Bay Area Economic Update

Alexander Quinn
Senior Director of Research, Northern California
November 9, 2022
San Francisco Peninsula

$427 Billion

40th Largest Economy

$415.5 Billion

$427.9 Billion
Silicon Valley

$465 Billion

35th Largest Global Economy

$483 Billion

$458 Billion

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Bay Area

$1.3 Trillion
17th Largest Global Economy

$1.25 Trillion

$1.37 Trillion
Northern California

$1.6 Trillion
14th Largest Global Economy
State of the Economy
Looking good… for now
Employment Levels are 1% below pre-pandemic levels.
The Bay Area is lagging the U.S. in total employment rebound, albeit starting at a higher basis than the rest of the country in 2019.
Unemployment rates flatten into Q3 across all Bay Area markets. The region now sits at 2.5% unemployment.

Source: JLL Research, California Economic Development Department
Labor Force

-1.0%
Below pre-pandemic levels

- The Bay Area was only 1% below pre-pandemic levels whereas New York was down 3.6%
- Labor force growth critical for the long-term economic productivity of the region.
Office related employment well above pre-pandemic levels in the Bay Area. Scientific research positions now up 27% from February 2020.

Bay Area Employment Levels (February 2020 to September 2022)

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VC Funding

$62.74B
Funding in the Bay Area YTD

- Funding continued to slow into Q3, but September returned a monthly total of $6.2B (1.5 times August).
- Despite contracting in May, the Bay Area is still operating at a higher relative capacity to global funding, which has been slowing all year.
$6.7B

Amount the East Bay has raised in VC funding year to date

- The US has raised $235B in 2022 YTD, 29.3% of which was concentrated in the Bay Area.
- Silicon Valley alone exceeded Boston, Chicago, Miami, and Seattle totals.
The Bay Area overall has seen publicly traded companies come back to Q3 2020 levels but well above their previous peak. The Mid-Peninsula and San Francisco are now below their previous peaks in February 2020.

San Francisco remains the only U.S. multifamily market to still sit below its pre-pandemic effective rates, secondary and sunbelt market continue to lead the country in recovery.

Source: JLL Research, Axiometrics

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The pandemic provided a slight respite from Bay Area’s job : housing balance but remains critical to the region’s competitiveness.

Source: JLL Research, Oxford Economics, California Economic Development Department and Department of Finance
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Return to Work Indicators
Office re-entry continues to be steady at 49%, led by Sun Belt markets

Forecast

<table>
<thead>
<tr>
<th>Market</th>
<th>Re-entry rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austin</td>
<td>64.3%</td>
</tr>
<tr>
<td>Houston</td>
<td>58.6%</td>
</tr>
<tr>
<td>Dallas</td>
<td>54.3%</td>
</tr>
<tr>
<td>New York</td>
<td>47.8%</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>46.6%</td>
</tr>
<tr>
<td>Chicago</td>
<td>46.2%</td>
</tr>
<tr>
<td>Washington, DC</td>
<td>45.9%</td>
</tr>
<tr>
<td>Silicon Valley</td>
<td>43.2%</td>
</tr>
<tr>
<td>San Francisco</td>
<td>42.0%</td>
</tr>
<tr>
<td>Philadelphia</td>
<td>41.5%</td>
</tr>
</tbody>
</table>

Includes non-desk-using employees, such as janitorial and mail room staff.

Source: JLL Research, Kastle, 2022
Even with re-entry plans in place from many high-profile tenants, the return to office is stalling.

Source: JLL Research, Kastle, Last Updated October 2022.
Q. How many days per week do you expect to be working in each of these locations in 12 months’ time?

**2.7 days in the office**

**2.3 days outside the office**

**Hybrid occupancy curve**

Office

- **Monday**: 0.7 days from a third place (e.g., coworking facility, hotel, etc.)
- **Tuesday**: 1.6 days from home
- **Wednesday**: 2.7 days in the office
- **Thursday**: 2.3 days outside the office
- **Friday**: Pre-COVID peak weekly occupancy, -10% Post-COVID peak weekly occupancy

Source: 2022 JLL Workforce Preference Survey, respondents n= 4,015
Toll Bridge Crossings

Bay Bridge crossing show a much lighter slow down as toll bridge crossings only down ~10% from pre-pandemic levels.

Source: Bay Area Toll Authority, 2022
By the numbers in Silicon Valley

Signs of slowing momentum follow closing of the quarter’s largest deal

- Economic uncertainty and shifting work dynamics have led to a wave of negative absorption this quarter. However, firms such as Apple, Comcast, and Peloton have mandated that employees to return to the office in some capacity.

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office Vacancy</td>
<td>17.8%</td>
<td>160 basis point increase quarter-over-quarter</td>
</tr>
<tr>
<td>Asking Rents (FSG)</td>
<td>$5.61</td>
<td>Stay flat quarter-over-quarter</td>
</tr>
<tr>
<td>S.F. of Leasing Volume</td>
<td>1.3M</td>
<td>800K s.f. less than Q2 2022</td>
</tr>
<tr>
<td>Available Sublease Space</td>
<td>2.8M</td>
<td>Stable avail quarter-over-quarter</td>
</tr>
</tbody>
</table>
Multimarket conditions

San Francisco realized the largest net jump in office vacancy amongst major markets, followed by Silicon Valley.
Silicon Valley

Q3 2022

Office Map Overview

Palo Alto
$9.08/FSG
Total Vacancy: 17.9%

Mountain View
$7.95/FSG
Total Vacancy: 14.8%

Sunnyvale
$7.50/FSG
Total Vacancy: 13.0%

Cupertino
$7.14/FSG
Total Vacancy: 3.8%

Fremont/Newark
$2.86/FSG
Total Vacancy: 7.3%

North San Jose
$5.45/FSG
Total Vacancy: 17.4%

Milpitas
$2.84/FSG
Total Vacancy: 36.2%

San Jose Airport
$4.20/FSG
Total Vacancy: 39.8%

Santa Clara
$4.96/FSG
Total Vacancy: 25.1%

Downtown San Jose
$5.14/FSG
Total Vacancy: 14.0%

West Valley/Campbell/South San Jose
$5.70/FSG
Total Vacancy: 21.7%

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Leasing Volume

1.3 million
Square feet of leasing activity in Q3

- Leasing volume this quarter accounted for 31.2% of YTD leasing volume
- Largest deals:
  - Bytedance at Coleman Highline – 657,934 s.f. (sublease)
  - Logitech at Assembly at North First – 86,243 s.f. (direct)
  - SiFive at Santa Clara Square – 45,657 s.f. (sublease)
Office Vacancy

17.8%

As of the end of Q3 2022

- Overall office vacancy rose 1.6 percentage point QoQ
- San Antonio Center vacated – the biggest vacancy of the quarter
- Tenants such as Singularity University and Dell vacated their existing locations while others, such as Analog Devices downsized and leased new space

*Analog Devices downsized from 445,000 s.f. in to 111,264 s.f (+102,375 s.f flex/R&D at 130-134 Rio Robles and 90 Rio Robles in NSJ) in Santa Clara square, sublessor was Pure Storage.
Absorption

-957,311

Square feet of absorption in Q3

- Largest positive absorption:
  - Applied Materials – 245,830 sf at 3333 Scott Blvd
  - 3075 Olcott St – 172,824 sf at Thirty75Tech
  - AMD – 62,500 sf at Santa Clara Square

- Largest negative absorption:
  - San Antonio Center – 403,877 sf at 391 & 401 San Antonio Rd
  - Singularity University – 150,000 sf at 2831 Mission College Blvd
  - Dell – 150,000 sf at 2841 Mission College Blvd
100K+ Deals

Seven Deals over 100,000 s.f. year-to-date

- Average deal size this quarter was 19,999 sf, on par with Q2’s average deal size
- Bytedance at Coleman Highline – 657,934 s.f. (sublease)
Rents

$5.71 FSG

Average direct asking rents at the end of Q3 2022

- Direct rents changed minimally quarter-over-quarter.
- Palo Alto, Mountain View, and Sunnyvale have the highest direct rents, between $7.5-10 FSG.
- Direct rent average stay flat quarter-over-quarter.
Silicon Valley R&D Leasing Volume

Q3 2022 leasing activity fell 19% quarter-over-quarter to 1.6M s.f. Year-to-date leasing volume remains strong.
Historical 100K+ Deals Count and Volume By Year

While 2022’s YTD average lease size is 24.4% lower than 2021’s average lease size, companies are still actively leasing and volume will surpass pre-pandemic levels by year-end.
R&D Vacancy Rate Projection

Woven Planet - 154,649 SF
Onsemi - 92,448 SF
Luminous – 65,380 SF
Astra- 60,517 SF

QuantumScape – 141,740 SF
Apple – 129,594 SF
Foxconn – 118,488 SF
Archer Aviation – 68,243 SF
Kawasaki – 56,000 SF
Tarana Wireless – 52,812 SF

Nvidia – 171,382 SF
Nuro– 114,175 SF
Blue River Technology– 83,590 SF

BD Biosciences- 239,529 SF
NIO– 201,500 SF
Procept BioRobotics- 83,221 SF
Sanmina Corp- 59,034 SF
DLA Piper- 52,252 SF

2023: 7.92%
Q4 Vacancy rate

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335,205

Square feet of leasing activity in Q3

- 88% of leasing activity that took place in Q3 were in Class A product.
- The life sciences and tech industry held the most leasing activity this quarter at 23.38% and 25.58% of Q3’s leasing volume, respectively.
- Largest leases:
  - Luminary Clouds at 101 S Ellsworth in San Mateo – 33,766 sf
  - Biomea Fusion renewal at 900 Middlefield in Redwood City – 27,033 sf
- YTD leasing activity is at 8.6M s.f., 11.7% lower than 2021’s leasing volume
Absorption

-49,115

Square feet of absorption in Q3

- Largest positive absorption:
  - Verkada – 116,122 sf at 406 3rd Ave in San Mateo
  - Confidential tenant – 76,181 sf at Park Place at Bay Meadows
- Largest negative absorption:
  - SurveyMonkey – 133,137 sf at Bay Meadows Station 4
  - Guidewire – 38,934 sf at Bay Meadows Station 2
  - Digital Insight – 34,205 sf at 1300 Seaport Blvd
Rents

$5.62 FSG
Average asking rents at the end of Q3 2022

- Direct rents increased marginally (41 basis points) quarter-over-quarter.
- Sublease rents rose 5.44% quarter-over-quarter due more availabilities in San Mateo.
- Redwood City and Menlo Park have the highest direct rents, between $8-10.50 FSG.
- Total rent average rose 1% quarter-over-quarter to $5.62 FSG.
Rent premiums for new construction are widening, as are rent discounts for older vintage

Source: JLL Research, 2022
Flight to quality and the “amenities arms race”

“\textit{What we’ve got today is good old-fashioned oversupply. We have an enormous amount of obsolete office space.}” \hspace{1cm} – Sam Zell
Life Science
Real Estate
Trends
Q3 2022

Bay Area

1.2M SF
Year-to-date Net Absorption

4.4M SF
Total Life Sciences Requirements

2.9%
Bay Area Lab Direct Vacancy

9.6M SF
Under Development (Ground Up & Conversion)

East Bay

478k SF
Year-to-date Net Absorption

1.6M SF
Total Life Sciences Requirements

6.4%
Bay Area Lab Direct Vacancy

1.9M SF
Under Development (Ground Up & Conversion)
Market Availability – Bay Area Q3 2022

- Total Availability 14.0%
- Direct Availability 10.3%
- Sublease Availability 3.7%

Source: JLL Research, 2022
Historical Asking Rental Rates (NNN)

North County: $7.31
Central/South County: $7.15
Oakland Metro: $6.34

Source: JLL Research

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Life Sciences VC Funding

Bay Area Top VC Funded Biotech Companies 2022 YTD

- **verily** $1B
- **Ultima Genomics** $600M
- **eikon therapeutics** $518M
- **freenome** $290M

Bay Area Life Sciences Funding by Year

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<tr>
<th>Year</th>
<th>VC Life Science Funding (B$)</th>
<th>NIH (B$)</th>
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<tbody>
<tr>
<td>2010</td>
<td>$1.24</td>
<td>$1.00</td>
</tr>
<tr>
<td>2015</td>
<td>$1.47</td>
<td>$5.94</td>
</tr>
<tr>
<td>2020</td>
<td>$14.65</td>
<td>$2.00</td>
</tr>
<tr>
<td>2021</td>
<td>$21.55</td>
<td>$2.12</td>
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<tr>
<td>2022 YTD</td>
<td>$16.33</td>
<td>$2.18</td>
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Lab Future Supply

Existing Supply s.f.  Future Supply s.f.

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<tr>
<td>Supply</td>
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- 2022: 29,703,690
- 2023 Forecast: 29,703,690
- 2024 Forecast: 47,273,894
- 2025 Forecast: 50,000,000

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Bay Area 2023: Big Bets

A.I. Goes Big

Bay Area Population Growth
A.I. Goes Big
Aggregated valuation of AI companies: collected data by gathering the private companies, categorized in “Artificial Intelligence & Machine Learning” in PitchBook, with valuation above USD 100m.

Amount of stored digital data: total amount of data created on data center (on-premise / cloud), edge, and devices (source) PitchBook & IDC.

*1 Exabyte (EB) = 1 billion GB
*Index assuming the market cap. of the Internet companies in 1994 was 1

Net traffic: calculated per month

(source) Internet traffic: Cisco VNI (Visual Networking Index) & OECD.

Market cap. of the internet companies: estimated by SoftBank Group Corp. based on S&P Capital IQ.
The global AI market size is projected to grow at an average compound annual rate of 38.2 percent thru 2030 and could contribute up to $15.7 trillion to the global economy in 2030 according to PwC.

Source: https://www.precedenceresearch.com/artificial-intelligence-market and PwC
A.I. have been active across the U.S. but are mostly concentrated in the Bay Area followed by Boston, New York, and Los Angeles. The Bay Area is home to roughly 42 percent of all active AI companies in the US. Boston, New York, and Los Angeles are other major AI hubs.

Source: Crunchbase, US based companies currently active that have a description of “artificial intelligence, AI, Machine learning, deep learning”. Does not include IBM Watson, Amazon.
The Bay Area sees population growth in 2023
U.S. Legal Immigration fell by over 60% from 2019 to 2021 driven by COVID and U.S. immigration policy. Both conditions have changed since 2021.

Legal Immigration by Year (2010 - 2021)

Source: U.S. Census Bureau, State Department, Bureau of Consular Affairs, June 2022.
The Bay Area depends on international migration for population growth. Bay Area International Migration declined by over 65% over the same period (2019 – 2021) while domestic out-migration accelerated, mostly to surrounding counties.

Bay Area Net Migration by Origin and Destination

Source: California Department of Finance, E2 Survey. Components of population change by county. Nine-County Bay Area population change estimates.
Bay Area’s University population returns and continues to grow. Students are back, including international students.

<table>
<thead>
<tr>
<th>University</th>
<th>2020 (Many remote only)</th>
<th>2022</th>
<th>Planned Future (2027)</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of California – Berkeley</td>
<td>42,597</td>
<td>45,435 (exceeded plan)</td>
<td>48,000+</td>
</tr>
<tr>
<td>San Jose State University</td>
<td>33,025</td>
<td>36,208 (exceeded plan)</td>
<td></td>
</tr>
<tr>
<td>San Francisco State University</td>
<td>27,075</td>
<td>29,607</td>
<td>30,000</td>
</tr>
<tr>
<td>University of San Francisco</td>
<td>~27,000</td>
<td>~27,000</td>
<td>~27,000</td>
</tr>
<tr>
<td>California State University – East Bay</td>
<td>16,253</td>
<td>15,191</td>
<td>18,000</td>
</tr>
<tr>
<td>Santa Clara University</td>
<td>~8,400</td>
<td>8,546</td>
<td>17,092</td>
</tr>
<tr>
<td>Stanford University</td>
<td>14,000</td>
<td>14,000</td>
<td>14,500</td>
</tr>
<tr>
<td><strong>Total Major University Enrollment</strong></td>
<td><strong>168,000+</strong></td>
<td><strong>175,000+</strong></td>
<td><strong>178,000+</strong></td>
</tr>
</tbody>
</table>

Source: Reported student population estimates by University. Note that some Universities have not reported their growth plans or have already exceeded their long range enrolment plan (i.e. U.C. Berkeley. JLL Research.)

2019 SF Avg Rent/ SF Median HH Income = 29%
2022 SF Avg Rent/ SF Median HH Income = 22%

The Bay Area will see population growth in 2023 as domestic migration slows and international migration returns.
Economic Forecasts (2021 – 2030)

Tech and life science hubs are expected to lead the country in overall growth through 2030. Bay Area markets are forecasted to see GDP and employment growth double the U.S. in the same period.