



BOULDER  
**INNOVATION**  
VENTURE 2.0





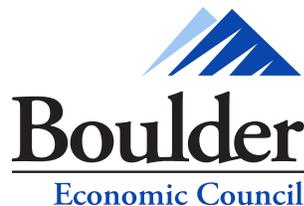
# TABLE OF CONTENTS

Introduction .....	1
Innovation Peer Communities .....	2
Executive Summary .....	3
Acknowledgment .....	4
People .....	5
Economy .....	15
Research & Development .....	25
Investment Capital .....	33
Place .....	39
Sponsors .....	53
Glossary of Terms .....	54
Bibliography .....	55

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# INTRODUCTION

## Background

In 2017, the Boulder Economic Council of the Boulder Chamber launched the Boulder Innovation Venture. The goal was to benchmark the productivity of Boulder's innovation economy and startup ecosystem compared to other leading entrepreneurial communities in the U.S.

The Boulder Innovation Venture initiative resulted in the publication of the inaugural Boulder Innovation Venture report in 2018. The first edition report generated a high volume of interest online, was cited in numerous media posts and articles, and it was presented at regional and international conferences.

This Boulder Innovation Venture 2.0 is the second edition, with new and updated benchmark data and additional comparative communities.

## Methodology

The Boulder Economic Council contracted with the Business Research Division of the Leeds School of Business at the University of Colorado Boulder to assist in the research and data analysis underlying the new Boulder Innovation Venture 2.0 edition. Research began by reviewing recent studies of innovation and startup ecosystems in U.S. cities and regions. The research review resulted in a set of 46 metrics with data sources to quantify innovation and entrepreneurship at the metropolitan statistical area (MSA) or city geographic levels.

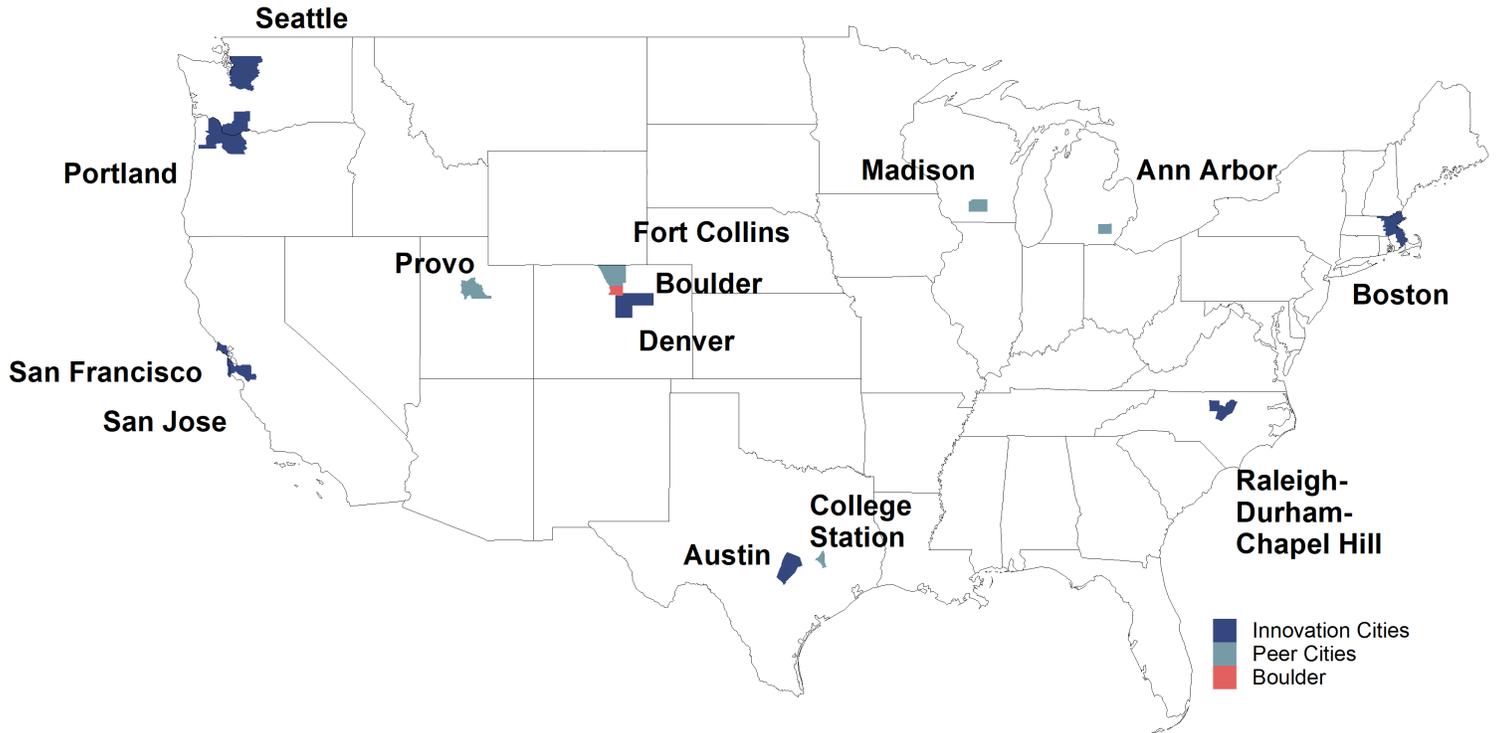
The selected innovation and entrepreneurship metrics have been used to compare Boulder with a number of the leading centers of innovation in the U.S. Silicon Valley, San Francisco, Seattle, Denver, Austin, Boston, Portland, and Raleigh were selected for comparison. In addition, several "peer" startup communities with characteristics similar to Boulder were selected for benchmarking: Ann Arbor, College Station, Provo, Madison, and Ft. Collins.

Most of the communities selected for comparison are considerably larger than Boulder – some of them orders of magnitude larger. In order to make meaningful comparisons, the innovation metrics used in this report are normalized based on population or other standard measures. In most cases, metrics are calculated on per capita basis, but other bases for comparison are also utilized.

The Boulder Innovation Venture 2.0 report presents key findings of the research based on the analysis of the metrics comparing innovation and entrepreneurship in Boulder with the communities selected for benchmarking.



# INNOVATION PEER COMMUNITIES



## Comparative Innovation and Entrepreneurship Metropolitan Statistical Areas (MSAs)

- Austin-Round Rock, TX MSA:**  
 Bastrop County, Caldwell County, Hays County, Travis County, Williamson County  
 Population: 2,168,316
- Boston-Cambridge-Newton, MA-NH MSA:**  
 Norfolk County, Plymouth County, Suffolk County, Essex County, Middlesex County, Rockingham County, Strafford County  
 Population: 4,875,390
- Denver-Aurora-Lakewood, CO MSA:**  
 Adams County, Arapahoe County, Broomfield County, Clear Creek County, Denver County, Douglas County, Elbert County, Gilpin County, Jefferson County, Park County  
 Population: 2,932,415
- Portland-Vancouver-Hillsboro OR-WA MSA:**  
 Clackamas County OR; Columbia County OR; Multnomah County OR; Washington County OR; Yamhill County OR; Clark County, WA; Skamania County, WA  
 Population: 2,478,810
- Raleigh-Durham-Chapel Hill, NC CSA:**  
 Wake County, Johnston County, Franklin County, Durham County, Orange County, Chatham County, Person County, Harnett County, Lee County, Granville County, Vance County  
 Population: 1,937,952
- San Francisco-Oakland-Hayward, CA MSA:**  
 Alameda County, Contra Costa County, San Francisco County, San Mateo County, Marin County  
 Population: 4,729,484
- San Jose-Sunnyvale-Santa Clara, CA MSA:**  
 San Benito County, Santa Clara County  
 Population: 1,999,107
- Seattle-Tacoma-Bellevue, WA MSA:**  
 King County, Snohomish County, Pierce County  
 Population: 3,939,363

### Peer Startup MSAs

- Ann Arbor, MI MSA:**  
 Washtenaw County  
 Population: 370,963
- Ft. Collins-Loveland, CO MSA:**  
 Larimer County  
 Population: 350,518
- Boulder, CO MSA:**  
 Boulder County  
 Population: 326,078
- Madison, WI MSA:**  
 Dane County, Columbia County, Green County, Iowa County  
 Population: 660,422
- College Station-Bryan, TX MSA:**  
 Brazos County, Burleson County, Robertson County  
 Population: 262,431
- Provo-Orem, UT MSA:**  
 Juab County, Utah County  
 Population: 633,768

# EXECUTIVE SUMMARY

The Boulder Innovation Venture 2.0 report is the newest edition of an initiative launched by the Boulder Economic Council of the Boulder Chamber. The report presents key findings of research and analysis conducted to compare measures of innovation and entrepreneurship in Boulder relative to selected innovation and peer communities. The report is organized by five key chapters:

## PEOPLE | ECONOMY | RESEARCH & DEVELOPMENT | INVESTMENT CAPITAL | PLACE

Each chapter presents innovation and entrepreneurship metrics comparing Boulder's productivity with selected communities from throughout the U.S. Some of the key findings from each section include:

### PEOPLE

- Sixty-three percent of residents in the Boulder MSA have a bachelor's degree or higher. This educational attainment is the highest of all metro areas in the U.S.
- The Boulder metro area has been ranked #1 on the Bloomberg Brain Concentration Index since the 2016 inception of the index.
- The Boulder MSA has almost three times the concentration of Science, Technology Engineering, and Math (STEM) occupations relative to the U.S., and the second highest density of STEM jobs among the innovation and peer regions studied.

### ECONOMY

- A diverse mix of key industries are represented in the Boulder MSA with concentrations of employment ranging from more than twice the U.S. average for the IT and bioscience industries, and up to 12 times the U.S. average for aerospace.
- Twelve percent of employment in the Boulder metro area is classified as manufacturing, second only to Silicon Valley among the selected regions studied.
- The Boulder region had the highest density in the U.S. of Inc. 5000 high growth companies, as determined by Brookings Institution.

### RESEARCH & DEVELOPMENT

- The economic impact of tech transfer and commercialization activities at CU Boulder over the last five years amounted to \$1.9 billion.
- Innovation in the Boulder MSA receives substantially higher investments per capita from federal Small Business Innovation Research and Small Business Technology Transfer programs, relative to the other innovation and peer regions.
- The Boulder region had the 3rd-most utility patents granted per capita compared to the other regions, behind only Ann Arbor and San Jose.

### INVESTMENT CAPITAL

- Since 2013, one-third of all venture capital funding in Colorado has been invested in City of Boulder startups.
- Boulder ranks 4th among innovation and peer communities in per capita venture capital investment, behind Palo Alto, San Francisco, and Boston.
- Dozens of venture capital firms from throughout the world invest in Boulder startups, with funding rounds often led by one of more than a dozen Boulder-based VC firms.

### PLACE

- In 1967, Boulder became the first city in the U.S. to approve a tax to purchase land and preserve it as open space. Today, Boulder owns over 70 square miles of open space, nearly three times the 27 square miles of developed area within the city limits.
- The City of Boulder was awarded the 2nd-highest bike score among the innovation and peer regions by Walk Score, and ranked the best city for bikes in the U.S. on the PlacesforBikes City Rating list.
- The Boulder metro area has more arts establishments and higher employment per capita relative to the other innovation and peer regions.
- There are more restaurants and breweries per capita in the Boulder MSA than in the other regions studied.

# ACKNOWLEDGMENT

Thank you to the Business Research Division at the University of Colorado Boulder, whose collaboration made this project possible.



Serving Colorado since 1915, the Business Research Division (BRD) of the Leeds School of Business, University of Colorado Boulder, provides economic and demographic information needed by businesses, governments and nonprofit organizations. Specializing in economic and fiscal analysis, market research, and customized research projects, the division also produces the longest-running annual forecast of the state's economy.

To learn more about the Business Research Division of the Leeds School of Business:

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# PEOPLE

Boulder's most vital strength is its people, who drive the economy and shape its quality of place. The success of the region's innovation economy is largely attributable to its human capital.

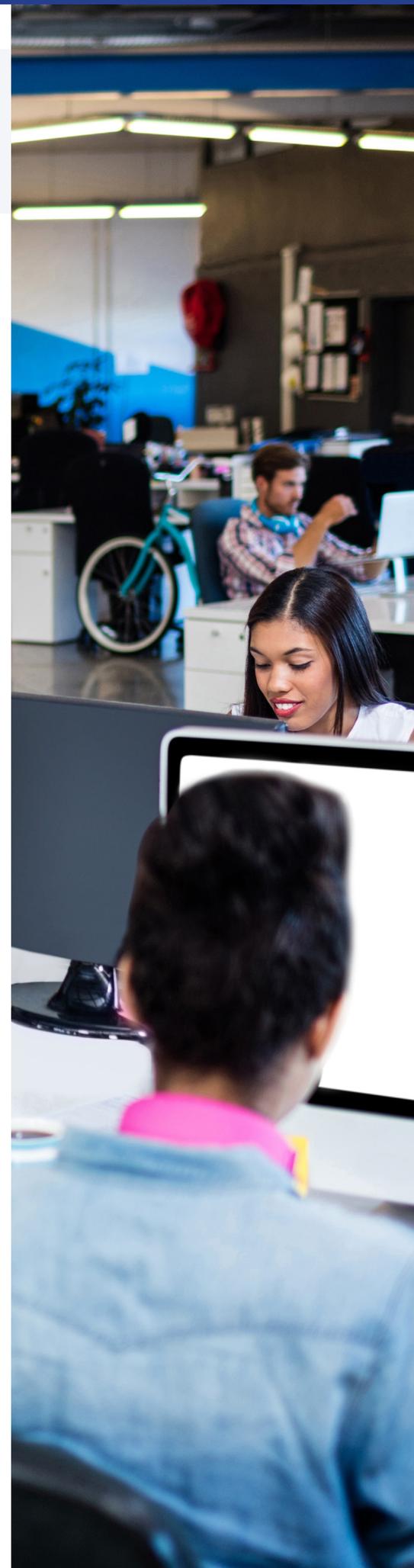
As a desirable place to live and work, Boulder attracts well-educated, skilled, and talented people. The region has the most highly educated workforce in the U.S.; concentrated jobs in science, technology, engineering, and math; and one of the densest concentrations of employment in the arts, among many other attributes.

# Why is this important?

Well-educated, talented, and collaborative people are the most essential force in generating innovative ideas, original products and services, and startup brands and businesses. Innovative and entrepreneurial people even launch whole new industries. Boulder's economy benefits from the entrepreneurial spirit of the people who have gravitated here for decades from around the globe.

Boulder's human capital fuels the region's companies and industries. From early stage startups to multinational corporations, the most critical factor to business success is a talented workforce. Boulder's workforce is routinely cited by area businesses as the most important criterion in their decisions to expand locally or to move here.

A distinctive attribute of the people who live and work in Boulder is their openness and commitment to collaboration. The area's collaborative culture propels innovation and business vitality through what University of Colorado Boulder Distinguished Professor and Nobel Laureate Tom Cech describes as "productive collisions" between people.

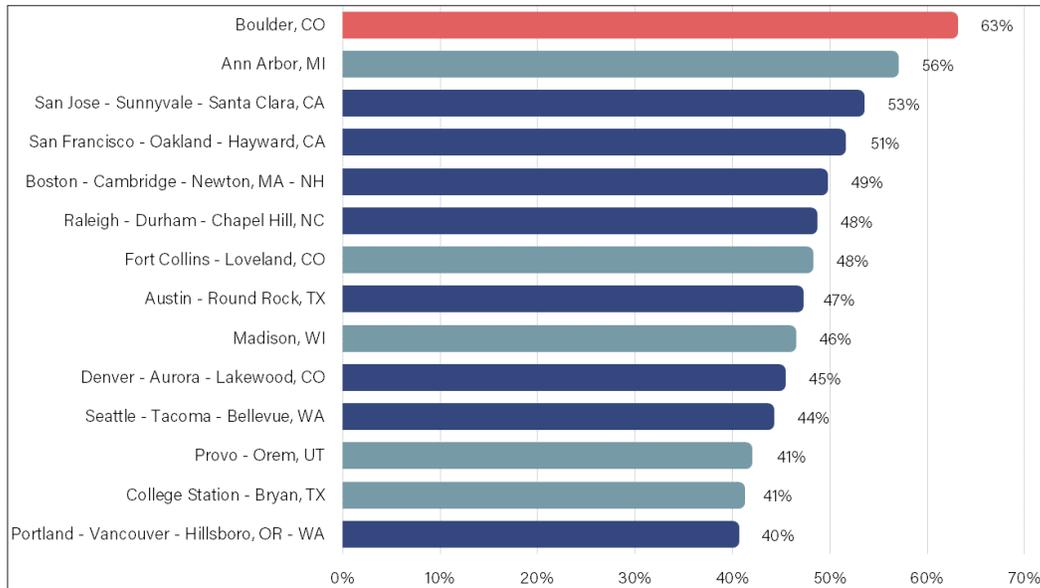


# EDUCATIONAL ATTAINMENT

People living in the Boulder Metropolitan Statistical Area (MSA) have the highest educational attainment of all regions in the nation according to the U.S. Census Bureau. The Boulder MSA has sustained that ranking for many years in a row.

Boulder's educational attainment ranking is a product of advanced degrees and, in particular, science and engineering degrees, as recognized on the Bloomberg Brain Concentration Index. Boulder has ranked first among all metro areas in the U.S. since the Bloomberg Index was first published in 2016.

## Percent of Population 25+ with Bachelor's Degree or Higher (MSA)



**63%**

of the residents over 25 years old in the Boulder MSA have a bachelor's degree or higher. This educational attainment is the highest of all MSAs in the U.S.

Source: U.S. Census Bureau, American Community Survey, 2018

## 2019 Bloomberg Brain Concentration Index (MSA)

Metropolitan Statistical Area (MSA)	Score	STEM	Sci & Eng Degrees	Advanced Degrees	Net Biz Formation
Boulder, CO	99.47	7.7	19.8	18.4	73.5
Fort Collins, CO	97.33	5.4	13.6	13.2	85.7
San Jose, CA	96.91	9.6	20.1	16.8	35.6
Durham, NC	96.53	4.8	14.3	15.5	50.8
San Francisco, CA	96.52	6	16.6	14.6	46.8
Washington, DC	96.51	6.5	15.8	17.1	37.8
Raleigh, NC	96.09	6	13.1	11.4	66.7
Madison, WI	94.97	6	12.1	12.5	43.7
Seattle, WA	94.53	5.7	13	11.2	51.5
Denver, CO	94.5	4.7	11.9	10.9	74.5

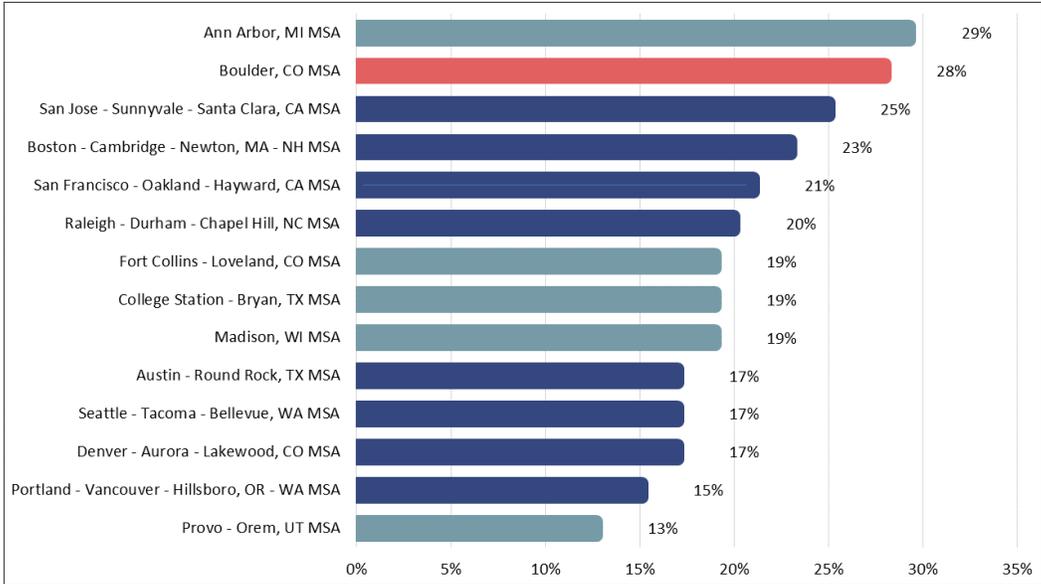
Source: Bloomberg, 2019

The Boulder MSA has been ranked

**#1**

on the Bloomberg Brain Concentration Index since the 2016 inception of the index.

### Percent of Population 25+ with Graduate Degree (MSA)

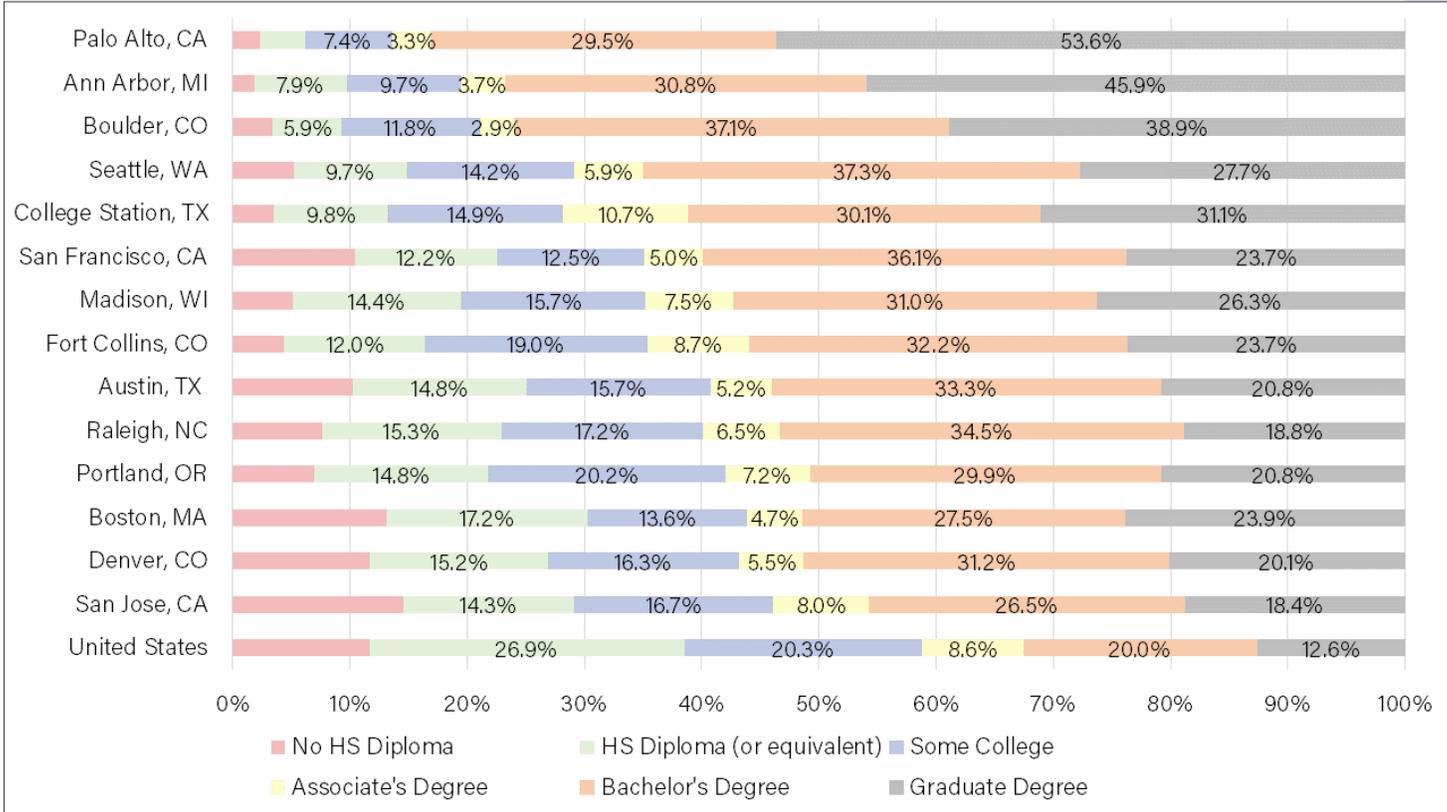


**28%**

of Boulder MSA residents age 25 and over hold a graduate degree, 2nd highest among the peer and innovation regions and just below Ann Arbor.

Source: U.S. Census Bureau, American FactFinder, 2018

### Educational Attainment of Population 25+ (City)



Source: U.S. Census Bureau, American Community Survey, 2018

The City of Boulder has one of the most educated populations in the U.S., with **76%** of the population attaining a Bachelor's Degree or Graduate Degree. Only Palo Alto and Ann Arbor have higher educational attainment among the peer and innovation cities studied.

# OCCUPATIONS

Measuring the concentration of employment in innovation-related occupations reveals the strengths of a region's workforce relative to other regions and national averages. The Boulder MSA compares favorably to the other regions studied for this report. Based on selected STEM (science, technology, engineering, and math) and other occupations, Boulder ranks high in the concentration of jobs in innovation-related fields.

## Occupation Comparison by Location Quotients\* (MSA)

Occupation Type	Boulder	San Jose	San Francisco	Seattle	Boston	Austin	Denver	Portland	Fort Collins	Ann Arbor	Madison
Natural Sciences Managers	3.27	1.37	2.37	1.27	3.33	0.78	1.06	1.41	3.37	2.89	1.40
Software Developers, Applications	4.72	7.22	2.81	4.11	1.70	2.11	2.12	1.74	0.93	1.18	3.13
Software Developers, Systems	2.47	9.03	2.52	2.67	3.22	2.65	1.75	0.74	0.58	1.72	1.02
Aerospace	8.14	3.38	1.76	-	0.51	-	1.60	0.10	0.45	0.41	-
Computer Hardware Engineers	13.58	17.99	3.55	1.50	1.43	0.92	2.66	2.75	6.32	-	-
Aerospace Engineering & Operations	10.57	-	2.92	2.78	-	0.88	1.71	-	-	-	-
Biochemists & Biophysicists	8.69	2.50	4.20	0.57	8.04	1.29	0.60	-	2.74	0.98	2.97
Physicists	35.47	1.59	4.57	0.76	1.06	2.01	-	0.25	-	2.52	0.84
Art Directors	2.83	1.18	2.61	1.38	1.55	1.54	0.76	2.56	0.74	0.84	0.83
Sales Managers	1.17	2.66	1.98	1.03	1.99	1.00	0.97	1.52	0.52	0.61	0.64

Source: Bureau of Labor Statistics, Occupational Employment Statistics, 2018

The Boulder MSA ranks **1st** among the regions studied in occupations as diverse as aerospace, biochemistry, physics and art direction.

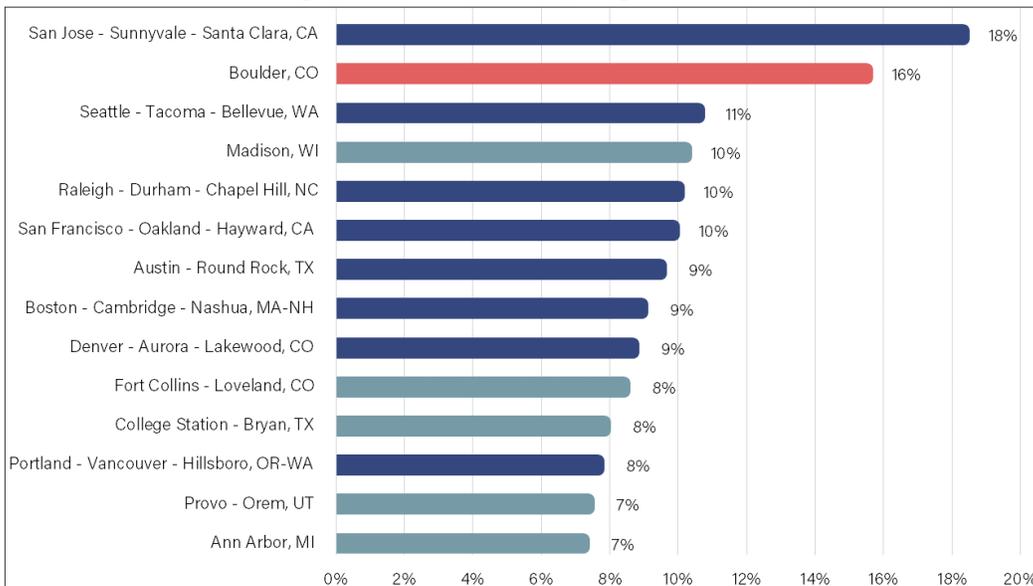
*\*A location quotient (LQ) is a common metric used to compare the regional concentration of employment in a given occupation relative to other regions or the nation as a whole. See the Glossary of Terms in the back of this report for more information about LQ's.*

# SCIENCE, TECHNOLOGY, ENGINEERING AND MATHEMATICS

The percentage of science, technology, engineering, and mathematics (STEM) occupations in the Boulder area is second only to Silicon Valley among the innovation and peer MSAs studied. The gap between Boulder and Silicon Valley has narrowed by 5 percentage points since the first edition of the Boulder Innovation Venture report.

STEM-related occupations are defined by the U.S. Bureau of Labor Statistics to include computer occupations, engineers, life and physical scientists, architects, mathematical science occupations, and STEM-related teachers and managers, among other occupations.

## STEM Percentage of Total Employment (MSA)

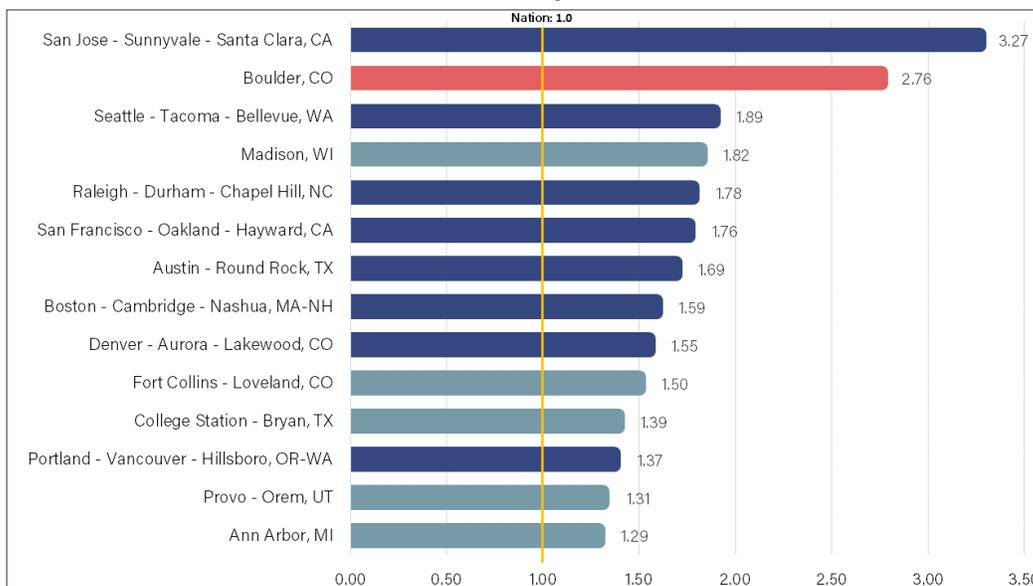


Source: Bureau of Labor Statistics, Occupational Employment Statistics, 2018

**16%**

of all jobs in the Boulder MSA are STEM-related, nearly equal to Silicon Valley among innovation and peer MSAs studied.

## Concentration of STEM Occupations (MSA)



Source: Bureau of Labor Statistics, Occupational Employment Statistics, 2018

The Boulder MSA has almost

**3x**

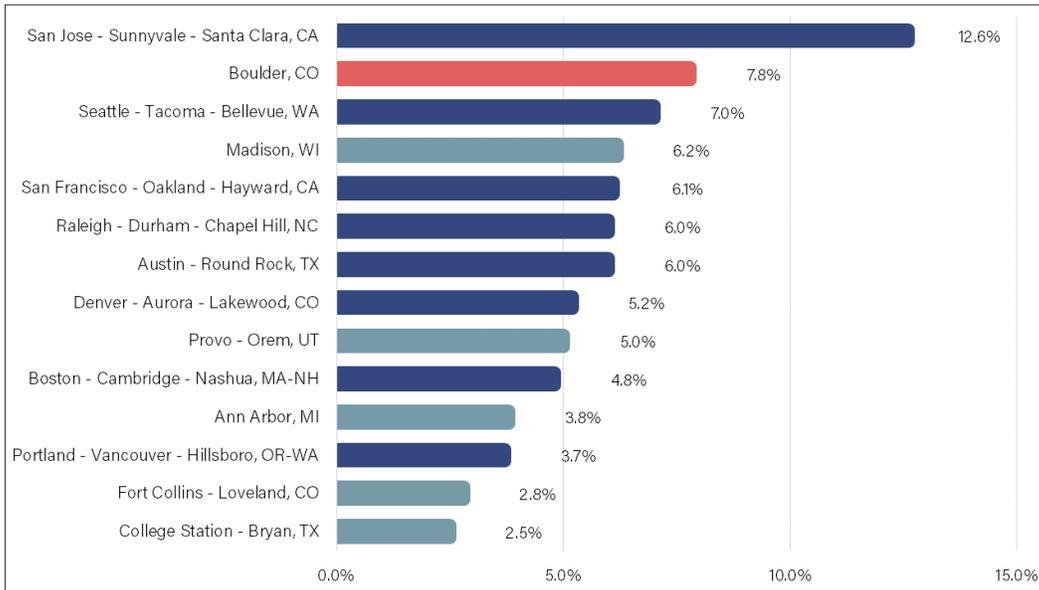
the concentration of STEM occupations relative to the U.S. as a whole, and the second highest density among the regions studied.

# COMPUTER AND MATHEMATICAL OPERATIONS

The Boulder MSA has the second-highest percentage of computer and mathematical operations occupations among the comparative innovation and peer regions studied.

In addition to computer programmers, software developers, system administrators, and other computer positions, this occupational group includes mathematicians, research analysts, and actuaries.

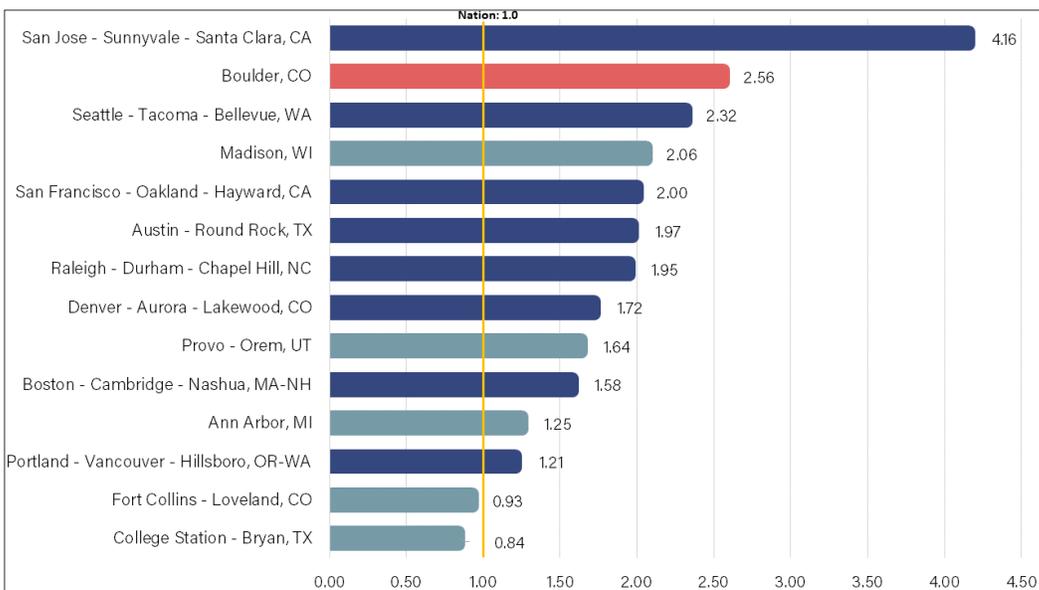
## Computer and Mathematical Operations Percentage of Total Employment (MSA)



Source: Bureau of Labor Statistics, Occupational Employment Statistics, 2018

Nearly **8%** of all jobs in the Boulder MSA are computer and mathematical operations-related, compared to 3% for the United States. Only Silicon Valley ranked higher.

## Computer and Mathematical Operations Concentration of Employment (MSA)



Source: Bureau of Labor Statistics, Occupational Employment Statistics, 2018

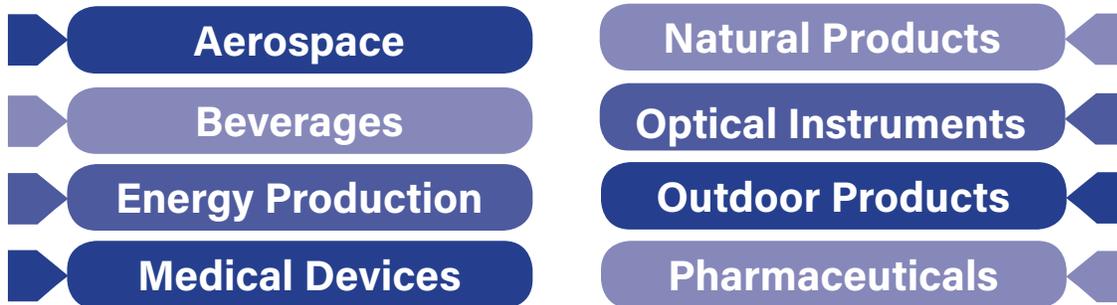
Boulder MSA has a concentration of computer and mathematical operations jobs that is **2.6x** the national average, which is the second highest behind Silicon Valley among the peer and innovation cities studied.

# MANUFACTURING

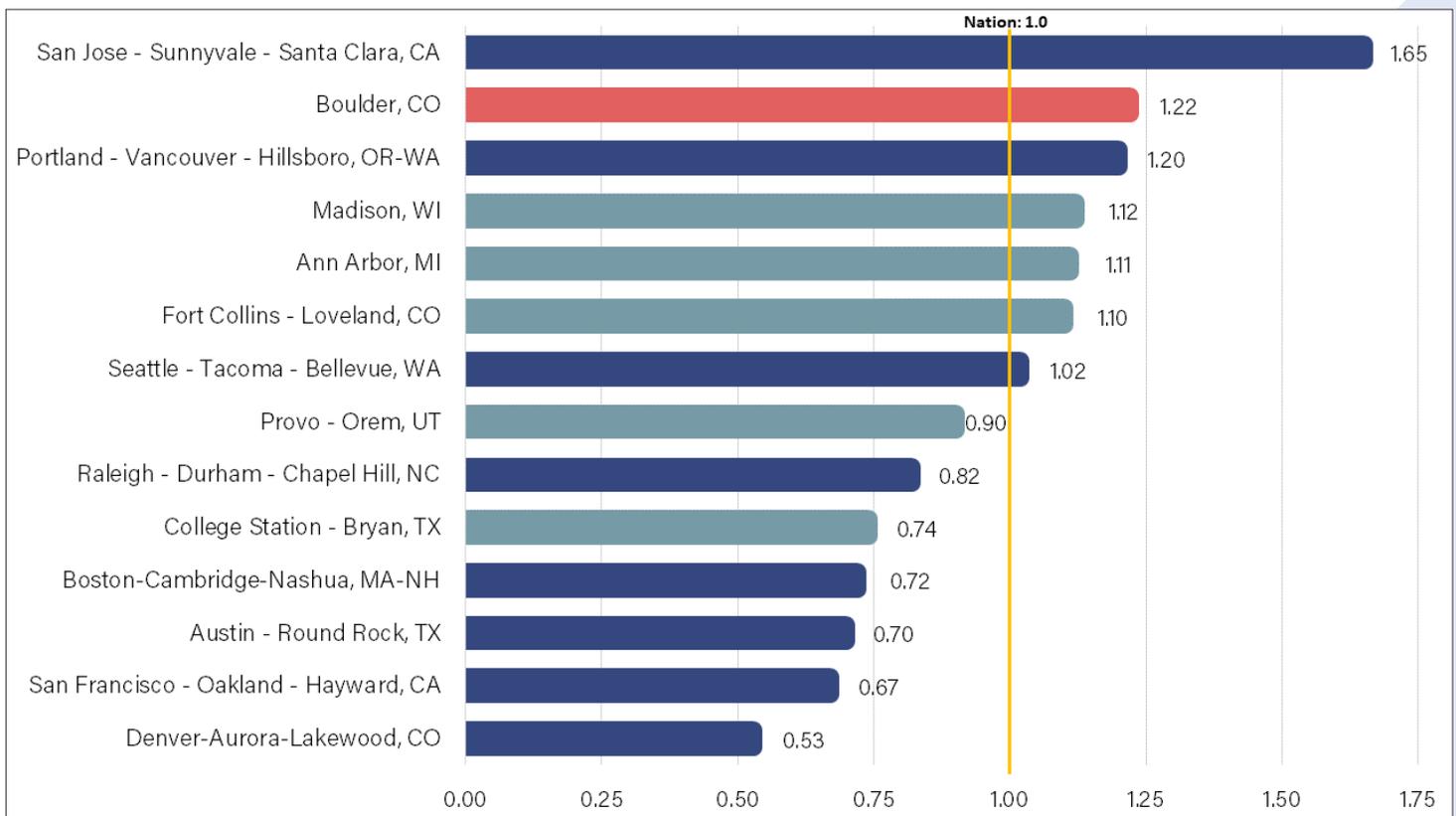
More than 12% of all jobs in the Boulder MSA are in manufacturing, a concentration of employment that is almost 25% higher than the national average and

second behind Silicon Valley among the regions studied.

The leading industries in Boulder’s manufacturing sector include:



## Manufacturing Concentration of Total Employment (MSA)



Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW), 2018

Boulder has a manufacturing employment-related concentration that is **1.22x** the national average, which is the second highest behind the San Jose region.

# DEMOGRAPHICS

The Boulder MSA's millennial population is larger than most of the other innovation regions studied, although it ranks lower compared to peer communities. The working age population in the Boulder region is somewhat smaller than the other regions, as is Boulder's retirement age population.

Generation Z (ages 0-21) is the largest cohort in the Boulder MSA, due in part to students attending the University of Colorado Boulder.

Since 2010, the population of the City of Boulder has grown at an annual average rate of 1.1%, slower than most of the other large cities in the surrounding area.

## Population by Millennials (MSA)

Metropolitan Statistical Area (MSA)	Millennials (20 – 34)
City of Boulder	35.2%
College Station – Bryan, TX	32.5%
Ann Arbor, MI	27.5%
Provo – Orem, UT	26.7%
Fort Collins – Loveland, CO	25.1%
Madison, WI	24.4%
Austin – Round Rock, TX	24.3%
Boulder, CO	24.2%
Seattle – Tacoma – Bellevue, WA	23.1%
Denver – Aurora – Lakewood, CO	22.6%
San Jose – Sunnyvale – Santa Clara, CA	22.3%
Boston-Cambridge-Newton, MA-NH	22.3%
San Francisco – Oakland – Hayward, CA	21.9%
Portland-Vancouver-Hillsboro, OR-WA	21.2%

Source: Census Bureau, American Community Survey, 2018

The millennial age cohort (aged 20-34) represents

**24%**

of the Boulder MSA's total population. The City of Boulder millennial age cohort represents 35% of city residents.

## Population by Working Age (MSA)

Metropolitan Statistical Area (MSA)	Working Age (30 – 64)
San Francisco – Oakland – Hayward, CA	49.1%
Seattle – Tacoma – Bellevue, WA	48.3%
Denver – Aurora – Lakewood, CO	48.3%
Portland-Vancouver-Hillsboro, OR-WA	48.0%
San Jose – Sunnyvale – Santa Clara, CA	48.0%
Austin – Round Rock, TX	47.8%
Boston-Cambridge-Newton, MA-NH	46.6%
Boulder, CO	44.5%
Madison, WI	44.5%
Fort Collins – Loveland, CO	42.6%
Ann Arbor, MI	40.7%
City of Boulder	37.0%
College Station – Bryan, TX	35.9%
Provo – Orem, UT	33.8%

Source: Census Bureau, American Community Survey, 2018

More than

**44%**

of the Boulder MSA population is in the working-age cohort (30-64 years of age).

## Population by Retirement Age (MSA)

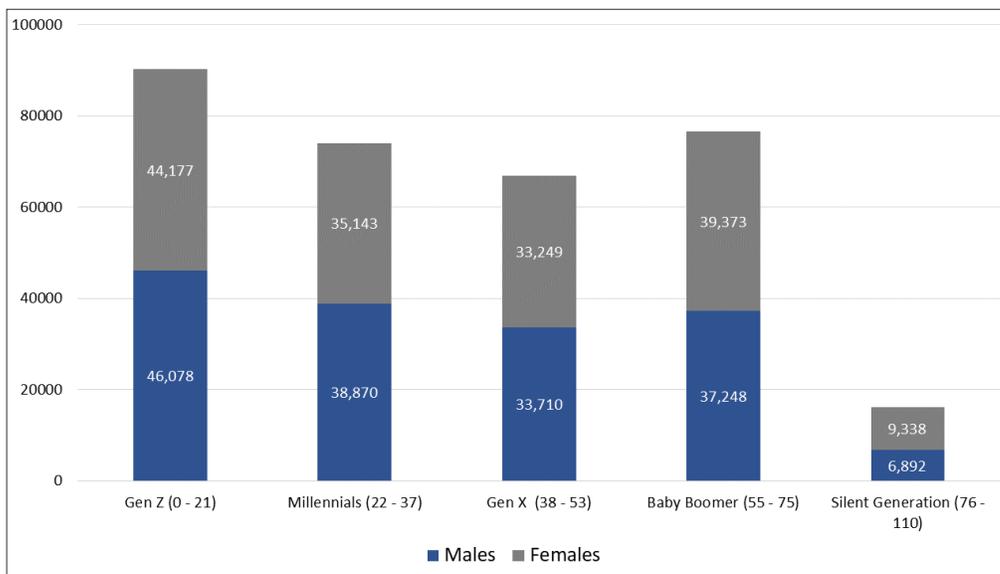
Metropolitan Statistical Area (MSA)	Retirement Age (65+)
Fort Collins – Loveland, CO	15.7%
Boston-Cambridge-Newton, MA-NH	15.7%
San Francisco – Oakland – Hayward, CA	15.5%
Portland-Vancouver-Hillsboro, OR-WA	14.9%
Madison, WI	14.6%
<b>Boulder, CO</b>	<b>14.1%</b>
Ann Arbor, MI	14.0%
San Jose – Sunnyvale – Santa Clara, CA	13.5%
Seattle – Tacoma – Bellevue, WA	13.4%
Raleigh-Durham-Chapel Hill	13.1%
Denver – Aurora – Lakewood, CO	12.9%
<b>City of Boulder</b>	<b>11.5%</b>
Austin – Round Rock, TX	10.8%
College Station – Bryan, TX	10.6%
Provo – Orem, UT	7.8%

The City of Boulder has a **relatively small cohort of retirement age population**

(65+) compared to the peer and innovation regions studied.

Source: Census Bureau, American Community Survey, 2018

## Boulder MSA Population by Generation



**Generation Z** (ages 0-21) is the **largest cohort** in the Boulder MSA, followed by Baby Boomers.

Source: Colorado State Demography Office, Boulder County, 2018

## Boulder Area Population Change (2010-2018)

City	2010	2018	Population Change (2010-2018)	Average Annual % Change
Boulder	97,928	106,456	8,537	1.1%
Erie (Part)*	8,409	11,251	2,811	4.2%
Jamestown	274	299	25	1.1%
Lafayette	24,553	28,950	4,400	2.2%
Longmont (Part)*	86,409	95,993	9,479	1.4%
Louisville	18,412	21,182	2,772	1.9%
Lyons	2,038	2,066	28	0.2%
Nederland	1,447	1,552	105	0.9%
Superior (Part)*	12,500	13,119	619	0.6%
Ward	150	165	15	1.3%
Unincorp. Area	43,363	44,447	1,084	0.3%

The City of Boulder has seen **slower average annual population growth**

(1.1%) relative to other larger cities in the area.

(Part)\* indicates the population that lives in the Boulder County portion. Additional population resides in a bordering county and is not counted in these totals.

Source: Colorado State Demography Office, Boulder County, 2018



# ECONOMY

The City of Boulder is home to more than 7,000 businesses – not counting self-employed sole proprietorships – and about 100,000 jobs. Companies in Boulder range from small businesses and startups to large operations of well-established, multinational enterprises. 78% percent of the companies in the city have fewer than 10 employees; 96% have fewer than 50 employees.

In 2018, there were about 15,700 businesses in the Boulder Metropolitan Statistical Area (MSA). These businesses employed more than 180,000 individuals. The unemployment rate in the Boulder MSA averaged 2.4% in 2019.

# Why is this important?

Robust and sustained economic vitality is important in many ways. It provides employment opportunities for residents of the city and the region. It generates the capital and revenue to support research, development, and innovation; new business formation; public services and infrastructure investment; and social, environmental, and cultural programs, among other community benefits.

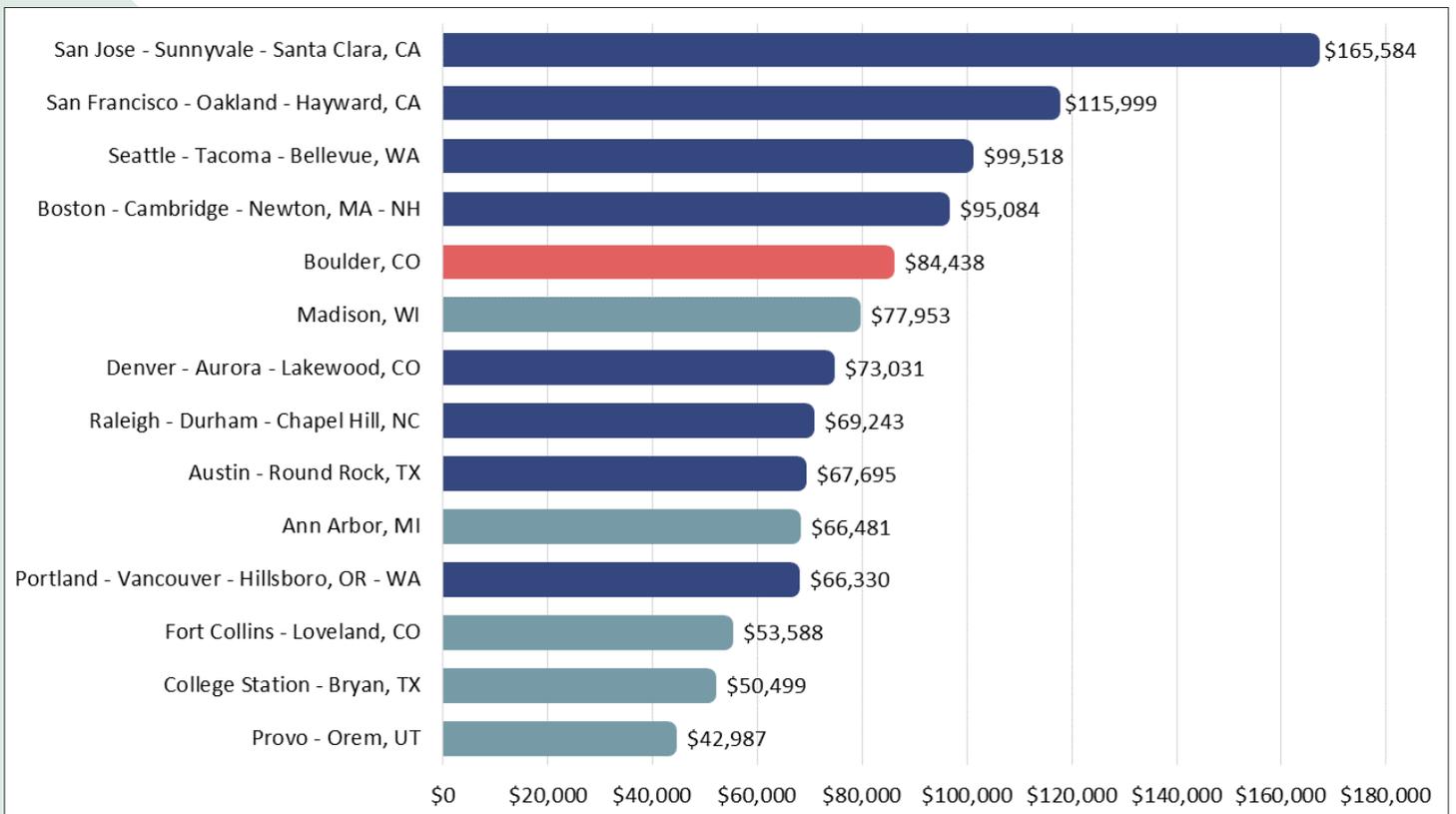
A dynamic economy attracts the talent, investment, innovation, entrepreneurs, and businesses critical to sustain economic vitality over time. It also strengthens the resilience of communities to adapt to constantly evolving demographics, public policies, regional and global markets, and other macro trends.



# GROSS DOMESTIC PRODUCT

The nominal gross domestic product (GDP) of the Boulder MSA was \$27.5 billion in 2018, the most recent data available from the U.S. Bureau of Economic Analysis. As used in this report, GDP is an estimate of the total value of the goods and services produced in a metro area.

## Per Capita Nominal GDP (MSA)



Source: Bureau of Economic Analysis, 2019

The Boulder MSA ranks **5th** among the innovation communities and top among the peer communities in per capita nominal GDP.

# BOULDER KEY INDUSTRY CLUSTERS

At least ten established industry clusters are part of Boulder’s economic diversification, including aerospace, biosciences, clean energy, IT-software, natural products, outdoor recreation, beverages, tourism, photonics, and creative services, among others. An industry cluster refers to a concentration of companies, professional services, and suppliers supporting a particular industry.

Five key industry clusters in the Boulder MSA are regularly profiled by the Metro Denver Economic Development Corporation. These clusters are important to Boulder’s economy because each has levels of employment significantly higher than most other regions in the United States.

CU Boulder analyzed three additional key industries in the Boulder MSA: creative services (advertising agencies, web and app developers), outdoor recreation, and food manufacturing. In each industry, the concentration of local businesses was significantly higher than peer communities.

## Boulder Industry Clusters (MSA)

Industry Cluster	Number of Businesses	Total Employment	Concentration (Nation = 1.0)
Aerospace	44	5,796	11.9
Bioscience	175	5,449	2.34
Beverages	68	1,410	2.72
Cleantech	353	4,793	4.00
IT-Software	951	12,233	2.51

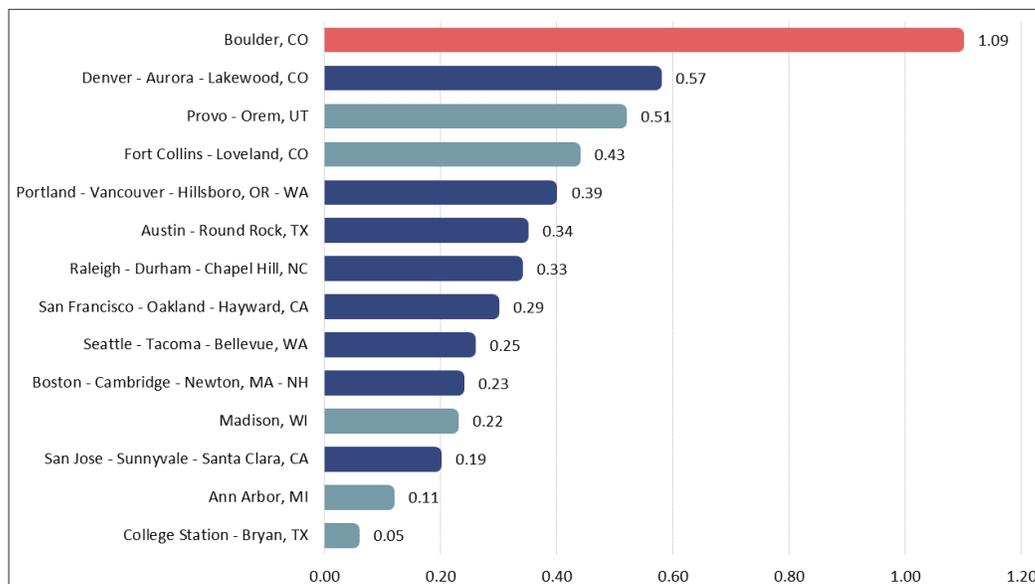
Source: Metro Denver Economic Development Corporation, 2019

The concentration of key industry employment in the Boulder MSA ranges from 2x the U.S. average for the bioscience industry, up to

**12x**

the U.S. average for aerospace.

## Creative Professional Services Businesses per 1,000 Residents (MSA)

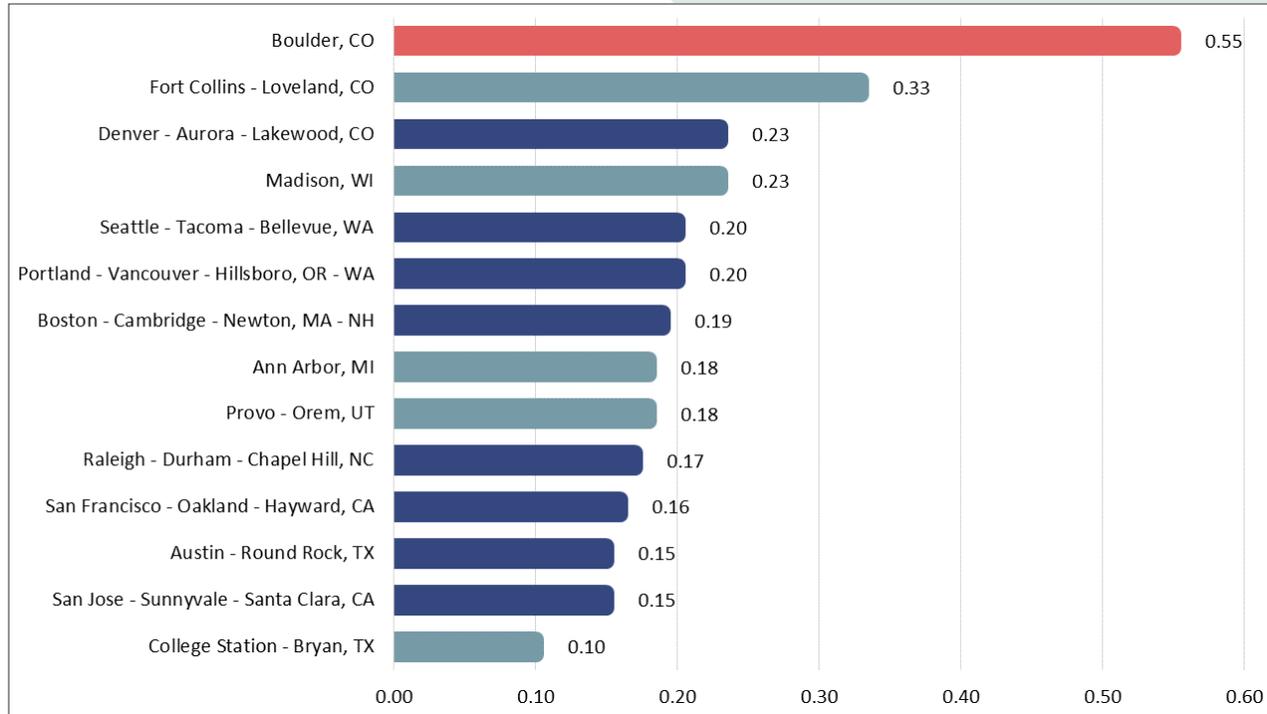


Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW), 2019

The Boulder MSA has about **one ad agency or marketing firm per 1,000 residents,**

the highest concentration of the innovation and peer communities.

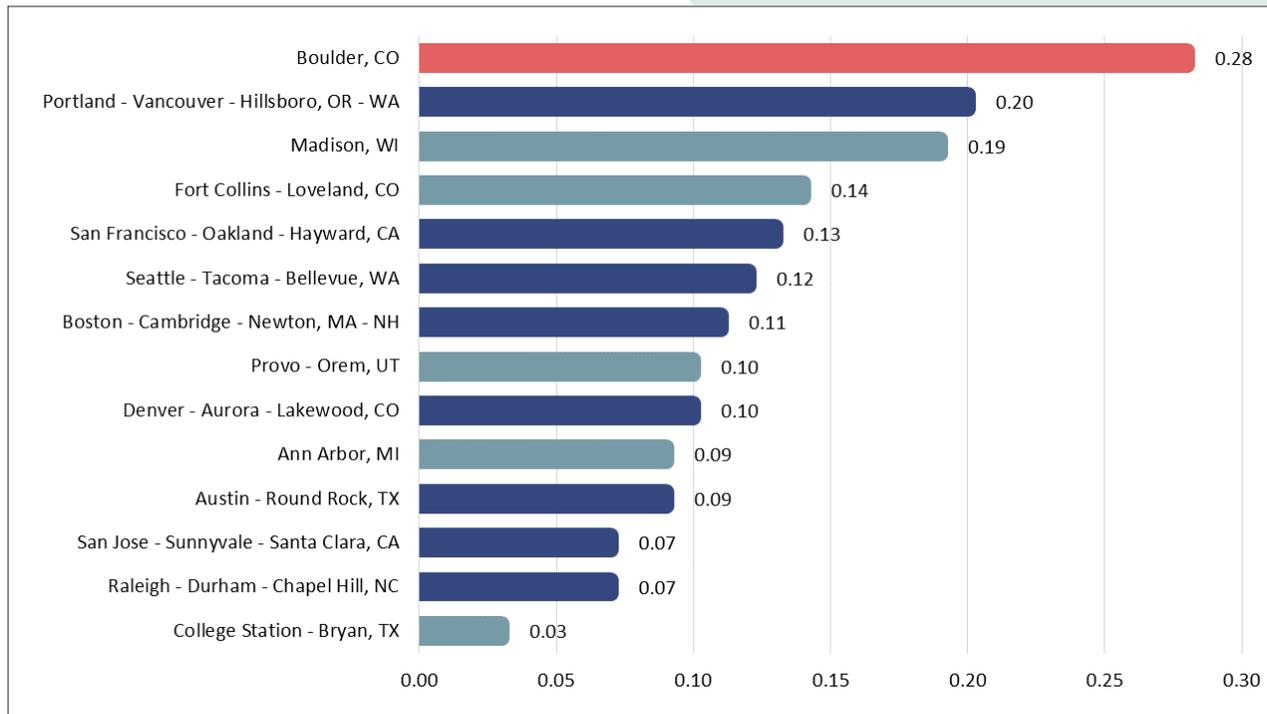
## Outdoor Industry Businesses per 1,000 Residents (MSA)



Source: Bureau of Labor Statistics, QCEW, 2019

The Boulder MSA outranks innovation and peer communities with **0.55** sporting goods wholesalers and retailers, manufacturers, and sports instruction businesses per 1,000 residents.

## Food Manufacturing Businesses per 1,000 Residents (MSA)



Source: Bureau of Labor Statistics, QCEW, 2019

With **0.28** businesses per 1,000 residents, the Boulder MSA had the highest concentration of food manufacturers among peer and innovation communities.

# BOULDER BUSINESSES & EMPLOYMENT

The density of businesses and jobs in the Boulder MSA relative to the other innovation and peer communities represents a robust and dynamic economic base. The Boulder MSA's top ranking for business density is largely attributable to the region's small business-dominated economy.

## Private Business and Employment Density (MSA)

Metropolitan Statistical Area (MSA)	Businesses 2018	Businesses Per Capita	Rank (Bus.)	Employment 2018	Jobs Per Capita	Rank (Jobs)
Boulder, CO	15,538	0.048	1	154,420	0.47	4
San Francisco - Oakland - Hayward, CA	195,822	0.041	2	2,110,363	0.45	6
San Jose - Sunnyvale - Santa Clara, CA	73,512	0.037	3	1,021,226	0.51	2
Portland - Vancouver - Hillsboro OR -WA	88,866	0.036	4	1,040,238	0.42	9
Denver - Aurora - Lakewood, CO	103,603	0.035	5	1,282,928	0.44	7
Fort Collins - Loveland, CO	12,337	0.035	5	128,476	0.37	11
Boston - Cambridge - Newton, MA - NH	164,583	0.034	7	2,379,975	0.49	3
Seattle - Tacoma - Bellevue, WA	133,249	0.034	7	1,723,433	0.44	7
Raleigh - Durham - Chapel Hill, NC CSA	59,407	0.031	9	1,010,675	0.52	1
Madison, WI	18,672	0.028	10	307,546	0.47	4
Austin - Round Rock, TX	59,095	0.027	11	851,122	0.39	10
Provo - Orem, UT	16,651	0.026	12	216,830	0.34	13
Ann Arbor, MI	8,083	0.022	13	132,545	0.36	12
College Station - Bryan, TX	5,198	0.020	14	75,565	0.29	14

Source: Bureau of Labor Statistics, QCEW, 2019

The density of private businesses in the Boulder MSA is the **highest among the innovation and peer MSAs.** Boulder has the 4th highest density of jobs.

## ▶ MANUFACTURING

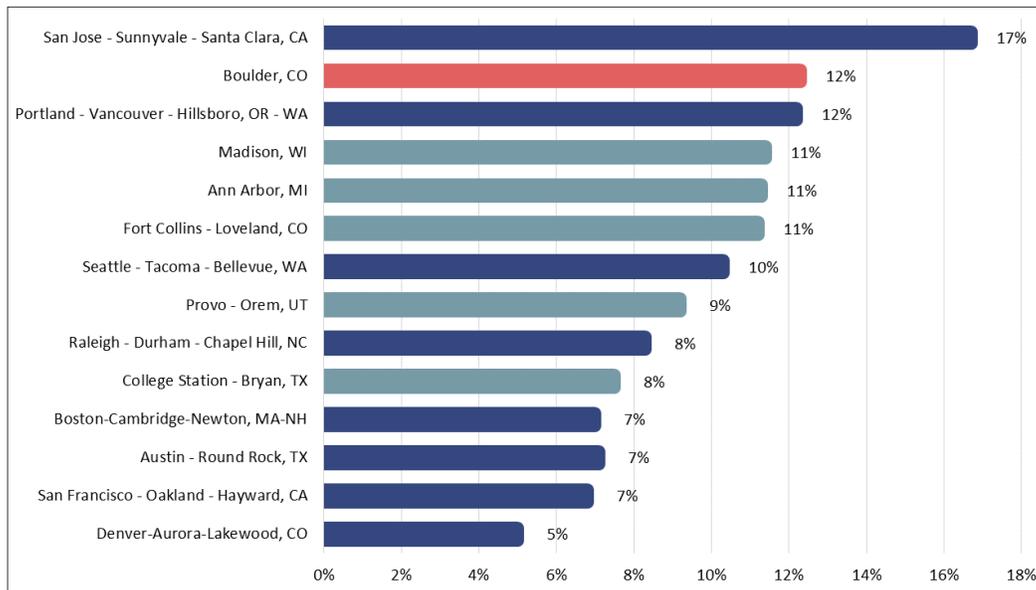
Boulder's manufacturing sector contributes substantially to the regional economy. From aerospace and biosciences to natural foods and photonics, manufacturing can be found in almost every industry in the Boulder MSA. While often overlooked as an economic driver of the area, manufacturing in Boulder outperforms most other regions.

Manufacturing employment in the Boulder MSA accounts for 12% of total employment, compared to 8% in the United States and 5% in the Denver MSA.

Regional manufacturing activity produces goods that are typically exported outside of Colorado, often even outside the United States. These export sales generate income for Boulder businesses which is then circulated through the region in the form of payroll, capital investment, taxes and fees, and supplier payments.

Manufacturing employment in the Boulder MSA is growing, even as the sector currently shows weakness at the national level.

## Manufacturing Percentage of Total Employment (MSA)



Source: Bureau of Labor Statistics, QCEW, 2019

**12%**

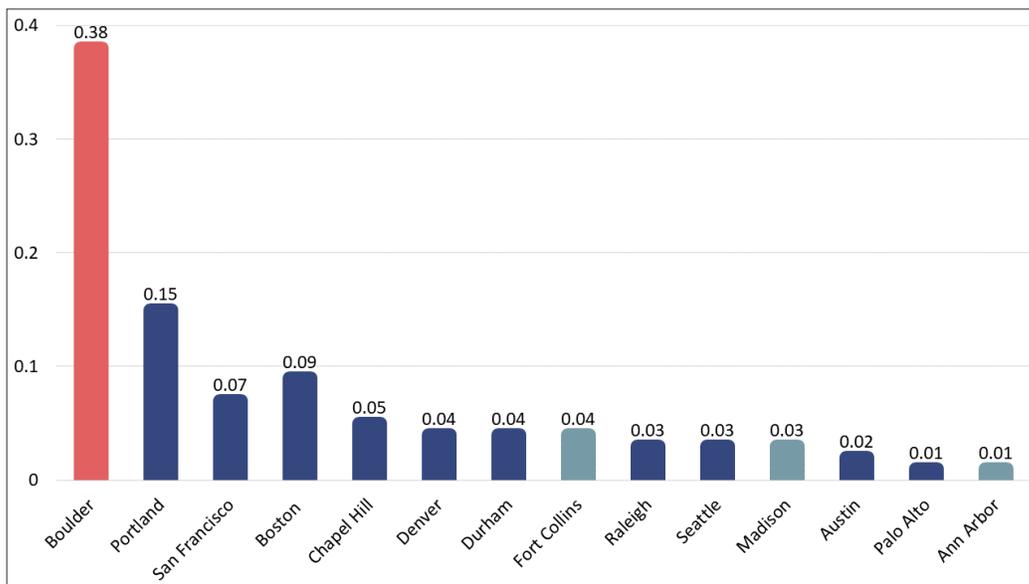
of employment in the Boulder MSA was classified as manufacturing jobs, second only to Silicon Valley among innovation and peer regions.

## B CORPORATIONS

The City of Boulder has a dramatically higher concentration of certified B Corporations (B Corps) than the other cities studied for this report. B Corps meet the highest standards of verified social and

environmental performance, public transparency, and legal accountability and aspire to use the power of markets to solve social and environmental problems.

## Certified B Corps per 1,000 Residents (City)



Source: B Lab, Inc., B Corp Directory, 2019

Boulder has more than

**2x**

the density of B Corps compared to Portland, the second ranked city, and more than four times that of San Francisco.

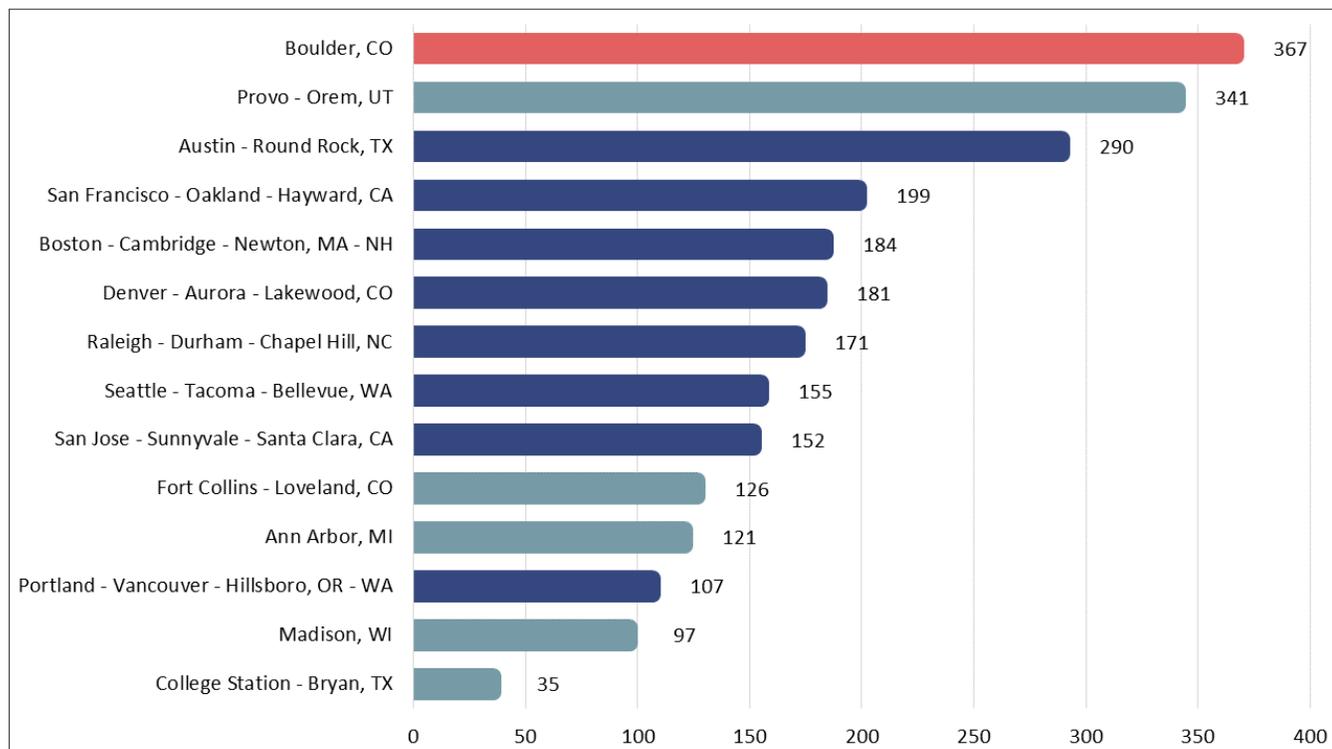
# BOULDER STARTUP & ENTREPRENEURIAL PERFORMANCE

Perhaps the best-known attribute of Boulder’s economy is its dynamic entrepreneurial ecosystem. The region is propelled by innovation and entrepreneurship, resulting in one of the highest concentrations of startup activity in the world. The performance of Boulder’s entrepreneurial ecosystem is often cited as a benchmark for other communities by research organizations such as the Brookings Institution and the Ewing and Marion Kauffman Foundation, and by business publications such as Entrepreneur, Fortune, Forbes and Inc.

Measuring startup activity – even defining a “startup” – continues to challenge researchers. Some define any new business as a startup, while others only consider new ventures expected to scale up quickly as startups. The challenge of defining a startup makes measuring the performance of a startup community difficult.

The Brookings Institution analyzed the 2018 “Inc. 5000”, a list of the fastest growing companies in the U.S. to determine the locations where they were most concentrated. Boulder ranked highest among innovation and peer communities.

## INC. 5000 High-Growth Company Density, 2011-2017 (MSA)



Source: Brookings Institution, 2018

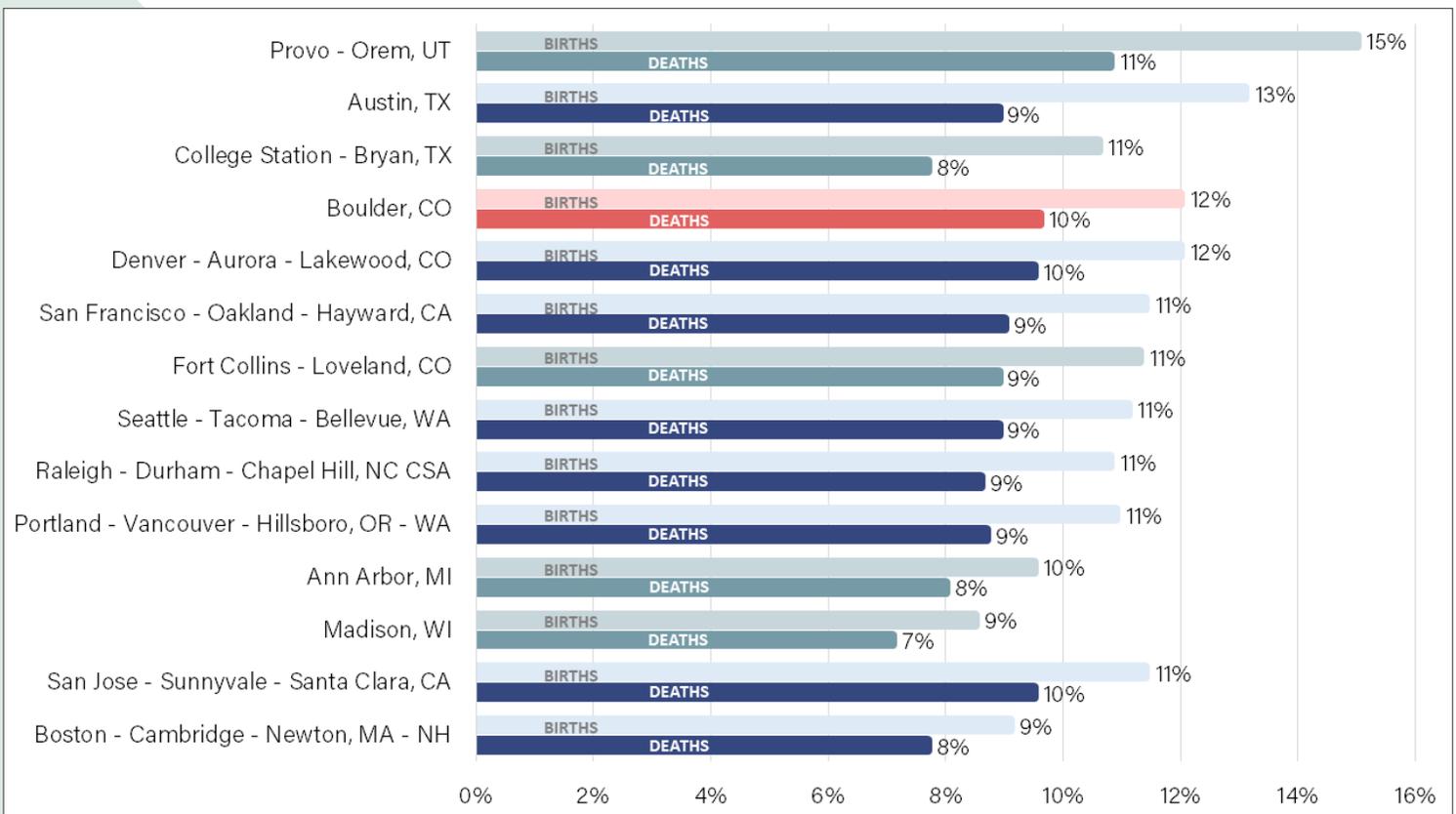
Among the innovation and peer communities studied, the Boulder MSA had the **highest concentration** of Inc. 5000 high-growth companies from 2011 – 2017.

## NEW BUSINESS FORMATION

Research conducted by CU Boulder for this report analyzed the ratio of business births over business deaths (closures) to measure the velocity of new business formation. CU Boulder also analyzed the

number of new businesses started in the City of Boulder between 2011 and 2017. An average of 664 new businesses were started annually with a startup rate of 11%.

### Establishment Births and Deaths, Percentage of Total Business (MSA)



Source: Bureau of Labor Statistics, QCEW, 2019

The Boulder MSA ranked **4th** among the innovation and peer regions for the number of new business establishments formed as a percent of total businesses in the region.

## City of Boulder New Businesses, Q1 2013-Q1 2018

Industry by NAICS Classification	NAICS Code	Total Businesses	Average New Businesses Per Year	Startup Rate
Agriculture	11	5	1	28%
Mining	21	11	1	11%
Utilities	22	3	1	20%
Construction	23	206	13	6%
Manufacturing	31-33	242	21	9%
Wholesale Trade	42	373	39	10%
Retail Trade	44-45	545	39	7%
Transportation & Warehousing	48-49	34	3	9%
Information	51	204	39	19%
Finance & Insurance	52	336	26	8%
Real Estate, Rental, Leasing	53	316	31	10%
Professional, Scientific & Technical Services	54	1,736	220	13%
Management of Companies & Enterprises	55	47	18	39%
Administrative & Support & Waste Management	56	272	32	12%
Education Services	61	149	16	11%
Healthcare & Social Assistance	62	650	55	8%
Arts, Entertainment, Recreation	71	135	17	12%
Accommodation & Food Services	72	399	34	9%
Other Services	81	476	57	12%
<b>Total</b>		<b>6,139</b>	<b>664</b>	<b>11%</b>

Source: Colorado Department of Labor and Employment, QCEW (BRD calculations)

An average of

**664**

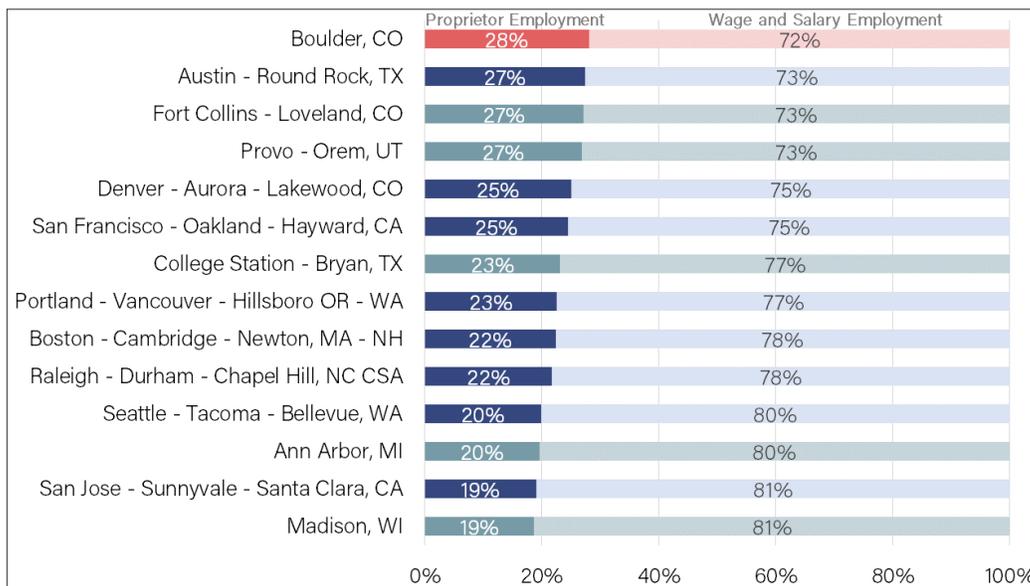
new businesses were formed annually in the City of Boulder between Q1 2013 and Q1 2018.

## SOLE PROPRIETORS

Boulder has a high concentration of self-employed sole proprietorships owned by entrepreneurs and other small business professionals. Sole proprietors

in the Boulder MSA make up 28% of employment in the region – the highest percentage of innovation and peer regions studied.

## Proprietor Employment and Wage and Salary Employment (MSA)



Source: Bureau of Economic Analysis, 2019

Among the comparison regions, the Boulder MSA has the **highest ratio** of sole proprietor employment to reported wage and salary employment.



# RESEARCH & DEVELOPMENT

Boulder's research and development ecosystem fuels innovation and entrepreneurship regionally, nationally, and even globally.

Public sector R&D, evidenced by the University of Colorado Boulder and the federal labs, and private sector R&D conducted by companies across Boulder's key industries, represent the bedrock on which Boulder's innovation economy has developed over many decades.

# Why is this important?

Research and development produce innovations which often lead to new technologies and new products, which in turn can lead to the formation of new businesses and even entire new industries. Successful R&D ecosystems attract world-class scientists, engineers, and entrepreneurs whose inquisitiveness and vision can be rewarded with billions of dollars in research funding.

Thriving R&D cultures promote a tolerance of risk which can inspire entrepreneurs to pursue opportunities others may overlook. At its most productive, early investment in R&D yields returns on commercialization that are substantial enough to attract more funding for new research, innovation, and entrepreneurship.



# UNIVERSITY OF COLORADO BOULDER

CU Boulder is a tier-one research university, ranked in the same classification as Harvard, MIT, Stanford, and other prestigious institutions. CU Boulder is one of the top-funded universities in the U.S., receiving federal research grants from NASA, National Science Foundation (NSF), Department of Commerce, National Institutes of Health (NIH), and the Department of Defense, among others. In addition, CU Boulder receives sponsored research funding from private industry, other universities, and international partners, as well as private charitable gifts.

CU Boulder attracted a record \$631 million in research funding in fiscal year 2019 for groundbreaking studies investigating a changing environment, exploring new opportunities in space, mitigating the effects of natural hazards, advancing biomedical research, and seeking cleaner, more sustainable energy solutions. A recent study by CU Boulder found that the economic impact of tech transfer and commercialization activities at CU Boulder over the last five years amounted to \$1.9 billion.

CU Boulder's Research & Innovation Office (RIO) provides leadership in campus-wide research collaboration through a number of programs. According to the RIO website, the Research Development program offers resources to help faculty identify opportunities for research activities. The Office of Industry Collaboration helps faculty collaborate with industry by supporting connections between companies and CU Boulder and by cultivating new partnership opportunities. Venture Partners (formerly the Technology Transfer Office) unites industry partners, entrepreneurs, and investors to help researchers solve problems and improve quality of life worldwide.



## Research Dollars at Universities (City)

Innovation City	Number of Research Universities	Total R&D Expenditures (thousands)	Average per University	Federal Funds (thousands)
Ann Arbor	1	\$1,530,139	\$1,530,139	\$829,695
Madison	1	\$1,193,413	\$1,193,413	\$570,796
Palo Alto	1	\$1,109,708	\$1,109,708	\$710,698
College Station	1	\$905,474	\$905,474	\$307,656
Research Triangle	4	\$2,743,551	\$685,888	\$1,530,106
<b>Boulder</b>	<b>1</b>	<b>\$499,389</b>	<b>\$499,389</b>	<b>\$374,209</b>
San Francisco	3	\$1,441,940	\$480,647	\$621,990
Seattle	3	\$1,350,839	\$450,280	\$954,413
Boston	8	\$2,991,890	\$373,986	\$1,614,378
Austin	2	\$662,336	\$331,168	\$404,436
Fort Collins	1	\$338,404	\$338,404	\$239,165
Denver	2	\$502,887	\$251,444	\$323,368
Provo	1	\$43,406	\$43,406	\$26,441
San Jose	1	\$39,192	\$39,192	\$31,396
Portland	4	\$54,751	\$13,688	\$34,042

Source: National Science Foundation, Higher Education Research and Development (HERD) Survey, FY 2017

Among the peer and innovation communities, Boulder ranks

# 6th

in average R&D expenditures per university.

## Startup Ventures Spun Out of CU Boulder (2017-2019)

Company	Startup Date
Aspero Medical, Inc.	August 1, 2018
Bcell Solutions, Inc.	January 11, 2018
BioLoomics, Inc.	February 5, 2019
Brek Electronics, Inc.	June 29, 2017
Emergy, LLC	October 1, 2017
Hive Tech Solutions	April 16, 2018
Humla, LLC	January 30, 2018
Longpath Technologies	July 5, 2018
MRX Analytics	January 3, 2019
New Iridium	April 25, 2018
Point Designs, LLC	March 15, 2019
Radi-Cool, Inc.	September 18, 2017
Raspirogen, Inc.	January 1, 2017
Toll Biotech, Inc.	April 10, 2019
Triangle Biotechnology, Inc.	November 14, 2017
Vitrivax, Inc.	June 22, 2017

Source: CU Boulder, RIO Office

CU Boulder has contributed to Boulder's innovation economy through **technology transfer, patents, and spin-off companies.**

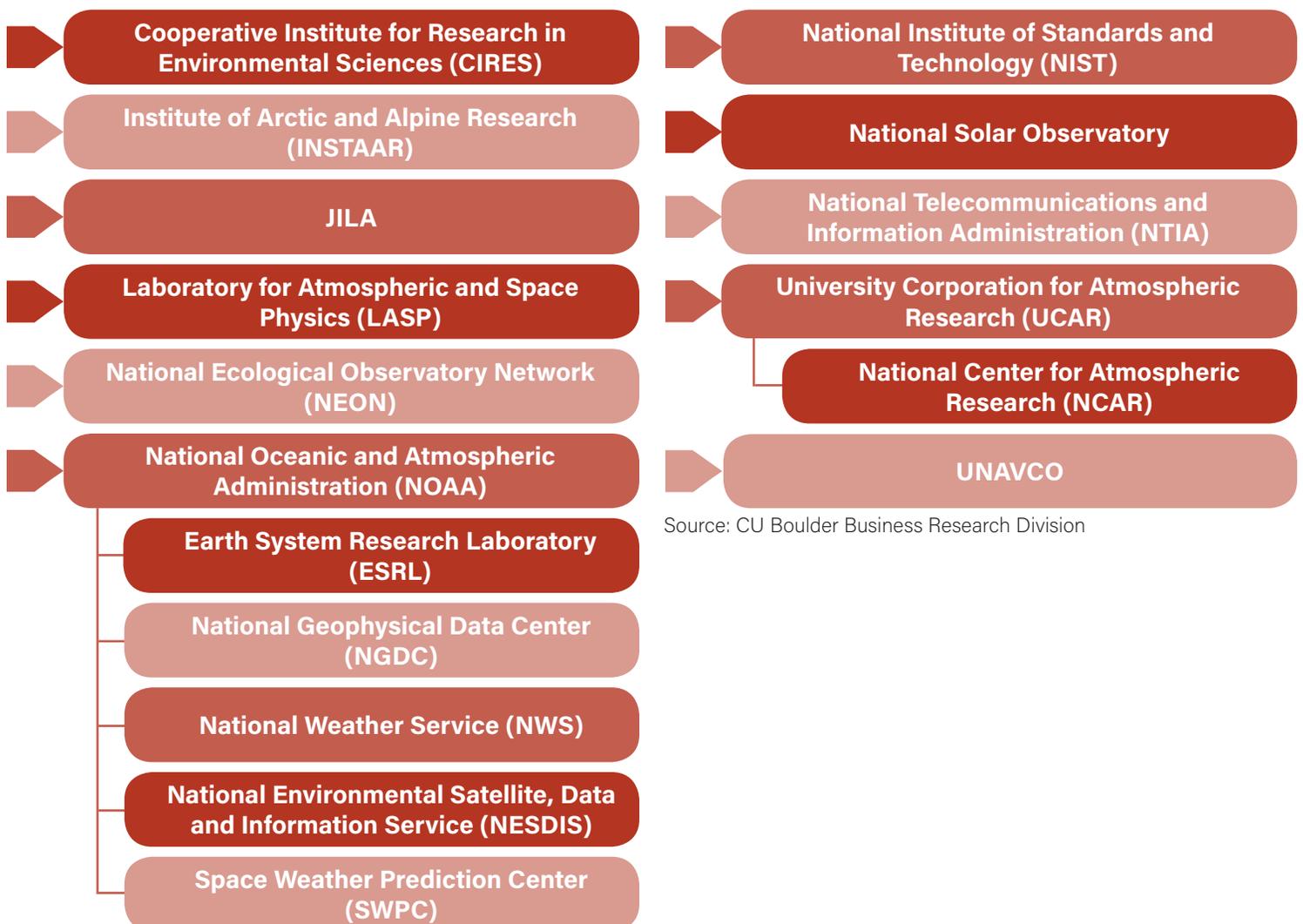
# FEDERAL RESEARCH LABS

Federally funded research labs in Colorado contributed an estimated \$2.6 billion to the state's economy, according to a 2017 report from CO-LABS and CU Boulder. The labs employed 7,800 people in the state, with a job multiplier effect estimated to support 17,600 total jobs.

The economic impact of federal labs on the Boulder MSA totaled \$1.1 billion and employed 3,900 people with annual salaries and benefits totaling \$390 million.

The concentration of federal labs (11 labs and 6 subsidiaries) and CU Boulder are important drivers of innovation. Boulder is home to labs conducting cutting edge research in a variety of fields. Notable labs include the National Oceanic and Atmospheric Administration (NOAA), the National Institute of Standards and Technology (NIST), the University Corporation for Atmospheric Research (UCAR), and the National Solar Observatory (NSO).

## Boulder Federal Labs



Source: CU Boulder Business Research Division



### Impact of Colorado Federal Labs on Boulder County: FY 2013-FY 2015

Impact	2013	2014	2015
Output	\$1,070,000,000	\$1,093,000,000	\$1,099,000,000
Value Added	\$643,000,000	\$664,000,000	\$698,000,000
Employment	7,367	7,592	7,627

Source: CU Boulder Business Research Division, Feb. 2017

The economic impact of federally funded research labs on the Boulder County economy was

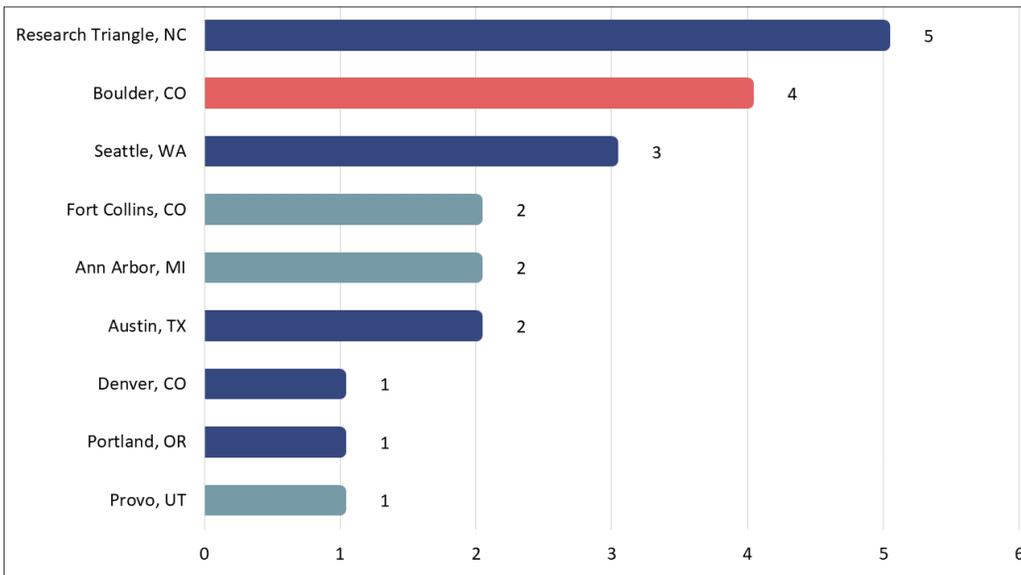
**\$1.1 billion**  
in 2015.

## FEDERAL LABORATORY CONSORTIUM

The Federal Laboratory Consortium for Technology Transfer (FLC) is a network of over 300 federal laboratories and research centers that fosters

commercialization of federal technologies from the labs into the marketplace.

### Federal Consortium Labs (City)



Source: Federal Lab Consortium for Technology Transfer

The City of Boulder ranks  
**2nd**  
among the regions studied with four labs as members of the Federal Lab Consortium.

# PRIVATE & PUBLIC/PRIVATE R&D

In addition to research and development conducted by CU Boulder, the federal labs and other public entities, private sector R&D contributes substantially to innovation in the Boulder MSA. Leading companies in Boulder’s aerospace, bioscience, energy, software, photonics, and other key industries invest in R&D. In many instances, this research is conducted in partnership with CU Boulder and federal labs. In other cases, public funding supports innovation and entrepreneurship of very early stage business ventures.

## SBIR AND STTR

The U.S. Small Business Administration manages two investment programs it describes as “America’s Seed Fund”: Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR).

The Small Business Innovation Research (SBIR) program encourages domestic small businesses to engage in R&D that has the potential for commercialization. Through a competitive awards-based program, SBIR enables small businesses to explore their technological potential and provides the

incentive to profit from its commercialization. According to the U.S. SBA’s website, the Small Business Technology Transfer (STTR) program is intended to expand public/private joint venture opportunities for small businesses and nonprofit research institutions. The unique feature of the STTR program is the requirement for the small business to formally collaborate with a research institution in Phase I and Phase II. STTR’s most important role is to bridge the gap between performance of basic science and commercialization of resulting innovations.

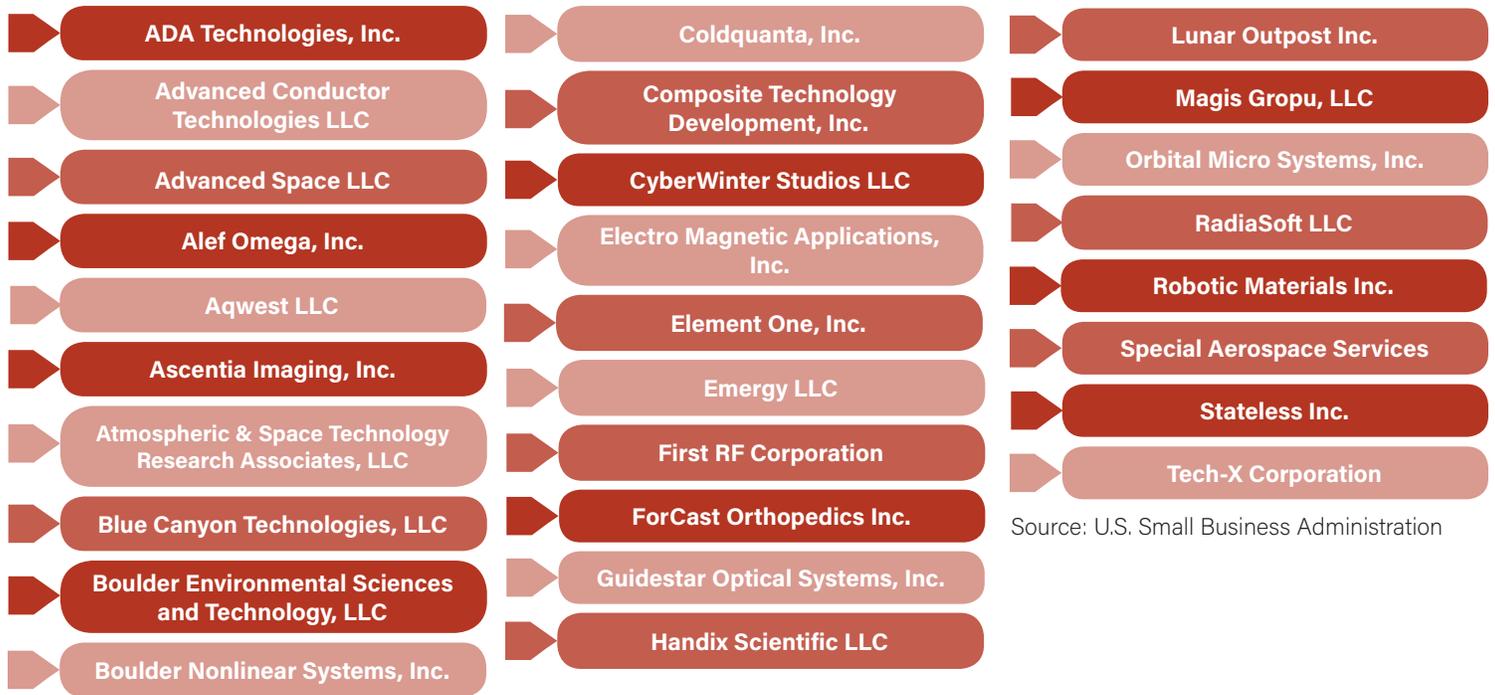
### SBIR and STTR Funding (MSA)

Metropolitan Statistical Area (MSA)	Population (2018)	SBIR	STTR	Total	Per Capita (2014-2018)
City of Boulder	107,355	\$156,744,373	\$18,660,288	\$175,404,660	\$1,634
Boulder, CO	321,030	\$232,458,666	\$23,563,929	\$256,022,595	\$798
Ann Arbor, MI	365,961	\$135,943,858	\$20,921,007	\$156,864,865	\$429
College Station – Bryan, TX	253,947	\$89,500,255	\$6,677,225	\$96,177,480	\$379
Boston – Cambridge – Newton, MA – NH	4,811,732	\$1,201,395,600	\$137,217,326	\$1,338,612,925	\$278
San Jose – Sunnyvale – Santa Clara, CA	1,981,616	\$290,920,106	\$19,341,173	\$310,261,279	\$157
Madison, WI	647,280	\$79,218,375	\$13,271,712	\$92,490,087	\$143
Fort Collins – Loveland, CO	338,161	\$44,596,038	\$3,305,640	\$47,901,678	\$142
San Francisco – Oakland – Hayward, CA	4,673,220	\$480,334,698	\$49,789,549	\$530,124,247	\$113
Austin – Round Rock, TX	2,058,351	\$150,221,629	\$28,428,817	\$178,650,446	\$87
Denver – Aurora – Lakewood, CO	2,850,220	\$166,952,269	\$17,924,338	\$184,876,607	\$65
Seattle – Tacoma – Bellevue, WA	3,809,717	\$185,369,349	\$20,564,512	\$205,933,861	\$54
Portland – Vancouver – Hillsboro OR – WA	2,417,933	\$107,474,742	\$19,702,726	\$127,177,468	\$53
Raleigh – Durham – Chapel Hill, NC CSA	1,937,952	\$43,276,559	\$6,117,880	\$49,394,439	\$25
Provo – Orem, UT	601,387	\$12,491,232	\$797,538	\$13,288,770	\$22

Source: U.S. Census Bureau, 2018; Small Business Administration, Small Business Innovation Research

The Boulder MSA has **substantially higher** SBIR and STTR funding per capita relative to the innovation and peer innovation regions studied.

## 2019 Select SBIR/STTR Award Recipients in Boulder County



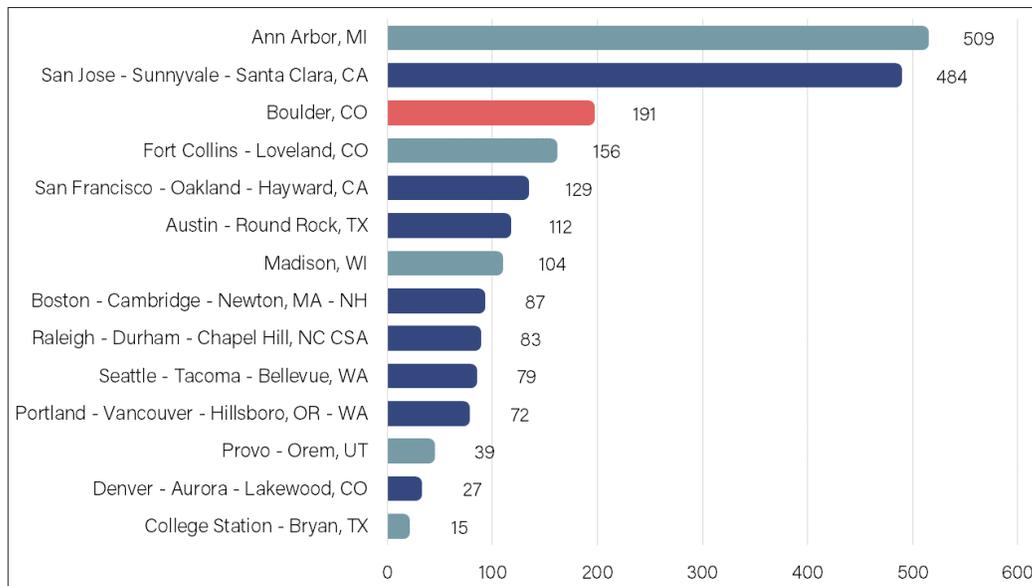
Source: U.S. Small Business Administration

## UTILITY PATENTS

A common metric used to measure innovation and R&D is patents. According to the U.S. Patent and Trademark Office, a utility patent may be granted to anyone who invents or discovers any new and useful process, machine, article of manufacture, composition

of matter, or any new and useful improvement. It confers the right to exclude others from making, using, offering for sale, or selling the invention in the U.S. or importing the invention into the United States.

### Utility Patents Granted per 100,000 Residents (MSA)



Source: U.S. Patent and Trademark Office, U.S. Census Bureau, 2018

The Boulder MSA had the **3rd-most** utility patents granted per 100,000 residents in 2018, behind only Ann Arbor and San Jose regions



# INVESTMENT CAPITAL

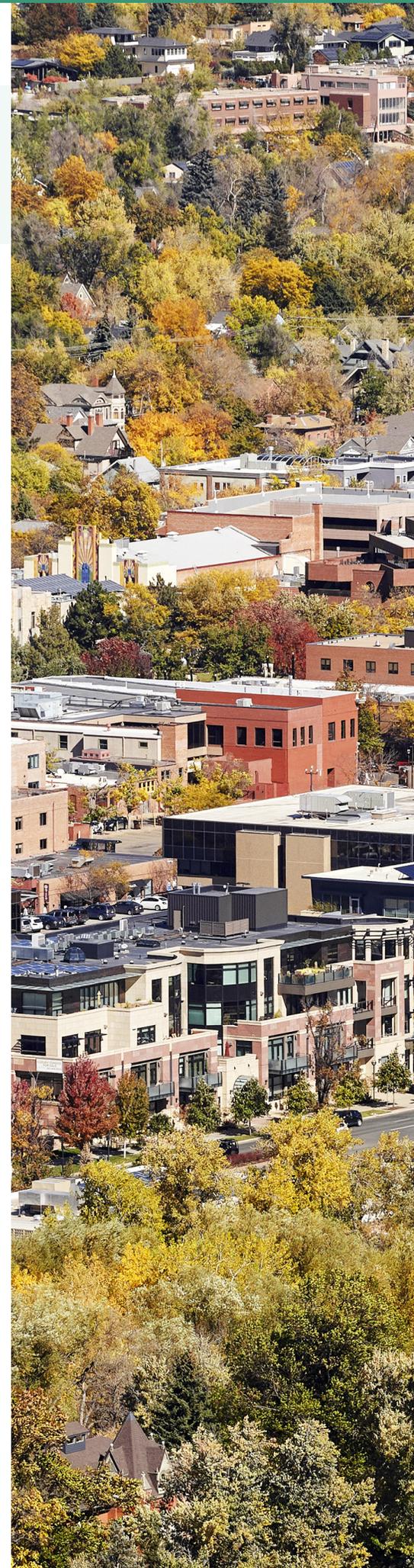
Innovation and entrepreneurship are fueled by investment capital. From venture capital to mergers and acquisitions, the availability of capital in the 2010's reached historic highs.

The volume of venture capital invested in entrepreneurs and their startups hit highs not seen since the dot-com era of the 1990's. Merger and acquisition activity also reached record levels as entrepreneurs or other owners sold some or all of their interests in their companies.

# Why is this important?

The availability of investment capital is vital to every business at every stage of its development. From seed funding to launch a new company, to venture capital to scale a business, to company ownership exits through merger, acquisition or public equity offering, every business depends on capital.

Capital is equally critical to the economic vitality of cities and regions. Successful businesses provide employment opportunities for community residents, and they fund public services, infrastructure, and social and cultural programs through taxes, fees, and philanthropy. They also support the innovation and development of new products and businesses, creating a virtuous cycle of sustained economic vitality.



# PRIVATE INVESTMENT

## VENTURE CAPITAL

Venture capital (VC) is an especially important source of funding for entrepreneurs, who often struggle to raise capital from other, more risk-averse funding sources. The volume of venture capital raised in a region is commonly tracked as a measure of the area's innovation and entrepreneurial activity.

In addition to benefiting from one of the highest rates of VC funding per capita, Boulder entrepreneurs and their startups are well supported by area business accelerators with mentorship programs and investment funds.

### 2018 – 2019 Boulder Venture Capital Deal Highlights

Year	Company	Amount Raised
2018 - 2019	Inscripta	\$231,000,000
2018 - 2019	ArcherDX	\$150,000,000
2018 - 2019	PanTheryx	\$60,000,000
2018 - 2019	Biodesix	\$40,000,000
2019	Techstars	\$42,000,000
2019	JumpCloud	\$50,000,000
2019	Edgewise Therapeutics	\$50,000,000
2019	Stateless	\$12,000,000
2019	DMC Biotechnologies	\$11,100,000
2018	minuteKey	\$83,000,000
2018	SomaLogic	\$39,000,000
2018	Sovrn	\$25,000,000

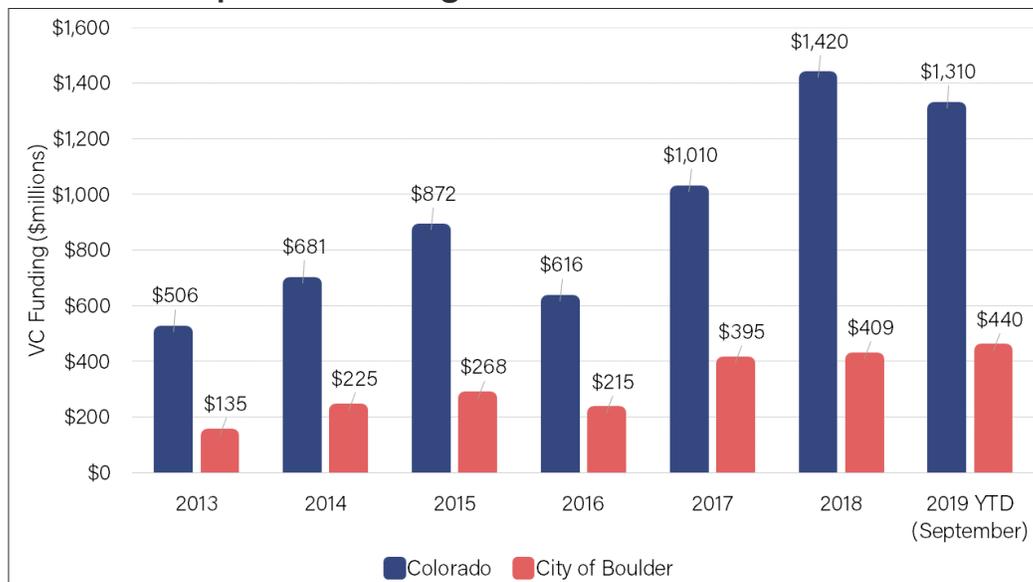
Startups in the City of Boulder raised about

**\$409 million**

in venture capital in 2018 and had surpassed that volume by Q3 2019.

Source: CB Insights (as of Q3 2019)

### Venture Capital Funding: Boulder & Colorado 2013 – 2019 (\$M)



Since 2013, approximately

**33%**

of all venture capital funding in Colorado was invested in City of Boulder startups.

*Note: includes seed/angel, VC, and other venture capital; excludes convertible notes, private equity, growth equity, debt, grant, M&A, IPO, dead, and other*

Source: CB Insights (as of Q3 2019)

## Venture Capital Investment (City)

City	VC Investment Deals	Total VC Investment	Per Capita Investment
San Francisco	826	\$18,700,000,000	\$35,581.4
Palo Alto	135	\$1,990,000,000	\$29,855.2
Boston	179	\$3,400,000,000	\$4,885.6
<b>City of Boulder</b>	<b>54</b>	<b>\$409,300,000</b>	<b>\$3,812.6</b>
Durham	21	\$563,400,000	\$2,052.5
San Jose	85	\$1,920,000,000	\$1,863.9
Seattle	121	\$1,330,000,000	\$1,785.4
Ann Arbor	21	\$133,400,000	\$1,094.5
Austin	131	\$959,900,000	\$995.5
Denver	70	\$644,800,000	\$899.9
Portland	41	\$562,100,000	\$861.4
Raleigh	14	\$178,000,000	\$378.3
Madison	18	\$94,600,000	\$366.6
College Station	2	\$25,200,000	\$216.8
Provo	5	\$21,800,000	\$186.8
Chapel Hill	3	\$9,100,000	\$153.6
Fort Collins	5	\$22,500,000	\$134.1

Source: CB Insights (as of Q3 2019)

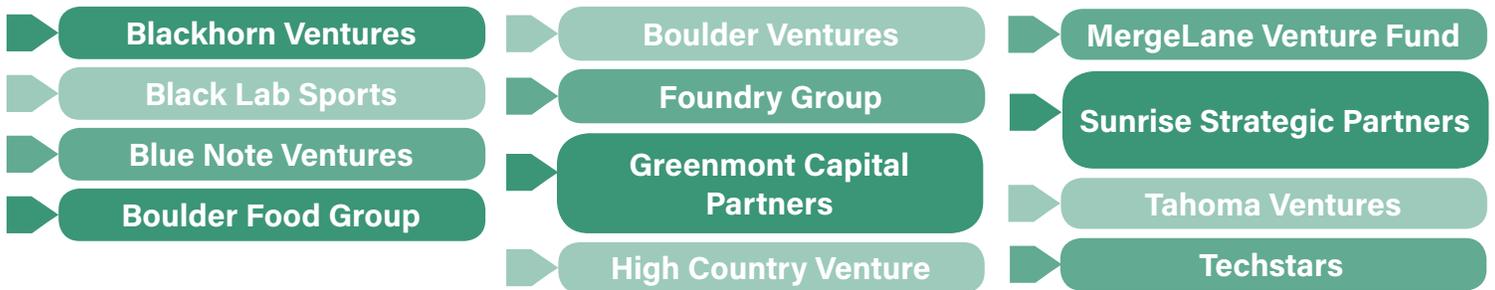
In 2018, the City of Boulder ranked

**4th**

among the innovation and peer communities in per capita venture capital investment.

*Note: includes seed/angel, VC, and other venture capital; excludes convertible notes, private equity, growth equity, debt, grant, M&A, IPO, dead, and other*

## Select Boulder Venture Capital Firms



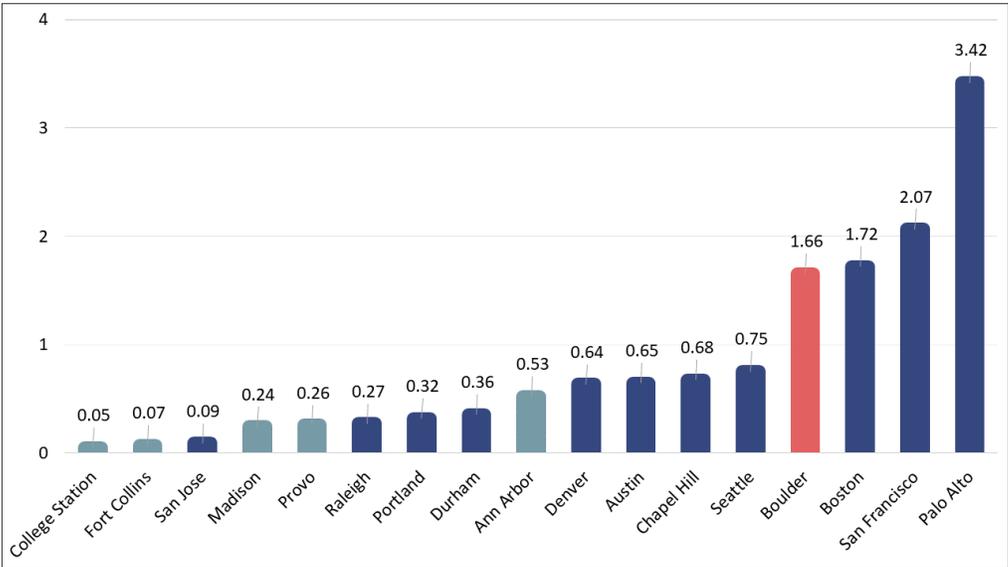
## SEC FORM D FILINGS

The U.S. Securities and Exchange Commission's (SEC) Form D is used to file a notice of an exempt offering of securities with the SEC. Form D filings allow companies to sell equity to finance their

businesses without going through a public equity offering and selling stock to the public. Entrepreneurs often use a Form D private placement of equity as an alternative to raising venture capital.



## Form D Filings per 1,000 Residents (City)



Relative to the other cities studied, Boulder had the

**4th**

highest number of Form D filings per 1,000 residents.

Source: U.S. Securities and Exchange Commission, U.S. Census Bureau, 2018

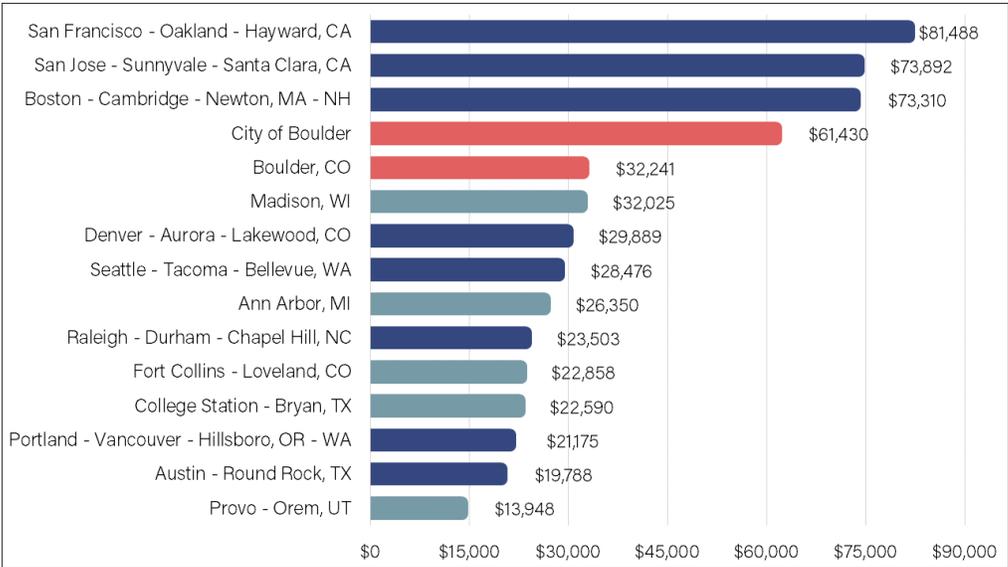
## BANKING

The Federal Deposit Insurance Corporation publishes information about bank deposits by institution and branch for communities throughout the U.S. This data is one metric of an area's wealth. The City of Boulder and the Boulder MSA recorded \$6.6 billion and \$10.5 billion, respectively, in deposits as of June 30, 2018.

Colorado commercial banks, nonprofit community development organizations, micro-lending programs, and other lending sources to guarantee portions of loans ranging from \$500 to \$5.5 million. The advantage of SBA loans is that the programs are designed to be more flexible than traditional loans, which helps small businesses qualify more easily for debt financing. In Colorado, the SBA approved 1,443 loans worth \$837 million in fiscal year 2019.

U.S. Small Business Administration (SBA) loan programs are important resources for small and early stage businesses. The SBA works with

## Per Capita Summary of Deposits as of June 30, 2018 (MSA)



The City of Boulder and the Boulder MSA are ranked

**4th and 5th,**

respectively, in bank deposits per capita among the communities studied.

Source: Federal Deposit Insurance Corporation, Summary of Deposits; U.S. Census Bureau

# ENTREPRENEURIAL SUPPORT

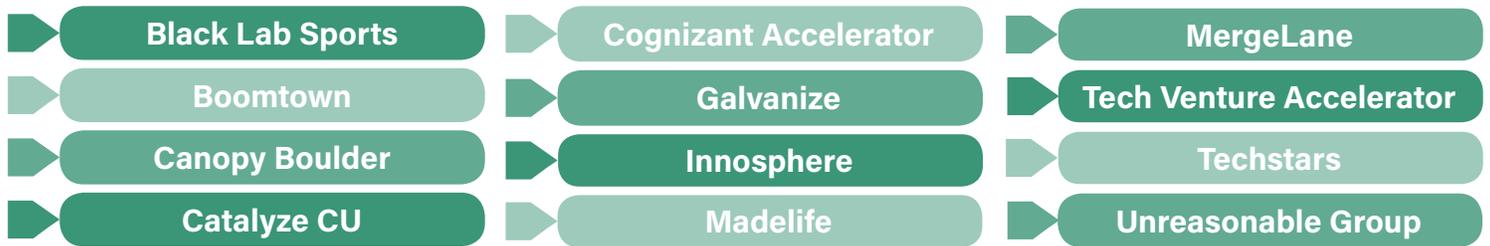
Access to investment capital is essential to innovation and entrepreneurship, but the support given entrepreneurs in Boulder's ecosystem extends beyond capital. Accelerators, incubators, and coworking spaces play an important role in innovation as they combine mentorship, funding, and a collaborative community to help support the success of entrepreneurs.

## ACCELERATORS

Startup accelerators support early-stage, growth-driven companies through education, mentorship, and often, financing. The accelerator experience is a process of intense and rapid education aimed at accelerating the life cycle of young innovative

companies. As highlighted in a 2016 Harvard Business Review article, four distinct factors make accelerators unique: they are fixed-term, cohort-based and mentorship-driven, culminating in a graduation or "demo day."

### Select Boulder Accelerators



## COWORKING SPACES

Coworking spaces allow different businesses to share office space, resulting in flexible real estate solutions, cost savings, and the convenience of shared infrastructure such as office equipment, utilities, custodial services, and more. Coworking is popular

with sole proprietors, independent contractors, and telecommuters, among others. It is especially attractive to entrepreneurs and other professionals seeking a collaborative environment where cross-industry networking and support is encouraged.

### Select Boulder Coworking Spaces





# PLACE

Boulder's picturesque physical environment and desirable quality of life attract artists, scientists, celebrated chefs, investors, engineers, competitive athletes, entrepreneurs, and other innovators who bring their own unique qualities to the regional ecosystem. Boulder is often chosen by "creatives" as their preferred place to live even though many of them could choose to live and work almost anywhere in the world.

In 2012, well-known economist Richard Florida revised his seminal analysis of the places in the U.S. that are most attractive to what he describes as the "creative class". He defined the creative class to include professionals in the fields of science and technology; design and architecture; arts, entertainment and media; and healthcare, law, management and education. In Florida's *The Rise of the Creative Class, Revisited*, Boulder was the top-ranked place in the U.S. on the author's "Creativity Index" measuring technology, talent, and tolerance in regions throughout the country.

# Why is this important?

Innovation ecosystems prosper as creative professionals are drawn to the quality of place they offer. When creatives and innovators move to a community, they collectively recharge innovation in everything from the arts, food and beverages to sciences and advanced technologies.

Boulder is widely recognized for its collaborative culture, an attribute propelled by creatives and innovators who are committed to supporting each other's success and the entrepreneurial vitality of the community. A desirable quality of place and collaborative culture give Boulder businesses a competitive advantage in attracting and retaining talent and raising investment capital.



"Happiest Cities in the U.S."  
- *National Geographic*



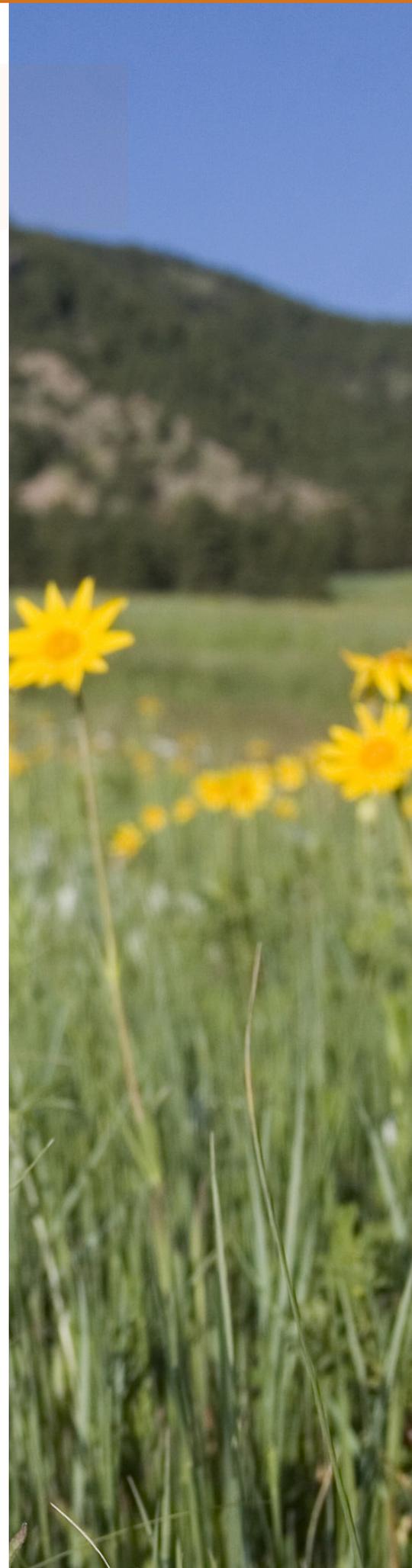
"Highest Well Being Communities"  
- *Gallup-Healthways Well Being Index*



"Healthiest Cities in the U.S."  
- *Niche*



"America's Fittest Cities"  
- *Forbes*



# PHYSICAL ENVIRONMENT

Boulder offers advantages to innovators as a small community cradled in a striking natural setting at the foot of the Rocky Mountains. As a compact city, Boulder encourages an unusually collaborative community of people with diverse backgrounds, education, capabilities, and interests. Situated in the Boulder Valley of the Rockies' foothills, local residents find inspiration from miles and miles of undeveloped open spaces abundant with outdoor recreational amenities, beautiful vistas, and wildlife.

One of the main attractions of living and working in the City of Boulder and Boulder County is access to one of the most extensive networks of open space environments in the nation.

In 1967, Boulder voters took the innovative step to tax themselves to purchase land and preserve it as undeveloped open space. Boulder was the first city in the nation to approve an open space tax of this kind. Since then the city has acquired more than 70 square miles of open space, nearly three times the 27 square miles of developed land within the city limits. Boulder County has an additional 66,000 acres of publicly owned open space, plus another 40,000 acres with conservation easements on private land.



## OUTDOOR RECREATION

Dedicated open spaces in Boulder and Boulder County allow for a network of outdoor running, hiking, and biking trails unparalleled in the U.S. There are 155 miles of multi-use paths and trails in Boulder, accessible throughout the city and from 35 trail running and hiking trailheads in city open space and mountain parks.

Boulder has built a nationally recognized pedestrian-friendly community, earning the Gold-Level Walk Friendly Community designation from Walk Friendly Communities. An additional 110 miles of trails on Boulder County open space complete the region's portfolio.

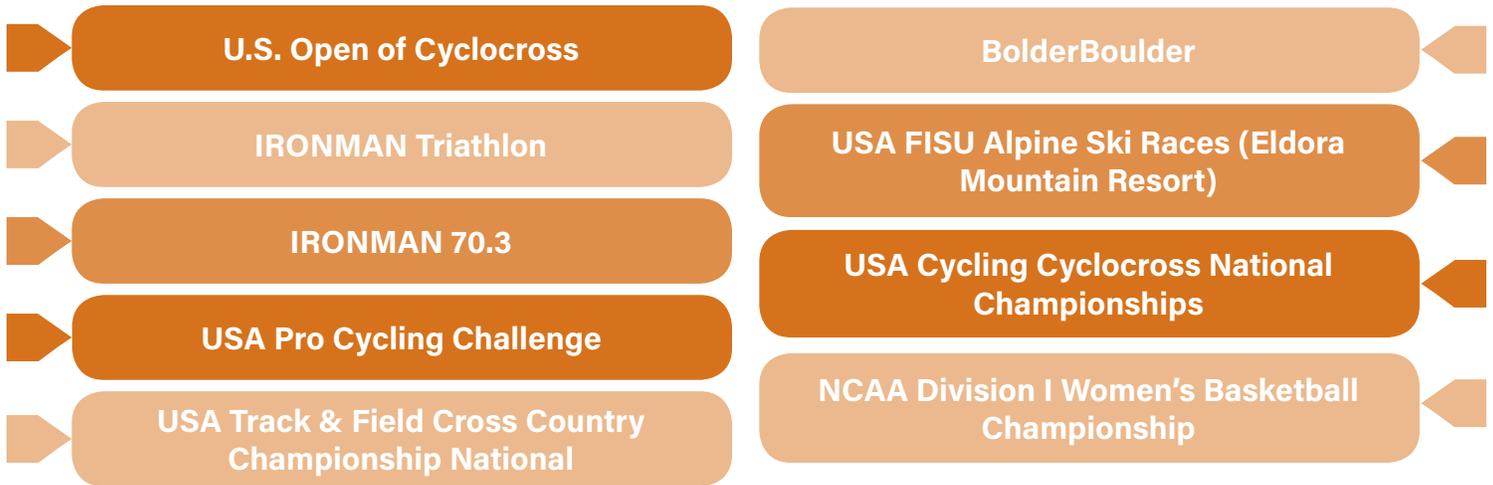
Boulder is famous for its bicycling amenities. Boulder was named the top city for bikes in the 2019 PlacesforBikes City Ratings. Boulder's bike system received recognition for its innovative overpasses, underpasses, and off-street bike paths, which provide travel routes for bicyclists and pedestrians that are protected from traffic. The City of Boulder and the surrounding area have more than 300 miles of bikeways, including 96 miles of bike lanes, 84 miles of multi-use paths, and 50 miles of designated bike routes.

Boulder’s varied terrain and avid climbing community make it a world-class area for climbing. Top Boulder outdoor climbing areas include the iconic Flatirons, Boulder Canyon, and the legendary Eldorado Canyon State Park. For indoor climbing, one of the fastest growing sports in the world, options include The Spot Bouldering Gym, Movement Climbing + Fitness,

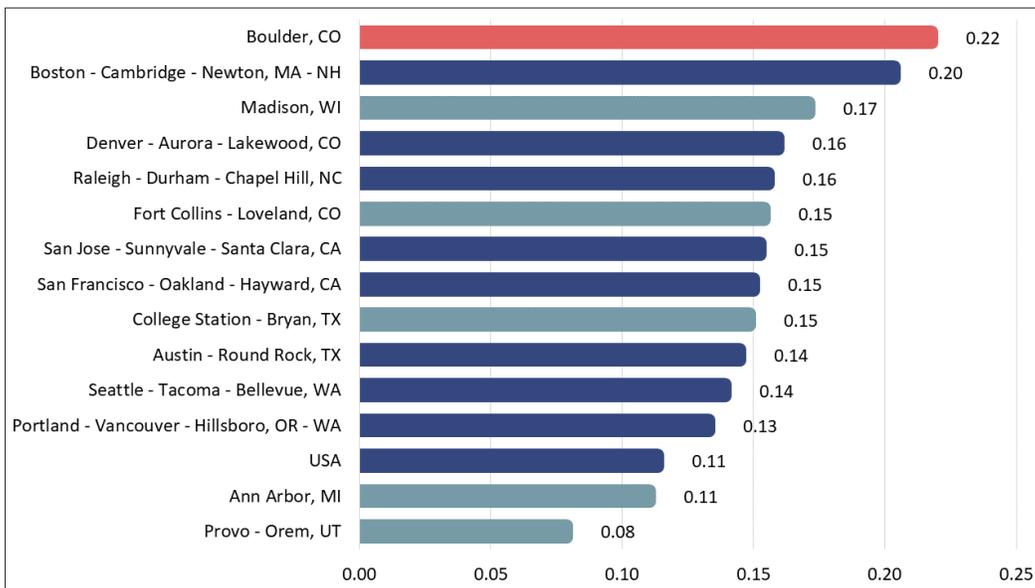
Boulder Rock Club, EVO Rock + Fitness, and ABC Kids Climbing, among others.

Boulder is acclaimed as a host for national, even international sporting competitions. A variety of sports facilities and outdoor venues continue to prove attractive to major event organizers.

### Top Sporting Competitions Hosted in Boulder



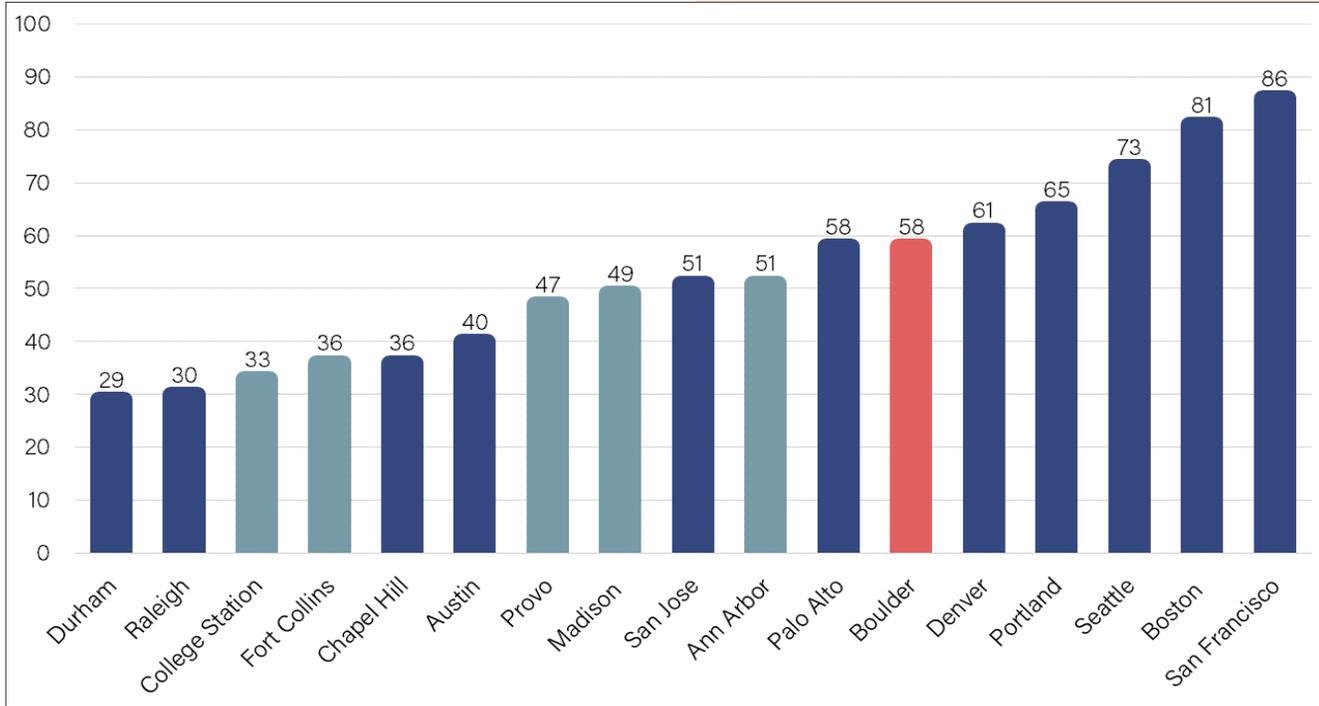
### Fitness and Recreational Sport Centers per 1,000 Residents (MSA)



Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW), 2018

The Boulder MSA ranks **1st** in fitness and recreational centers among all the innovation and peer communities studied.

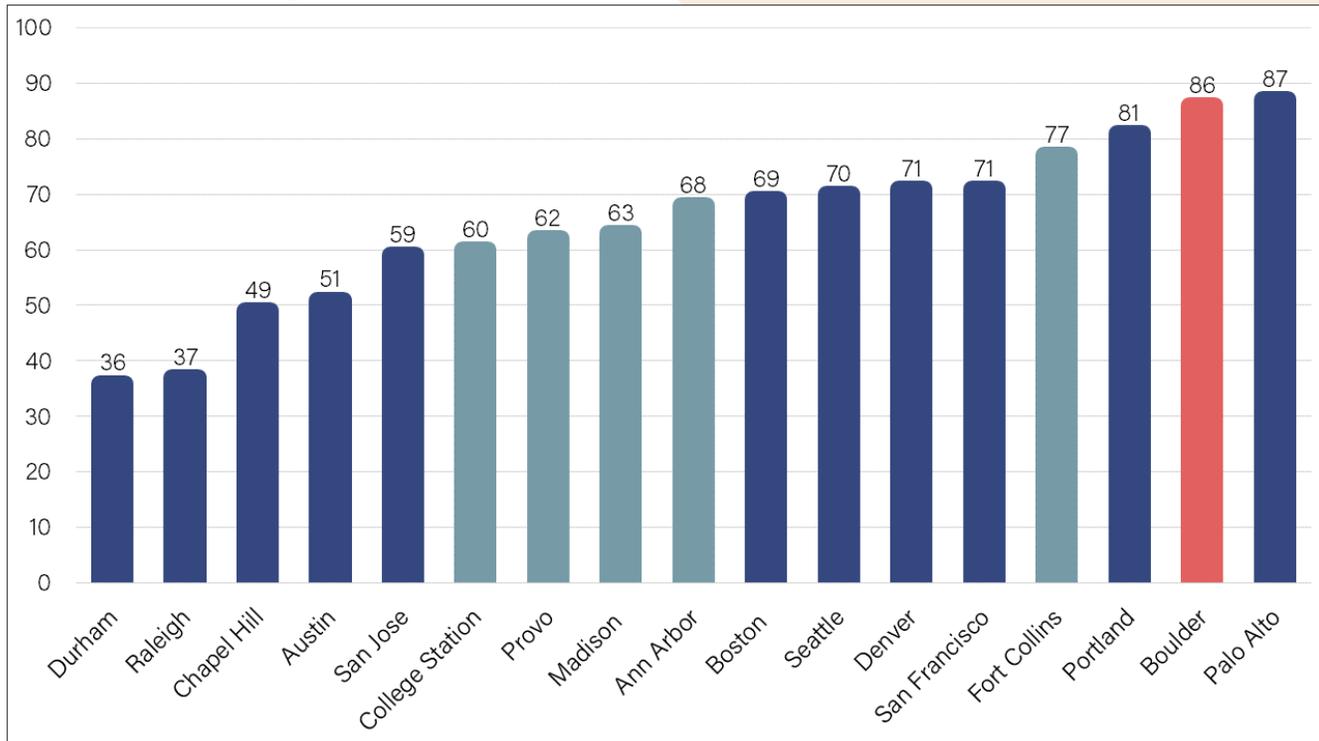
## Walkability Score (City)



Source: walkscore.com

The City of Boulder’s walkability score is **highest of the peer cities studied** and 6th among the large innovation cities.

## Bike Score (City)



Source: walkscore.com

The City of Boulder has the **2nd highest bike score**, as reported by Walk Score, among all the peer and innovation cities.

# ARTS & CULTURE

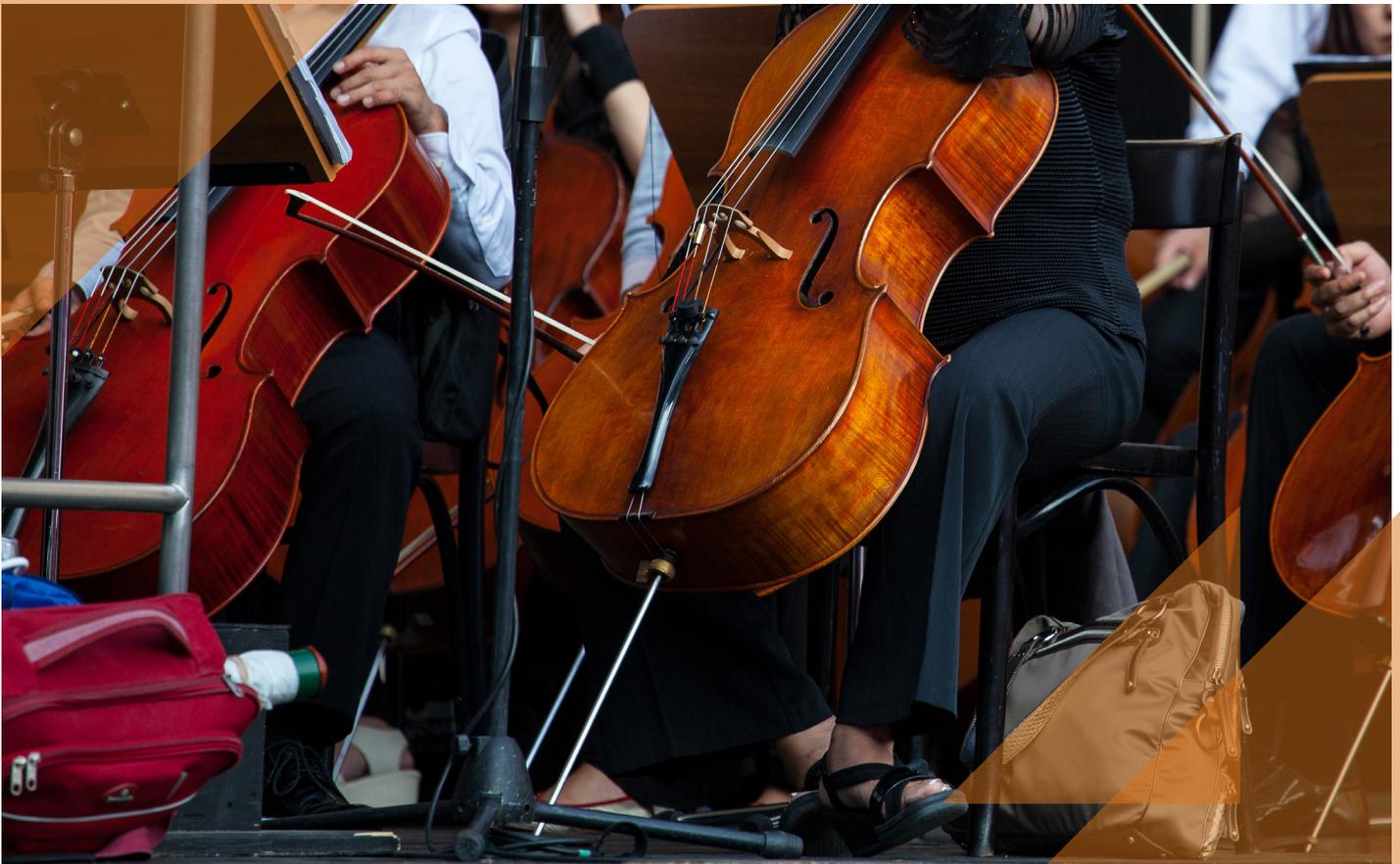
## ARTS

The City of Boulder Community Cultural Plan produced by the city's Office of Arts and Culture extols Boulder as an "outstanding place to be creative." Boulder's "environment of inspiration" attracts creative people with an "innate drive of innovation and self-reliance that fosters a marketplace for cultural organizations, venues and businesses."

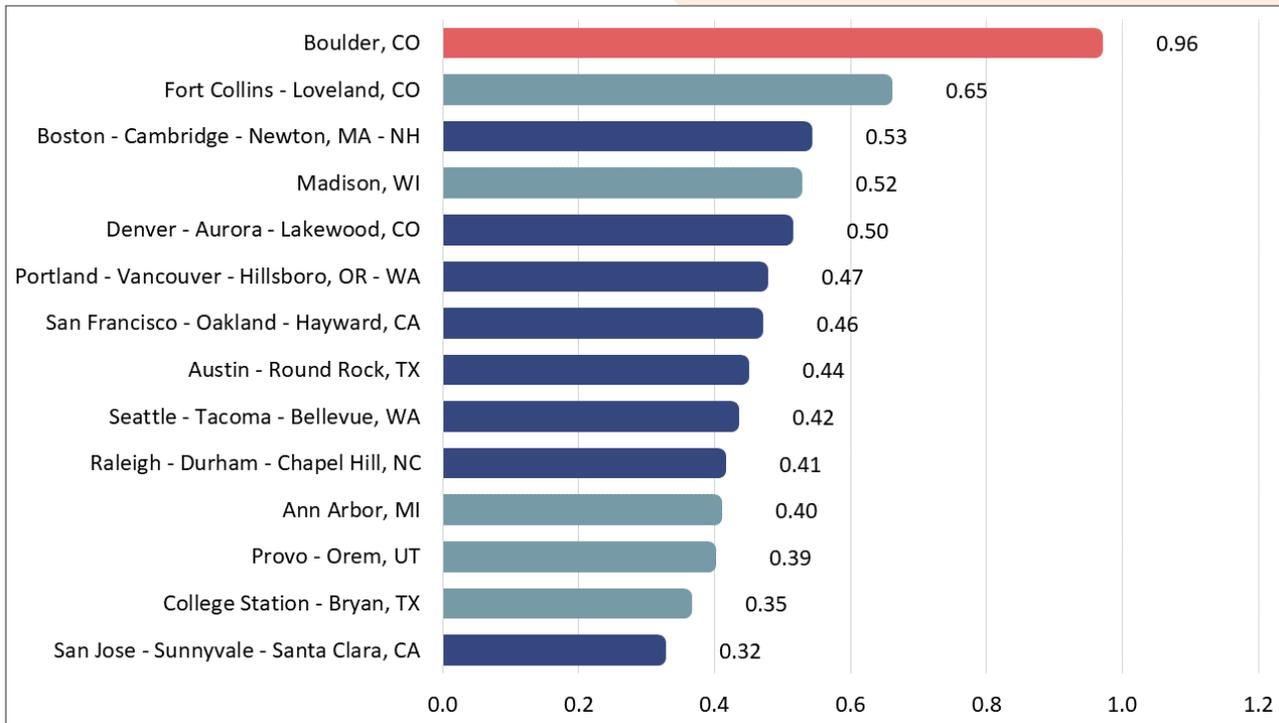
In the 2019 Arts Vibrancy Index Report released by the National Center for Arts Research at Southern Methodist University, Boulder ranked eighth in the nation as the most "arts-vibrant" medium-sized community. Boulder was also named one of America's

Most Artistic Towns by Expedia, which noted that "the art coming from Boulder is fresh and experimental." In the "Working Artists in America" series published by the National Endowment for the Arts, the Boulder metro area was highlighted as one of the leading regions in the United States where artists cluster as a percentage of the workforce.

Boulder's arts and cultural amenities are a major attraction for millions of visitors annually who are drawn to an exciting variety of galleries, performing arts, museums and special events.



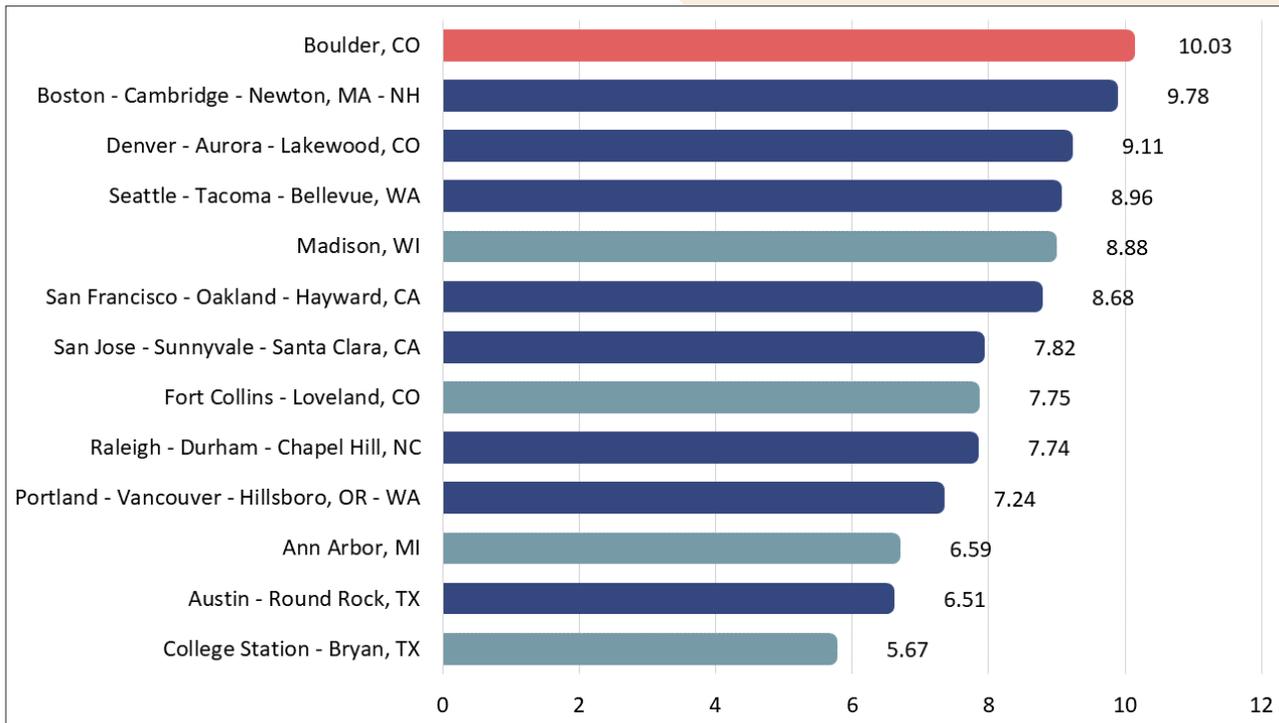
## Arts Establishments per 1,000 Residents (MSA)



Source: Bureau of Labor Statistics, QCEW, 2018

The Boulder MSA has the **highest density of arts establishments** of the regions studied.

## Arts Employment per 1,000 Residents (MSA)



Source: Bureau of Labor Statistics, QCEW, 2018

Boulder employs the **most people per capita** in arts-related jobs relative to the innovation and peer regions.

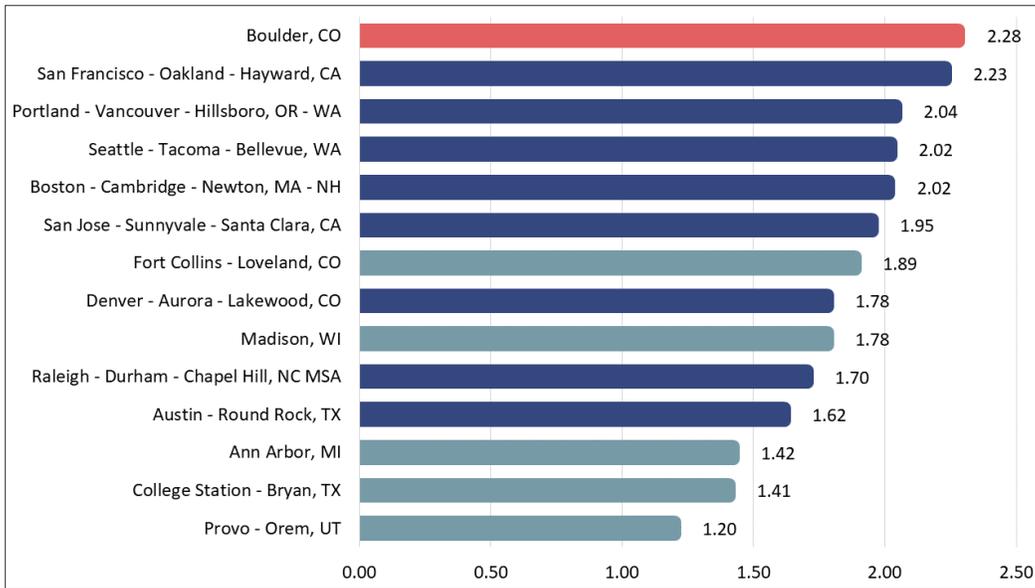
# ▶ FOOD, BEVERAGES AND RESTAURANTS

When Bon Appetit named Boulder "America's Foodiest Town," it specifically cited the number of innovative food companies, top-tier restaurants and chefs, and one of the best farmers' markets in the country.

In addition to its restaurant scene, the Boulder MSA is regularly singled out for the variety of wholesale food and beverage production of dozens

of companies in the region. Among the innovation and peer communities, the Boulder MSA has the most restaurants per capita. It is nearly tied for first among comparative regions for the most coffee shops. A number of craft brewers, winemakers, and liquor distilleries are all well-established in the City of Boulder, and the city's craft brewing industry is often celebrated as one of the most developed in the U.S.

## Restaurants Per 1,000 Residents (MSA)



The Boulder MSA has

**744**

businesses classified as restaurants and drinking places, the highest density among the innovation and peer regions studied.

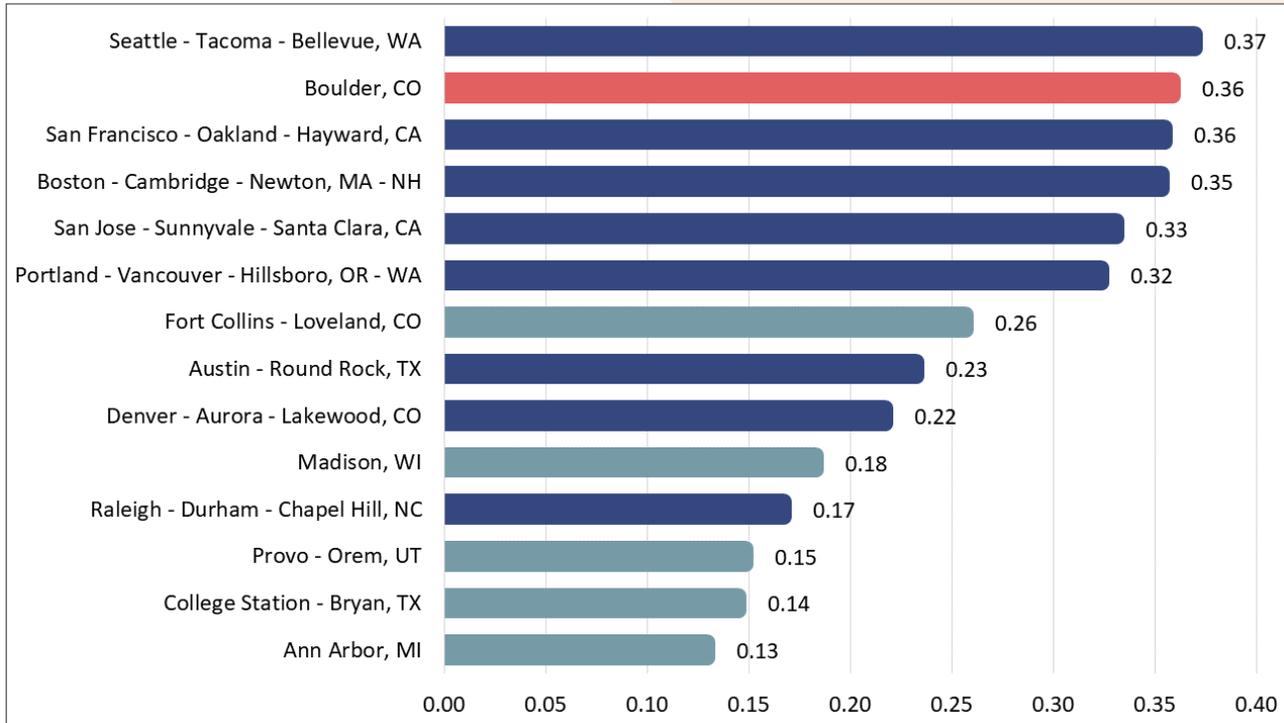
Source: Bureau of Labor Statistics, QCEW, 2018

Note: includes full-service restaurants, limited-service eating places, special food services and alcoholic beverage drinking places.

Just some of the most celebrated, fine dining restaurants – and award-winning chefs – in the City of Boulder include:

▶ <b>Basta</b> <i>Kelly Whitaker</i>	▶ <b>Corrida</b> <i>Amos Watts</i>	▶ <b>Jax Fish House</b> <i>Ricky Myers</i>
▶ <b>Black Cat</b> <i>Eric Skokan</i>	▶ <b>Flagstaff House</b> <i>Chris Royster</i>	▶ <b>The Kitchen</b> <i>Hugo Matheson</i>
▶ <b>Blackbelly Market</b> <i>Hosea Rosenberg</i>	▶ <b>Frasca Food and Wine</b> <i>Lachlan Mackinnon-Patterson</i>	▶ <b>Oak at Fourteenth</b> <i>Steven Redzikowski</i>
▶ <b>Cafe Aion</b> <i>Dakota Soifer</i>	▶ <b>Izakaya Amu</b> <i>Naoto Kanda</i>	▶ <b>River and Woods</b> <i>Daniel Asher</i>

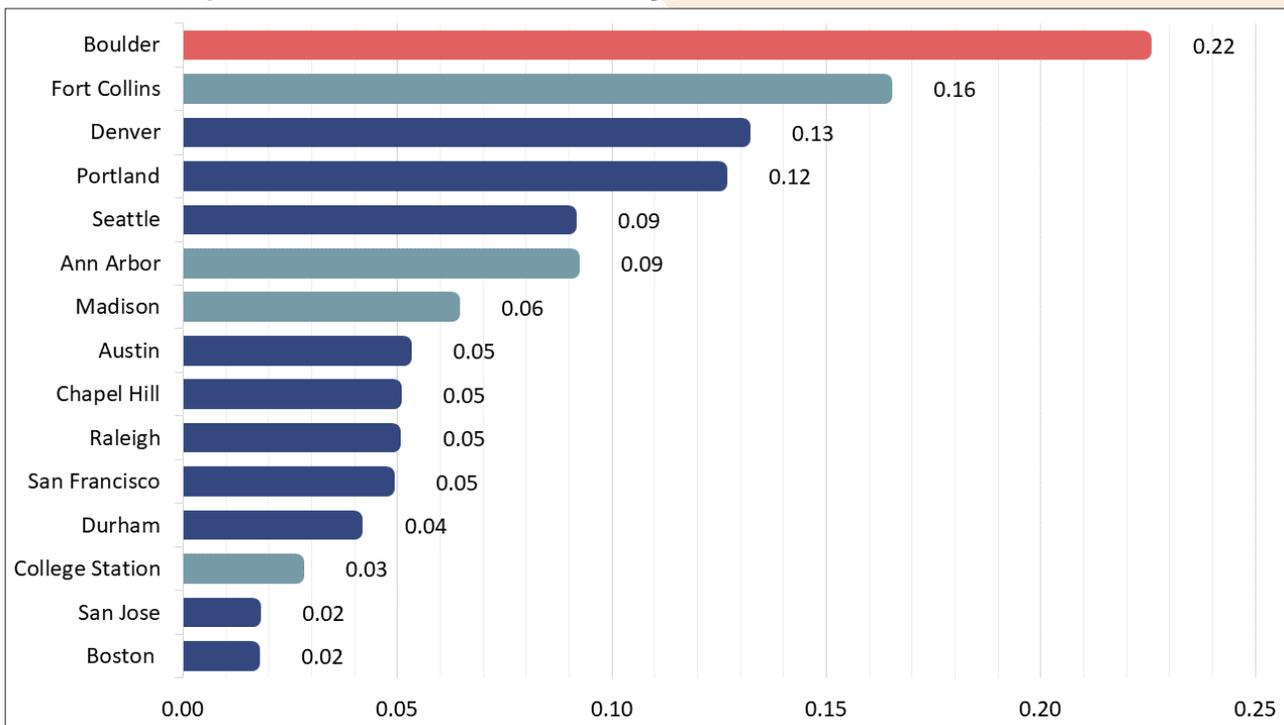
## Coffee Shops per 1,000 Residents (MSA)



Source: Bureau of Labor Statistics, QCEW, 2018. Note: includes bakeries and similar non-alcoholic businesses

The Boulder MSA is **second only to the Seattle MSA**, home of Starbucks, for the highest concentration of coffee shops.

## Breweries per 1,000 Residents (City)



Source: Bureau of Labor Statistics, QCEW, 2018

Surpassing all the peer and innovation cities studied by a large margin, the City of Boulder has the **highest number of breweries per capita.**

## NATURAL & ORGANIC FOODS

Boulder is routinely acknowledged by champions of natural and organic food as one of the places where the “health food” movement first took root. Boulder innovators Mo Siegel (Celestial Seasonings), Steve Demos (White Wave), Hanna Kroeger (Hanna’s Herb Shop), Hass Hassan (Alfalfa’s Market), Mark Retzloff (Alfalfa’s, Aurora Organic Dairy), and Doug Greene (New Hope Natural Media), among others, were pioneers in the emerging industry.

In 2005, natural products industry leaders in Boulder joined with the City of Boulder and the Boulder Economic Council of the Boulder Chamber to found

Naturally Boulder. The first industry association of its kind in the United States, the mission of Naturally Boulder is “To nurture conscious growth, leadership and innovation in the Colorado natural products community.”

In 2018, Naturally Boulder replicated its model in the San Francisco Bay Area in pursuit of creating the Naturally Network of natural products accelerator communities. Naturally Bay Area became the first affiliate of the Naturally Network, with Naturally Chicago, Naturally Austin, and Naturally North Bay Area following soon after.



# HOUSING, SCHOOLS, HEALTHCARE AND TRANSPORTATION

## HOUSING

For many innovators and entrepreneurs, housing affordability is one of the most important criteria in evaluating where to live, work and grow a business. SmartAsset named the Boulder MSA as the “best housing market for growth and stability in 2019” in the U.S. Boulder was ranked first in the nation for the fifth year in a row, and Colorado was ranked among the top ten states for homeownership.

Boulder and all of the innovation and peer communities studied have experienced significant and sustained housing price appreciation since the Great Recession. Some have seen periodic appreciation at levels higher than most other regions of the country. Data reported by Zillow and the National Association of Realtors shows that all but one of the metro areas studied for this report ranked among the 25 most expensive housing markets in the United States.

### Median Home Value (City)

City	Median Value	Annual Change (12/18 – 12/19)
Palo Alto	\$2,852,600	-11.5%
San Francisco	\$1,352,300	-0.9%
San Jose	\$989,000	-10.1%
Boulder	\$751,700	3.3%
Seattle	\$718,500	-2.7%
Boston	\$596,700	0.6%
Denver	\$426,200	1.0%
Portland	\$420,400	-0.9%
Fort Collins	\$393,500	3.5%
Austin	\$384,600	7.4%
Ann Arbor	\$371,600	1.6%
Provo	\$309,300	6.3%
Raleigh	\$281,800	5.5%
Madison	\$256,900	2.3%
College Station	\$249,100	3.6%
United States	\$231,700	4.7%

Source: Zillow, Dec. 2019

Measured by median home values, Boulder has the **fourth highest housing costs** relative to the other innovation and peer communities.

## SCHOOLS

The Boulder Valley School District (BVSD) is a highly-rated public school district headquartered in the City of Boulder. Fifty-six schools in 11 different communities serve approximately 30,000 students. BVSD consistently ranks among the top three districts in Colorado – often as the top district – as measured by state and national academic rankings.

The other major school district in the Boulder MSA is the St. Vrain Valley School District (SVVSD), based in the City of Longmont. The district includes 57 schools

in 13 communities serving 32,000 students. SVVSD is a leader in innovative educational programming. It won one of the original Investing in Innovation (i3) grants under the U.S. Department of Education’s Race to the Top program.

In the 2019 U.S. News & World Report rankings of the best high schools in the nation, 13 schools in BVSD were recognized, as were 12 schools in SVVSD.

### School District Graduation Rates

School District	Average Graduation Rate	Enrollment
Boulder Valley School District (Boulder)	91%	31,189
College Station Independent School District	91%	13,188
Austin Independent School District	90%	83,067
San Jose Unified School District	90%	32,004
Wake County (Raleigh) Public Schools	89%	160,367
San Francisco Unified School District	84%	60,133
St. Vrain Valley School District (Longmont)	84%	32,171
Madison Metropolitan School District	83%	26,999
Seattle Public Schools	79%	54,215
Poudre School District	79%	29,682
Portland Public Schools	78%	48,173
Boston Public Schools	73%	53,393
Provo City School District	72%	18,177
Denver Public Schools	67%	91,138

Source: Niche, 2019

Comparing the largest districts in each of the regions studied, **Boulder Valley School District had the highest graduation rate** and St. Vrain Valley School District ranked seventh.

## HEALTHCARE

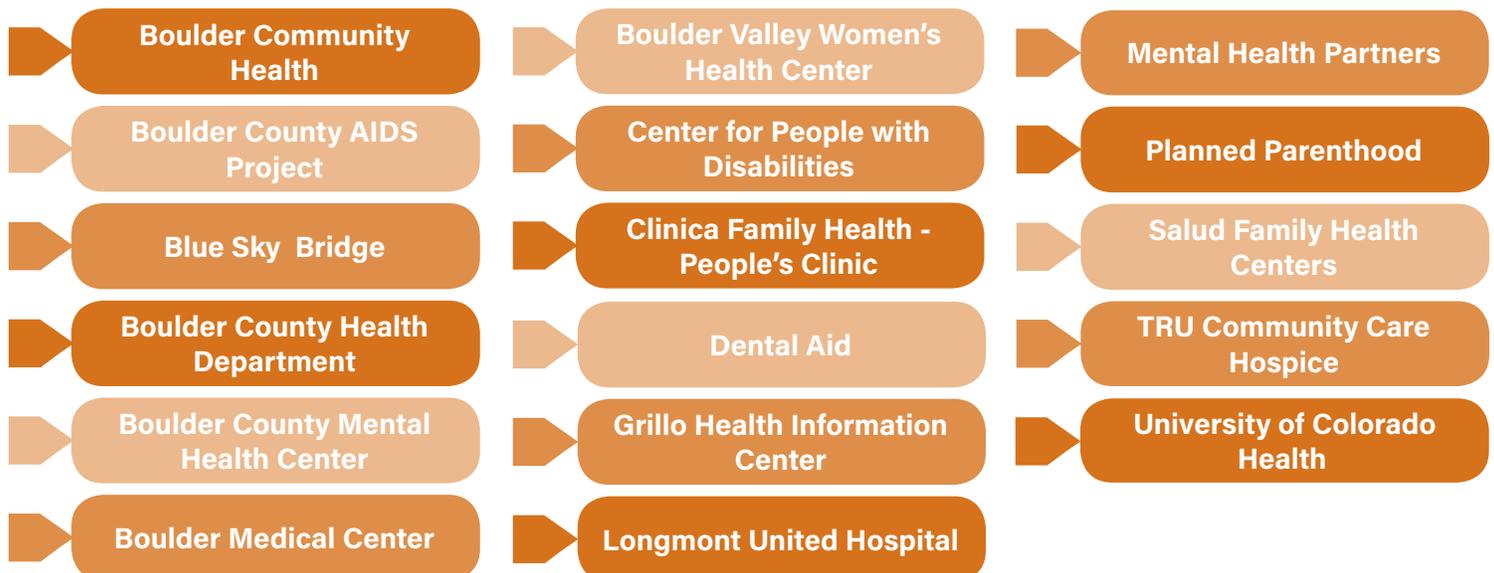
Publications as diverse as National Geographic, Forbes, and Gallup regularly cite Boulder as one of the healthiest, fittest, and happiest cities in the United States – often ranking Boulder first on their lists. These and other similar accolades reflect residents’ predilection for outdoor recreation and healthy foods.

The most recent assessment of healthcare in the Boulder MSA on the AARP Livability Index indicates the region is among the top third in the nation for healthy behaviors and quality of care. Key metrics used to measure healthcare in Boulder compared to the U.S. include:

AARP Livability Index	Boulder	Nationwide
People who smoke regularly	<b>15%</b>	<b>20%</b>
People who are obese	<b>16%</b>	<b>29%</b>
People who have access to exercise opportunities	<b>98%</b>	<b>91%</b>
Hospitalization rate of preventable conditions	<b>30%</b>	<b>50%</b>
Patient satisfaction rate	<b>78%</b>	<b>71%</b>

Source: AARP Livability Index, 2018

The health and wellbeing of Boulder residents are cared for through a network of regional health organizations:



Source: Boulder Community Network Health Organization Index

## TRANSPORTATION

The City of Boulder Transportation Division works to create an innovative and balanced transportation system that enhances Boulder's quality of place. Since 1989, the city has implemented numerous programs designed to reduce single-occupancy vehicle travel. The most recent city data indicates that 63% of all trips by Boulder residents are made by multi-occupancy vehicle, foot, bike, or bus, with the balance of trips made by single occupancy vehicle.

Boulder supports bicycle and pedestrian mobility with 155 miles of trails, including multi-use paths, and more than 300 miles of bikeways, including 96 miles of bike lanes and 50 miles of designated bike routes.

Transportation mobility and congestion are important factors in assessing quality of place and regional economic vitality. The 2019 Urban Mobility Report produced by the Texas A&M Transportation Institute presents metrics quantifying travel delays caused by congestion in metro areas nationwide. According to the report, the Boulder MSA has the second lowest travel delays among the innovation regions studied, and the highest travel delays of the peer regions.

### Yearly Travel Congestion Delay (MSA)

Metropolitan Statistical Area (MSA)	Total Congestion Hours Per Year	Congestion Hours Per Commuter
San Francisco – Oakland – Hayward, CA	253,838,000	103
San Jose – Sunnyvale – Santa Clara, CA	126,774,000	81
Boston – Cambridge – Newton, MA-NH	189,426,000	80
Seattle – Tacoma – Bellevue, WA	167,384,000	78
Portland – Vancouver – Hillsboro, OR-WA	88,009,000	66
Austin – Round Rock, TX	68,187,000	66
Denver – Aurora – Lakewood, CO	107,463,000	61
<b>Boulder, CO</b>	<b>4,464,000</b>	<b>44</b>
Raleigh – Durham – Chapel Hill, NC	27,243,000	42
Madison, WI	9,664,000	38
Provo – Orem, UT	8,701,000	25
Ann Arbor, MI	7,020,000	22
Ft. Collins – Loveland, CO	5,968,000	21

Source: 2019 Urban Mobility Report, Texas A&M Transportation Institute

Boulder MSA has the **second lowest travel delays among the innovation regions studied, and the highest travel delays of the peer regions.**

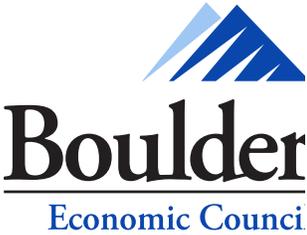
# SPONSORS



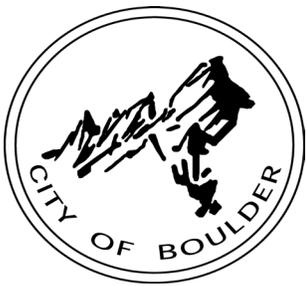
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GREENLEAF RUSCITTI** LLP

Ruscitti, LLP offer a depth of experience and expertise in law related to business, construction, criminal defense, environment and water, litigation, public entities, real estate and trusts and estates. In addition to our principal office in Boulder, we also have offices in Denver, Cheyenne, Wyoming and Irvine, California to better reach and serve our clients along the Front Range and across the country. Each of our attorneys brings a unique perspective and high level of expertise to our team, giving us the resources to solve even the most complex legal matters, including yours.

**Berg Hill Greenleaf Ruscitti, LLP** is a full-service law firm offering a wide range of legal services to both corporate clients and individuals alike. Since our founding in 2001, we have grown to 45 attorneys specializing in a variety of different practice areas. The attorneys at Berg Hill Greenleaf



**The Boulder Economic Council (BEC)**, the economic development arm of the Boulder Chamber, is a private, nonprofit leadership group of prominent business and community executives dedicated to Boulder's economic prosperity. The BEC's priorities are to support existing businesses in Boulder's key industries and to advocate for a business environment that continues to nurture primary employers and industries.



**The City of Boulder** is following a sustainable path to economic development by adopting strategies that promote innovation, entrepreneurship and a positive business climate while enhancing community character and preserving environmental quality. The city's Community Vitality department provides assistance to businesses and manages economic initiatives, commercial districts and parking services. For more information, visit [www.BoulderColorado.gov/business](http://www.BoulderColorado.gov/business).



Founded in 1963 in Boulder, Colorado, **Dean Callan & Company** is a full-service real estate company specializing in commercial brokerage, development, property management and investment acquisitions in Boulder County, Colorado. During its 55 years of serving the Boulder community, the Company has committed itself to building one of the oldest, full-service family-owned and operated, commercial real estate organizations in the region. Our longevity, knowledge and involvement within the community has allowed us to cultivate and maintain many relationships within the industry. It is these long term relationships that enable us to better serve our clients in providing answers to every question and solutions to every problem. Today, Dean Callan & Company, Inc. stands as the market's best source of real estate information, representation and results.



**Zayo Group Holdings, Inc.** (NYSE: ZAYO) provides mission-critical bandwidth to the world's most impactful companies, fueling the innovations that are transforming our society. Zayo's 130,000-mile network in North America and Europe includes extensive metro connectivity to thousands of buildings and data centers. Zayo's communications

infrastructure solutions include dark fiber, private data networks, wavelengths, Ethernet, dedicated internet access and data center colocation services. Zayo owns and operates a Tier 1 IP backbone and 45 carrier-neutral data centers. Zayo serves wireless and wireline carriers, media, tech, content, finance, healthcare and other large enterprises. For more information, visit [zayo.com](http://zayo.com). Dan Caruso serves as the company's chairman and CEO.

**The Caruso Foundation** was created by Dan and Cindy Caruso to inspire and support entrepreneurship, advance knowledge and empower healthier lives.

# GLOSSARY OF TERMS

**Combined Statistical Area**—A geographic entity consisting of two or more adjacent Core Based Statistical Areas with employment interchange measures of at least 15.

**Employment Interchange Measure**—A measure of ties between two adjacent entities. The employment interchange measure is the sum of the percentage of workers living in the smaller entity who work in the larger entity and the percentage of employment in the smaller entity that is accounted for by workers who reside in the larger entity.

**Firms and Establishments**—Establishments represent single location businesses, whereas firms can represent multiple locations.

**Form D Filings** — Form D is used to file a notice of an exempt offering of securities with the SEC. The federal securities laws require the notice to be filed by companies that have sold securities without registration under the Securities Act of 1933 in an offering made under Rule 504 or 506 of Regulation D or Section 4(a)(5) of the Securities Act. Regulation D allows companies to issue debt and equity to accredited investors without undergoing the cost of a typical SEC registration.

**Industries**—Based on the North American Industry Classification System (NAICS), businesses are classified based on their primary function.

**Location Quotient (LQ)**—A location quotient is a useful tool for analyzing an industry's clustering in a given geographical area. Literally, this is an industry's relative concentration in one area compared to the same industry in another area. For the purpose of looking at employment statistics in the city of Boulder and Boulder County, the relative concentration is calculated in comparison to the nation. A location quotient of 1.0 indicates the study area has the same concentration of industry employment as the nation. A location quotient of >1.0 indicates the study area has a greater concentration of industry employment compared to the nation and a location quotient of <1.0 indicates the area has a smaller industry concentration than the nation.

## LOCATION QUOTIENT EQUATION

$$LQ = \frac{(Regional\ Industry\ Concentration)}{(US\ Industry\ Concentration)}$$
$$= \frac{\left(\frac{Area\ Sector\ Employment}{Total\ Area\ Employment}\right)}{\left(\frac{US\ Total\ Sector\ Employment}{US\ Total\ Employment}\right)}$$

**Metropolitan Statistical Area**—A Core Based Statistical Area associated with at least one urbanized area that has a population of at least 50,000. The Metropolitan Statistical Area comprises the central county or counties containing the core, plus adjacent outlying counties having a high degree of social and economic integration with the central county or counties as measured through commuting. Locally, the Boulder MSA comprises Boulder County and the Denver-Aurora-Lakewood MSA comprises Adams, Arapahoe, Broomfield, Clear Creek, Denver, Douglas, Elbert, Gilpin, Jefferson and Park counties.

**North American Industry Classification System (NAICS)** -- The North American Industry Classification System (NAICS) is the "standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing and publishing statistical data related to the United States business economy." NAICS replaced the Standard Industrial Classification (SIC) system and includes Canada, Mexico and the United States. NAICS was adopted in 1997 and the transition from SIC to NAICS occurred gradually over the following years. The NAICS system is reviewed and revised every five years to economic changes, with the most recent iteration occurring in 2017.

**Proprietors**—A business without any paid employees (i.e., self-employed).

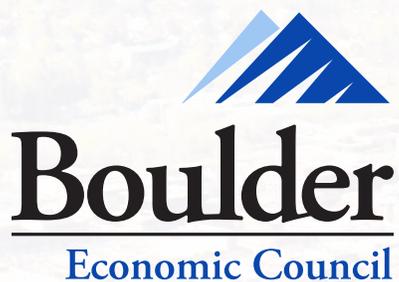
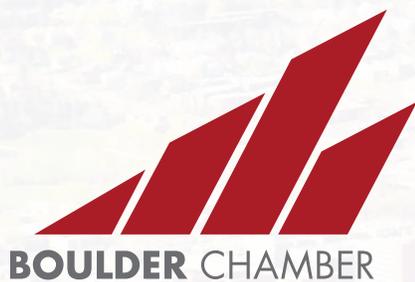
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