

Virginia Manufacturing Competitive Indexes

Updated November 2019

Introduction to the Indexes

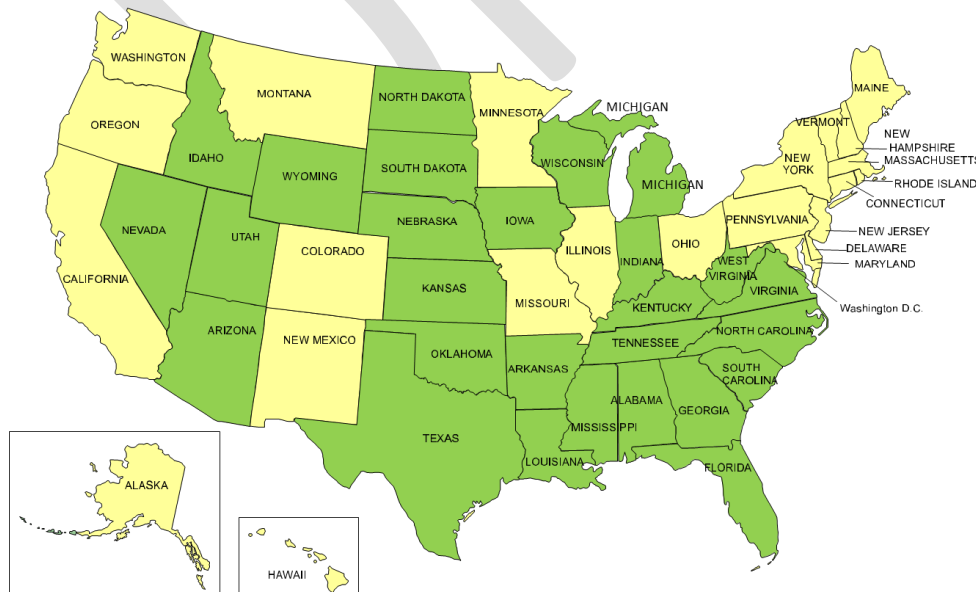
The Virginia Manufacturers Association has worked for the past several years to develop a multifactor **Manufacturing Competitiveness Index** that allows members and policymakers to assess complex data and inform strategic choices. This data analytics tool is used to help craft our messaging and policy agenda.

In 2017, the Virginia Manufacturers Association Board reviewed the metrics used in the *Manufacturing Competitiveness Index* report, which was part of *A New Blueprint – Making the American South’s Manufacturing Sector More Competitive by 2030*, a report for the Economic Development Administration. In addition, the Association held several member meetings to review the individual metrics and discuss the rankings. The original report divided the metrics into five categories: Business Climate, Workforce, Infrastructure, Innovation and Economic Strength. For the 2017 report, the categories of metrics were weighted to calculate the final state rankings.

This was followed up with a report in 2018, which used the same metrics as the 2017 report. The data was updated to the most recent available. The only significant change from the 2017 report was that the indexes are not weighted in the final overall state rankings. At the direction of the Virginia Manufacturers Association, the index weighting was removed, and all the indexes carried equal weight.

This year the existing metrics were updated, where available, and were used to rank the fifty states. In addition, the Board decided to add three new metrics. Right-to-Work was added to the Workforce Index as a positive measure. In the Economic Strength Index two metrics were added that reflect manufacturing’s impact on private sector GDP.

RIGHT-TO-WORK STATES 2019- IN GREEN



Data was gathered from public sources including the Bureau of Economic Analysis, National Science Foundation, Bureau of Labor Statistics, Energy Information Administration, and the US Census Bureau. Indicators were standardized to account for differences in states' population or economy size. The most recent available data was used, meaning most data is from the years 2018 or 2019. To evaluate time trends, a five-year percent change was used. All data, and these tools, are part of a broader competitive picture and should be used in conjunction with other information to further public policy discussion to improve Virginia's economy.

The Index Results

Business Climate Index

Manufacturing sensitive to labor costs and other costs of doing business. These factors are often cited as critical reasons when manufacturing companies consider expansion or relocation. The Business Climate Index focuses on wages, taxes, and legal barriers. These metrics are often related to state government policy choices and are opportunities for states to make changes that will improve manufacturing competitiveness. The Business Climate Index consisted of the following nine metrics.

Business Climate Index Metrics

- Manufacturing Industry Health Scorecard (Conexus Indiana) 2019
- Top marginal corporate tax rate 2019
- Legal Climate Rankings 2019
- Air Quality – Average Exposure to PM2.5 2017
- Workers Comp insurance premium per \$100/payroll 2018
- State and Local Tax Costs for Capital-Intensive Manufacturing 2014 (this metric was not updated as more current information is not available)
- State and Local Tax Costs for Labor-Intensive Manufacturing 2014 (this metric was not updated as more current information is not available)
- Value of \$100 2019
- Greenhouse Gas Emissions Per Capita (Metric Tons of CO₂) 2017

Business Climate Index Performance

In the 2018 index Virginia ranked as the 5th most competitive state. As can be seen in the new data below, Virginia is now ranked 8th, ranking in second place of all Southern states. In the individual metrics, Virginia has remained stable, with the rankings staying the same or shifting by one position, except for Top Marginal Corporate Tax Rate which moved from 16th position nationally in 2018 to 19th in 2019, as several other states have aggressively reduced their corporate tax rate. Virginia's Manufacturing Health Scorecard ranking moved from a "D" to "D-" which changed the state's rank for this metric from 39th to 44th; the Legal Climate Ranking, (from the Institute for Legal Reform) moved from 10th nationally in 2018 to 12th in 2019; and the bi-annual Workers Compensation Premium Rating fell from 5th nationally in 2018 to 10th in 2019.

Southern States Business Climate Index Performance

State	Business Climate Rank	State	Business Climate Rank
North Carolina	3T	Oklahoma	25
Virginia	8	Alabama	26
Kentucky	13T	Georgia	27
Missouri	15T	Maryland	29
South Carolina	19T	Mississippi	30T
Tennessee	19T	Florida	35
Arkansas	22T	West Virginia	41
Texas	24	Louisiana	42

MANUFACTURING COMPETITIVENESS INDEX

BUSINESS CLIMATE	Manufacturing Industry Health Scorecard (Conexus Indiana) 2019	top marginal corporate tax rate 2019	Legal Climate Rankings (2019)	Air Quality - Average Exposure to PM2.5 (2017)	Workers Comp insurance premium per \$100/payroll 2018	State and Local Tax Costs for Capital-Intensive Manufacturing 2014	State and Local Tax Costs for Labor-Intensive Manufacturing 2014	Value of \$100 (2019)	Greenhouse Gas Emissions Per Capita (Metric Tons of CO2) 2017	AVERAGE RANKING	STATE RANK
Alabama	8	24	42	40	22	19	23	3	36	24.1	26
Alaska	47	45	5	22	47	32	36	41	46	35.7	48
Arizona	20	10	17	48	11	10	7	26	17	18.4	6
Arkansas	20	24	30	16	3	44	39	2	35	23.7	22
California	16	43	48	50	49	44	43	48	3	38.2	50
Colorado	38	9	21	10	16	41	32	40	25	25.8	30
Connecticut	16	33	3	27	44	14	12	45	6	22.2	13
Delaware	38	42	1	41	46	19	26	37	21	30.1	44
Florida	38	15	46	16	30	29	21	36	12	27.0	35
Georgia	32	16	41	41	45	9	3	20	20	25.2	27
Hawaii	47	23	15	6	38	34	49	50	19	31.2	45
Idaho	8	30	9	10	30	36	36	21	11	21.2	11
Illinois	16	46	50	47	29	38	48	33	26	37.0	49
Indiana	1	16	31	44	2	50	45	11	44	27.1	36
Iowa	1	50	23	20	21	1	16	11	40	20.3	9
Kansas	6	31	32	14	6	29	40	13	33	22.7	17
Kentucky	1	12	40	35	18	24	22	5	43	22.2	13
Louisiana	20	38	49	33	41	15	9	14	47	29.6	42
Maine	32	44	2	9	32	48	44	32	15	28.7	39
Maryland	38	40	27	36	12	24	4	46	2	25.4	29
Massachusetts	20	38	28	8	13	36	45	44	4	26.2	33
Michigan	1	19	33	36	14	15	9	21	24	19.1	7
Minnesota	14	47	20	16	23	2	17	29	27	21.7	12
Mississippi	6	12	47	25	20	49	35	1	37	25.8	30
Missouri	20	22	44	31	24	12	6	9	34	22.4	15
Montana	44	29	7	12	38	39	28	24	45	29.6	43
Nebraska	32	36	8	16	25	10	5	10	41	20.3	9
Nevada	47	1	29	45	8	13	14	30	18	22.8	18
New Hampshire	8	35	18	2	25	33	38	42	9	23.3	21
New Jersey	36	49	43	36	48	7	23	47	14	33.7	47
New Mexico	47	18	22	6	17	27	30	23	38	25.3	28
New York	44	24	36	15	50	6	17	49	1	26.9	34
North Carolina	16	7	16	22	32	17	19	18	13	17.8	3
North Dakota	38	8	6	1	1	18	25	14	49	17.8	3
Ohio	8	1	35	46	15	8	13	7	31	18.2	5
Oklahoma	20	19	14	31	27	29	29	8	39	24.0	25
Oregon	14	34	25	27	6	35	33	35	4	23.7	22
Pennsylvania	20	48	39	48	34	4	11	31	29	29.3	40
Rhode Island	38	31	24	25	43	39	50	34	8	32.4	46
South Carolina	1	12	37	22	37	42	20	16	22	23.2	19
South Dakota	20	1	10	5	28	4	7	6	28	12.1	1
Tennessee	8	24	34	27	19	28	30	16	23	23.2	19
Texas	20	1	38	41	9	23	14	27	41	23.8	24
Utah	20	11	19	36	5	26	26	27	32	22.4	15
Vermont	20	41	11	4	42	47	41	39	6	27.9	38
Virginia	44	19	12	20	10	19	1	38	16	19.9	8
Washington	32	1	26	33	35	22	33	43	10	26.1	32
West Virginia	20	24	45	30	4	43	47	4	48	29.4	41
Wisconsin	8	37	13	12	40	46	42	19	30	27.4	37
Wyoming	36	1	4	2	35	3	2	25	50	17.6	2



Workforce Index

The availability of a skilled labor force is consistently ranked in the top five factors impacting site selection by *Area Development* magazine. In 2019, it moved up in the rankings to #1, ahead of access to highways and labor costs. Today, manufacturing business leaders often express concern about difficulties finding skilled employees such as CNC machinists and other middle-skilled credentialed workers. As manufacturing becomes more advanced and computer-based, the importance of STEM education rises for the manufacturing workforce. The Workforce Index measures education, health of the population, creative class population, and manufacturing productivity. For 2019 the Board included Right-to-Work as a positive measurement. The Workforce Index consisted of the following sixteen metrics.

Workforce Index Metrics

- Right-to-Work State 2019
- Percentage of Population with Adult Obesity 2018
- Persons age 18 to 24 not attending school, not working, and no degree beyond high school 2017
- High School Graduation Rate for all students 2016-17
- Labor Force Participation Rate 2018
- Manufacturing Output Per Manufacturing Employee 2018
- Change in Manufacturing Output Per Manufacturing Employee 2013-2018
- Age 25-44 Population Growth 2012-2017
- Completed Tech & STEM Education Programs Per 1,000 Enrolled Students 2017
- Percent Change in Tech & STEM Education Program Completions 2013-2018
- Average 8th Grade Reading Score 2017
- Average 8th Grade Math Score 2017
- Veteran Unemployment Rate 2018
- Veteran % share of total population 2018
- Total number of sub-baccalaureate occupational credentials in manufacturing 2013 (this metric has not been updated as new data is not available)
- Sub-baccalaureate occupational credentials in manufacturing as percent of total credentials 2013 (this metric has not been updated as new data is not available)

Workforce Index Performance

Virginia's workforce competitiveness continues to be good and Virginia dropped from 9th ranked in 2018 to 14th ranked in 2019, behind only Maryland among Southern states. In the individual metrics, Virginia improved in the categories of Persons Age 28-24 not attending school or working; 4-year High School Graduation Rate; and Labor Force Participation Rate while in the category of Manufacturing Output per Manufacturing Employee the state fell from 12th in 2018 to 29th in 2019, and in Percent Change in Tech & STEM Education Completions Virginia moved from 36th to 45th. A new metric was added: Right-to-Work State. All of the 27 states that are Right-to-Work States were ranked equally at #1 and the remaining states were equally ranked at 28th.

Southern States Workforce Index Performance

State	Workforce Rank	State	Workforce Rank
Maryland	8T	Oklahoma	34
Virginia	14	Tennessee	39
North Carolina	18	Arkansas	40
Kentucky	19	Louisiana	42
Texas	20T	Alabama	46
Georgia	25T	West Virginia	47
Missouri	30	South Carolina	48
Florida	32	Mississippi	49

MANUFACTURING COMPETITIVENESS INDEX

WORKFORCE	Right-to-Work State (2019)	Percentage of Population With Adult Obesity (2018)	Persons age 18 to 24 not attending school, not working, and no degree beyond high school (2017)	4 year High School Graduation Rate 2016-17	Labor Force Participation Rate (2018)	Manufacturing Output Per Manufacturing Employee (2018)	Change in Manufacturing Output Per Manufacturing Employee (2013-2018)	Age 25-44 Population Growth (2012-2017)	Completed Tech & STEM Education Programs Per 1,000 Enrolled Students (2017)	Percent Change in Tech & STEM Education Program Completions (2013-2018)	Average 8th Grade Reading Score (2017)	Average 8th Grade Math Score (2017)	Veteran Unemployment Rate 2018	Veteran % share of total population 2018	total number of sub-baccalaureate occupational credentials in manufacturing 2013	sub-baccalaureate occupational credentials in manufacturing as % of total credentials 2013	AVERAGE RANKING	STATE RANK
Alabama	1	45	44	7	48	42	39	40	20	15	46	49	33	16	27	22	30.9	46
Alaska	28	15	42	46	15	45	15	11	34	44	46	38	16	1	45	29	29.4	43
Arizona	1	15	34	48	36	19	28	12	31	49	34	24	26	10	9	24	25.0	30
Arkansas	1	48	44	14	46	50	36	29	31	8	41	45	4	25	24	14	28.8	40
California	28	5	21	34	31	5	13	14	45	17	34	38	44	48	1	35	25.8	35
Colorado	28	1	6	45	3	26	34	2	14	21	8	15	8	19	14	12	16.0	2
Connecticut	28	7	14	15	14	9	18	49	26	19	4	21	33	44	19	4	20.3	10
Delaware	28	33	34	19	30	2	2	18	2	1	34	36	46	14	49	50	24.9	29
Florida	1	24	27	38	42	30	8	4	38	41	20	34	32	18	4	41	25.1	32
Georgia	1	30	38	41	26	39	42	26	16	9	26	30	20	30	4	5	24.2	25
Hawaii	28	2	21	34	35	16	1	14	50	45	39	38	29	6	47	36	27.6	37
Idaho	1	12	34	43	21	35	14	10	49	21	8	21	38	7	40	33	24.2	25
Illinois	28	27	27	18	19	14	40	48	23	32	20	24	20	45	3	15	25.2	33
Indiana	1	35	27	30	17	22	47	35	7	34	6	8	20	34	23	36	23.9	24
Iowa	1	44	6	1	6	28	20	24	24	37	17	15	13	30	28	31	20.3	10
Kansas	1	38	10	24	12	32	33	38	40	30	20	20	7	22	26	21	23.4	22
Kentucky	1	46	42	4	43	18	26	42	5	5	30	36	29	30	10	3	23.1	19
Louisiana	1	47	48	47	44	3	48	19	8	11	48	50	49	38	6	2	29.3	42
Maine	28	22	14	19	25	49	19	44	48	25	11	21	1	5	39	20	24.4	27
Maryland	28	25	21	16	11	4	10	29	1	18	20	30	11	28	33	32	19.8	8
Massachusetts	28	3	2	12	10	8	22	23	6	13	1	1	25	47	35	42	17.4	4
Michigan	1	31	27	42	36	27	31	37	9	37	30	33	42	39	18	42	30.1	45
Minnesota	28	20	2	34	1	31	29	26	44	43	11	2	20	39	17	27	23.4	22
Mississippi	1	49	47	33	49	47	21	41	34	3	49	47	41	36	31	15	34.0	49
Missouri	28	42	21	12	24	25	23	29	27	31	26	30	11	25	21	25	25.0	30
Montana	28	6	14	27	28	12	6	8	17	24	20	15	26	4	46	17	18.6	5
Nebraska	1	35	6	8	3	36	37	21	47	41	11	8	4	25	36	6	20.3	10
Nevada	1	15	44	40	27	37	32	9	30	4	41	42	38	10	44	49	28.9	41
New Hampshire	28	18	4	10	6	23	5	43	46	2	2	3	16	16	48	47	19.8	8
New Jersey	28	3	14	2	31	6	17	45	15	14	2	4	44	49	29	45	21.8	17
New Mexico	28	29	48	50	47	15	38	38	39	48	49	48	48	9	34	27	37.2	50
New York	28	9	21	39	40	11	9	33	18	15	33	24	35	49	13	46	26.4	36
North Carolina	1	31	27	22	38	21	49	26	12	11	34	24	13	21	11	19	22.5	18
North Dakota	1	43	1	17	2	40	25	1	20	37	30	8	2	28	43	13	19.4	6
Ohio	28	34	21	28	31	20	30	35	13	21	17	8	19	33	12	40	24.4	27
Oklahoma	1	40	38	37	38	38	27	14	9	35	39	42	13	10	16	7	25.3	34
Oregon	28	19	27	49	34	24	50	7	36	27	26	24	29	19	37	39	29.7	44
Pennsylvania	28	25	27	22	29	17	16	34	4	27	8	15	37	35	7	9	21.3	15
Rhode Island	28	10	6	29	19	43	7	24	37	35	26	38	50	43	38	11	27.8	38
South Carolina	1	37	34	32	45	44	43	13	41	32	41	42	42	8	25	23	31.4	48
South Dakota	1	20	14	31	5	48	11	17	11	27	20	15	10	22	42	17	19.4	6
Tennessee	1	38	38	3	41	33	35	21	42	47	38	34	38	22	15	10	28.5	39
Texas	1	40	38	4	22	7	45	4	29	10	41	24	35	39	2	30	23.2	20
Utah	1	11	10	26	8	34	44	4	33	6	11	14	20	46	32	26	20.4	13
Vermont	28	8	4	8	12	41	4	47	22	19	4	8	26	42	50	48	23.2	20
Virginia	1	22	10	19	15	29	46	32	28	45	17	5	8	2	22	36	21.1	14
Washington	28	13	14	44	23	10	41	3	3	26	6	6	16	13	8	5	16.2	3
West Virginia	1	49	48	6	50	13	12	49	25	7	45	46	46	14	41	44	31.0	47
Wisconsin	1	28	10	11	9	46	24	46	18	37	11	8	4	36	20	34	21.4	16
Wyoming	1	14	14	25	18	1	3	20	42	50	11	6	2	2	30	1	15.0	1



Infrastructure Index

Highway accessibility was ranked as the number three factor for site selection by *Area Development* in 2019 and is always among the top 10 factors. Over 87 percent of managers considered highway accessibility as very important or important when deciding on a new facility, expansion, or relocation. Infrastructure is still tremendously significant for manufacturing firms because of the need to move raw materials in and products out to major markets. The growing trend of large industrial parks (with large distribution centers) and consumer demand for on-time, quick delivery also drives the call for improved infrastructure. The American Society of Civil Engineers currently gives the nation a grade of D+ when it comes to infrastructure, estimating a needed investment of \$3.6 trillion by 2020. These findings show that for economic development, infrastructure is a quantity as well as a quality issue. Improving aging infrastructure not only supports current industry but is also seen as an investment to spur future growth. Broadband was added and is now often a key infrastructure measure. The Infrastructure Index consisted of the following nine metrics.

Infrastructure Index Metrics

- Total State Spending on Transportation Per Capita FY2018
- Average Retail Electricity Price for Industrial Customers, Cents Per kWh Aug 2019
- Percent of bridges in poor condition 2018
- Percentage growth in Freight Shipments tons (thousands) 2013-2017
- Percentage growth in Freight Shipments \$\$ (millions) 2013-2017
- Miles of Interstate highways per 10,000 population 2018
- Average Retail Natural Gas Price for Industrial Customers, \$ per thousand cubic feet Aug 2019
- State Transportation Expenditures as Percent of Total Expenditures FY2018
- Percentage of Population Without 25 Mbps/3 Mbps Broadband Access - All Areas Dec 2017

Infrastructure Index Performance

Infrastructure is another critical area for manufacturers, and Virginia rose in the rankings from 15th to 9th (tied with Kansas) and is now the fourth highest ranked Southern state after Texas, Kentucky and Florida. In the individual metrics, Virginia improved in the category of Total State Spending on Transportation per Capita from 10th to 8th; State Spending on Transportation as Percent of Total Spending from 6th to 2nd; Average Price of Electricity for Industrial Customers from 24th to 21st; Percent of Bridges in Poor Condition from 16th to 11th; while the Percent Growth in Freight Shipment Value ranking dropped from 28th in 2018 to 33rd in 2019; and Percent of Population Without Broadband dropped from 25th to 27th.

Southern States Infrastructure Index Performance

State	Infrastructure Rank	State	Infrastructure Rank
Texas	2	West Virginia	20
Kentucky	6	Oklahoma	22
Florida	8	South Carolina	25
Virginia	9T	Louisiana	26

Alabama	12	North Carolina	32
Maryland	13T	Mississippi	45
Georgia	17	Arkansas	46
Tennessee	18T	Missouri	48

MANUFACTURING COMPETITIVENESS INDEX

INFRASCTURE	Total State Spending on Transportation Per Capita (FY2018)	Average Retail Electricity Price for Industrial Customers, Cents Per KwH (Aug 2019)	% bridges in poor condition (2018)	% growth in Freight Shipments tons (thousands) 2013-2017	% growth in Freight Shipments \$\$ (millions) 2013-2017	Miles of Interstate highways per 10,000 people (2018)	Average Retail Natural Gas Price for Industrial Customers, \$ per thousand cubic feet (Aug 2019)	State Transportation Expenditures as % of Total Expenditures (FY2018)	Percentage of Population Without 25 Mbps/3 Mbps Broadband Access - All Areas (Dec 2017)	AVERAGE RANKING	STATE RANK
Alabama	43	13	9	20	8	19	7	40	42	22.3	12
Alaska	1	49	38	43	2	2	27	1	47	23.3	13
Arizona	29	23	3	32	40	30	14	28	40	26.6	33
Arkansas	21	17	11	46	38	16	40	37	50	30.7	46
California	32	48	23	14	10	47	44	44	9	30.1	42
Colorado	47	30	18	23	14	27	33	46	21	28.8	39
Connecticut	5	45	26	40	48	41	36	15	1	28.6	38
Delaware	3	27	8	2	43	49	49	19	6	22.9	14
Florida	27	31	6	6	37	45	31	4	10	21.9	8
Georgia	42	24	7	13	17	39	17	30	24	23.7	17
Hawaii	2	50	22	39	30	50	50	7	11	29.0	40
Idaho	39	20	23	29	44	8	11	18	43	26.1	30
Illinois	38	18	31	22	9	26	34	31	15	24.9	23
Indiana	45	25	21	34	21	22	37	40	33	30.9	47
Iowa	19	40	48	4	13	14	18	26	32	23.8	18
Kansas	41	26	16	7	23	10	6	39	30	22.0	9
Kentucky	24	3	25	37	5	23	8	32	31	20.9	6
Louisiana	48	1	44	14	11	20	5	48	38	25.4	26
Maine	23	41	45	36	35	12	32	22	19	29.4	41
Maryland	7	33	15	9	35	44	47	7	6	22.6	13
Massachusetts	12	46	36	28	31	43	46	25	5	30.2	44
Michigan	36	28	41	3	3	36	41	28	26	26.9	34
Minnesota	14	36	14	14	20	30	16	19	13	19.6	4
Mississippi	28	9	37	44	42	13	20	34	48	30.6	45
Missouri	44	32	33	41	34	18	28	26	37	32.6	48
Montana	14	4	28	49	49	3	25	14	41	25.2	24
Nebraska	26	35	34	27	21	15	13	24	39	26.0	29
Nevada	34	38	2	42	14	21	42	16	22	25.7	28
New Hampshire	36	44	35	12	11	29	38	16	15	26.2	31
New Jersey	9	42	29	21	28	48	43	9	1	25.6	27
New Mexico	16	5	20	30	4	7	9	32	45	18.7	3
New York	25	7	39	31	46	42	35	43	3	30.1	42
North Carolina	18	19	40	34	41	37	30	6	13	26.4	32
North Dakota	5	39	42	1	1	5	2	11	20	14.0	1
Ohio	49	12	19	19	27	34	26	47	15	27.6	35
Oklahoma	40	2	43	18	14	17	1	37	49	24.6	22
Oregon	32	14	16	8	6	25	24	48	25	22.0	9
Pennsylvania	11	16	46	11	31	33	45	12	12	24.1	21
Rhode Island	20	47	50	17	25	46	48	40	4	33.0	49
South Carolina	31	11	31	33	29	27	14	19	33	25.3	25
South Dakota	13	37	47	47	38	4	29	2	36	28.1	37
Tennessee	46	8	9	25	19	24	10	45	28	23.8	18
Texas	30	29	1	5	7	38	3	9	22	16.0	2
Utah	17	14	4	45	45	11	21	5	18	20.0	5
Vermont	4	43	5	24	50	6	12	13	35	21.3	7
Virginia	8	21	11	38	33	35	23	2	27	22.0	9
Washington	35	6	11	10	24	40	39	34	8	23.0	15
West Virginia	10	10	49	48	18	9	4	23	44	23.9	20
Wisconsin	22	34	27	25	25	32	22	36	28	27.9	36
Wyoming	50	22	30	50	47	1	19	50	46	35.0	50



Innovation Index

The Innovation Index measures states' performance in university technology transfer, patent development, research & development funding, and venture capital funding. Innovation and research help generate new manufacturing companies and products. Innovation is a tool that grows manufacturing from within a region, as businesses are more likely to start and remain close to their original research connection. An area known for innovation and a talented technological workforce is more likely to attract businesses looking to relocate. It is also more likely to draw top talent in the creative class. The Innovation Index consisted of the following seven metrics.

Innovation Index Metrics

- Technology Licenses and Options Executed from Universities 2017
- Patents Issued 2010-2017
- Total Technology Industry Employment Growth 2013-2018
- Total R&D percent of GDP 2016
- Business Performed R&D - Percent of Private Industry Output 2016
- Average Venture Capital Funding Per \$1 Million of GDP 2013-2018
- Average Annual Number of New Entrepreneurs per 100,000 people 2018, replacing Start-Up Firms per 1,000 Firms 2016 (this metric has not been updated as new data is not available)

Innovation Index Performance

Virginia dropped in the Innovation Index from 23rd in 2018 to 31st in 2019, remaining in the middle of the Southern states. In the individual metrics, Virginia has remained stable, with the rankings staying the same or shifting by one position, except for Technology Industry Employment Growth which improved from 36th in 2018 to 30th in 2019. Technology Licenses and Options which dropped from 20th in 2018 to 23rd in 2019; Total R&D as Percent of GDP from 20th to 26th; Business Performed R&D as Percent of Private Output from 28th to 30th. In the future, a state economic development focus on attracting and growing technology companies and advanced industry manufacturing firms is likely to provide improvements in this index.

Southern States Innovation Index Performance

State	Innovation Rank	State	Innovation Rank
North Carolina	4	South Carolina	33
Florida	8	Alabama	37
Maryland	10	Oklahoma	40
Texas	12	Kentucky	43
Georgia	15	Mississippi	45
Missouri	18	Louisiana	46
Tennessee	29	Arkansas	47
Virginia	31	West Virginia	50

MANUFACTURING COMPETITIVENESS INDEX

INNOVATION	Technology Licenses and Options Executed from Universities (2017)	Patents Issued (2010-2017)	Total Technology Industry Employment Growth (2013-2018)	Total R&D % of GDP (2016)	Business Performed R&D - % of Private Industry Output (2016)	Average Venture Capital Funding Per \$1 Million of GDP (2013-2018)	Average Annual Number of New Entrepreneurs per 100,000 people (2018)	AVERAGE RANKING	STATE RANK
Alabama	26	35	29	17	29	44	42	31.7	37
Alaska	47	50	50	44	49	42	7	41.3	49
Arizona	16	15	14	14	12	17	13	14.4	7
Arkansas	37	43	47	44	42	38	25	39.4	47
California	1	1	12	4	1	1	2	3.1	1
Colorado	22	14	18	23	25	6	13	17.3	14
Connecticut	41	18	37	7	6	8	45	23.1	22
Delaware	42	37	43	10	7	16	38	27.6	28
Florida	6	10	6	35	32	20	1	15.7	8
Georgia	10	16	19	31	27	14	5	17.4	15
Hawaii	40	45	35	44	48	45	22	39.9	48
Idaho	32	26	4	9	9	30	10	17.1	13
Illinois	18	8	27	21	16	10	36	19.4	19
Indiana	14	21	28	21	16	35	42	25.3	26
Iowa	20	27	31	23	20	41	28	27.1	27
Kansas	28	28	45	28	23	33	29	30.6	35
Kentucky	34	32	42	40	35	39	34	36.6	43
Louisiana	31	38	43	50	49	48	15	39.1	46
Maine	not reported	41	9	40	35	24	21	28.3	30
Maryland	11	22	23	2	16	9	29	16.0	10
Massachusetts	2	4	10	3	2	2	38	8.7	3
Michigan	12	7	15	6	4	32	38	16.3	11
Minnesota	9	6	26	17	13	12	45	18.3	17
Mississippi	39	42	39	38	46	50	17	38.7	45
Missouri	18	24	17	19	13	26	17	19.1	18
Montana	34	44	36	38	42	23	8	32.1	38
Nebraska	30	40	22	35	35	37	22	31.6	36
Nevada	38	31	1	49	42	28	15	29.1	32
New Hampshire	17	30	5	11	9	11	41	17.7	16
New Jersey	25	9	33	11	8	25	25	19.4	19
New Mexico	29	36	34	1	33	31	5	24.1	23
New York	5	3	13	29	27	3	17	13.9	6
North Carolina	8	13	3	14	15	7	29	12.7	4
North Dakota	48	46	46	35	35	47	11	38.3	44
Ohio	15	12	24	26	23	29	45	24.9	24
Oklahoma	36	33	40	40	40	46	9	34.9	40
Oregon	13	17	11	8	5	13	29	13.7	5
Pennsylvania	3	11	25	19	16	15	48	19.6	21
Rhode Island	44	39	38	13	22	21	50	32.4	39
South Carolina	32	29	6	34	33	40	34	29.7	33
South Dakota	43	48	15	44	42	43	17	36.0	42
Tennessee	21	25	21	31	40	27	29	27.7	29
Texas	7	2	32	29	26	18	4	16.9	12
Utah	26	23	8	14	11	4	25	15.9	9
Vermont	45	34	41	33	30	19	11	30.4	34
Virginia	23	20	30	26	30	22	49	28.6	31
Washington	4	5	2	5	2	5	22	6.4	2
West Virginia	46	47	48	44	46	49	42	46.0	50
Wisconsin	24	19	20	23	20	34	36	25.1	25
Wyoming	not reported	49	49	40	35	36	2	35.2	41



Manufacturing Economic Strength

Finally, the Economic Strength Index evaluates the existing presence of the manufacturing sector within each state and evaluates indicators of overall economic performance. Existing industry in a state can create a clustering effect and attract further manufacturing to the area. Clusters have been known to attract other prospective businesses because of the benefit of higher concentrations of skilled employees and regional suppliers. A strongly performing overall economy beyond manufacturing is important for prospective companies as growth inspires innovation, talent movement, and investment. For 2019 two new metrics were added to reflect manufacturing's impact on private sector gross state product. The Economic Strength Index consisted of the following twelve metrics.

Manufacturing Economic Strength Index Metrics

- Manufacturing's Share of Gross State Product 2018
- Change in Manufacturing's Share of Gross State Product 2013 -2018
- NEW - Manufacturing's Share of PRIVATE Gross State Product 2018
- NEW - Change in Manufacturing's Share of PRIVATE Gross State Product 2013 -2018
- Growth in Manufacturing GDP 2013 - 2018
- Total Manufacturing Employment 2018
- Manufacturing Employment as percent of Total Employment 2018
- Change in Real GDP per Capita 2013-2018
- Change in Real Personal Income per Capita 2013-2018
- Change in Real GDP chained 2009 dollars 2013-2018
- Exports of Manufactured Goods percent change 2017 - 2018
- Total Exports of Goods Per Capita 2018
- Manufacturing establishments total capital expenditures (\$millions) 2016
- Manufacturing establishments total capital expenditures per manufacturing employee 2016

Economic Strength Results

Virginia improved its position from 46th in 2018 to 37th (tied with North Dakota) in the 2019 economic strength index. In the individual metrics, Virginia remained stable in five categories and improved in seven categories: Five Year Change in Manufacturing's Share of GSP (from 35th in 2018 to 29th in 2019); Five Year Change in Manufacturing GDP (from 43rd to 34th); Five Year Change in Real GDP per Capita (from 45th to 35th); Five Year Change in Real Personal Income per Capita (from 37th in 2018 to 33rd in 2019); Five Year Change in Real GDP (from 38th in 2018 to 33rd in 2019); One Year Change in Export of Manufactured Goods (from 39th in 2018 to 12th in 2019); and in Total Exports per Capita (from 43rd in 2018 to 41st in 2019). In the two new metrics Virginia ranked 34th in Manufacturing's Share of Private Gross State Product and 35th in Five Year Change in Manufacturing's Share of Private Gross State Product.

State	Economic Strength Rank	State	Economic Strength Rank
South Carolina	1	Kentucky	23
Georgia	7T	North Carolina	25
Tennessee	10	Alabama	26

Louisiana	13	Maryland	30
Texas	17	Missouri	33T
Florida	18	Oklahoma	36
Arkansas	19	Virginia	37T
Mississippi	22	West Virginia	46

MANUFACTURING COMPETITIVENESS INDEX

ECONOMIC STRENGTH	Manufacturing's Share of Gross State Product 2018	Change in Manufacturing's Share of Gross State Product 2013-2018	Manufacturing's Share of PRIVATE Gross State Product 2018 (chained 2012 dollars)	Change in Manufacturing's Share of PRIVATE Gross State Product 2013-2018 (chained 2012 dollars)	Growth in Manufacturing GDP 2013-2018	Total Manufacturing Employment 2018	Manufacturing Employment as percent of Total Employment 2018	Change in Real GDP per Capita (2013-2018)	Change in Real Personal Income per Capita (2013-2018)	Change in Real GDP (2013-2018) chained 2012 dollars	Exports of Manufactured Goods % change 2017-2018	Total Exports Per Capita (2018)	Manufacturing establishments total capital expenditures per manufacturing employee 2016	Manufacturing establishments total capital expenditures per manufacturing employee 2016	AVERAGE RANKING	STATE RANK
	Alabama	8	35	7	37	41	17	5	35	38	39	47	21	14	10	25.3
Alaska	49	5	48	4	8	49	45	49	46	50	49	7	49	13	33.6	48
Arizona	37	7	35	5	3	25	39	27	17	9	15	35	29	26	22.1	15
Arkansas	13	5	15	22	25	27	7	43	26	42	5	42	28	22	23.0	19
California	28	35	25	22	10	1	31	1	1	3	27	20	2	42	17.7	4
Colorado	40	37	40	27	27	29	41	4	9	5	34	49	32	36	29.3	35
Connecticut	24	45	26	46	50	28	22	45	22	47	6	13	33	45	32.3	45
Delaware	41	29	41	10	20	45	40	38	32	29	7	12	41	6	27.9	31
Florida	45	14	45	13	2	12	43	17	11	6	26	36	15	35	22.9	18
Georgia	26	21	27	27	9	11	25	5	8	8	18	31	13	28	18.4	7
Hawaii	50	24	50	18	18	48	50	13	10	24	50	50	50	46	35.8	50
Idaho	20	7	22	22	5	37	24	18	16	7	39	39	34	5	21.1	14
Illinois	19	40	18	32	43	5	19	22	21	36	28	11	8	27	23.5	21
Indiana	1	40	1	42	32	7	1	30	28	30	23	8	7	20	19.3	9
Iowa	4	11	9	42	15	23	4	22	41	22	22	17	17	9	18.4	7
Kansas	11	1	12	1	1	26	11	14	47	27	29	25	27	18	17.9	5
Kentucky	6	37	3	44	44	18	6	40	36	40	32	5	16	11	24.1	23
Louisiana	2	26	2	8	46	32	32	44	45	44	4	1	4	1	20.8	13
Maine	31	29	31	29	31	39	28	19	14	28	37	43	44	47	32.1	43
Maryland	43	18	42	13	12	34	46	14	24	19	3	44	35	33	27.1	30
Massachusetts	34	43	33	32	36	21	34	6	7	13	42	27	25	44	28.4	32
Michigan	3	26	4	39	15	4	3	7	12	16	45	9	5	25	15.2	2
Minnesota	16	26	16	16	23	14	13	24	23	17	14	24	19	37	20.1	11
Mississippi	12	3	8	3	20	30	8	42	48	44	24	30	30	32	23.9	22
Missouri	18	21	19	35	35	16	21	40	33	40	33	37	21	38	29.1	33
Montana	41	18	39	5	28	47	43	46	33	35	16	47	38	3	31.4	42
Nebraska	23	42	27	47	47	35	17	37	43	32	11	23	36	29	32.1	43
Nevada	46	18	46	19	6	38	47	34	6	10	48	32	42	40	30.9	41
New Hampshire	22	14	20	9	13	36	15	16	19	18	41	28	39	50	24.3	24
New Jersey	38	14	38	16	17	20	37	29	14	34	40	26	22	31	26.9	29
New Mexico	48	12	46	10	14	44	49	21	30	31	30	45	40	7	30.5	40
New York	47	34	48	26	36	10	42	8	5	23	16	22	10	30	25.5	28
North Carolina	7	48	6	48	40	9	14	28	19	15	35	34	9	34	24.7	25
North Dakota	39	3	43	10	25	46	37	50	50	49	1	3	47	19	30.1	37
Ohio	10	29	11	25	24	3	8	11	30	21	19	16	3	12	15.9	3
Oklahoma	32	14	36	41	42	31	30	25	49	25	13	48	26	8	30.0	36
Oregon	15	43	13	29	10	24	17	3	3	2	44	10	23	17	18.1	6
Pennsylvania	21	29	24	32	30	6	19	10	17	20	19	33	6	21	20.5	12
Rhode Island	36	12	37	13	22	42	28	39	29	43	43	40	46	48	34.1	49
South Carolina	9	7	9	19	7	19	11	25	13	12	21	6	18	15	13.6	1
South Dakota	29	2	31	2	4	41	16	47	40	38	25	46	45	41	29.1	33
Tennessee	14	37	14	38	18	13	10	12	27	14	38	14	11	14	19.6	10
Texas	17	49	17	49	49	2	32	32	42	11	9	2	1	4	22.6	17
Utah	27	47	20	39	29	33	26	9	4	4	2	18	31	24	22.4	16
Vermont	33	24	30	19	33	43	22	30	37	37	10	15	48	43	30.3	39
Virginia	35	29	34	35	34	22	36	35	33	33	12	41	20	23	30.1	37
Washington	24	50	23	50	48	15	27	2	2	1	36	4	24	49	25.4	27
West Virginia	30	21	29	29	45	40	35	33	38	46	46	19	37	16	33.1	46
Wisconsin	4	45	4	44	38	8	2	19	24	26	31	29	12	39	23.2	20
Wyoming	44	7	44	5	38	50	48	47	44	48	8	38	43	2	33.3	47



Overall Manufacturing Competitiveness Index All States

In addition to each of the five indexes a composite index was created using all of the 52 data points. As the chart below shows, Virginia is ranked as the 15th most competitive state in overall manufacturing competitiveness, a drop from its 8th overall ranking in 2018. Close neighbors North Carolina and Maryland also scored high finishing #6 and #9. The chart below provides a quick visual reference with states ranked among the 15-best coded in green and states scoring in the bottom 15 coded red.

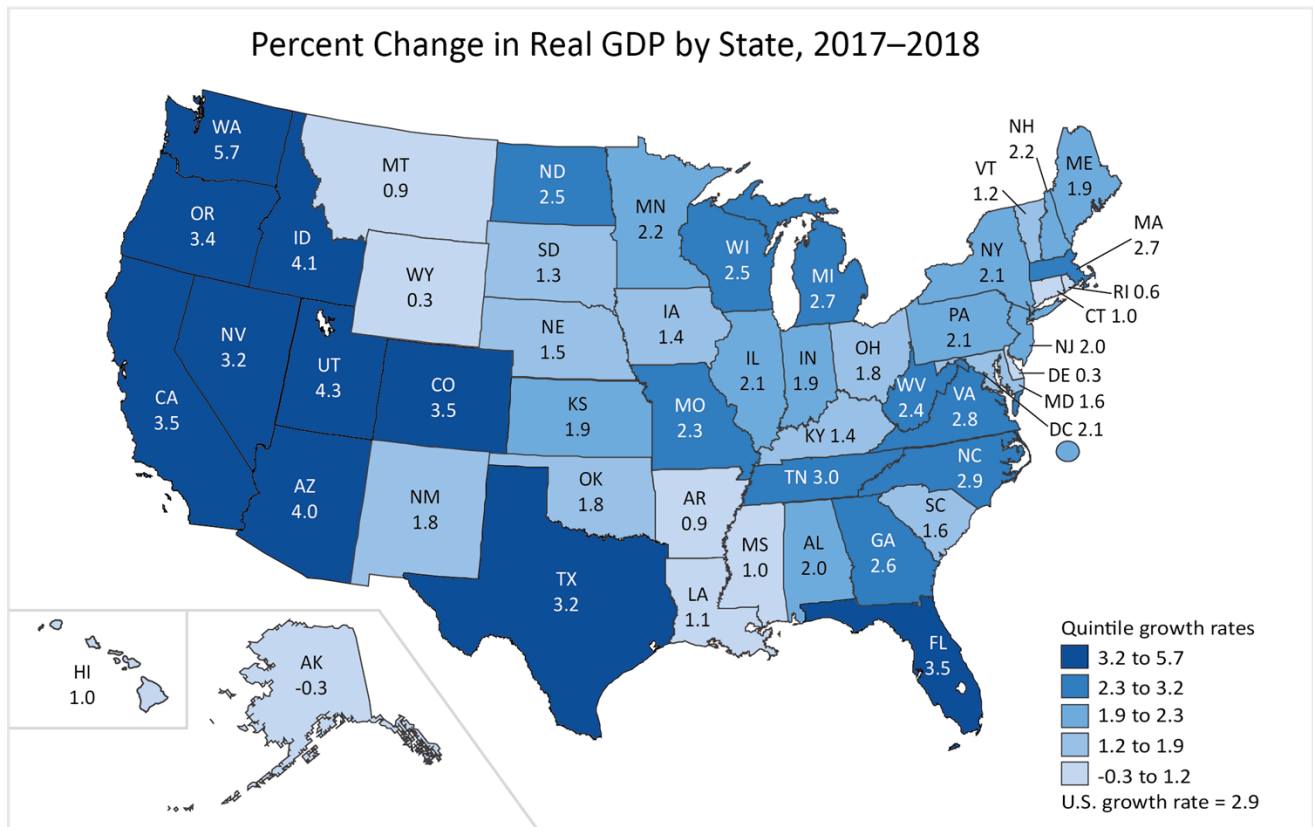
DRAFT

2019 OVERALL STATE RANKINGS								
		BUSINESS CLIMATE	WORKFORCE	INFRA-STRUCTURE	INNOVATION	ECONOMIC STRENGTH	TOTAL RANKINGS	AVERAGE RANK
1	Utah	15T	13	5	9	16	58	11.6
2	Minnesota	12	22T	4	17	11	66	13.2
3	Iowa	9T	10T	18T	27	7T	71	14.2
4	Texas	24	20T	2	12	17	75	15.0
5	Washington	32	3	16	2	27	80	16.0
6	North Carolina	3T	18	32	4	25	83	16.6
7	Oregon	22T	44	9T	5	6	86	17.2
8	Kansas	17	22T	9T	35	5	88	17.6
9	Maryland	29	8T	13T	10	30	90	18.0
10T	Georgia	27	25T	17	15	7T	91	18.2
10T	Arizona	6	30T	33	7	15	91	18.2
10T	North Dakota	3T	6T	1	44	37T	91	18.2
13	Idaho	11	25T	30	13	14	93	18.6
14	Ohio	5	27T	35	24	3	94	18.8
15T	Michigan	7	45	34	11	2	99	19.8
15T	Virginia	8	14	9T	31	37T	99	19.8
17	New Hampshire	21	8T	31	16	24	100	20.0
18	Florida	35	32	8	8	18	101	20.2
19	Kentucky	13T	19	6	43	23	104	20.8
20	Pennsylvania	40	15	21	21	12	109	21.8
21	Tennessee	19T	39	18T	29	10	115	23.0
22	Massachusetts	33	4	44	3	32	116	23.2
23	South Dakota	1	6T	37	42	33T	119	23.8
24	Colorado	30T	2	39	14	35	120	24.0
25	South Carolina	19T	48	25	33	1	126	25.2
26	Nebraska	9T	10T	29	36	43T	127	25.4
27	Connecticut	13T	10T	38	22	45	128	25.6
28	California	50	35	42T	1	4	132	26.4
29	Wisconsin	37	16	36	25	20	134	26.8
30	Vermont	38	20T	7	34	39	138	27.6
31	New Jersey	47	17	27	19T	29	139	27.8
32	Wyoming	2	1	50	41	47	141	28.2
33	Indiana	36	24	47	26	9	142	28.4
34T	Missouri	15T	30T	48	18	33T	144	28.8
34T	New Mexico	28	50	3	23	40	144	28.8
36	Illinois	49	33	23	19T	21	145	29.0
37	New York	34	36	42T	6	28	146	29.2
38T	Alabama	26	46	12	37	26	147	29.4
38T	Delaware	44	29	15	28	31	147	29.4
40	Montana	43	5	24	38	42	152	30.4
41	Oklahoma	25	34	22	40	36	157	31.4
42	Nevada	18	41	28	32	41	160	32.0
43	Louisiana	42	42	26	46	13	169	33.8
44	Arkansas	22T	40	46	47	19	174	34.8
45	Maine	39	27T	41	30	43T	180	36.0
46	Mississippi	30T	49	45	45	22	191	38.2
47	Alaska	48	43	13T	49	48	201	40.2
48	West Virginia	41	47	20	50	46	204	40.8
49	Hawaii	45	37	40	48	50	220	44.0
50	Rhode Island	46	38	49	39	49	221	44.2
			top 15			bottom 15		



Conclusions –

The overall economy in Virginia has begun to rebound from the post great recession challenges that the state faced. From 2011 to 2016, Virginia's change in GDP per capita and real personal income growth were among the lowest in the country. As the chart below shows from 2017-2018 state GDP growth grew at 2.8 percent, still below some neighboring states, but in the fourth best quintile for growth.



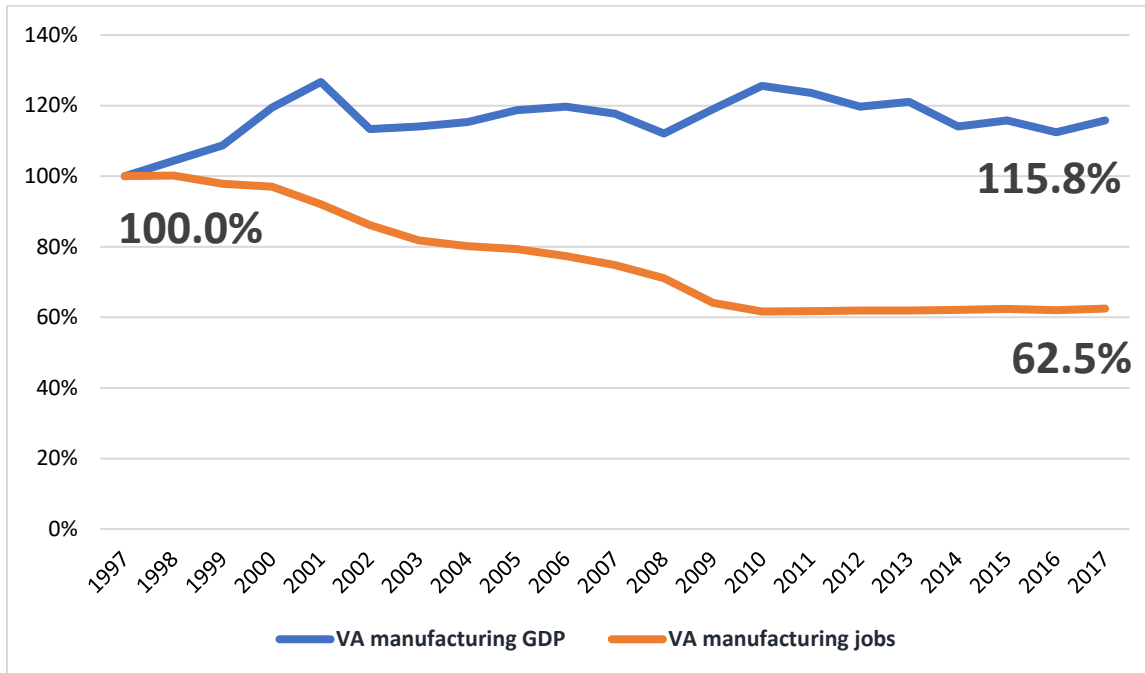
U.S. Bureau of Economic Analysis

The fundamentals of the Virginia economy's business climate and workforce appear to be positioned as one of the most competitive states, but some headwinds remain. The Federal government's large and rising debt will likely limit future investment and, as home to significant military facilities and government contractors, will impact the state. Another concern is the widening gap between prosperous areas of the state and those that have yet to experience new growth.

An economic development prioritization to strengthen Virginia's manufacturing sector could take better advantage of the state's skilled workers, sound infrastructure and stream of innovative ideas. New manufacturing investment and jobs could also better spread prosperity across more of Virginia. While manufacturing jobs have declined over the past 30 years due to

many factors, including automation, per employee output expanded significantly. The chart below shows that despite fewer jobs, manufacturing GDP has risen over 50 percent in the past 20 years.

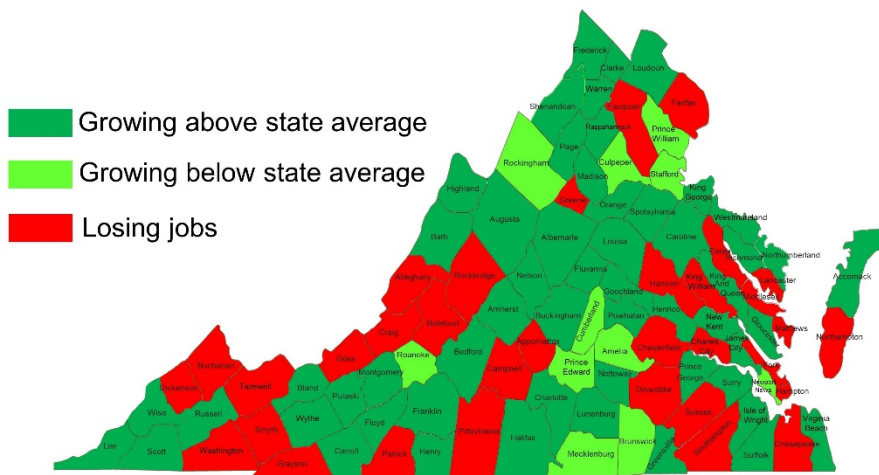
Virginia Manufacturing Jobs and Manufacturing GDP Growth 1997 – 2018 (normalized as percent of levels in 1997)



Source: US Bureau of Labor Statistics QCEW & US Bureau of Economic Analysis GDP

This map shows that manufacturing job expansion over the past five years has been widespread across the state, bringing growth and prosperity to places that have been experiencing economic hardship.

Percent Manufacturing Job Growth 2013 to 2018 Virginia average 3.5%



Source: US Bureau of Labor Statistics

Manufacturing can be better supported by a strategic commitment to

improve the business climate, focus on middle skill job training, increased global trade,



improved innovation commercialization, a cluster approach to economic development and to sustained private sector engagement. Virginia can be a national leader in nurturing tomorrow's advanced manufacturing. The foundation is strong. The Virginia Manufacturers Association is a ready and willing partner.

Below are the 2018 and 2017 Overall State Rankings.

2018 OVERALL STATE RANKINGS								
		BUSINESS CLIMATE	WORKFORCE	INFRA-STRUCTURE	INNOVATION	ECONOMIC STRENGTH	TOTAL RANKINGS	AVERAGE RANK
1	Minnesota	12	8	6	12	10	48	9.6
2	Texas	20T	10	3	14	7	54	10.8
3	Utah	14	11	4	6	21T	56	11.2
4	Washington	24	4	12	2	20	62	12.4
5	Iowa	10T	14	10	33	8T	75	15.0
6	North Carolina	8	23	25	7	14	77	15.4
7	Oregon	13	36	9	4	23	85	17.0
8	Idaho	7	37	5	21	26	96	19.2
9	Virginia	5	9	15	23	46	98	19.6
10	North Dakota	10T	5	1	41	42	99	19.8
11	Michigan	4	47	40T	8	2	101	20.2
12	Kansas	16	22	11	32	21T	102	20.4
13T	Arizona	6	31T	21	10	35T	103	20.6
13T	Colorado	30T	3	32T	11	27	103	20.6
15	Massachusetts	25	7	45	3	25	105	21.0
16	South Dakota	1	16	6	45	38	106	21.2
17T	Nebraska	9	13	16	40	29	107	21.4
17T	Pennsylvania	41	15	23	20	8T	107	21.4
19T	Maryland	30T	6	17	15T	41	109	21.8
19T	Ohio	2	28T	49	25T	5	109	21.8
21	Indiana	34	20	34T	24	1	113	22.6
22	Tennessee	19	34	32T	27	4	116	23.2
23	Kentucky	18	27	20	39	15	119	23.8
24	Florida	29	40	24	9	18	120	24.0
25T	Georgia	20T	38	37T	15T	11	121	24.2
25T	New Hampshire	26	12	48	18T	17	121	24.2
27	Wyoming	3	1	27	46	45	122	24.4
28	South Carolina	15	42	30	31	6	124	24.8
29	Illinois	50	24	18T	17	16	125	25.0
30	Nevada	17	45	2	30	32	126	25.2
31	Montana	45	2	13	37	30	127	25.4
32	California	49	33	44	1	3	130	26.0
33	Connecticut	32T	18	18T	22	47	137	27.4
34	Missouri	22T	19	47	13	40	141	28.2
35T	New Jersey	47	25	26	18T	28	144	28.8
35T	Wisconsin	38T	17	42	28	19	144	28.8
37T	Alabama	27T	44	39	35T	12	157	31.4
37T	New York	35	43	43	5	31	157	31.4
39	Vermont	32T	31T	8	38	49	158	31.6
40	Arkansas	22T	46	40T	43	13	164	32.8
41	Oklahoma	38T	21	22	42	43	166	33.2
42	Delaware	43T	39	36	25T	33	176	35.2
43	New Mexico	36	48	14	29	50	177	35.4
44	Louisiana	37	41	29	48	24	179	35.8
45	Maine	42	30	28	35T	48	183	36.6
46	Mississippi	27T	50	34T	47	35T	193	38.6
47	Rhode Island	46	28T	50	34	37	195	39.0
48T	Alaska	48	35	37T	49	34	203	40.6
48T	Hawaii	43T	26	46	44	44	203	40.6
50	West Virginia	38T	49	31	50	39	207	41.4
			top 15			bottom 15		



2017 OVERALL STATE RANKINGS								
		BUSINESS CLIMATE	WORKFORCE	INFRA-STRUCTURE	INNOVATION	ECONOMIC STRENGTH	TOTAL RANKINGS	AVERAGE RANK
1	Minnesota	9	8	7	15	9	48	9.6
2	Utah	10	11	17	4	21	63	12.6
3	Washington	32	4	13	2	16	67	13.4
4	Texas	34	10	1	16	8	69	13.8
5	Iowa	6	14	8	34	12	74	14.8
6	Massachusetts	17	7	39	3	17	83	16.6
7	Colorado	28	3	17	10	27	85	17.0
8	North Carolina	3	23	29	9	22	86	17.2
9	Virginia	4	9	11	25	46	95	19.0
10T	Idaho	21	37	9	19	13	99	19.8
10T	Connecticut	11	18	6	22	42	99	19.8
12	North Dakota	23	5	3	39	30	100	20.0
13	Michigan	2	47	46	5	1	101	20.2
14T	Ohio	8	28	40	26	5	107	21.4
14T	Pennsylvania	31	14	30	21	11	107	21.4
14T	Maryland	18	6	22	16	45	107	21.4
17T	Nebraska	4	13	21	35	36	109	21.8
17T	South Dakota	1	16	2	43	47	109	21.8
19T	Kentucky	24	27	13	40	6	110	22.0
19T	Missouri	15	19	50	8	18	110	22.0
21	Oregon	7	35	34	7	29	112	22.4
22	Kansas	20	22	12	33	27	114	22.8
23T	Illinois	50	24	16	11	14	115	23.0
23T	New Hampshire	16	12	44	20	23	115	23.0
25	Georgia	13	38	35	12	19	117	23.4
26	Indiana	25	20	47	24	3	119	23.8
27T	Tennessee	13	34	43	27	4	121	24.2
27T	Wisconsin	38	16	26	27	14	121	24.2
29	Wyoming	18	1	22	49	39	129	25.8
30	Montana	45	2	5	41	37	130	26.0
31	California	49	33	49	1	2	134	26.8
32	Arizona	12	31	48	13	34	138	27.6
33	New York	34	43	31	5	26	139	27.8
34	Florida	33	40	24	18	25	140	28.0
35	Vermont	30	31	4	38	43	146	29.2
36T	Alabama	21	44	38	36	9	148	29.6
36T	Oklahoma	42	20	20	42	24	148	29.6
38T	South Carolina	25	42	44	31	7	149	29.8
38T	New Jersey	39	25	37	14	34	149	29.8
40	Delaware	34	39	15	22	48	158	31.6
41	Louisiana	25	41	27	47	19	159	31.8
42	Nevada	37	45	10	32	38	162	32.4
43	Maine	41	30	31	30	44	176	35.2
44	Rhode Island	43	28	40	36	33	180	36.0
45	Arkansas	29	46	33	44	32	184	36.8
46	New Mexico	44	48	19	29	49	189	37.8
47	Mississippi	40	50	25	45	30	190	38.0
48	Hawaii	48	26	42	46	41	203	40.6
49	Alaska	47	35	27	48	50	207	41.4
50	West Virginia	46	49	36	50	40	221	44.2
			top 15			bottom 15		

