metric receiving a weight of 0.66 and each per capita population metric receiving a weight of 0.33.

<sup>36</sup> Virginia Department of Education.

# Virginia's Data Center Sales and Use Tax Exemption

Virginia's data center incentive program is primarily a sales and use tax exemption on qualifying equipment.<sup>37</sup> Generally, the sales and use tax exemption is available to data centers that make a minimum new capital investment of \$150 million and that create a minimum of 50 new jobs in a Virginia locality. If the data center is located in an enterprise zone, the minimum new job requirement is reduced to 25. Each new job must pay at least 150% of the annual average wage in the locality where the data center is located. Tenants of colocation data centers that qualify for the incentive may also receive the sales and use tax exemption. The incentive program is set to sunset in 2035.

In March of 2021, Virginia revised its sales and use tax exemption to require only 10 new employees and \$70 million of capital investment for data centers that locate where the unemployment and poverty rates are higher than statewide averages.<sup>38</sup>

According to the JLARC, as of fiscal year 2017 (the most recent year that data is available), 24 data centers had qualified for the incentive, plus 135 colocation data center tenants.<sup>39</sup> According to JLARC's 2021 report on Virginia's economic development incentives, in fiscal year 2020, \$138.3 million of sales and use tax was exempted under the incentive.<sup>40</sup>

## Virginia Treats Data Centers Like Other Capital-Intensive Industries

The Virginia data center incentive program offers qualifying data centers the same tax treatment that it applies to all manufacturers. Like most states, Virginia exempts all manufacturing firms (regardless of size) from paying sales and use tax on their production equipment. Part of the rationale for exempting manufacturing equipment from sales and use tax is that the manufacturing industry requires large amounts of expensive equipment in order to make products. If the state charged sales and use tax on manufacturing equipment, manufacturers would locate in other states in order to reduce their costs of production. Virginia's sales and use tax exemption for qualifying data centers is a limited way to attract large data centers to the state.

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<sup>37</sup> Virginia also offers a single sales factor apportionment method for calculating corporate tax liability. According to JLARC's 2021 report, that incentive was first used by data centers in 2020 and amounted to a change in taxes of only \$100,000. Because this incentive has such a limited impact, we do not discuss it in this report.

<sup>38</sup> Dan Swinhoe, "[Virginia lowers threshold for data center tax exemption](#)," Data Center Dynamics, March 31, 2021.

<sup>39</sup> Joint Legislative Audit and Review Commission, Data Center and Manufacturing Incentives, Economic Development Incentives Evaluation Series. June 17, 2019.

<sup>40</sup> <http://jlarc.virginia.gov/pdfs/reports/Rpt557.pdf>

## JLARC’s Evaluation of the Data Center Incentive

In June of 2019, Virginia’s Joint Legislative Audit and Review Commission published an evaluation of the state’s data center incentive using confidential tax information that is not publicly available.<sup>41</sup>

**JLARC found that 90% of the data center investment made by the companies that received the sales and use tax exemption would not have occurred in the state of Virginia without the incentive.** Instead, that 90% of data center investment would have occurred in states other than Virginia. So, the “cost” of the State data center incentive is only 10% of the amount of State sales tax revenue exempted. Using the confidential tax information, JLARC estimated the economic and government budgetary impact, not of the total data center industry in Virginia (as we have done in this report), but specifically of Virginia’s data center sales and use tax exemption.<sup>42</sup>

Table 11 shows the text of Appendix N from the JLARC report with JLARC’s calculations of the amount of State tax revenue exempted by the Virginia incentive; the amount of additional State tax revenue that was generated by the investment of the data centers that received the tax incentive; the net impact of the incentive on the State budget (additional tax received minus tax revenue exempted); net new jobs added, net additional state gross domestic product (GDP) generated, and net new worker pay generated throughout the statewide economy as a result of the investment by data centers that received the incentive. Table 11 shows data for the fiscal years 2013 through 2017. This is the most recent data available that covers the years when the current version of Virginia’s data center incentive has been implemented. The General Assembly made significant revisions to the data center incentive in 2012.



<sup>41</sup> Joint Legislative Audit and Review Commission, Data Center and Manufacturing Incentives, Economic Development Incentives Evaluation Series. June 17, 2019.

<sup>42</sup> Appendix N: Results of economic and revenue impact analyses.

Table 11: Economic and Tax Impacts of Virginia’s Sales and Use Tax Exemption for Data Centers <sup>43</sup>

With Data Center Incentive	FY2013	FY2014	FY2015	FY2016	FY2017
State Tax Revenue Exempted	(\$81,298,000)	(\$80,131,000)	(\$93,249,000)	(\$54,757,000)	(\$54,516,000)
Additional State Tax Revenue	\$44,548,000	\$49,705,000	\$64,494,000	\$54,742,000	\$59,171,000
Net State Budgetary Impact	(\$36,751,000)	(\$30,426,000)	(\$28,755,000)	(\$15,000)	\$4,655,000*
State Revenue Recovered per \$1 of State Revenue Exempted	\$0.55	\$0.62	\$0.69	\$1.00	\$1.09
Net Additional Jobs	11,631	12,168	14,138	9,968	10,324
Net Additional State GDP	\$1,594,238,000	\$1,838,394,000	\$2,268,541,000	\$1,862,303,000	\$2,028,606,000
Net Additional Worker Pay	\$852,123,000	\$987,672,000	\$1,238,666,000	\$1,022,226,000	\$1,126,545,000

\* In 2017, the data center tax incentive generated more State tax revenue than it exempted.

The appendix to the JLARC report shows that:

- In 2017, the State took in \$1.09 in state tax revenue from data center related activity for every \$1 of potential state tax revenue that was exempted from qualifying data centers.
- In 2016, the data center incentive was revenue neutral – it generated one dollar in additional state tax revenue for every dollar of potential state tax revenue that it exempted.
- In every year since the data center incentive was modified in 2012, the State recovered the majority of the state tax revenue that was exempted from qualifying data centers.
- From 2013 through 2017, on average the State recovered 75 cents in state tax revenue for every dollar of potential tax revenue exempted from qualifying data centers. <sup>44</sup>

<sup>43</sup> Data Source: Appendix N: Results of Economic and Revenue Impact Analyses.

<sup>44</sup> The JLARC report states that the data center incentive recovered 72 cents in state tax revenue for every dollar of potential tax revenue exempted from qualifying data centers. That conclusion is based on including the years 2010 through 2012, prior to the significant change made to the incentive in 2012. The 75-cent estimate more accurately reflects

## Incentive Helps to Attract Some Data Centers that Do Not Qualify for Incentive

Data centers tend to cluster, with smaller data centers often locating adjacent to larger data centers. Therefore, one data center that is attracted by the incentive can attract other data centers to take advantage of the existing local fiber and power infrastructure.<sup>45</sup> Some of these follow-on data centers will be smaller than the larger data center projects that qualified for the tax incentive and may, themselves, not initially achieve the investment and job creation thresholds required to receive tax benefit from the state.

Because large data centers that qualify for Virginia's incentive help provide the infrastructure and technology supply chain to attract smaller data centers that do not initially qualify for the incentive, the incentive yields more data center investment than is measured by just counting the data centers that qualify for the incentive. Virginia's data center tax incentive plays an important role in attracting new data centers to the state and in keeping them from moving to other states.

## National Context for Virginia Incentives

Over 30 states offer some sort of incentive program to attract data centers. Twenty-six states have sales and use tax incentives that last for 10 years or more, with 11 of them having incentives that are valid indefinitely. Examples in the Southeast include:

- Alabama offers up to a 30-year sales and use tax exemption. (AL 40-9B-3)<sup>46</sup>
- Mississippi's 10-year sales and use tax exemption has no program sunset. (MS 57-113-25)<sup>47</sup>
- North Carolina's sales and use tax exemption has no program sunset. (NC 105-164.13)<sup>48</sup>
- South Carolina's sales and use tax exemption sunsets for new applicants in 2031 with benefits ending in 2041. (SC 12-36-2120)<sup>49</sup>
- Tennessee's sales and use tax exemption and reduced tax on electricity has no program sunset. (TN 67-6-206)<sup>50</sup>

In the last few years several states have added or expanded sales and use tax exemptions for data centers. The following list does not include states like Ohio and Texas which have robust incentives in place.

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<sup>45</sup> Loudon Blair, "[Finding Strength in Numbers: The Data Center Clustering Effect](#)," Data Center Knowledge,

<sup>46</sup> <http://alisondb.legislature.state.al.us/alison/CodeOfAlabama/1975/135558.htm> and Alabama Department of Revenue, General Summary of State Taxes.

<sup>47</sup> Mississippi Tax Incentives, Exemptions and Credits.

<sup>48</sup> North Carolina Data Center Sales and Use Tax Exemptions.

<sup>49</sup> South Carolina Department of Revenue Ruling #13-5.

<sup>50</sup> Changes in Requirements for a Qualified Data Center, Tennessee Department of Revenue.

<sup>51</sup> [Pennsylvania Brings in Data Center Tax Breaks](#).

<sup>52</sup> Matt Pilon, "[In a crowded pond, CT goes fishing for data centers with new incentives](#)," Hartford Business Journal, April 19, 2021.

<sup>53</sup> [Maryland Department of Commerce, Data Center Tax Incentive Program](#).

<sup>54</sup> Rich Miller, "[Quantum Loophole Plans 2,100 Acre Data Center Campus in Maryland](#)," Data Center Frontier, June 28, 2021.



## East

- Pennsylvania's original incentive was ineffective at attracting data center investment to the state while billions of dollars of investments were being made in nearby states. The legislature enacted a new sales and use tax exemption that is open indefinitely with benefits available for at least 15 years. (72 PS 9931-D) <sup>51</sup>
- Connecticut became the latest state to add a completely new data center incentive. Depending on the size and location of the facility, data centers could be exempted from state sales and use taxes for 20 to 30 years. (CT Public Act 21-1, HB 6514) <sup>52</sup>
- Maryland enacted a new sales and use tax incentive with a benefit period of 10 to 20 years depending on the level of investment. The incentive has no sunset date. <sup>53</sup> Following the enactment of Maryland's data center incentive, a data center developer announced plans for a new 2,100-acre data center campus in the state. (MD 11-239) <sup>54</sup>

## Midwest

- North Dakota enacted a data center incentive to replace an incentive that expired in 2020. The new incentive has no sunset date or limitation on the benefit period. (NDCC 57-39.2-04.17) <sup>55</sup>

## West

- Arizona revised and extended its data center sales and use tax exemption by 10 years to run through 2033. The benefit period ranges from 10 to 20 years, with the 20-year benefit reserved for data centers with that are considered a sustainable redevelopment project. (AZ 41-1519) <sup>56</sup>
- Idaho enacted a new sales and use tax exemption for data center equipment used in new data centers. The new incentive has no program sunset or limitation on the benefit period. (63-3622V) <sup>57</sup>
- Utah expanded its sales and use tax exemption for data centers with no minimum investment or employment criteria and no program sunset. (UT 59-12-104) <sup>58</sup>

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<sup>55</sup> North Dakota Century Code § 57-39.2-04.17.

<sup>56</sup> Dan Swinhoe, "[Arizona extends data center tax breaks for another 10 years](#)," Data Center Dynamics, April 27, 2021.

<sup>57</sup> HB 521.

<sup>58</sup> Utah Sales and Use Tax General Information, Revised 6/21 and SB 114.

## Competition Between States

With so many states offering incentives to attract data centers to their states, the competition for data centers is keen.

### New York - New Jersey - Connecticut

New Jersey is debating adding an incentive. There is a growing realization that the New York-New Jersey region lost its lead in the data center market to Northern Virginia, at least in part because New Jersey is not competitive with other markets on taxes.<sup>59</sup>

An even more dramatic illustration of the sensitivity of data centers to tax changes is the way in which data centers showed their mobility in response to a potential increase in taxes in New Jersey. In the summer of 2020, some elected state officials proposed imposing a 25/100th of one percent or a 1/100th of one percent tax on financial transactions processed in data centers located in New Jersey.<sup>60</sup> In the fall of 2020, the New York Stock Exchange ran its financial transactions out of its data center in Chicago for five days to practice for any possible relocation of the market to data centers outside of New Jersey. The Governor of Texas was involved in attempting to attract Nasdaq to migrate its data center operations to Dallas, the second-largest data center market in the United States. In the spring of 2021, the state of Connecticut enacted a data center incentive to make that state a viable alternative, in the event that New Jersey proceeded with the financial transaction tax.<sup>61</sup>

### Illinois - Indiana

In June of 2019, Illinois added a new data center incentive.<sup>62</sup> Although the Chicago area is one of the largest data center markets in the United States, it was not keeping pace with the growth of data centers in the markets of Northern Virginia, Dallas, and Phoenix – all located in states that provide sales and use tax exemptions to attract data center investment. Since the enactment of the Illinois incentive, several new large data center projects have been announced in the state, and over \$5 billion in additional data center investment has been committed, making it one of the fastest-growing states in terms of data center activity.<sup>63</sup> The neighboring state of Indiana also enacted a 50-year sales and use tax exemption for data centers to attract data centers to the Indiana suburbs of Chicago.

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<sup>59</sup> “Twenty years ago, New Jersey probably led the country and data center space, but we haven’t moved the needle at all in 20 years.” – Gil Santaliz, NJFX “New Jersey was once a hotbed of data center activity, with thriving markets for colocation and financial data centers. The state maintains a substantial and strategically important data center community, but the hottest leasing action has shifted elsewhere, primarily to Northern Virginia.” – Data Center Frontier, 1/28/20 “There is a bill being looked at, and it looks very similar to the broad strokes of what you see in Virginia.” – Santaliz

<sup>60</sup> Alex Alley, “[NYSE and Nasdaq threaten to leave New Jersey if transaction tax goes ahead](#),” Data Center Dynamics, October 20, 2020.

<sup>61</sup> Matt Pilon, “[In a crowded pond, CT goes fishing for data centers with new incentives](#),” Hartford Business Journal, April 19, 2021.

<sup>62</sup> Ally Marotti, “[Data center boosters hope new tax incentives 'stop the bleeding,' keep tech sites in Illinois](#),” Chicago Tribune, June 2019.

<sup>63</sup> Companies announcing large data center projects in Illinois since the enactment of the incentive include: Aligned Energy, Meta, Prime Data Centers, NTT, and Stream.