



Silicon Valley Competitiveness and Innovation Project - 2017 Report

A Dashboard and Policy Scorecard for a Shared Agenda of Prosperity and Opportunity



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About the SVCIP partners

The **Silicon Valley Leadership Group**, founded in 1978 by David Packard of Hewlett-Packard, represents nearly 400 of Silicon Valley's most respected employers on issues, programs and campaigns that affect the economic health and quality of life in Silicon Valley. The Leadership Group focuses on key issues of importance including energy, transportation, education, housing, health care, taxation, economic vitality and the environment. Leadership Group members collectively provide nearly one of every three private sector jobs in Silicon Valley and have more than \$3 trillion in annual revenue.

Silicon Valley Community Foundation advances innovative philanthropic solutions to challenging problems. As the largest community foundation in the world, we engage donors and corporations from Silicon Valley, across the country and around the globe to make our region and world better for all. Our passion for helping people and organizations achieve their philanthropic dreams has created a global philanthropic enterprise committed to the belief that possibilities start here.

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A Letter from the SVCIP Partners

February 2017

Dear Friends,

Silicon Valley's success as the world's leading innovation region did not occur by accident. Nor will it continue—much less grow—without deliberate and thoughtful actions that promote innovation and opportunities for our employers, employees and our communities.

Responding to this challenge, the Silicon Valley Leadership Group and Silicon Valley Community Foundation joined together three years ago to create the Silicon Valley Competitiveness and Innovation Project (SVCIP), a multi-year effort to assess the region's economic health and advance a shared policy agenda so that our innovation advantage remains strong and all residents can share in our success.

The 2017 report shows strong job growth and economic output that exceed those of other innovation regions. Silicon Valley continues to attract people from around the world: 2,000 people move here each month. However, warning signs indicate that our continued success is not a given. Venture capital investments have fallen for the first time in several years. Housing costs and commute times are among the highest in the nation. And gaps in educational achievement persist, resulting in fewer students graduating with the knowledge and skills they need to participate in our innovation economy.

As we enter a period of uncertainty with the new federal administration, it is critical that we join together to ensure that our region's continuing success is not left up to chance. This will require intentional public policy action at the federal, state and local levels. We are proud of several local tax measures approved by voters last November that will bring increased public funding for transportation improvements, affordable housing and other community services to enhance the region's quality of life. But as this report's data tell us, there is much more to be done.

Now more than ever, we must work together to ensure that Silicon Valley's economic engine remains strong, recognizing the vital role it plays in driving U.S. growth and competitiveness. We invite you to visit our website at svcip.com for important updates on our data and progress.

Sincerely,



Carl Guardino
President and CEO
Silicon Valley Leadership Group



Emmett D. Carson, Ph.D.
CEO and President
Silicon Valley Community Foundation

SVCIP Indicator Dashboard

2017 Report

| | | Strong and Gaining Ground | Needs attention, losing ground to other regions | Critical need for attention, and/or trending down | Change from SVCIP 2016 | |
|-----------------------|--------------------------|--|---|---|------------------------|---|
| INNOVATION ASSETS | Talent | STEM Talent Pool | ● | | | ★ |
| | | Change in Educational Attainment | ● | | | ○ |
| | | STEM Degrees Conferred | | ● | | × |
| | | International Talent | ● | | | ○ |
| | | Talent Migration | | ● | | × |
| | | New Entrepreneurs | | ● | | × |
| INNOVATION ASSETS | Risk Capital and R&D | Venture Capital | | | ● | × |
| | | Very Early Stage Funding | ● | | | ★ |
| | | Universities' R&D Expenditures | | ● | | ★ |
| INNOVATION PROCESSES | Idea Generation | ● | | | × | |
| | Commercialization | Follow-On Investment by Stage | | | ● | × |
| | | Company Pre-Exit Valuations | | ● | | × |
| | Business Innovation | Initial Public Offerings | | ● | | × |
| | | Mergers and Acquisitions | ● | | | ○ |
| OUTCOMES & PROSPERITY | Business Competitiveness | Labor Productivity | ● | | | ★ |
| | | Output in Innovation Industries | ● | | | ★ |
| | Quality of Life | Home and Rent Values | | | ● | × |
| | | Traffic Congestion | | | ● | × |
| | | Preschool Enrollment | | ● | | ○ |
| | Access to Opportunity | 3rd Grade English and 8th Grade Math Proficiency | | | ● | ★ |
| | | 11th Grade English and Mathematics Proficiency | | | ● | ★ |
| | Jobs | Jobs in Innovation Industries | ● | | | ★ |

| | |
|---|---------------------|
| ★ | Some improvement |
| ○ | Remained the same |
| × | Conditions worsened |

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Executive Summary

In 2015, the Silicon Valley Leadership Group and Silicon Valley Community Foundation joined together to develop the Silicon Valley Competitiveness and Innovation Project (SVCIP) to proactively identify a data-driven, overarching economic strategy to enhance and reinforce the Silicon Valley region's competitive advantages in innovation, and ensure that Silicon Valley residents have access to the job opportunities and prosperity linked to growth in key industries. Guided by an advisory council and a series of discussions with legislators, business and civic leaders, the SVCIP team developed an Indicator Dashboard and public policy agenda to evaluate and promote the health of Silicon Valley's innovation ecosystem.

The 2017 Report includes a "check up" on the Indicator Dashboard using the most recent data available from 2015 and 2016 as well as progress on the public policy agenda. It also includes new indicators on entrepreneurship and college readiness of the region's high-school students. Data for each of the indicators is compared to key innovation regions in the U.S., including the New York City metro area, Boston, Southern California, Seattle and Austin, and also to global innovation regions in a few key areas. The Silicon Valley region is defined as Santa Clara, San Mateo and San Francisco counties.

Key findings:

Silicon Valley's innovation industries created jobs at a faster rate than other U.S. innovation regions.

Silicon Valley's innovation industries continue to set the pace nationally, with 8% growth in 2015. Austin's innovation industry growth was close at 7%, but Silicon Valley's growth was double or more than the rate of other regions including New York City (4%), Boston (3%), Seattle (2%), and Southern California (2%). The Valley also continues to have the highest proportion of workers in innovation industries (26%) among U.S. innovation regions.

Output from Silicon Valley's innovation industries doubled since 2010.

Innovation industries continue to drive the Silicon Valley economy. The cumulative output (gross domestic product) of the region's software, internet and information services, information and communications technology manufacturing, specialized innovation services, and other innovation-intensive sectors rose almost 150% in the last decade compared to just under 60% for the rest of the Valley's economy.

Venture capital investment fell 46% between Q3 2015 and Q3 2016.

Venture capital investment in Silicon Valley is down for the first time since 2012—and substantially so. Coming off its 2015 peak, venture capital investment dropped four out of the five quarters, ending in Q3 2016.

Later stage investments, company valuation and Initial Public Offerings (IPOs) dropped between 2015 and 2016.

Early stage investment grows, while the climate for later stage investment worsens. Very early stage funding (i.e., angel, seed and seed venture capital) was up 22% while Series A investment was down 3% between Q3 2015 and Q3 2016. Only about a quarter of 2014 Silicon Valley start-ups with Series A venture capital investment secured next-stage Series B venture capital funding, compared to 40% of 2012 start-ups. Later stage company median valuation dropped 37%, and IPO valuations dropped more than 70% between 2015 and 2016.

Silicon Valley's concentration of STEM workers was three times the national average, twice that of Boston, and more than one and a half times that of Austin and Seattle.

Silicon Valley's talent advantage remains strong, but there are reasons for concern. The Valley has higher worker productivity, a larger percentage of Science, Technology, Engineering, and Mathematics (STEM) oriented workers in the overall workforce, and the largest share of foreign-born STEM workers compared to other innovation regions. Yet, the Valley is also experiencing a net domestic out-migration, lagging behind the leading innovation regions in STEM degrees conferred per capita, and is producing fewer entrepreneurs.

More than half (53%) of Silicon Valley's 11th grade students failed to meet state standards in mathematics and a third (33%) failed to meet standards in English Language Arts.

Silicon Valley is leaving large numbers of young people behind, without the skills to participate in the region's innovation industries. Although Hispanic and Latino students comprised the largest ethnic group of Silicon Valley 11th grade test-takers in 2016 (37%), 80% did not meet state standards in mathematics and about half failed to do so in English language arts.

Already high housing and rental costs continue to rise at rates that are close to or above those of other innovation regions.

Silicon Valley's housing and traffic situation is worsening compared to other innovation regions. Last year among innovation regions, only Seattle's housing and rental prices grew faster than Silicon Valley's. Commute times have lengthened by more than 15% since 2010, compared to 5-11% in other innovation regions.

While Silicon Valley's innovation industries and foreign talent base remain strong by any measure, the region's ability to sustain its post-recession growth may be eroding. Venture capital investment is off by about 50% from a year ago, along with drops in later-stage funding and valuations. Talented people worldwide still come to Silicon Valley, but rising housing costs, longer commute times, and growing opportunities in other innovation regions are drawing more residents away. Too many of the region's youth are leaving high school without the math and English skills to enter opportunities for STEM-based higher education and careers, and the number of STEM graduates per capita is lower than some innovation regions. These trends, along with major changes on the national scene, create a level of uncertainty for Silicon Valley that is arguably the highest since the recession. In light of past contributions the region has made to U.S. economic recovery and growth, it is a national imperative that Silicon Valley remains a leader in the Innovation Economy.

It is even more important during a period of growing uncertainty that stakeholders within Silicon Valley work together. SVCIP has identified a number of public policy areas critical to the region's continuing success, including STEM education and high-quality Pre-K education, R&D, high-skill immigration, housing and transportation, and business regulation. As the Policy Scorecard at the end of this report shows, there were successes both locally and on the state level to improve education, housing, and transportation in 2016—with much more work to do. The years ahead will require continuing attention to the Valley's innovation assets if the region is to navigate successfully through uncertain times.

International Comparisons At A Glance

The Compass' Global Startup Ecosystem Ranking of 2015 found Silicon Valley to be the world's leading innovation region based on a composite measure incorporating venture capital investment, start-up company exit valuations, talent pool, and entrepreneurial supports and networks. At the same time, other regions like Berlin, London, Tel Aviv, Chicago, and Boston scored higher on the Compass Report's Growth Index, meaning they are gaining ground on Silicon Valley in these areas.

The Brookings Institution has released a comprehensive analysis in late 2016 of the 123 largest metropolitan areas in the world. On a variety of indicators, the San José and San Francisco metropolitan areas rank among the top regions in the world. Silicon Valley clearly produces new ideas that others value. It has the largest share of publications in the top 10% of cited papers (University Research Impact, 2010-2013), and generates the most patents per capita. It is the most productive region, and attracts the largest venture capital investment per capita of any metropolitan area in the world. It has among the highest percentage of people with bachelors' degrees or higher, only exceeded by Singapore, London, and Washington D.C.

Despite being the birthplace of many founding internet technologies, one of the measures on which the region performs poorly is average internet download speed. Silicon Valley is actually well behind several regions across Asia (e.g., Singapore, Tokyo, Osaka, Nagoya, Seoul, Hong Kong), Europe (e.g., Paris, Stockholm, Amsterdam, Barcelona, Copenhagen, Zürich), and the United States (e.g., innovation regions Austin, Seattle, Boston, New York City, and Los Angeles, as well as other US communities including Baltimore, Philadelphia, Kansas City, St. Louis, and Riverside).

The Global Startup Ecosystem Ranking 2015

| Global Innovation Region* | Ranking | Growth Index |
|---------------------------|---------|--------------|
| Silicon Valley | 1 | 2.1 |
| New York City | 2 | 1.8 |
| Los Angeles | 3 | 1.8 |
| Boston | 4 | 2.7 |
| Tel Aviv | 5 | 2.9 |
| London | 6 | 3.3 |
| Chicago | 7 | 2.8 |
| Seattle | 8 | 2.1 |
| Berlin | 9 | 10 |
| Singapore | 10 | 1.9 |

*China, Taiwan, Japan, and South Korea are not included in this ranking, based on data availability. Compass estimates that Beijing ranks in the top five innovation regions, and Shanghai ranks in the top 15. Data Source: Compass. The Global Startup Ecosystem Ranking 2015. Analysis: Collaborative Economics

Global City-Region Rankings on Selected Innovation Indicators With San José and San Francisco Metropolitan Areas Delineated

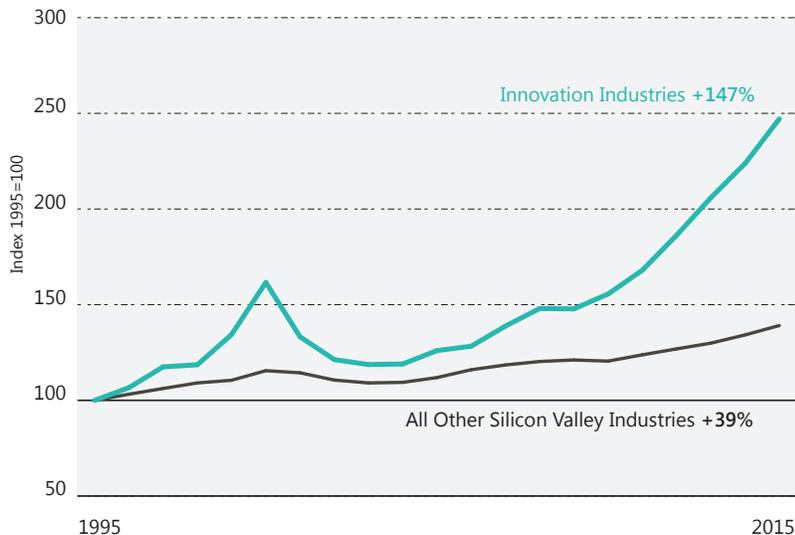
| Measure | San José Metropolitan Area | San Francisco Metropolitan Area |
|---|----------------------------|---------------------------------|
| Gross Domestic Product (GDP) per capita, 2015 | #1 | #4 |
| Gross Domestic Product (GDP) per worker, 2015 | #1 | #3 |
| University Research Impact, 2010-2013 | #1 | #2 |
| Patents per capita, 2008-2012 | #1 | #3 |
| Venture capital per capita, 2006-2015 | #1 | #2 |
| Higher education attainment, 2015 | #4 | #6 |
| Internet Speed, Mbps, 2014 | #26 | #27 |

Source: Redefining Global Cities, The Brookings Institution, 2016. Analysis: Collaborative Economics

Innovation Industries Overview

Silicon Valley Growth in Output

Innovation Industries and All Other Industries Silicon Valley, 1995=100



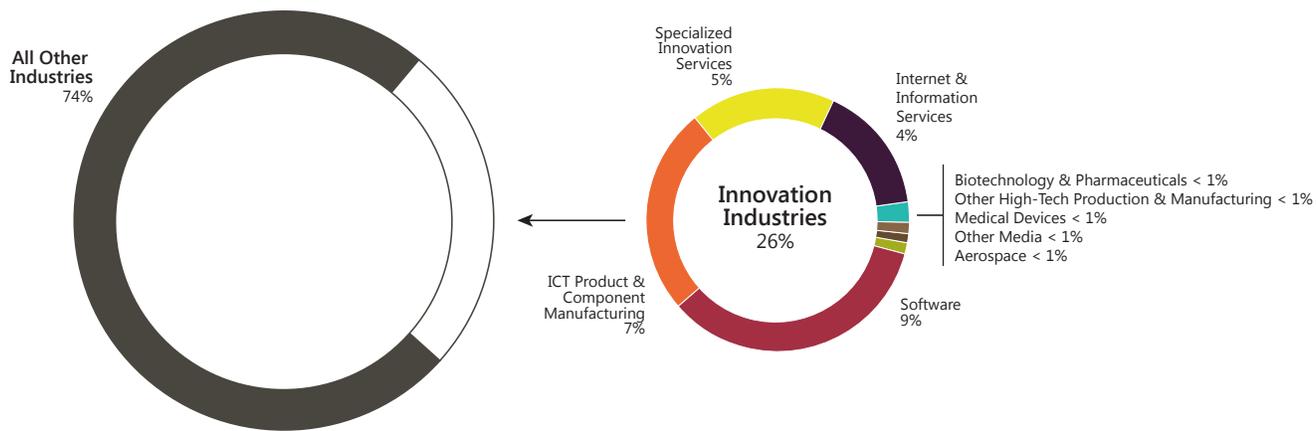
Data Source: Moody's Analytics, Bureau of Labor Statistics
 Analysis: Collaborative Economics

As in the first two years of this report, Innovation Industries continue to drive Silicon Valley's growth. Between 1995 and 2015, output in Innovation Industries increased by almost 150%, while output in all other Silicon Valley industries increased by less than 40%. A decade ago output for both sets of industries was rising at a comparable rate. By 2010, Innovation Industry output significantly accelerated and this trend has continued through 2015.

Twenty-six percent of Silicon Valley jobs were in Innovation Industries in 2015, rising from 25% in 2014. Software continues to represent the largest share of innovation industry jobs, followed by ICT (Information and Communications Technology) product and component manufacturing jobs, specialized innovation services jobs and information and internet services jobs.

Silicon Valley Employment

Detailed Innovation Industries and All Other Industries, 2015

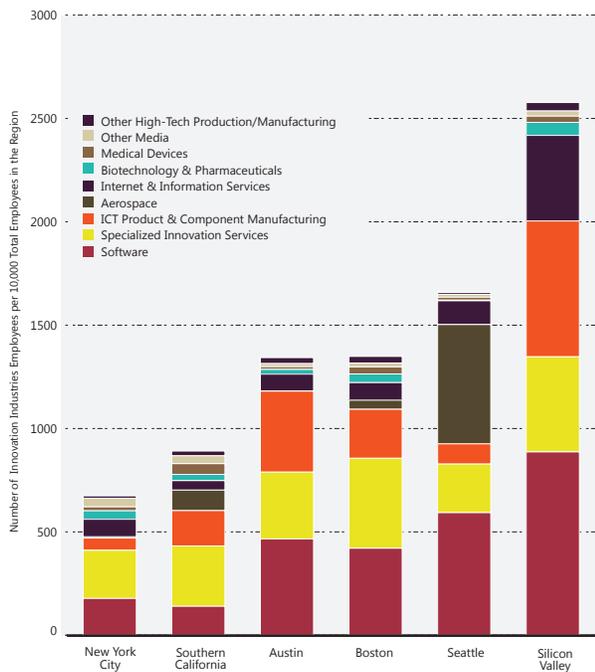


Data Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages
 Analysis: Collaborative Economics

¹ Note that Specialized Innovation Services in this indicator are comprised of management, scientific and technical consulting and development services.

Employment in Innovation Industries by Region

Per 10,000 Workers in Overall Economy
Innovation Regions, 2015



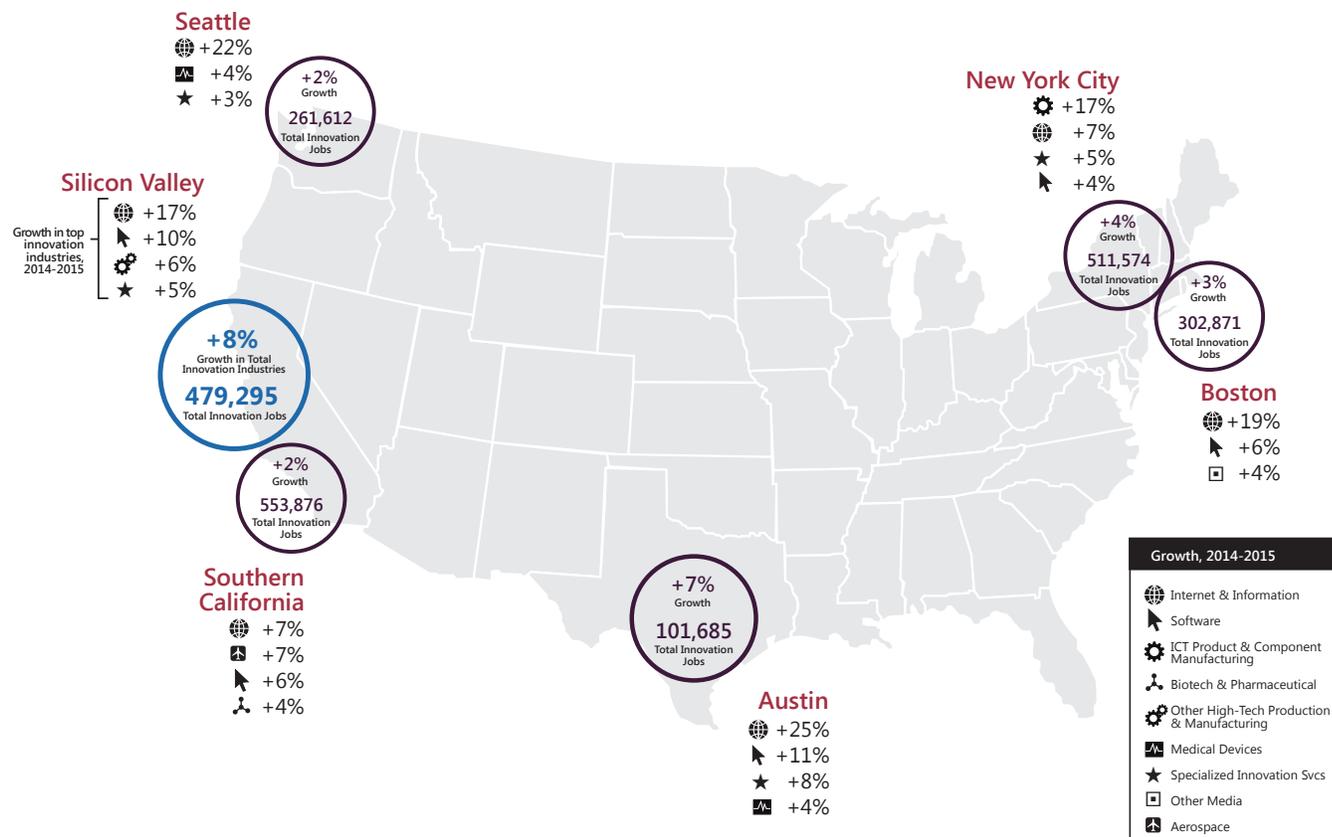
Among innovation regions, Silicon Valley has the highest proportion of workers in Innovation Industries. Moreover, the Valley's share of workers in Innovation Industries is growing faster than that of other innovation regions, rising eight percent between 2014 and 2015. Most innovation regions grew at less than half the rate of Silicon Valley in 2015. Also in 2015, Silicon Valley surpassed Austin's Innovation Industry growth rate for the first time in several years.

While Software is still the largest of Silicon Valley's Innovation Industries, Internet and Information Services jobs grew at a faster rate in 2015 (17%) than that of Software (10%).

Data Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages
Analysis: Collaborative Economics

Employment Growth in Top Innovation Industries 2014-2015

2014-2015



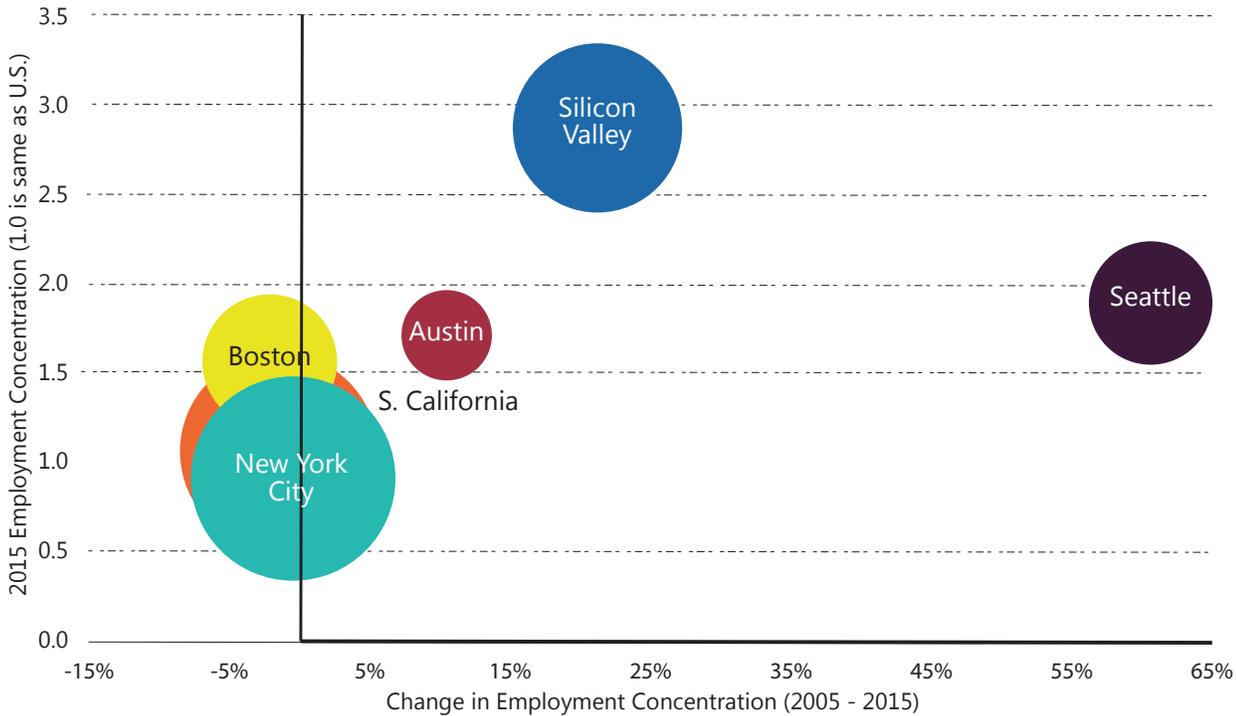
Data Source: Bureau of Labor Statistics, Quarterly Census of Employment and Wages
Analysis: Collaborative Economics

Innovation Assets: Talent

Science, Technology, Engineering, and Math (STEM) talent is a key competitive asset in innovation regions as STEM skills are critical in researching, developing, improving, and scaling innovative technologies, business and processes.

STEM Talent Pool for Innovation Industries

Concentration*, Change in Concentration 2005-2015, and Employment



*Concentration is calculated as (Regional STEM Emp/Regional Total Emp)/(National STEM Emp/National Total Emp)

**Size of bubble reflects the number of High-Tech STEM Employees in 2015

Data Source: Bureau of Labor Statistics

Analysis: Collaborative Economics

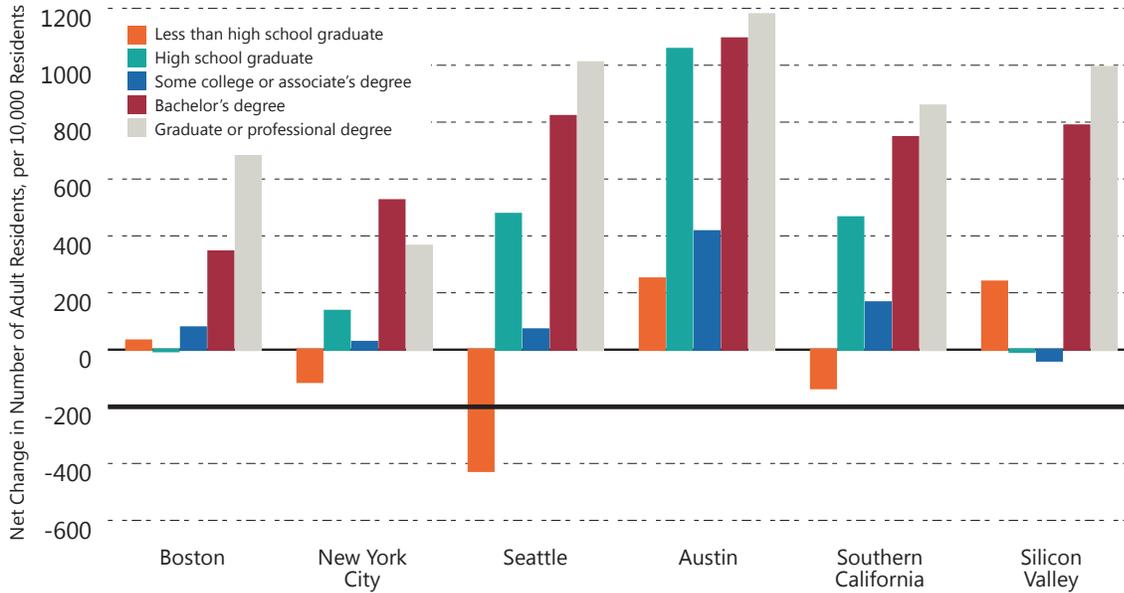
Silicon Valley has an overall large number of STEM workers compared to other innovation regions. In 2015, the region had 336,820 STEM workers, behind much bigger population centers such as New York City (463,780) and Southern California (412,780), but well ahead of Boston (226,570), Seattle (196,480), and Austin (93,600).

Silicon Valley also has a much higher concentration of STEM talent than other innovation regions—that is, the proportion of STEM workers in the overall workforce relative to the national average. The Valley is almost three times more concentrated in STEM workers than the nation as a whole, nearly twice as concentrated as the Boston region, and over one and one half times more concentrated than both Seattle and Austin. Concentration is an indicator of specialization and comparative advantage important to regional economic competitiveness.

Between 2005 and 2015, the region's concentration of STEM talent grew 22%, increasing the size of the available labor force for employers. Of the comparison regions, only Seattle's concentration increased at a faster rate. Austin's pool grew at half the rate of the Valley. And, strikingly, Boston, Southern California, and the New York City region all lost ground, as their concentration of STEM workers actually declined relative to that of the U.S.

Population Change by Educational Attainment Per 10,000 Residents

Innovation Regions, 2013-2015



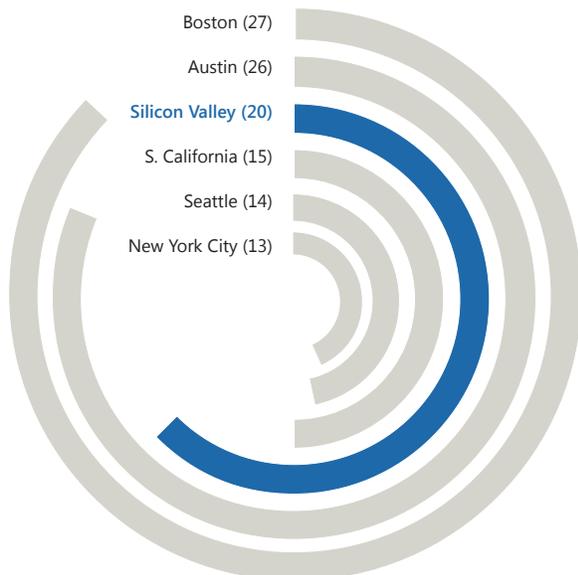
*Data is by Metropolitan Statistical Area (MSA) because county-level estimates are not available. As a result, the geographical definition for Southern California combines the Los Angeles and San Diego MSAs; and Silicon Valley combines the San Francisco and San José MSAs which additionally include data from Alameda, San Benito and Marin counties.
 Data Source: American Community Survey, reflects adult population 25 years old and over.
 Analysis: Collaborative Economics

Population change by education attainment indicates how prepared a region is to meet the demand for the kind of high-skilled jobs needed in an innovation economy. The number of master's and bachelor's degree holders per capita grew faster in Austin and Seattle than in Silicon Valley. Between 2013 and 2015, Austin's pool of adult residents with graduate or professional degrees above the master's level grew 12% and bachelor's degrees rose 11%, while Silicon Valley's totals grew 10% and just under 8%, respectively. Seattle's master's degree holders per capita grew 10% and bachelor's degree holders just over 8%.

While the number of adults with a bachelor's degree or higher grew between 2013 and 2015, the pool of adults with less than a high school diploma also grew. At the same time, the number of adults with a high school diploma, and those with some college or an associate's degree dropped. None of the other innovation regions experienced this pattern. In particular, the number of residents with some college or an associate degree grew in every region.

STEM Degrees Conferred Per 10,000 Residents

Innovation Regions, 2015



Note: Data are based on first major and include bachelor's, master's and doctorate degrees.
 Data Source: National Center for Educational Statistics, IPEDS
 Analysis: Collaborative Economics

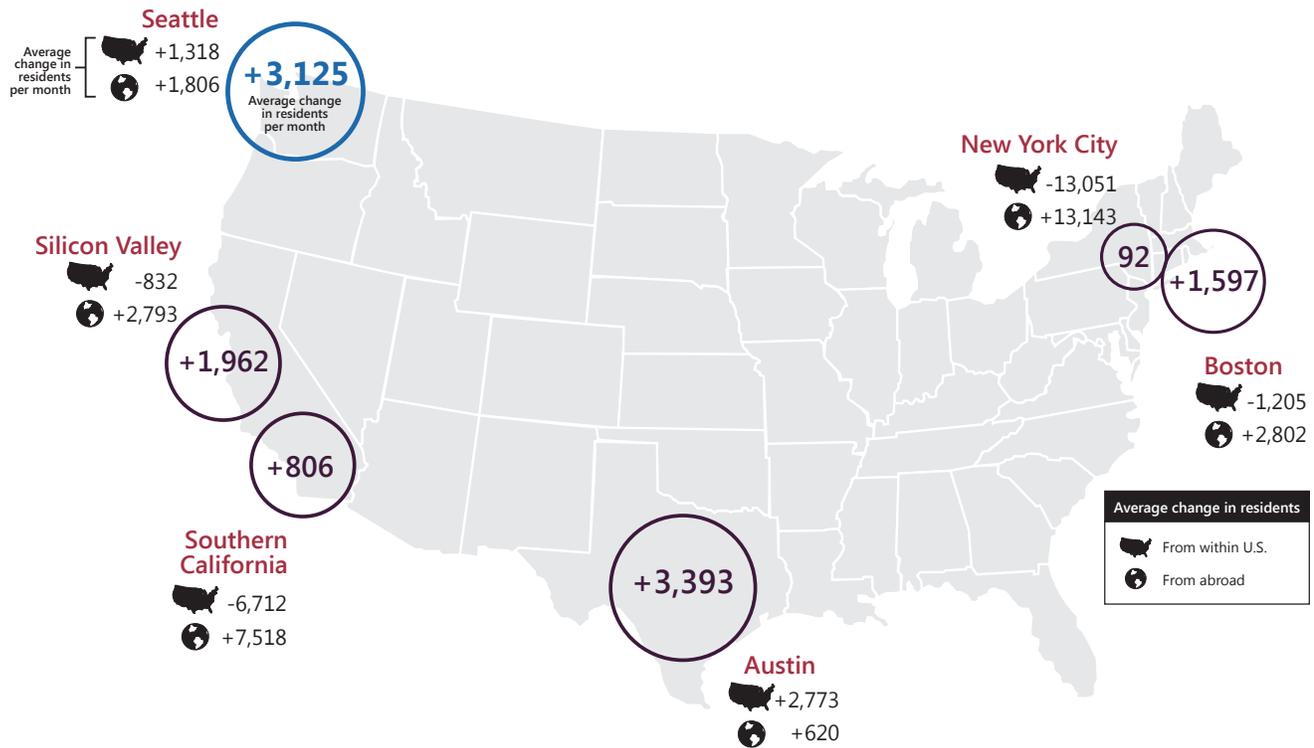
| Growth in STEM Degrees Conferred 2014-2015 | |
|--|-------|
| Southern California | 12.0% |
| New York City | 8.0% |
| Boston | 8.0% |
| Austin | 6.2% |
| Silicon Valley | 4.2% |
| Seattle | 2.8% |

STEM degrees conferred indicates the availability of homegrown, high-skilled talent. Silicon Valley ranks behind Boston and Austin, and ahead of Southern California, Seattle, and the New York City region in terms of the number of STEM degrees conferred per capita.

Although currently behind Silicon Valley, STEM degrees conferred per capita in Southern California grew almost three times as fast as our region between 2014 and 2015. STEM degrees conferred per capita in Boston and New York City grew almost twice as fast. If sustained, these diverging growth rates will mean that New York City and Southern California surpass Silicon Valley on this measure and Boston moves even further ahead.

Migration Flows

Average Net New Residents Per Month
Innovation Regions, 2015



Data Source: U.S. Census Bureau Population Estimates
Analysis: Collaborative Economics

By a substantial margin, Austin and Seattle led other innovation regions in the growth of new residents per month from in-migration. Most of Austin's increase came from domestic migration (82%), while Seattle's growth was more balanced between domestic (42%) and foreign migration (58%).

Silicon Valley also had a substantial increase per month due to net in-migration, with foreign in-migration vastly outpacing domestic out-migration. While an average of 832 individuals left Silicon Valley for the rest of the United States every month in 2015, Boston (1,205), Southern California (6,712), and New York City (13,051) all experienced much larger domestic out-migration per month. Each of these regions balanced those losses with larger gains in foreign in-migration.

Net foreign migration exceeded net domestic migration in all innovation regions except Austin.

International Talent

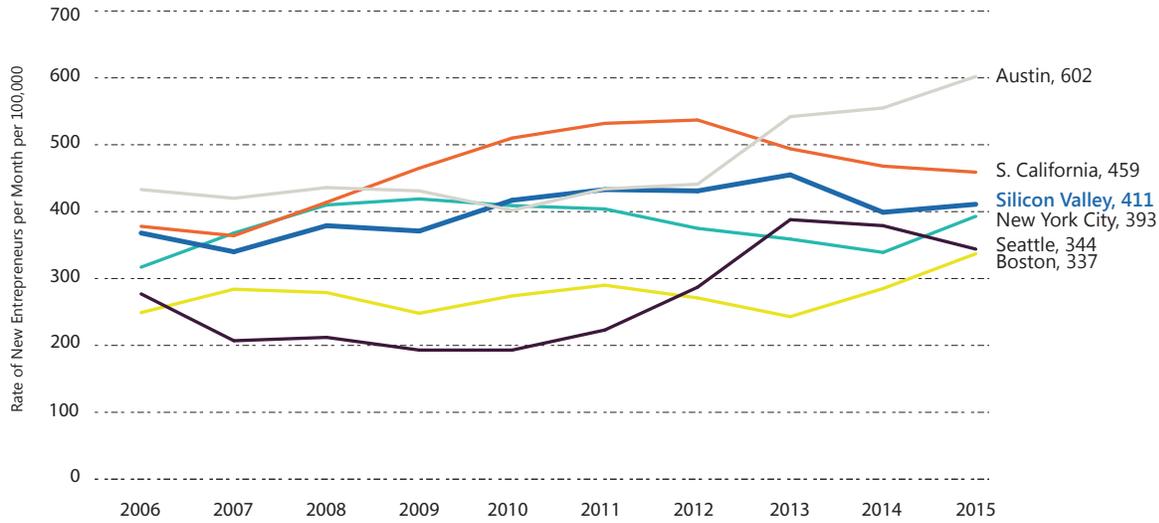
Foreign and U.S. Born Share of Population in STEM Professions, with a Bachelor's Degree or Higher, 2015

| | Foreign Born Share | In-State Born Share | Out-Of-State Domestic Born Share |
|---------------------|--------------------|---------------------|----------------------------------|
| Silicon Valley | 57% | 18% | 25% |
| New York City | 43% | 29% | 28% |
| Boston | 33% | 30% | 37% |
| Southern California | 42% | 31% | 27% |
| Austin | 29% | 28% | 43% |
| Seattle | 36% | 19% | 45% |

Except for Seattle, Silicon Valley relies much more on STEM workers who were born either in another country or state other than California (82%) compared to other innovation regions (ranging from 69% to 72%). Over half of Silicon Valley's STEM workers (57%) with a bachelor's degree or above are foreign-born, which is by far the highest among the innovation regions. Only 18% of Silicon Valley's STEM workers were born in-state, the lowest among innovation regions.

Data Source: U.S. Census Bureau, PUMS
Analysis: Collaborative Economics

Average Monthly Growth in New Entrepreneurs Per 100,000 Population
Innovation Regions, 2006-2015



Data Source: Fairlie, Robert W. Kauffman Index of Entrepreneurial Activity Current Population Survey
Analysis: Collaborative Economics

Growth in new entrepreneurs is a proxy for how desirable Silicon Valley is for business. It also indicates the flow of new business ideas to a region. While Silicon Valley's average number of new entrepreneurs grew between 2006 and 2013, it declined most recently over the 2013-2015 period. In contrast, Austin's production of new entrepreneurs increased: by 2015 that region was adding a monthly average of 602 new entrepreneurs per 100,000 population compared to Silicon Valley's 411.

Silicon Valley's production of new entrepreneurs has dropped back to its 2010 level, while Austin, Seattle, and Boston are all well above their 2010 levels. Both Southern California and New York City are below their 2010 levels, but Southern California's production of new entrepreneurs per 100,000 population remains higher than that of Silicon Valley.

Share of New Entrepreneurs Who are Female
Innovation Regions, 2013-2015

| | 2013 | 2014 | 2015 |
|-----------------------|------------|------------|------------|
| Seattle | 46% | 47% | 51% |
| Silicon Valley | 46% | 45% | 42% |
| NYC | 44% | 40% | 41% |
| Austin | 40% | 40% | 39% |
| U.S. Average | 39% | 39% | 39% |
| Boston | 32% | 34% | 36% |
| Southern California | 35% | 33% | 33% |

Data Source: Fairlie, Robert W. Kauffman Index of Entrepreneurial Activity, Current Population Survey
Analysis: Collaborative Economics

One measure for examining inclusion and equity in an innovation region is to look at how populations traditionally under-represented in innovation are succeeding, in this instance, women entrepreneurs. In Silicon Valley, the share of new women entrepreneurs is second highest among the innovation regions, behind only Seattle. However, between 2013-2015, Silicon Valley experienced the biggest drop in the share of new female entrepreneurship among the innovation regions, from 46% to 42%.

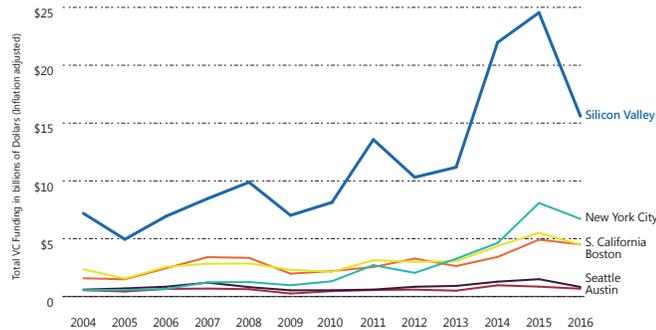
Silicon Valley, along with Seattle and New York City are above the national average in the share of new women entrepreneurs. The national average of 39% remained the same between 2013 and 2015, while Seattle and Boston added to their shares of new female entrepreneurs. New York City, Austin, and Southern California all lost ground.

Innovation Assets: Risk Capital and R&D Funding

Venture capital is important for the growth of start-up companies as venture investors tolerate more risk than conventional investors and lending institutions. R&D funding helps to build a pipeline of research for future innovations.

Total Venture Capital Investment - Annual

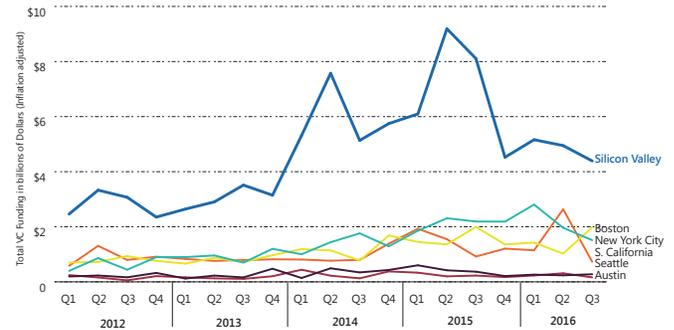
Innovation Regions, 2004-2016*



*Data through November 14, 2016
Data Source: CB Insights
Analysis: Collaborative Economics

Total Venture Capital Investment - Quarterly

Silicon Valley and Innovation Regions, Q1 2012 - Q3 2016

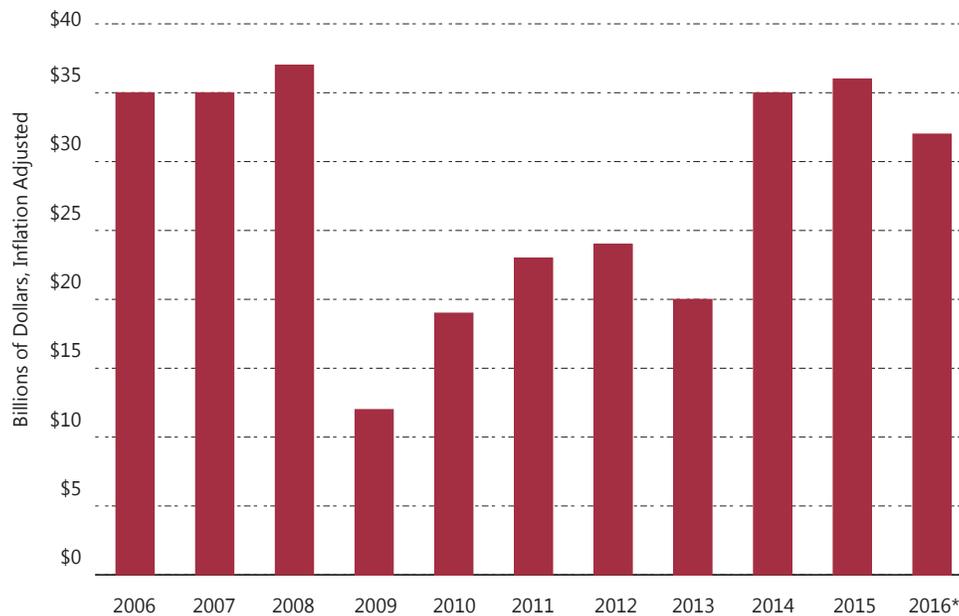


Silicon Valley venture capital investment in 2016 is well behind 2015 levels. While Silicon Valley is still the leader in venture capital investment, the gap has closed considerably with other regions.

Between Q3 2015 and Q3 2016, total venture capital investment in Silicon Valley companies fell 46 percent. Moreover, venture capital funding levels have now dropped four out of the last five quarters up to Q3 2016. The number of venture capital investments in Silicon Valley declined too, but by a much smaller 4.6% between Q3 2015 and Q3 2016. Except for New York City (+4.8%), other innovation region experienced drops in venture capital investments ranging from 12-19%.

Venture Capital Fundraising

United States, 2006-Q3 2016

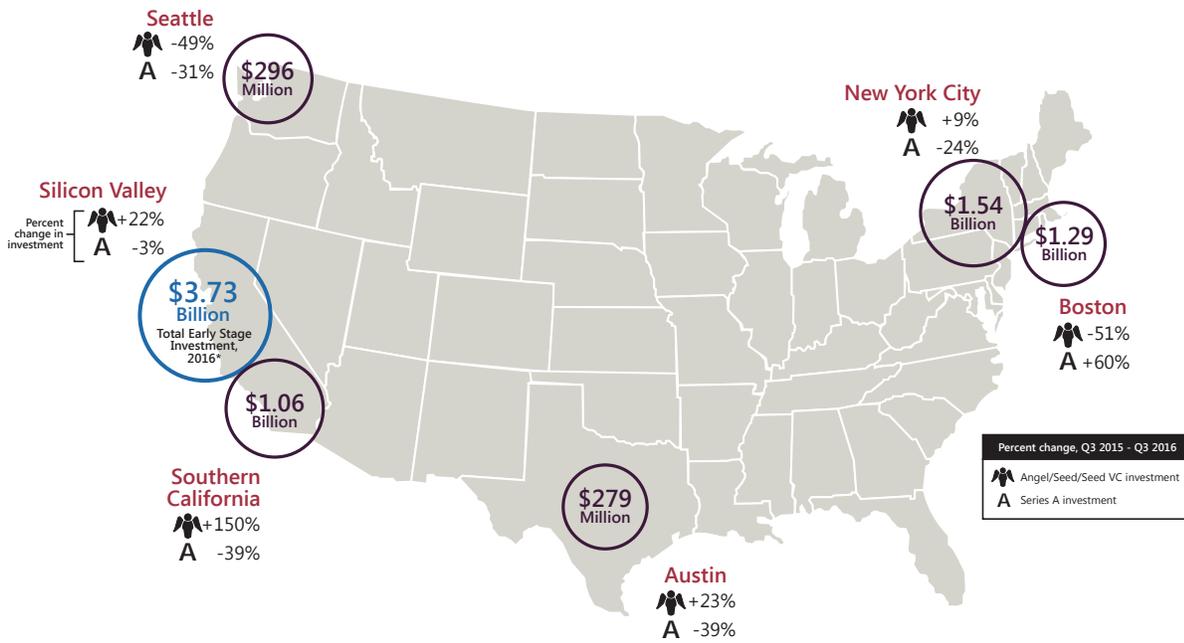


A key forward-looking indicator of the health of venture capital investment is venture capital fundraising. Despite declines in venture capital investment, venture capital fundraising continues to be well ahead of 2009-2013 levels, closer to pre-recession totals. In fact, fundraising in 2016 is on pace to meet or exceed that of 2015, which recorded the highest total in seven years. While venture capital investment has slowed recently in Silicon Valley and other innovation regions, the amount of venture capital available nationally has grown substantially from just three years ago.

*2016 through September 30, 2016
Data Source: National Venture Capital Association (NVCA) and Thomson Reuters Fundraising Report
Analysis: Collaborative Economics

Very Early Stage Funding

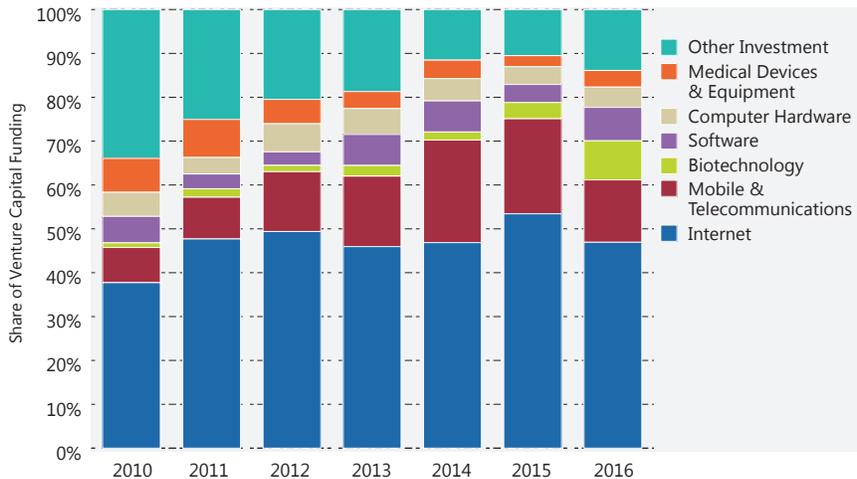
Angel/Seed and Series A Investments, 2016*
Innovation Regions



*2016 Data through November 14, 2016
Data Source: CB Insights
Analysis: Collaborative Economics

In contrast to the decline in total venture capital investment, very early stage investments (including angel, seed and seed venture capital) increased in Silicon Valley, as the region outpaced Boston, Seattle, and New York City, was on par with Austin, and trailed only Southern California in percentage growth between Q3 2015 and Q3 2016. Series A investment was down substantially in most innovation regions, with the exception of Boston (which was up substantially) and Silicon Valley (which was down a small percentage compared to other regions).

Venture Capital Investment, Share by Industry Silicon Valley



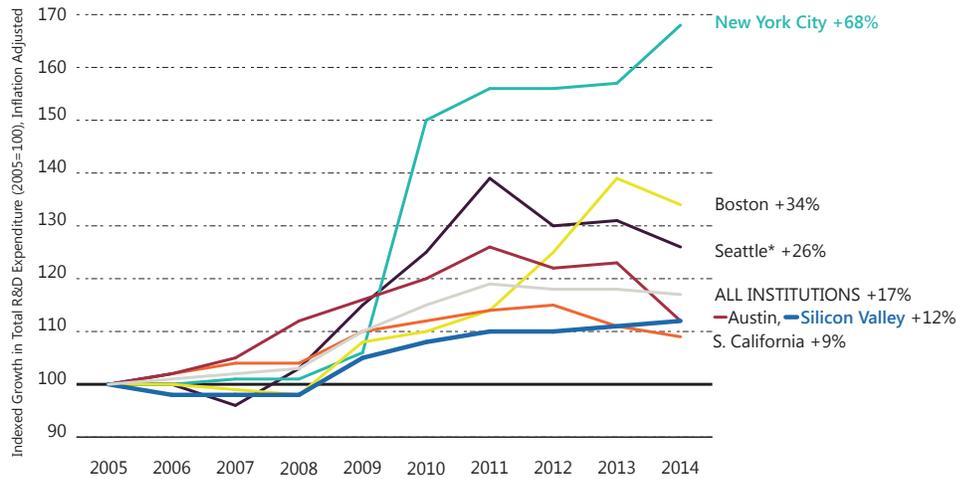
*2016 through November 14, 2016
Data Source: CB Insights
Analysis: Collaborative Economics

A closer examination of venture capital funding trends reveals that investment in some industries grew and in others declined between Q3 2015 and Q3 2016. Venture capital investment rose nearly 40% in Biotechnology and 7% in Software between 2015 and mid-November 2016. Venture capital investment in Medical Devices and Equipment and Computer Hardware were also up during this period.

Gains in some industries, however, did not offset steep declines in Silicon Valley's biggest industry investment areas between 2015 and mid-November 2016: internet (-49%) and mobile/telecommunications (-62%). In 2015, these two sectors accounted for 75% of Silicon Valley's investments.

Growth in Academic R&D Expenditures

Innovation Regions, 2005-2014 (Index 2005=100)



| Total R&D Expenditures 2014 | |
|-----------------------------|---------------|
| All U.S. Institutions | \$67.2B |
| S. California | \$4.1B |
| New York City | \$3.6B |
| Silicon Valley** | \$2.9B |
| Boston | \$2.8B |
| Seattle* | \$1.2B |
| Austin | \$629M |

*Seattle's index growth path 2005-2010 is proxied by the University of Washington's federal R&D funding growth rate, 2010-2014 indexed growth reverts to Total R&D expenditures within the region.

** Silicon Valley includes East Bay universities

Data Source: National Science Foundation

Analysis: Collaborative Economics

University R&D expenditures are important to the innovation pipeline because they provide opportunities for risk taking and proving ideas. Nationally, university R&D expenditures rose 17% between 2005 and 2014 (the latest data available and adjusted for inflation), but some regions did much better: New York (+68%), Boston (+34%), and Seattle (+26%).

Silicon Valley, however, did not keep pace with the national average, increasing its university R&D expenditures only 12% during this ten-year period. Our region was tied with Austin (+12%) and only outpaced Southern California (+9%).

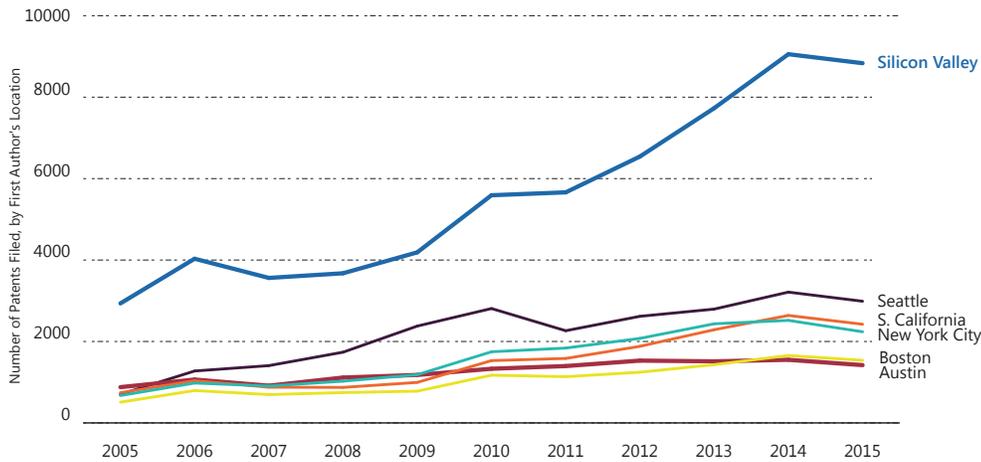
Between 2013 and 2014, Silicon Valley's university R&D expenditures grew faster (+1%) than the national average (-1%). New York City's R&D expenditures grew faster (+7%) than Silicon Valley, but spending levels dropped in Austin, Boston, Seattle, and Southern California.

Innovation Processes: Idea Generation and Commercialization

Innovation processes leverage the economy's assets in talent, capital and R&D to translate ideas into commercial products and services. Idea generation is an early step in that process. Patent filings and commercialization - the development and scaling of technology or services - are other critical elements of the innovation process. The progression of follow on investments into venture-backed startup companies illustrates the ability for early stage companies to grow and scale.

Patent Filings

Computers, Data Processing and Information Storage
Innovation Regions, 2005-2015



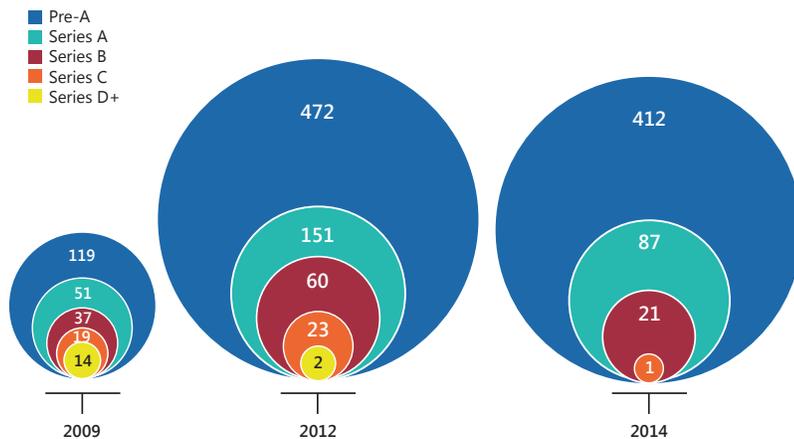
Data Source: US Patent and Trademark Office Custom Data Extracts
Analysis: Collaborative Economics

Patent filings indicate the number of new ideas generated by region. Compared to all other innovation regions, Silicon Valley has kept if not expanded its large lead during the past decade. Silicon Valley's inventors filed 8,834 computer, data processing, and information storage patents with the USPTO in 2015. No other innovation region filed more than 3,000 during that year.

While the number of patents registered declined in Silicon Valley for the first time in 2015 since 2007, other innovation regions also experienced similar declines.

Progression of Early Stage Investment*

Silicon Valley Based Startups - For Companies that Launched in 2009, 2012 and 2014



*Reflects follow-on venture capital investments into start-up companies, which secured their first Seed, Angel or Seed VC investment in 2009, 2012 or 2014
Incorporates investment data through November 14, 2016
Data Source: CB Insights
Analysis: Collaborative Economics

A smaller share of Silicon Valley start-up companies are progressing through investment stages than in the past. About 21 percent of the region's startups that first received very early stage investment in 2014 (Angel, Seed or Seed VC) successfully secured the next level of investment (Series A) compared to 32 percent in 2012. Similarly, only 24 percent of companies that received Series A investments secured Series B investments in 2014, compared to 40 percent in 2012.

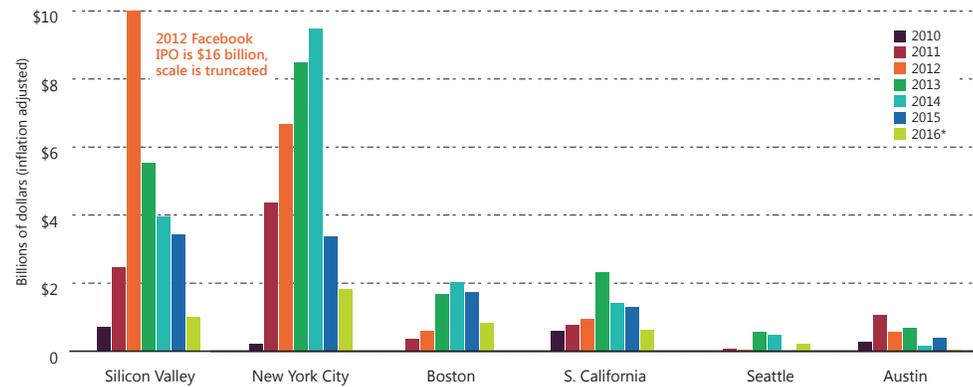
While investment progression has been lagging, more start-ups in 2015 and 2016 are securing very early stage investment (530 and 506 through mid-November 2016, respectively).

Innovation Processes: Business Innovation

Business innovation is an aspect of Innovation Processes and reflects new business models, technologies and services creating value in regions. Startup company valuations and initial public offerings (IPOs) compare the economic value (or potential for value) of business innovation across regions.

Value of IPOs

Innovation Regions, 2010-2016*



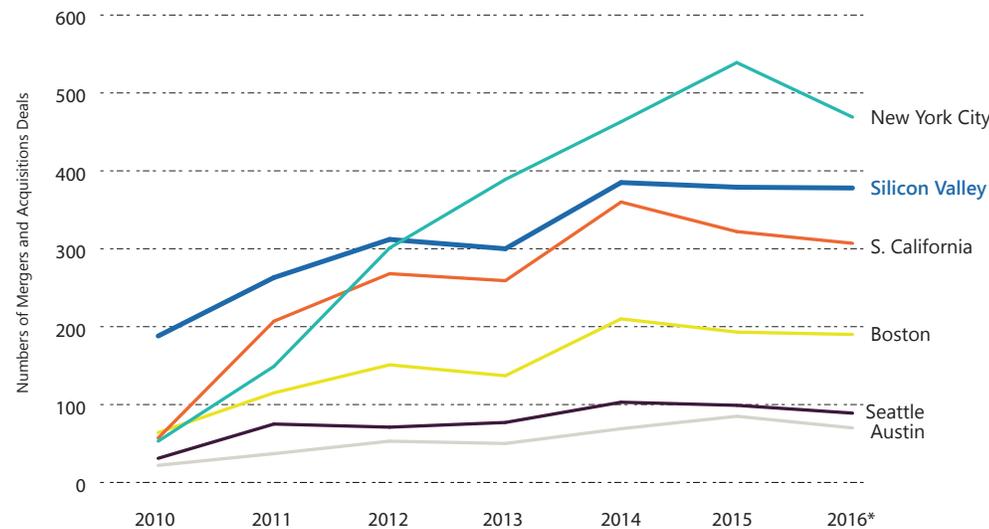
*Data through November 14, 2016
Data Source: CB Insights
Analysis: Collaborative Economics

Initial Public Offerings continued to decline in 2016, with valuations dropping 71 percent in Silicon Valley between 2015 through mid-November 2016.

While all of the innovation regions experienced declines over this period, there were none as substantial as the decline in Silicon Valley. New York City's IPO valuations (and number of IPOs) exceeded Silicon Valley's IPO valuations in 2016 through November (\$1.8B, across 16 deals, compared to \$1.1B across 11 deals, respectively).

Mergers and Acquisitions Activity

Innovation Regions, 2010-2016*



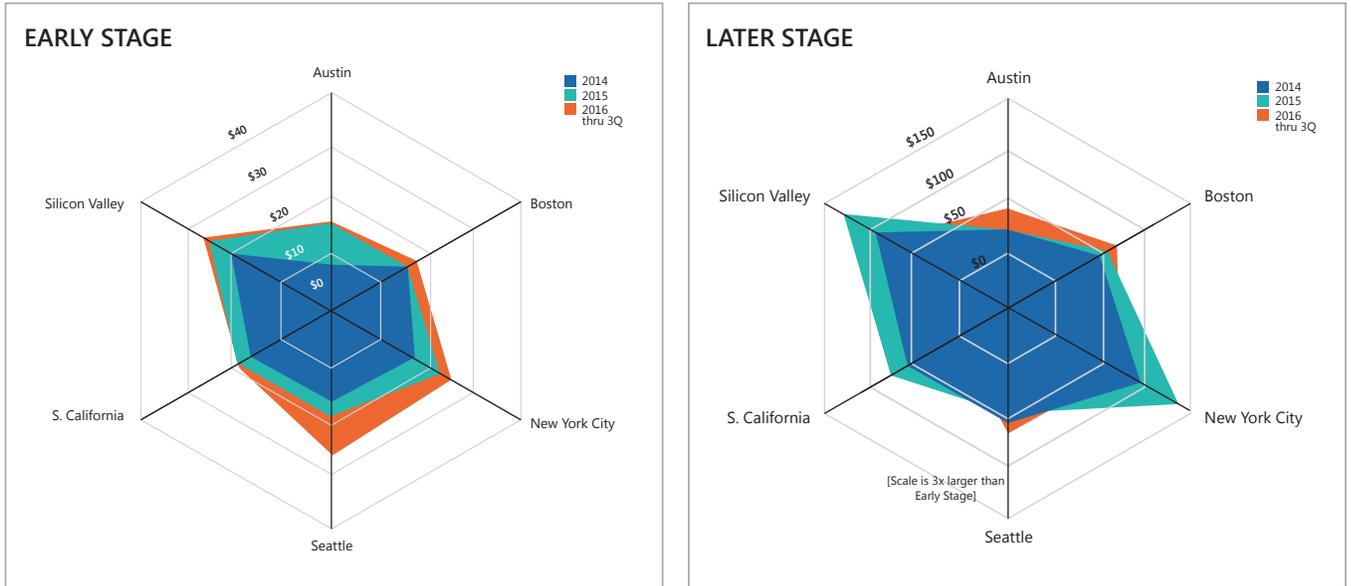
*Data through November 14, 2016
Data Source: CB Insights
Analysis: Collaborative Economics

In contrast to IPOs, Mergers and Acquisitions (M&A) have remained fairly steady. Silicon Valley recorded 380 M&A deals up to mid-November 2016, about the same as the prior year. M&A activity is an indicator of the value of company assets to others, a dimension of regional economic competitiveness.

Median Valuation of Early and Late Stage Start-Up Companies

In Millions of Dollars, Inflation Adjusted

Innovation Regions - 2014, 2015 and 2016 Thru Third Quarter (3Q)



Note: Adjusted amounts from Bureau of Labor Statistics CPI Inflation Calculator into 2016 dollars (www.bls.gov/data/inflation_calculator.htm)
 Data and Analysis: Pitchbook Data, Inc. July 2016

Valuations are estimates of start-up companies' worth, and a higher median regional valuation suggests that companies are larger, worth more and have been better able to secure past investment. Early stage median valuation of Silicon Valley companies increased between 2015 and the third quarter of 2016, comparable to Austin and Southern California, but much less than Seattle, New York City, and Boston. As a result, Silicon Valley no longer has the highest early stage median valuation as Seattle moved into the top ranking.

Silicon Valley's later stage median valuation dropped substantially between 2015 and the third quarter of 2016, as did those of Southern California and New York City, with declines ranging from 32% to 54%. However, later stage median valuation for Austin, Boston, and Seattle all rose substantially during the same period, with gains ranging from 19% to 94%, meaning several innovation regions thrived during the local decline.

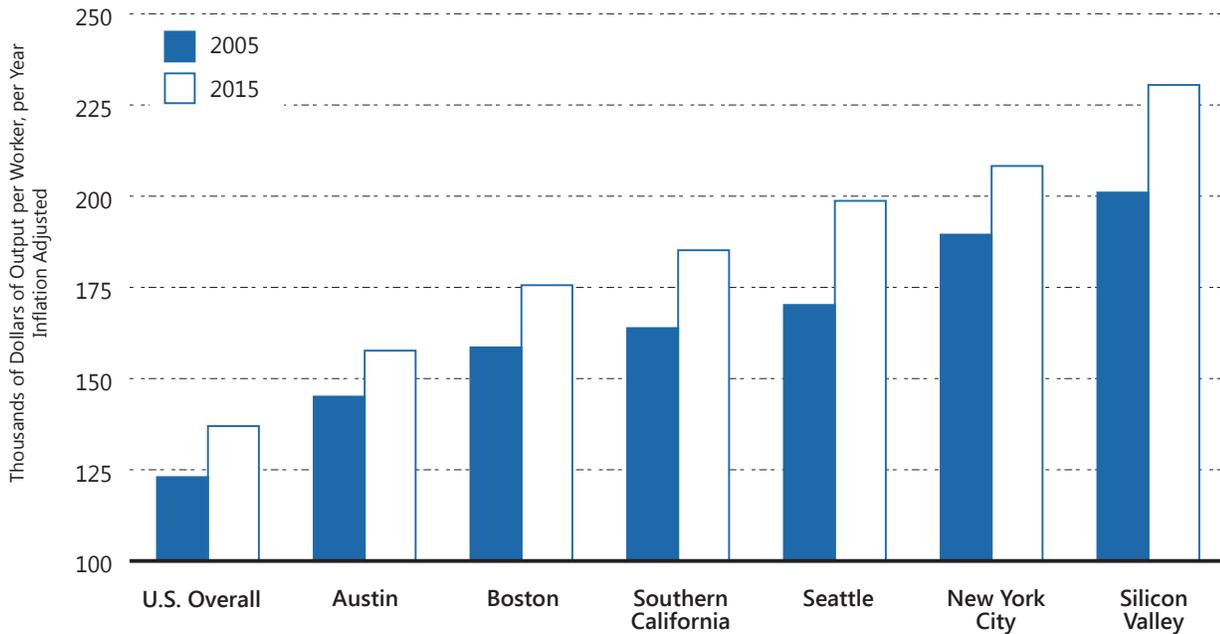
While Silicon Valley arguably experienced an unsustainably large increase in 2015, the region's later stage valuation in Q3 2016 had still not rebounded to its 2014 level. In contrast, Austin, Boston, and Seattle are above their 2014 levels. Even with these changes, Silicon Valley maintains the highest later stage valuation among the innovation regions.

Outcomes and Prosperity: Business Competitiveness

Labor productivity and business operations costs are critical considerations for companies as they determine where to conduct business, though strong labor productivity and other regional assets (such as access to suppliers and end markets) may outweigh cost trade-offs.

Worker Productivity

Annual Value Added per Employee
Innovation Regions and U.S. Overall, 2005 and 2015



Data Source: U.S. Bureau of Economic Analysis, U.S. Bureau of Labor Statistics
Analysis: Collaborative Economics

Silicon Valley's worker productivity remained the highest of the innovation regions in 2015. Average value added per employee (a rough proxy for labor productivity) was \$231,000 per Silicon Valley worker in 2015, up from \$225,000 in 2014.

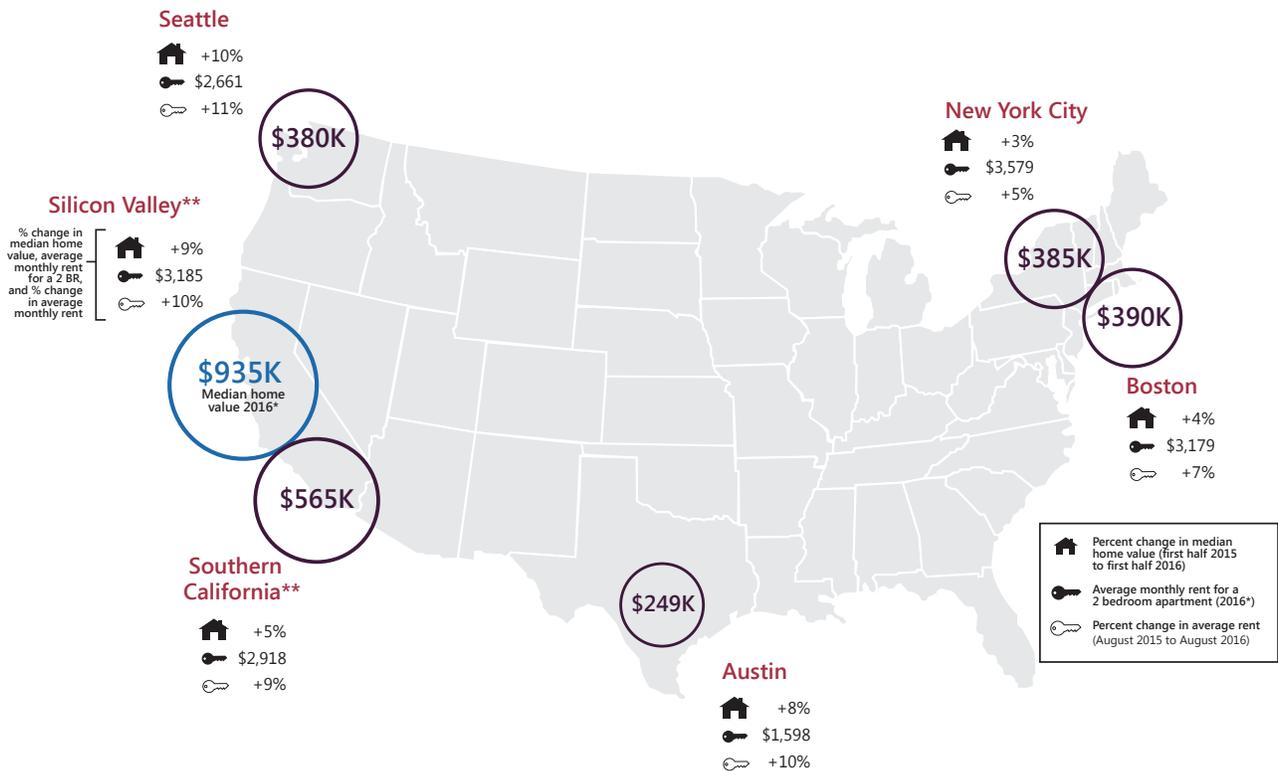
In 2015, the region's worker productivity was 1.7 times the U.S. average, a 15 percent increase from 2005. Seattle was the only innovation region where productivity expanded at an even higher rate (+17%).

Outcomes and Prosperity: Quality of Life

Housing costs and commutes are key factors influencing residents' quality of life, which affects innovation regions' ability to attract and retain talent.

Housing Costs in Innovation Regions

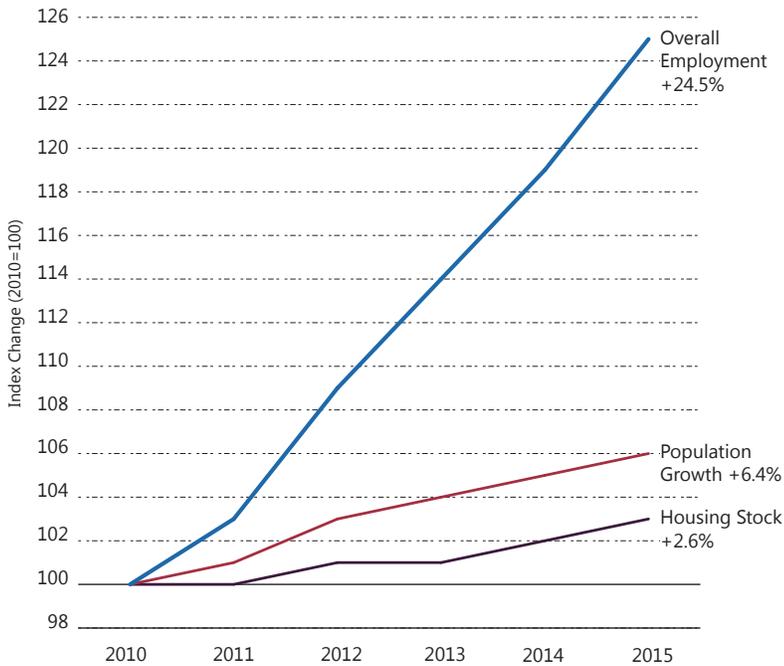
Median Home Values and Average Monthly Rent, 2016*



Using the San José Metropolitan Statistical Area to represent Silicon Valley home and apartment prices, we see that median home values continued to increase quickly in the first half of 2016. In fact, median home values rose to \$935,180, according to Zillow, exceeding home values in San Francisco (\$799,150), and all innovation regions by a substantial margin. The rate of increase was comparable to Austin and Seattle, while more than double that of Boston and triple that of the New York City region between the first half of 2015 and first half of 2016.

Rent prices in Silicon Valley also compounded the region's affordability challenge, with a two-bedroom unit renting for an average of \$3,185 per month in the first half of 2016. Other markets experienced even higher rental prices for two-bedroom rental units, including New York City (\$3,579 per month), with Boston close behind at \$3,179 per month. However, Silicon Valley's rate of increase in rents was among the highest of the innovation regions.

Growth in Employment, Population and Housing Stock
Silicon Valley (Index 2010=100)



Source: US Census, American Community Survey; California Department of Finance, Bureau of Labor Statistics
Analysis: Collaborative Economics

As Silicon Valley rebounded from the national recession, employment boomed and the population grew considerably. However, housing stock increased very little with few affordable housing options for households at or below the average median income.

Between 2010 and 2015, employment in the region increased by almost 25%, while the population increased more than six percent. However, housing units grew by less than three percent over the same period. While the economy added 367,064 jobs in Silicon Valley during this period, only 57,094 new housing units were created.

According to the Association of Bay Area Governments, between 2007 and 2014, jurisdictions in San Francisco, San Mateo, and Santa Clara Counties issued permits meeting about a quarter of the estimated housing need for households at or below their county median household income, while fully meeting the need for households at 120% or more than their county median household income.

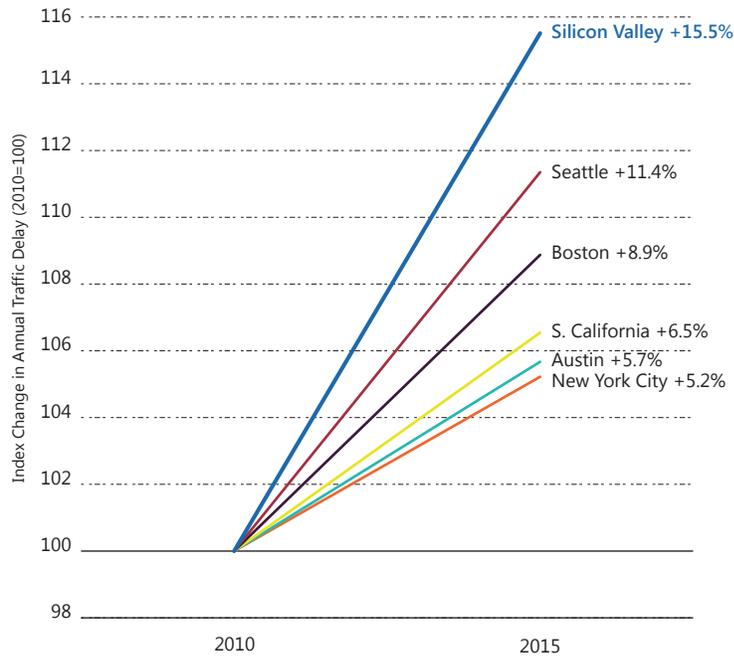
Silicon Valley Progress in Meeting Housing Need Allocation By Income, 2007-2014

| Counties | Very Low Income Households (0-50% of AMI*) | Low Income Households (50-80% of AMI) | Moderate Income Households (80-120% of AMI) | Higher Income Households (Above 120% of AMI) |
|---------------|--|---------------------------------------|---|--|
| San Francisco | 59% | 27% | 18% | 109% |
| San Mateo | 20% | 25% | 25% | 93% |
| Santa Clara | 27% | 28% | 22% | 139% |

*AMI is county area median household income. For more information about income categories and levels, consult the California Department of Housing and Community Development.

Change in Average Commute Time

Innovation Regions, 2010 and 2015 (Index 2010=100)



Reflects commute times for workers employed in the innovation regions

Source: US Census, American Community Survey

Analysis: Collaborative Economics

Commuter times continued to increase in 2015 across the innovation regions, with Silicon Valley's total increasing the most between 2010 and 2015 (+15.5%). Commute time can be an important factor in worker productivity and quality of life.

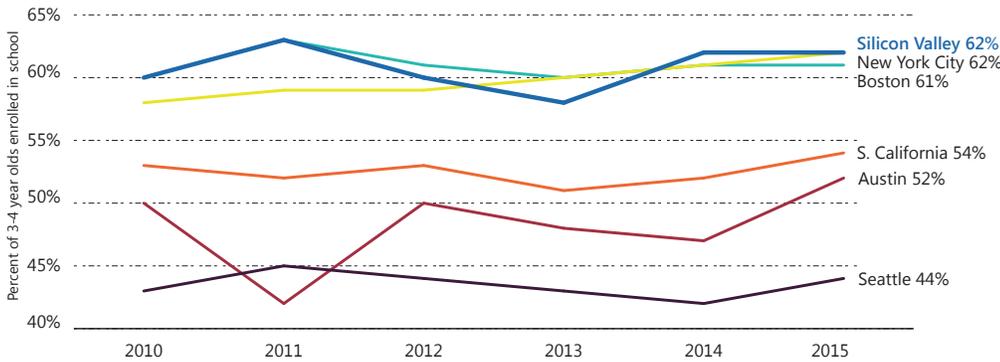
The average Silicon Valley worker spends an hour and 10 minutes commuting per day (both ways), second only to New York City workers, who spend an hour and 14 minutes commuting. Other innovation regions have shorter average round-trip commute times: Boston (66 minutes), Seattle (61.8 minutes), Southern California (61 minutes), and Austin (53.4 minutes).

Outcomes and Prosperity: Access to Opportunity

Education enables access to well-paying jobs and facilitates income mobility. Jobs in Innovation Industries have strong earning potential; high quality education is therefore particularly important to promote access to opportunity across the full population.

Preschool Enrollment

Share of 3-4 Year Olds Enrolled in School
Innovation Regions, 2010-2015

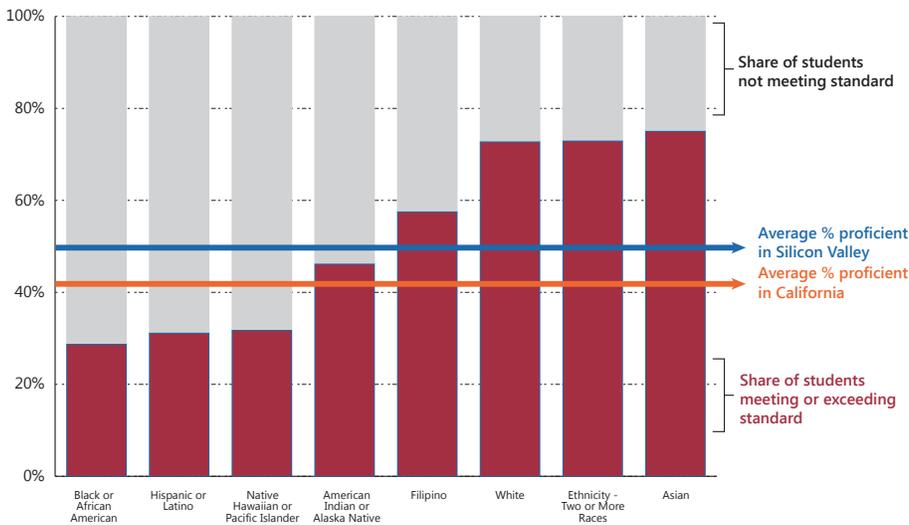


Data Source: American Community Survey
Analysis: Collaborative Economics

Attending preschool can provide youth with foundational skills critical to later educational success. In 2015, 62% of Silicon Valley's 3-4 year olds were enrolled in a preschool program, a level comparable to that of Boston and New York City. Other regions, while well behind, made gains in 2015. Although Silicon Valley has generally kept pace with other leading innovation regions, about four in ten of the region's 3-4 year olds continue to be without the advantages of preschool education.

English Language Arts Proficiency Levels Among 3rd Grade Students

Share of Students Meeting or Exceeding Standards, by Race and Ethnicity
Silicon Valley, 2016



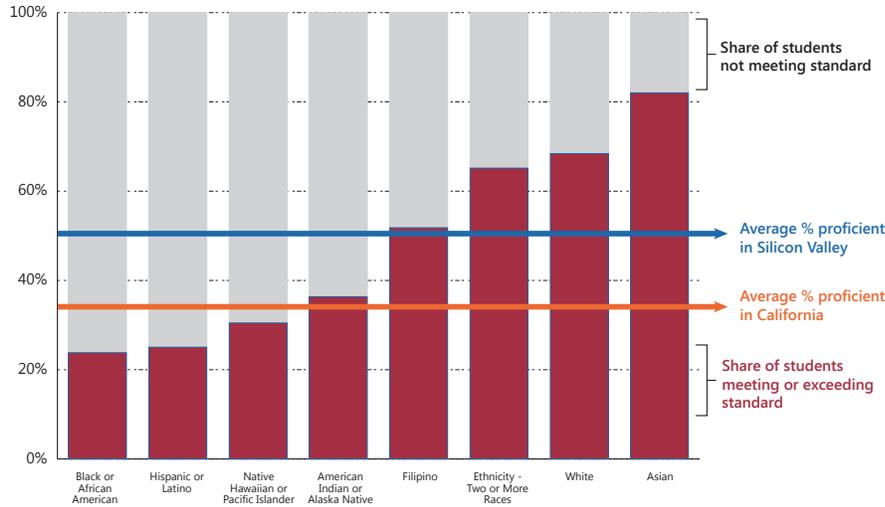
Data Source: California Department of Education, CAASPP 2016
Analysis: Collaborative Economics

Third grade proficiency in English Language Arts is an important indicator of future academic success. The percentage of local 3rd grade students meeting or exceeding the state standard for English Language Arts rose from 52% in 2015 to 55% in 2016.

In 2016, higher proportions of Silicon Valley 3rd grade students across all ethnicities met or exceeded the state standard for English Language Arts compared to the previous year. Notably, the proportion of Hispanic and Latino students (accounting for 38 percent of 3rd grade test takers) that met or exceeded the state standard rose by 4.6 percent in 2016, to 31 percent. The achievement gap by ethnicity was slightly less pronounced in Silicon Valley in 2016 than 2015. However, the gap was still large: 46 percentage points separated Asian students, who had the highest proportion meeting or exceeding the standards, and African American students, who had the lowest proportion.

Mathematics Proficiency Among 8th Grade Students

Share of Students Meeting or Exceeding Standards, by Race and Ethnicity
Silicon Valley, 2016



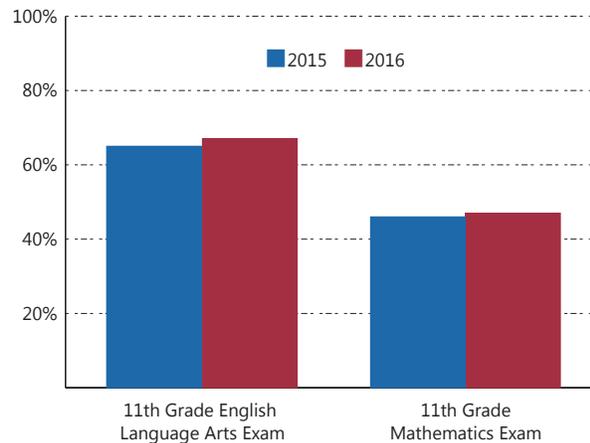
Data Source: California Department of Education, CAASPP 2016
 Analysis: Collaborative Economics

Eighth grade math proficiency is an important predictor for college preparedness and professional opportunities. In 2016, 53% of Silicon Valley's eighth grade students met or exceeded the state standards for mathematics proficiency, compared to 49% in 2015.

However, in 2016 the achievement gap in mathematics by ethnicity in Silicon Valley remained striking: only 24 percent of African American and 25 percent of Hispanic or Latino eighth graders met or exceeded the state standards for mathematics proficiency. At the same time, 82 percent of Asian students and 68 percent of Caucasian students met or exceeded the standard.

Share of Students Meeting and Exceeding State Learning Standards in 11th Grade Mathematics and English Language Arts

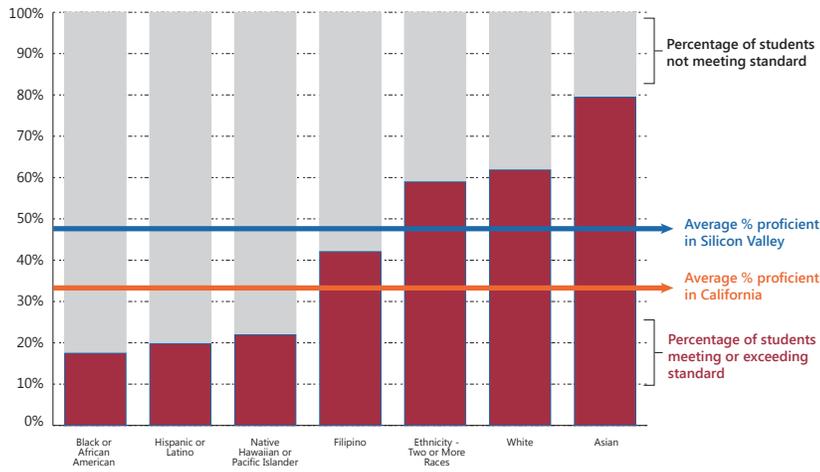
Silicon Valley, 2015 & 2016



Source: California Department of Education, CAASPP 2015, 2016
 Analysis: Collaborative Economics

Since 11th grade students are close to either entering college or the workforce, test results are an important indicator of their readiness for college or work. In 2016, about two-thirds of Silicon Valley 11th grade students (67%) met or exceeded the state standard for English Language Arts, an increase from 65% in 2015. Less than half of 11th graders met or exceeded the state standard in Mathematics (47%), an important indicator for STEM career readiness.

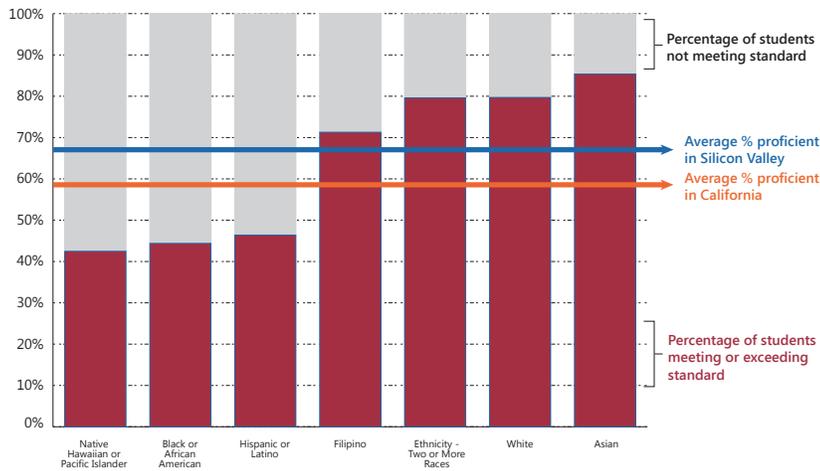
Mathematics Proficiency Levels Among 11th Grade Students by Race/Ethnicity
Silicon Valley, 2016



Note: Data for American Indian or Alaska Native students not available, due to small number of test takers
Source: California Department of Education, CAASPP 2016
Analysis: Collaborative Economics

There are substantial disparities in mathematics proficiency by race and ethnicity in Silicon Valley. Only about one in five African American (17%) and Hispanic or Latino 11th grade students (20%) met or exceeded the state standard in Mathematics, well below the regional average and the average among White and Asian students. The same pattern was true for English Language Arts. Notably, Hispanic and Latino students comprised the largest group (37%) of Silicon Valley's 11th grade students who took the state test in 2016, and thus the largest group of students who are about to move on to postsecondary education and training or join the labor force.

English Language Arts Proficiency Levels Among 11th Grade Students by Race/Ethnicity
Silicon Valley, 2016



Note: Data for American Indian or Alaska Native students not available, due to small number of test takers
Source: California Department of Education, CAASPP 2016
Analysis: Collaborative Economics

Policy Scorecard

In 2015, the Silicon Valley Leadership Group and Silicon Valley Community Foundation hosted a series of public policy strategy sessions with federal, state and local officials, CEOs, education administrators, and community leaders. The following public policy recommendations emerged as priorities to enhance the health of Silicon Valley's economy.

| High-Skill Immigration | |
|---|---|
| Streamline the visa process for permanent residents and non-immigration visas. |  |
| Broaden eligibility criteria for EB-5, to better reflect start-up company growth. |  |
| Maximize O-1 visas, especially for high-talent entrepreneurs. |  |
| Education: STEM Education and High-Quality Pre-K | |
| Increase funding for public preschool education programs, particularly targeting at-risk populations |   |
| Increase student opportunities to engage with STEM in pre-K and K-12 |   |
| Accept more STEM courses as A-G requirements (e.g., engineering, science courses) for UC/CSU admission |  |
| Increase student proficiency in 3rd grade reading and 8th grade Algebra |   |
| Transportation and Housing | |
| Increase funding for BART and Caltrain, leveraging New Starts, Cap & Trade funds, local ballot initiatives and infrastructure financing districts |    |
| Develop a permanent funding source for affordable housing |   |
| Engage corporate leaders to encourage connectivity to transit |  |
| Research and Development | |
| Develop R&D funding matching program for areas such as biotechnology, clean energy and DARPA |   |
| Implement permanent R&D (and R&D equipment) tax credits |   |
| Emphasize return on investment in funding formula, tax credits |   |
| Cost of Doing Business and Regulation | |
| Modernize CEQA |  |
| Augment tax credits, incentives to encourage business expansion locally |   |
| Automate local permitting system |  |

| Key | |
|----------------|---|
| Federal Action |  |
| State Action |  |
| Local Action |  |

Policy Scorecard Progress

The public policy priorities included in this scorecard have helped the Silicon Valley Leadership Group, Silicon Valley Community Foundation and partner organizations initiate and support focused public policy actions. While there was no substantial progress on high-skill immigration, regulation and R&D policies in 2016, there were significant wins in education, housing and transportation.

Education Policy Wins

 The state's 2016 budget included an additional \$145 million investment for child care and preschool programs with a commitment to build up to more than \$500 million over the next 4 years. The budget also included funding for more than 8,800 additional preschool spaces for low-income 3- and 4-year old children over the next 4 years. (Indicator: High quality pre-K education)

 Governor Brown signed AB 2329 (Bonilla) into law, which creates a strategic advisory board to expand access to computer science education with a focus on students under-represented in the computer science field. (Indicator: STEM degrees conferred per 100,000 students)

Housing and Transportation Policy Wins

 Governor Brown signed Assembly Bill 2584 (Daly) into law, which will remove certain NIMBY roadblocks for affordable housing projects. (Indicator: Median home values and average monthly rents)

 Governor Brown signed Senate Bill 1069 (Wieckowski) into law, which made secondary housing units easier and less expensive to build. (Indicator: Median home values and average monthly rent)

 BART's Phase II extension from north San Jose downtown and on to Santa Clara University received an initial \$20 million in transportation funds from the State of California. (Indicator: Economic costs of traffic congestion)

 Santa Clara County voters passed Measure A for Affordable Housing, which will generate \$950 million in affordable housing funds for vulnerable populations and support for first-time homebuyers. (Indicator: Median home values and average monthly rent)

 San Mateo County voters passed Measure K, Neighborhoods for Affordable Housing and Quality of Life, which extends the current sales tax another 20 years to generate \$80 million annually for affordable housing and other community services. (Indicator: Median home values and average monthly rent)

 Santa Clara County voters passed Measure B which will provide \$6.5 billion in local dollars to fund a wide range of transit and road improvements throughout the county. This effort was led by Silicon Valley Leadership Group (Indicator: Economic costs of traffic congestion.)

 Santa Cruz voters approved Measure D, the county's first local transportation funding measure, with 67.78 percent of the vote. The measure, which was led by the Santa Cruz Business Council with support from the Silicon Valley Leadership Group, will raise \$500 million for transit and road improvements over 30 years. (Indicator: Economic costs of traffic congestion.)

Appendix

Regional Output in Innovation Industries - Regional Output in Innovation Industries is estimated using Moody's Analytics nominal GDP levels for Santa Clara, San Mateo and San Francisco counties, adjusted for inflation using the Bureau of Economic Analysis personal consumption expenditures (PCE) price index. Due to data constraints, Innovation Industries include the following sectors: computer and electronic product manufacturing, electrical equipment, appliance and component manufacturing, and information. A share of professional, scientific, and technical services GDP was added as well, in the same proportion as the computer system design services and custom computer programming services employment share of professional, scientific, and technical services employment from BLS-QCEW.

Employment in Innovation Industries - BLS-QCEW employment data are county-level survey-based employment estimates, available to the 4-Digit NAICS level. In this report, BLS-QCEW employment levels are annual averages. As a consistent methodology over time, this source is the basis for industry growth estimates.

Talent Pool for Innovation Industries: Concentration, Jobs, Change in Concentration 2005-2015, and 2015 STEM

Employment - Data on high-technology STEM occupational employment is from the Bureau of Labor Statistics Occupational Employment Statistics for May of 2005 and 2015. Regional data is available by Metropolitan Statistical Area (MSA) rather than by county. High-technology STEM occupations are scientific, engineering and technical occupations defined by the BLS (Hecker, 2005), including computer and mathematical scientists, engineers, drafters, engineering and mapping technicians, life scientists, physical scientists, life and physical science technicians, computer and information systems managers, engineering managers, and natural science managers. Science and engineering industries are classified using the 2010 Standard Occupational Classification (SOC) System from the U.S. Census Bureau.

Population Change by Educational Attainment - Population Change by Educational Attainment report change in the number of adult residents 25 years and older by education level between 2013 and 2015, divided by the total number of adult residents in 2013 and normalized per 10,000 adult residents. Data are from the United States Census Bureau's American Community Survey (ACS). The report uses 1-year estimates, for 2013 and 2015. Due to data constraints, regions are defined by MSAs, rather than by county. The geographical definition for Southern California combines the Los Angeles, and San Diego MSAs; and Silicon Valley combines the San Francisco and San José MSAs which additionally include data from Alameda, San Benito, and Marin counties.

STEM Degrees Conferred - Data on the number of STEM Degrees conferred comes from the National Center for Education Statistics' Integrated Postsecondary Education Data System (IPEDS). Data are based on first major and include bachelor's, master's, and doctoral degrees in Biological & Biomedical Sciences, Physical Sciences, Engineering, Computer & Information Sciences, Mathematics & Statistics, Engineering Technologies and Related, Science Technologies/Technicians. To obtain STEM degrees conferred per 10,000 residents, Collaborative Economics divides the number of STEM degrees in each region by the region's population.

Migration - Migration estimates reflect net change in number of migrants, based on origin, from U.S. Census Bureau Population Estimates. To obtain monthly averages, yearly migration numbers are divided by 12 months. In Silicon Valley, Boston, Southern California and New York City, the net change in domestic migrants was negative, meaning that more people left those regions than arrived from the rest of the U.S., hence all positive change in population was from abroad.

International Talent - Data for international talent is provided by the United States Census Bureau's, 2015 American Community Survey (ACS) Public Use Microdata Sample (PUMS). Science and Engineering (S&E) occupations include science and engineering managers, computer scientists, programmers, developers and analysts; and Engineering; Art, Architecture, and Design; Mathematics; and Science occupations. Data includes all currently employed individuals with a Bachelor's degree or higher. Foreign-born does not include individuals from U.S. territories. Regions are defined by county. In-state-born share of workers for New York City only incorporates New York state, and for Boston, only the state of Massachusetts. Science and engineering occupational definitions are based on the U.S. Census Bureau's Standard Occupational Classification system, updated in 2010.

New Entrepreneurship and New Female Entrepreneurship Rates - The rate of new entrepreneurship measures the average share of the adult population that became entrepreneurs in a given month. Please refer to the 2016 Kauffman Index of Startup Activity for further discussion of the methods used to calculate the indicator. Microdata used to calculate the rate of new entrepreneurship and the rate of new female entrepreneurship come from the Current Population Survey (CPS), a joint production of the U.S. Census Bureau and U.S. Bureau of Labor Statistics. Robert W. Fairlie provided the underlying microdata files, which were also used to construct the Kauffman Foundation's Index of Startup Activity. Regions are based on 2010 MSA definitions as follows: Southern California combines 41740, San Diego-Carlsbad-San Marcos, CA, and 31100, Los Angeles-Long Beach-Santa Ana, CA; Silicon Valley combines 41860, San Francisco-Oakland-Fremont, CA and 41940, San José-Sunnyvale-Santa Clara, CA. Austin is 12420, Austin-Round Rock, TX; Boston is 71650 Boston-Cambridge-Quincy, MA-NH; and Seattle is 42660, Seattle-Tacoma-Bellevue, WA. New York City is 35620 New York-Northern New Jersey-Long Island, NY-NJ-PA, excluding the Pennsylvania portion of the sample.

Venture Capital & Early Stage Funding - Investment data are provided by CB InsightsTM (www.cbinsights.com) and include disclosed investment deals in private companies. Data are through November 14, 2016, unless explicitly noted to be through Q3 2016. All figures were adjusted for inflation, as described above. VC data includes Angel, Seed, Series A-E+, Growth Equity, Bridge, and Incubator series types.

Research and Development Expenditures at Universities - Data on university R&D Expenditures come from the Higher Education Research and Development Survey produced by the National Science Foundation's National Center for Science and Engineering Statistics. Universities were classified into their respective regions by county. Some institution totals for all R&D expenditure for FY 2004 through FY 2009 may be lower-bound estimates because the National Science Foundation did not attempt to correct for non-response on non-science and engineering R&D expenditure items. Total R&D expenditure estimates were not available for Seattle from 2004 to 2009: Collaborative Economics estimated Seattle's growth trajectory based on growth in the University of Washington's Federal R&D expenditure over time. The Federal R&D data were from the Statistical Abstract of the United States for 2007, and the U.S. Census Federal R&D Obligations in 2008. In 2012, the University of Washington accounted for 99% of Seattle's total reported research funding and Federal funding was 86% of the University of Washington's total R&D expenditure.

Patents - Patent data are obtained from the Custom Data Extract of the U.S. Patent and Trademark Office and reflect utility patents granted by location of the first inventor. Regions are defined by county, based on the first inventor's city and zip code. Patent registrations in Computers, Data Processing & Information Storage reflect USPC Classes 235, 341, 345-7, 360, 365, 369, 377, 700-20, 725-26, and 902.

Progression of Early-Stage Investment - Progression of Early-Stage Investment by Series data are from CB InsightsTM (www.cbinsights.com) and include disclosed investment deals in private companies through November 14, 2016. This indicator tracks venture-backed startup companies that launched in the selected year through subsequent rounds of funding. While companies may have received multiple rounds of funding within the series (e.g., several rounds of Series A funding), this indicator counts the first investment in the series only, and then that company's subsequent, higher-level series. Pre-A investments include angel, seed and seed VC investments. This indicator reflects 2013 as the most recent cohort because companies that launched in 2014 and 2015 have had less time to secure subsequent funding rounds, and historical comparisons would be inappropriate. Regions are defined by county, based on startups' HQ city.

IPO Valuations and M&A Activity - IPO Valuation data are from CB InsightsTM (www.cbinsights.com) and include initial public offering exits among private companies through November 14, 2016, adjusted for inflation. Where IPO valuation data were unavailable from CB Insights, valuations from CrunchBase (<http://www.crunchbase.com/>) were used. M&A activity also sourced from CB Insights as of November 14, 2016. Regions are defined by county, based on startups' HQ city.

Median Valuations of Startup Companies - Median Valuation of Startup Companies data and analysis are from Pitchbook Data, Inc. (pitchbook.com) as of July 2016. Valuations are evaluated before a subsequent round of investment ("pre-money"). Included are venture-backed companies that have not exited (e.g., through an initial public offering, merger/acquisition, etc). Figures are inflation adjusted using BLS CPI-U data. "Early Stage" startups are companies that have secured seed/seed VC or series A investments, while "Later Stage" startups refer to companies that received Series B investment or later. Regions are defined by county, based on startups' HQ city.

Productivity - Annual Output per Worker - Worker productivity is roughly proxied by annual regional output (GDP) in the private sector per private sector worker, in 2015. Regional GDP data are from Bureau of Economic Analysis, and employment data are from BLS-QCEW. Due to data constraints, regions are organized by principal metropolitan area. Silicon Valley is proxied by San José, New York City by New York metro, Southern California by Los Angeles. BLS-QCEW county-level data were matched to the MSA county definitions.

Median Home Value and Average Rents - Median Home Value data are from Zillow (www.zillow.com), and are inflation adjusted. Rents are sourced from Rent Jungle. Due to data constraints, regions are organized by principal city. Silicon Valley is proxied by San José, New York City by New York metro and Southern California by Los Angeles. Monthly data are averaged to estimate annuals.

Population, Housing, and Jobs - Data for this indicator is sourced from the U.S. Census American Community Survey, California Department of Finance, California Department of Housing and Community Development, U.S. Bureau of Labor Statistics, and Association of Bay Area Governments.

Average Commute Times - Change in average commute time for workers in innovation regions is sourced from the U.S. Census, American Community Survey.

Pre-School Enrollment - Preschool participation data are from the U.S. Census Bureau American Community Survey 1-year estimates from 2010 through 2015, and reflect the percent share of total three- and four-year-old children enrolled in school. Regions are defined by county.

English and Mathematics Proficiency - Exam performance data are from the California Department of Education, CAASPP Results in 2016, and "proficiency" reflect students meeting or exceeding state standards in 3rd grade English Arts, 8th grade Mathematics, and 11th grade English Arts and Mathematics. Regions are defined by county.



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