



2017 BAY AREA ECONOMIC ENGINE

Many diverse economic drivers, most on independent trajectories. October 2017

The 7.6 million people in the 9-county Bay Area represent 19.2% of the State’s population and 2.3% of the Nation’s. Compared to national economies, the Bay Area’s 2016 \$781 billion GDP would rank 18th in the world, between Turkey and the Netherlands. If it were a state, the Bay Area would be ranked fifth (up from 6th last year) between Florida and Illinois. At \$105,482 San Jose had the highest GDP per capita in 2016 among major US SMSA’s. Bay Area GDP growth is running at over twice the national average: at 5.4% in 2016 for San Francisco/Oakland and 5.9% for Santa Clara County. Yet, the Bay Area is not supporting this economic growth with housing or transportation infrastructure. Since 2011, 531,000 new jobs were created and only 124,000 new housing units. The number of commute miles spent at speeds below 35 MPH grew 80% between 2010 and 2016. Bay Area’s traffic is now second worst in the Nation, behind LA. Without adequate investment in housing and infrastructure, the Bay Area’s economic growth now depends on displacement: In the year ending July 2016, 22,500 foreign immigrants came to Silicon Valley with 20,801 mainly native-born people leaving. The health of the Bay Area economy may depend on getting the retiring Baby Boomers to leave, get off the roads and free up the housing stock.

The Bay Area has more Fortune 500 companies (36 with combined sales of \$1.3 trillion) than any U.S. region except New York City (with 46), 68% of California’s total. The list of Fortune 500 companies is growing, fed by a herd of “Unicorns”. As of September 2017, of the 216 start-ups worldwide with a \$1 billion valuation, 56 were from the Bay Area, versus 52 from the balance of the USA. Comparing the Unicorn list vs two years ago, one notices the emergence of NYC, Silicon Beach, Austin and Provo as start-up hubs. Bay Area Tech sectors are diverse, so I break it down in the Economic Engine. I ignore large economic sectors, such as construction, retail and healthcare that support but do not drive the Bay Area economy.

Traffic light colors to give current status. →↓↑ Arrows give likely direction for next 12 months.

	Economic Sector	Status	Indicators & Developments
↑	Automotive	Silicon Valley is the new Detroit. Tomorrow’s car: all-electric, safer, and smarter.	Tesla plant in Fremont, the West Coast’s only auto plant, doubles in size to target 600,000 cars/year. The major car companies are all here: Ford, GM, Toyota, Nissan, Hyundai, Volkswagen, BMW, Mercedes-Benz, are joined by Baidu, John Deere and others, make up the 64 automotive-tech companies in the Bay Area. Stanford University has the Center for Automotive Research. Software in a car costs more than the steel. Bay Area innovation is shaping the world’s driving future: electric vehicles, batteries, LiDAR, self-driving, and ride-hailing with Uber and Lyft.
→	Higher Education & Research Labs	Major Bay Area employment sector. UC sees first drop in foreign applicants in more than a decade due to immigration concerns.	The Bay Area has more graduate programs ranked in the top 10 nationwide than the consistently 2 nd ranked metro area-Boston. National Labs (bombs, missiles and space) were a foundation for the Bay Area’s tech bent: The Stanford Linear Accelerator Center (Menlo Park), Lawrence Livermore National Laboratory (Livermore) and Sandia National Laboratories-California (Livermore), as well as the Lawrence Berkeley National Laboratory (Berkeley), the NASA Ames Research Center (Mountain View), and SRI (which is now private, Menlo Park). Not just Quality Also Quantity: 97 colleges, universities, and seminaries in the Bay Area. There are over 1 million foreign students in the US as of 2017. The Bay Area’s estimated 100,000 foreign students are vital. Foreign born talent now makes up 63% of employees in Silicon Valley’s Computer and Mathematics jobs, 75% of women engineers and 45.6% of all Silicon Valley employees. The Bay Area thrives on diversity and immigration.

→	Banking and Finance	Banking, VC, Credit Cards, Mutual Funds, Brokerage are healthy. FinTech and Crowdfunding companies proliferate locally.	Bay Area is the West Coast's banking capital and a magnet for foreign capital. The Bay Area dominates venture capital in money raised <u>and</u> money received. In 2016 VCs invested \$69.1 billion in the USA, down 24% from 2015, but still the second highest year on record. In the first half of 2017 already \$32.3 billion invested and Bay Area got 44.7%. 2016 IPO market had 164 deals, raising \$20.2 billion the least since 2003. But in 2017, the IPO Market is coming back with the volume in the first 9 months exceeding 2016 totals. Many Bay Area financial companies, such as Charles Schwab and Wells Fargo, are growing but moving work to cheaper employment markets. Franklin/Templeton is #7 in funds. Visa #1 in credit brands. PayPal #1 in e-payments. Bay Area center of payment alternatives with Apple Pay, Square, Stripe, Intuit GoPayment, We Pay and Android Pay. Crowdfunding companies like LendingClub, CircleUp, AngelList, Indiegogo and SoFi are local.
→	International Trade	Bay Area is a major transit hub to Asia. Volumes are stable. Competition looms but investments will keep Oakland's Port in the game.	Shipping and air freight volumes inch up. Oakland is the 9 th largest container export location in the US and third on the West Coast after LA/Long Beach and Seattle/Tacoma. The Port of Oakland can dock post-Panamax container ships with a 50-foot draft and is spending \$1.2 billion to double in size, expanding into 530 acres of the former Oakland Army Base, with four new berths, a 250-acre container yard and double total railcar storage. Port of Oakland traffic of 2,369,576 TSU's in 2016 is up 4.0% from 2015. So far, the negative impact from the expansion of the Panama Canal in 2016 has not been severe. Oakland's Airport is second only to LAX on the West Coast in air freight with 591,803 tons in 2016, up 0.27% from 2015. SFO also has impressive freight volumes with 420,086 tons in 2016.
→	Tourism & Conventions	Occupancies flatten at peak: SF's RevPAR at \$242, up 3.7% in 2016. Airbnb's 5,514 SF listings charge an ADR of \$207 and had a 51.8% occupancy in 2016..	Tourism is San Francisco's biggest industry. 25.1 million visitors in 2016 (up 2.3% from 2015) spending \$9.69 billion (up 3.3%). San Francisco's 33,793 hotel rooms near full capacity in peak months, averaged 85.5% occupancy in 2016. SF's two Cruise-Ship Terminals at Pier 27 (new) and Pier 35 (old) saw 3,000,000+ passengers embark/disembark - cruise liner used as hotel during Dreamforce Convention. Conventions at Moscone Center generated only 861,000 room nights in 2016, down because of a \$500 million expansion underway to finish in 2018: Oracle OpenWorld and Salesforce's Dreamforce conventions will see over 60,000 & 170,000 attendees respectively in 2017. Silicon Valley's 46,800 rooms had an average 77.9% occupancy in 2016. Most Silicon Valley hotels are full on prime weekdays but have rooms to spare on weekends. Silicon Valley's ADR grew 6.1% to \$194.94 in 2016.
→	Biotech & Medical Equipment	NIH budget to be cut 18% under Trump. But more drug approvals to be fast-tracked. Bay Area location helps with VC funding.	Northern California is the birthplace of gene research. Bay Area is the largest biomedical node in the State, with 68,300 people employed as of 2015, second only to Boston nationally. VA's only research center is in San Francisco, leads nation in Brain Health. NIH will fund \$1.58 billion to Bay Area biotech for research in 2017 about half of funding for the State. UCSF receives \$589 million, Stanford \$464 million. Government funded university research spawns startups when VC money steps in. Healthcare received \$16.4 billion of VC funds in 2016, down 16%. Biotech stocks peaked in 2015, then stumbled but are on the way back.
→	Semiconductor & Semicon. Equipment, Manufacturers	August 2017 chip sales hit all time high of \$35 billion/month.	Semiconductors are the reason it is called Silicon Valley. Gartner predicts 16.8% increase in semiconductor sales for 2017, after only a 1.1% increase in 2016. SEMI equipment sales were up 9.1% in 2016 and expected to increase by 10.2% in 2017. Memory pricing spike due to shortage, with 52% increase in sales predicted in 2017. Intel Q2 2017 sales up 14% year over year. Nvidia sales up 56% in most recent quarter. AMD Sales up 18%.
↓	Consumer Electronics Including Mobile Devices	Smart Phones approach saturation in USA. Market awaits the next big thing, which is likely to be invented here.	Worldwide consumer electronics are expected to drop for the 4 th straight year in 2017 at \$929 billion. The peak was reached in 2013 at \$1.045 trillion. A slight uptick is expected for the USA. Emerging products: 4K Ultra HD TV, smart-home, drones, health and fitness tech. Smartphones are 47% of CE sales and Smartphones sales are flat. Both Android & iOS are local. Apple's soon release of iPhone X could set new sales records. Collaboration makes a Silicon Valley location a must: Apple's chief rival Samsung to make \$110 from every iPhone X sold, and thus will make more money selling parts to Apple than from its sales of the Galaxy S8.

→	On-line Advertising in Search and Social Media	On-line advertising dollars to overtake TV advertising in 2017. Success will bring regulation.	From its earliest days with the Hearst Corp, San Francisco sold exposure to eyeballs. The on-line ad market consolidates with Bay Area players winning. Google's market share grows to 78.8% in search. Facebook exceeds 2 billion active monthly users. Online ad revenue is projected to grow 15.9% to \$83 billion in 2017. Facebook's ad revenue is projected to jump 32.1% with Google getting a 14.8% increase. \$1.4 billion in reported on-line ad-spending in the 2016 election: But, unreported election spending draws the most scrutiny and will likely lead to new regulations. The Wild West days of the internet may come to an end.
↑	Enterprise (Business) Software including Software as a Service, SaaS	Enterprise software likely up 7.6% in 2017. SaaS to have 18% sales growth in 2017.	Selling IT as a capital item, with software installed on customers' boxes, is being replaced by IT as an operating expense hosted by vendors in the cloud. The transition is hard on the legacy software companies. Enterprise Software growing at 7.6%. Oracle's is 3rd largest software company (behind Microsoft and IBM), with sales up 7% YoY in most recent quarter (51% growth in Oracle's cloud services cannibalized license sales, down 6%). Symantec up 33% Adobe up 26%, Autodesk down 9%, Intuit up 12%. Synopsys up 13%, Cadence up 6%. All Cloud: Salesforce up 26%, Workday up 41%, Box up 28%. Many local cloud-players are still private.
↑	Online Sales and Web	On-line retail sales up 15.6% in 2016 but most gains go to Amazon, whose sales grew by 31.3%	E-commerce sales in the USA reach \$395 billion in 2016, with a growth rate of 15.6% highest since 2013. Macy's, Walmart and others have e-commerce groups in Bay Area. Of the 12 most visited sites on all platforms in September 2017 – 6 are in the Bay Area , almost all have engineers here: #1 Google, #2 Facebook, #3 Yahoo, #4 Microsoft (Seattle but large campus in Sunnyvale), #5 Amazon (Seattle but also Palo Alto, Sunnyvale and Cupertino), #6 Comcast NBCUniversal (NYC but also San Jose), #7 AOL, #8 CBS Interactive/Cnet, #9 Apple, #10 Turner Digital (Atlanta), #11 Time Inc. (New York), #12 Weather Company (Atlanta).
↑	Computer Games & Apps	261 Game companies in the Bay Area. \$109 billion global market with 2.2 billion gamers. China surpasses the USA market. 2017 projected growth is 7.8%. Mobile takes 42% market share.	The worldwide video game market grew 11% year over year in August 2017. The market expands and diversifies: Pokemon Go brought gamers outside temporarily, VR is off to a slow start, free to play (F2P) revenue model develops, 8-Bit games make a nostalgic comeback, Multiplayer video games are a social outlet. Sony has 1,300 workers at PlayStation campus in San Mateo. Electronic Arts in Redwood City had a record year for revenue, margins and profits thanks to blockbusters (FIFA 17, Madden NFL17, etc.). Mobile games sales expected to double by 2021. Watching others play games, eSports, is now entertainment and is why Amazon bought San Francisco based Twitch. There are 261 Game Companies (developers, hardware and publishers) in the Bay Area: Electronic Arts, Zynga, Lucas Games (Disney), Sony, Double Fine Productions, Kabam, Campo Santo, Ubisoft, Gracenote, SEGA, TellTale Games, Crystal Dynamics, Visceral Games, Supergiant Games, Linden Lab, Maxis, 2K, Gazillion Entertainment, Leapfrog, Oculus, Namco Bandai, Sourcebits.
↓	Personal Computers and Workstations	YoY PC Sales down 2.4% in 2017 Q1. 10 th consecutive quarterly decline.	The business PC market is flat, the home market is worse. Time to pivot: HP spins out its PC and printer business. Dell bets on storage and services with \$67 billion EMC acquisition. Exception: Apple's Mac sales up 4.5% in most recent quarter vs 2016. The product's life cycle has lengthened considerably. Office suites in the cloud, such as Microsoft Office 365 and Google Docs, give even less reason to upgrade hardware.
→	Enterprise IT Hardware & Systems	Cloud changes everything. Amazon estimated to be 10% of demand in most recent quarter.	Worldwide server shipments were flat in 2016, but up 6.3% in 2017 Q2 as the market was waiting for Intel's new Skylake processors. Worldwide IT spending predicted to grow 2.4% in 2017(Gartner). With SaaS, investment shifts to cloud suppliers like Amazon and Google who cut out the middlemen, making their own boxes, laying and buying fiber and even building electric substations. HPE occupies top spot, then Dell, IBB, Cisco and Lenovo make up the top 5. The line between software, hardware, chip supplier and user blur as software-defined everything evolves.

→	Telecom, Wireless & Broadband	IP traffic will grow three-fold from 2016-2021, when smartphone traffic will exceed PC traffic and global internet traffic will be 127 times that of 2005.	Need for telecom investment is relentless yet networks do not keep up with peak demand. Telecom-consolidation allows competition over content and services versus network. USA's average broadband speed lags much of the developed world but doubled anyway between 2014 and 2016. Demand from streaming makes peak-hour demand exceed average internet growth rate. US top telecom-providers have small Bay Area footprints but Bay Area has some of the largest Telecom and network equipment firms; Cisco, Juniper, Brocade, Ericsson. Internets of Things (IoT) connections proliferate as sensors are put into everything: your fridge and the light overhead may each have an IP address. By 2021 Cisco expects network devices equal to 3.5 times the world's population. Net neutrality is once again a major battleground, Silicon Valley vs Telco's. In 2015 Silicon Valley won round one but fears it will lose the war under Trump's FCC Chairman, Ajit Pai.
→	Film and Media	2017 big year for Computer Graphics (CG) & animation, both Bay Area specialties. Hardware, software <i>and</i> the creative talent are all here.	Film, digital special effect, CG, sound engineering, animation, commercials - all Bay Area strengths. Hollywood actors in front of a "Blue Screen", the Bay Area CG artists supply the rest. Disney with purchase of Pixar and Lucas is now largest Bay Area media employer. 10 of the top 10 grossing films so far in 2017 were either animations or almost more CG than reality: Beauty and the Beast, Wonder Woman, Guardian of the Galaxy Vol.2, Spider-Man: Homecoming, It, Despicable Me 3, Logan, the Fate of the Furious, Dunkirk, The Lego Batman Movie. Comcast buys DreamWorks Animation that has a 200,000 sf facility in Redwood City. Dolby (in SF's Mid-Market) & THX (Started by George Lucas) set the standards for sound. Netflix is the streaming-video model to beat, but Bay Area rivals; YouTube, (Google), Apple TV, Sling Media and Vudu (Walmart) are competition. Streaming audio is also strong locally: Pandora, Rhapsody, Beats Music, Apple Radio, iTunes Radio, Google Play All Access, Tidal, Rdio.
↑	Defense, Aerospace & War on Terror	Surveillance and modernization happens in the Bay Area. Satellites in orbit grew from 1,381 to 1,459 in 2016 alone.	Past defense cutbacks hurt but Trump adds to the defense budget, a lot will be spent here: The admirals and generals want more technology. Local Bay Area operations benefit: Lockheed Martin, General Dynamics, Raytheon, Northrup Grumman, BAE Systems, Bechtel, Loral. In cyber surveillance: HP, Narus/Symantec, Palantir Technologies are all local. The drones and missiles may be made elsewhere but their brains and satellite navigation come from here. SRI researches many items including chemical weapons. Livermore & Sandia have a large share of the potential \$1 trillion to be spent in next decades to modernize all nuclear warheads. Bay Area a center for satellite technology due to NASA, Space Systems Loral and startups like Astro Digital. Despite miniaturization, satellite payloads to grow at 9% per year through 2022.

Unmentioned – the Bay Area One-Offs - outstanding companies who stand on their own: Chevron, McKesson, Clorox, Gap, Levi, PG&E, Bechtel, Safeway, Fair Isaac, Del Monte, Ross Stores, Robert Half, Core-Mark.

Sources: Bureau of Economic Analysis, US Department of Commerce, Bay Area Economic Forum, Brookings MetroMonitor, UCLA Anderson Forecast, Bay Area Council, SF Travel Association, SF Chronicle, BayBio, ComScore, Money Tree, Consumer Electronics Association, SEMI, SIA, CEA, e3expo, Fortune, CB Insights, IEEE Spectrum, Search Engine Journal. California EDD, Chronicle 500, Gartner, Accenture and company web sites.

Eric Von Berg, Principal, Newmark Realty Capital, Inc. PHONE: 415-956-9922

evonberg@newmarkrealtycapital.com

xBay Area Companies in the 2017 Fortune 500

Bay Area Rank	State Rank	Fortune 500 Rank	Company	City	Revenues (\$ billions)
1	1	3	Apple	Cupertino	215.6
2	2	5	McKesson	San Francisco	192.5
3	3	19	Chevron	San Ramon	107.6
4	4	25	Wells Fargo	San Francisco	94.2
5	5	27	Alphabet (Google)	Mountain View	90.3
6	6	47	Intel	Santa Clara	55.9
7	8	59	Hewlett Packard Enterprises	Palo Alto	50.1
8	9	60	Cisco Systems	San Jose	49.2
9	10	67	HP	Palo Alto	48.2
10	11	81	Oracle	Redwood City	37.0
11	12	92	Gilead Sciences	Foster City	30.4
12	13	98	Facebook	Menlo Park	27.6
13	17	157	PG&E	San Francisco	17.7
14	19	178	Gap	San Francisco	15.5
15	20	187	Visa	Foster City	15.1
16	21	198	Synnex	Foster City	14.1
17	23	242	Western Digital	San Jose	13.0
18	24	219	Ross Stores	Dublin	12.9
19	27	247	Core-Mark Holdings	So. San Francisco	11.5
20	28	264	PayPal Holdings	San Jose	10.8
21	29	265	Applied Materials	Santa Clara	10.8
22	32	310	eBay	San Jose	9.0
23	33	314	Netflix	Los Gatos	8.8
24	35	326	Salesforce.com	San Francisco	8.4
25	37	330	Charles Schwab	San Francisco	7.6
26	38	383	Tesla	Palo Alto	7.0
27	39	387	Nvida	Santa Clara	6.9
28	41	405	Franklin Resources	San Mateo	6.6
29	43	414	Sanmina	San Jose	6.5
30	45	474	Lam Research	Fremont	5.9
31	46	443	Adobe Systems	San Jose	5.9
32	47	453	Clorox	Oakland	5.8
33	49	465	Symantec	Mountain View	5.6
34	50	468	NetApp	Sunnyvale	5.5
35	52	493	Robert Half	Menlo Park	5.3
36	53	498	Yahoo	Sunnyvale	5.2

Bay Area Unicorn List: Private Companies valued at \$1 Billion+

Source: CB Insights – September 2017

Bay Area Rank	USA Rank	Company	Headquarters	Industry	Valuation (\$ Billions)
1	1	Uber	San Francisco, CA	On-Demand	\$68.0
2	2	Airbnb	San Francisco, CA	eCommerce/Marketplace	\$29.3
3	3	Palantir Technologies	Palo Alto, CA	Big Data	\$20.0
4	6	Pinterest	San Francisco, CA	Social	\$12.3
5	7	Dropbox	San Francisco, CA	Internet Software & Services	\$10.0
6	9	Stripe	San Francisco, CA	Fintech	\$9.2
7	10	Lyft	San Francisco, CA	On-Demand	\$6.9
8	17	Houzz	Palo Alto, CA	eCommerce/Marketplace	\$4.0
9	18	Social Finance	San Francisco, CA	Fintech	\$4.0
10	19	Tanium	Emeryville, CA	Cybersecurity	\$3.8
11	20	Credit Karma	San Francisco, CA	Fintech	\$3.5
12	21	Insticart	San Francisco	On-Demand	\$3.4
13	22	DocuSign	San Francisco, CA	Internet Software & Services	\$3.0
14	24	ContextLogic (dba Wish)	San Francisco, CA	Fintech	\$3.0
15	26	Bloom Energy	Sunnyvale, CA	Greentech	\$2.7
16	27	Unity Technologies	So. San Francisco, CA	Gaming	\$2.6
17	30	Zenefits	San Francisco, CA	Fintech	\$2.0
18	33	Github	San Jose, CA	Internet Software & Services	\$2.0
19	36	Quora	San Francisco, CA	Internet Software & Services	\$1.8
20	38	Sprinklr	San Francisco, CA	Social	\$1.8
21	39	reddit	San Francisco, CA	Social	\$1.8
22	44	Coinbase	San Francisco, CA	Fintech	\$1.6
23	45	Quanergy Systems	Sunnyvale, CA	Auto Tech	\$1.6
24	46	Zoox	Menlo Park, CA	Auto Tech	\$1.6
25	50	Razer	San Francisco, CA	Hardware	\$1.5
26	52	23andMe	Mountain View, CA	Healthcare	\$1.5
27	55	C3 IoT	Redwood City, CA	IoT (Internet of Things)	\$1.4
28	57	Rubrik	Palo Alto, CA	Internet Software & Services	\$1.3
29	58	Zeta Interactive	San Mateo, CA	Internet Software & Services	\$1.3
30	59	Apttus	San Mateo, CA	Internet Software & Services	\$1.3
31	62	Thumbtack	San Francisco, CA	eCommerce/Marketplace	\$1.2
32	64	Clover Health	San Francisco, CA	Healthcare	\$1.2
33	70	Automatic	Santa Clara, CA	Internet Software & Services	\$1.1
34	71	Proteus Digital Health	Redwood City, CA	Healthcare	\$1.1
35	73	TangoMe	Mountain View, CA	Social	\$1.1
36	74	Nextdoor	San Francisco, CA	Social	\$1.1
37	75	Anaplan	San Francisco, CA	Internet Software & Services	\$1.1
38	76	AppDirect	San Francisco, CA	Internet Software & Services	\$1.0
39	78	Katerra	Menlo Park, CA	Construction Tech	\$1.0
40	79	Opendoor Labs	San Francisco, CA	Real Estate	\$1.0
41	81	Medalia	Palo Alto, CA	Internet Software & Services	\$1.0
42	82	Docker	San Francisco, CA	Internet Software & Services	\$1.0
43	83	CloudFlare	San Francisco, CA	Cybersecurity	\$1.0
44	84	Procore Technologies	Mountain View, CA	Construction Tech	\$1.0
45	85	Lookout	San Francisco, CA	Cybersecurity	\$1.0
46	88	Illumio	Sunnyvale, CA	Cybersecurity	\$1.0
47	89	Crowdstrike	Sunnyvale, CA	Cybersecurity	\$1.0
48	90	MarkLogic	San Carlos, CA	Big Data	\$1.0
49	93	Carbon3D	Redwood City, CA	Hardware	\$1.0
50	96	Gusto	San Francisco, CA	FinTech	\$1.0
51	97	Symphony	Palo Alto	FinTech	\$1.0
52	99	Glassdoor	Mill Valley, Ca	Internet Software & Services	\$1.0
53	102	Adaptive Biotechnologies	So. San Francisco, CA	Healthcare	\$1.0
54	104	Eventbrite	San Francisco, CA	Internet Software & Services	\$1.0
55	106	Zscaler	San Jose, Ca	Cybersecurity	\$1.0
56	108	Zoom Communications	San Jose, CA	Internet Software & Services	\$1.0