I. Technology

Overview

In the 1990s, the economic development slogan for Long Beach was: "The Three Ts – Trade, Tourism and Technology – and Retail." That third T – Technology – has proven to be elusive.

For almost a quarter century Long Beach has believed it can be – perhaps, has believed it *ought to be* – a technology center. Long Beach is not alone in that belief. Hundreds of cities and regions in the United States – and the world – believe they can be (*ought to be*) the Next Silicon Valley.

It rarely turns out that way. Notwithstanding, numerous cities and regions embark on the journey despite solid historical evidence of what it takes to be a tech center – and the first effort is usually to coin a catchy nickname because, of course, that's how a region becomes a tech center. Among the many are:

- Silicon Alley (a portion of New York City)
- Silicon Bayou (New Orleans, of course)
- Silicon Harbor (Charleston, South Carolina)
- Silicon Hill (Washington, D.C. As in *Capital Hill*, get it?)
- Silicon Hills (Austin, Texas)
- Silicon Forest (Portland, Oregon)
- Silicon Prairie (Chicago, Omaha, Des Moines, Kansas City, Wyoming, etc., etc.)
- Silicon Shore (Santa Barbara, California)
- Silicon Swamp (Gainesville, Florida)
- Silicon Surf (Santa Cruz)

And then there's:

- Sicotton Valley (Alabama)
- The Silicon Savannah (Nairobi, Kenya
- Chilecon Valley (Santiago, Chile)
- Philicon Valley (Philadelphia, PA)

Unfortunately, catchy nicknames alone don't do the trick. But there is general consensus about what the actual components of the primordial stew for a tech region have to be.

Component One: Technology

The first ingredient is pretty simple: there ought to be some technology lying around. After all, it's tough to be a tech center if your region – its businesses, individuals and universities – don't create technology. And a really good measure of technology is patents – because intellectual property is the key driver of technology. The following is a list of the Top Ten awardees of patents in California from 2010-2014:[1]

[1]U.S. PATENT AND TRADEMARK OFFICE, Patent Technology Monitoring Team (PTMT)

	Entity	2010	2011	2012	2013	2014	Total
1	Qualcomm	482	665	972	1,614	1,997	5,730
2	Apple	528	613	941	1,375	1,622	5,079
3	Google	220	326	769	1,202	1,688	4,205
4	Broadcom	707	893	902	821	835	4,158
5	HP	582	543	596	560	627	2,908
6	Cisco	626	524	501	449	556	2,656
7	Marvel Int.	289	370	400	448	493	2,000
8	IBM	381	381	367	403	433	1,965
9	Univ. of California	326	292	328	380	425	1,751
10	Intel	378	327	307	362	368	1,742

No surprises in this list; these are *exactly* the firms (plus the University of California) we'd suspect would have the most patents – because they are the firms richest in technology. (FYI, Marvel International, Ltd. is *not* Marvel Comics.)

Since it works pretty well for firms, let's use patents as a gauge of technology in cities. The number one city in California and the nation for patent applications per capita is a smallish city in Northern California. The city? Palo Alto, home to a fairly well known university known as Stanford. Over the period of 2008-15, there were 24,557 patents applications from entities in Palo Alto; that works out to be 370 patent applications per 1,000 residents. Not bad!

How does that compare with other tech-friendly cities? San Diego rang up the highest rate of any large city in the nation: 241.5 patents per thousand residents. The rate in Seattle, considered a tech hub, was 36.4 per 1000 residents.

Where does Long Beach fall in the patent application continuum? Unfortunately, not in the upper percentiles. The rate in Long Beach was 3.7 patent applications per 1,000 residents.

The California city most similar to Long Beach in terms of size and rate of patent applications? That would be Santa Ana, not generally considered a tech hub. So if we look at the presence of technology as a major component of being a tech center, Long Beach does not fare that well.

Here's a list of California cities and their rate of patents per 1000, with some other U.S. cities considered as tech centers thrown in.[2]

Cities	Patent Apps 2008-15	Population	Patents Per Capita	Patents Per 1000
Palo Alto	24,557	66,363	0.370040535	370.0
San Diego	37,669	155,986	0.241489621	241.5
Santa Clara	17,707	119,311	0.148410457	148.4
San Mateo	7,256	99,630	0.072829469	72.8
Ann Arbor	8,319	116,121	0.071640788	71.6

[2] City-data.com, January 2016; U.S.Census.

San Jose	56,062	982,765	0.057045174	57.0
Santa Cruz	3,148	62,041	0.050740639	50.7
Irvine	11,005	229,985	0.047850947	47.9
San Francisco	37,723	837,442	0.045045508	45.0
Seattle	23,091	634,535	0.036390428	36.4
Pasadena	3,979	138,547	0.028719496	28.7
Santa Monica	2,483	91,812	0.027044395	27.0
Portland	13,083	603,106	0.021692704	21.7
Pittsburgh	5,936	306,211	0.019385326	19.4
Culver City	726	39,313	0.018467174	18.5
Oakland	7,136	400,740	0.017807057	17.8
Minneapolis	6,615	392,800	0.016840631	16.8
St. Paul	4,164	297,770	0.013983947	14.0
Torrance	2,038	147,027	0.013861421	13.9
Boston	7,734	636,479	0.012151226	12.2
Chicago	11,778	2,714,857	0.004338353	4.3
Long Beach	**1,709**	**467,892**	**0.003652552**	**3.7**
Santa Ana	1,123	330,920	0.003393569	3.4
Anaheim	1,097	343,248	0.003195944	3.2
Los Angeles	10,936	3,857,799	0.002834777	2.8
Sacramento	1,202	475,516	0.002527783	2.5
Riverside	771	313,673	0.002457974	2.5
Fresno	568	509,924	0.001113891	1.1
Stockton	231	297,984	0.000775209	0.8

FYI, not only are patents a great indicator of a tech region, they are "a major driver of long-term regional economic performance." Patents trigger higher productivity growth, lower unemployment rates, and firm creation. Analysis shows that the impact of patent development is about equal to "having a highly educated workforce" -- a key component for economic success.[3]

Component Two: A Research University

There are two very good reasons why the Bay Area is the tech capital of the U.S. and the world: Stanford and UC Berkeley. Proximity to a research university is key to technology development, and Berkeley and Stanford are two of the finest.

Long Beach is fortunate to have the flagship of the California State University system, California State University Long Beach. It is the most highly regarded school in the CSU system, with outstanding colleges of engineering, business and art among others. It is a unique and incredibly important asset for economic development in Long Beach.

[3] "Patenting Prosperity: Invention and Economic Performance in the United States and its Metropolitan Areas", Jonathan Rothwell, José Lobo, Deborah Strumsky, and Mark Muro, Brookings Institute, February 2013.

But CSULB is not a research university. It offers doctorate level degree in three disciplines – education, nursing and physical therapy – and in conjunction with The Claremont Graduate University, a Ph.D. in Engineering and Industrial Applied Mathematics. Why only these? Because the construct of higher public education in California is clear: schools in the UC system are research institutions and schools in the CSU system are teaching institutions.

Why Isn't CSULB a Research University?

CSULB isn't a research university because that's not its statutory role. In 1960, Clark Kerr, then the President of the University of California, guided the creation of the California *Master Plan for Higher Education***.** The Plan has been emulated by states and countries around the world. Some plans work!

The Plan defined specific roles for the already-existing University of California (UC), the California State College system that now is the California State University (CSU), and the California Community College system (CCC). Those roles remain in place today:

UC

- UC is the academic research institution and provides undergraduate, graduate and professional education.
- UC has exclusive jurisdiction for doctoral degrees (with three exceptions) and for law, medicine, dentistry, and veterinary medicine.

CSU

- CSU's mission is undergraduate and graduate education (master's degrees), including professional and teacher education.
- Faculty research is authorized consistent with the primary function of instruction.
- CSU can offer doctorates in Education, Nursing and Physical Therapy – but that's it.

CCC

- Primary mission is academic and vocational instruction for students for the first two years of undergraduate education (lower division).
- CCCs also provide remedial instruction, English as a Second Language courses, adult noncredit instruction, community service courses, and workforce training services.

Because its mission is instruction – not research – CSULB is not and will never be a technology factory. For example, from 1992 through 2015, the College of Engineering CSULB secured a total of 19 patents.[4] Does this mean CSULB is failing? Absolutely not; it is succeeding remarkably well in its primary mission of graduating well-educated students to join the California workforce.

Look at the list of cities again. What cities score highest? Those with research universities nearby. Ann Arbor? The University of Michigan. Santa Cruz? UC Santa Cruz. Irvine? UC Irvine. Pasadena? Cal Tech.

One very good reason why research universities are crucial is because of the amount of low-cost scientific research funded by federal initiatives, from DOD to NIH. Research and Development (R&D) is costly and the private sector is a cautious investor in R&D; but the steady stream of federal dollars to research universities for low-cost R&D increases technology intensity in a region.

[4] CSULB, January 2016.

Component Three: Financing

Technology development requires financing. Few tech firms are profitable in their early stage. It's intellectual property and market potential, not initial profits, that contribute to long-term success.

Accordingly, venture capital financing has become the life-blood of tech firms.

U.S. venture capital investment hit $48.3 billion in 2014, its highest level since 2000, according to data from the National Venture Capital Association (NVCA) and PricewaterhouseCoopers (PwC). California continues to lead the rest of the country by a significant margin, capturing 56% of all U.S. investment by VCs. There were 1,804 VC deals in California in 2014 for a total of $27.15 billion.[5] Not surprisingly, Silicon Valley is the region that continues to dominate VC financing. Here are the results for Q2 and Q3 for 2015 (the latest numbers available):[6]

Region	Q2	%	Q3	%
Silicon Valley	$8,897,837,000	52%	$8,038,528,100	48%
New England	$1,507,660,600	9%	$2,051,542,400	12%
NY Metro	$2,363,121,000	14%	$1,912,641,700	12%
LA/OrangeCounty	$1,415,092,400	8%	$1,058,453,300	6%

Even combining all of LA County and Orange County results in just 8% (Q2) and 6% (Q3) of VC funding. VC funding for Long Beach firms in that time frame was $0. VC firms look to Silicon Valley first – that's why the funding occurs there, and that's why VC firms are headquartered there.

Technology regions require two fuels: technology and capital – and Long Beach is not in the upper percentiles for either.

Component Four: Critical Mass

Success breeds success and technology breeds technology. The size of a technology cluster is the very best predictor for large future growth. Large tech clusters attract talent, financing and ideas and become organic development grounds for new firms. Why? Here's a quick summary:

> "Tech ecosystems have a natural built-in multiplier effect, in that successful startups tend to give rise to multiple additional successful startups, as acquisitions take place and founders and other employees leave to start new companies. This serves to reinforce the growth of an ecosystem. Doubleclick famously has given rise to dozens of successful startups including Gilt Groupe, MongoDB, Business Insider, Right Media, Moat, Catchpoint and many others."[7]

Long Beach does not have a deep inventory of tech firms or tech employment. Without a critical mass – either in number of firms or employees – a region is not a tech center and becoming one is very difficult.

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[5] SSTI, January 22, 2015)
[6] PwC/NVCA MoneyTree™ Report, Data: Thomson Reuters
[7] Nick Beim, "The Rise and Future of the New York Startup Ecosystem", TechCrunch.com, February 28, 2014.

Recommendations: Enough with Doom & Gloom. What Can be Done?

Long Beach would like to build a more robust tech sector. To do so, let's begin with what doesn't work:

- Self-declaring Long Beach a tech center.
- Creating a catchy nickname.
- Thinking Long Beach can get a new UC campus to solve the research university issue.

Let's examine what can work:

- Leveraging existing assets.
- Managing expectations.
- Providing information and support.
- Creating a reasonable plan and plugging away.

Component One: Leverage Existing Assets

Long Beach has three key assets that can be very important in developing itself as a tech center: affordability, location and livability.

1. *Affordability*

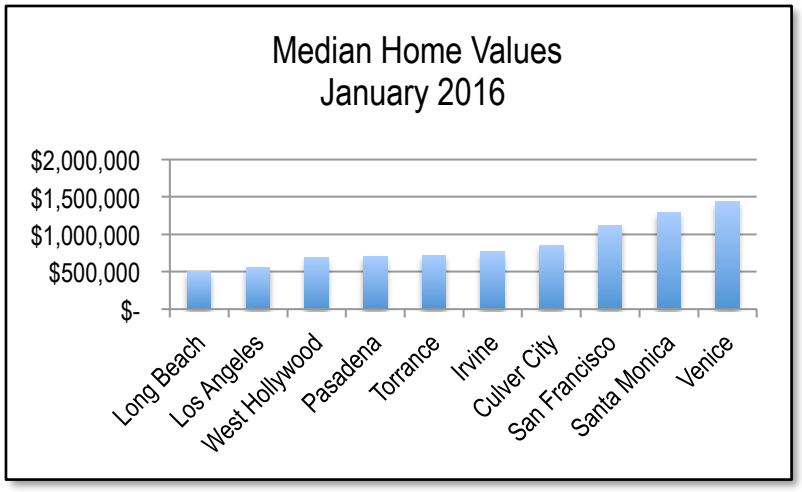
Commercial lease costs are lower in Long Beach. Tech firms are paying a premium to be on the Westside (Santa Monica, Venice, West LA, etc). For start-up and early stage firms, controlling costs by reducing facility expenses can be an important location decision. Here are average commercial office rates in key areas:[8]

- Westside LA/Santa Monica $4.56/sf
- Downtown Los Angeles $3.10/sf
- Long Beach/South Bay $2.31/sf

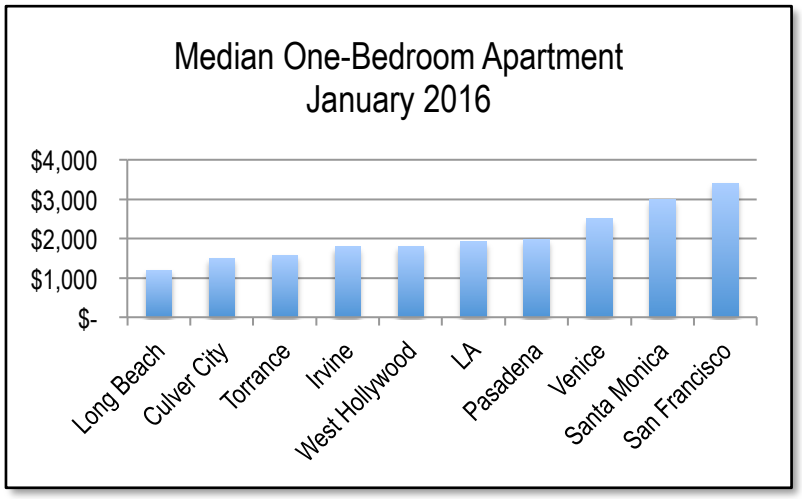
For a 1,000 square foot office, the annual difference between Long Beach and Westside is $27,840 – not insignificant for a start-up/early stage firm – and of course the margin increases as the square footage increases.

Affordability also means affordable residential real estate. Entrepreneurs and tech employees need housing too – and the more affordable residential housing in Long Beach is an asset. The following chart compares median home values for Long Beach and various California cities and communities.

[8] CBRE Marketview, Greater Los Angeles Office Report, Q4, 2015.



This chart compares median one-bedroom apartment rentals for those same cities. (The cost of a one-bedroom apartment in San Francisco at over $3,300 per month is extraordinary.)



2. Location

Commercial rents are much lower in the Antelope Valley (Lancaster and Palmdale) than on Silicon Beach (Santa Monica, Venice, West LA), but tech firms are not likely to move there because it's too far away from where they'd like to be. But Long Beach is fairly close – and as such becomes a reasonable alternative. Here are drive times to LA's tech hub, the Westside:[9]

Location	Miles	Time (no traffic)
Downtown LA	17	32 minutes
Long Beach	31	38 minutes
Glendale/Pasadena	24	42 minutes
Lancaster/Palmdale	70	1 hour 20 minutes

[9] Google Maps, January 2016.

Reasonable proximity to a tech center is an enormous asset, because a well-positioned nearby location can lure firms. That's been the Burbank/Glendale strategy for the Entertainment Industry for years: target the overflow by using zoning/permitting flexibility (such as relaxing density allowances) to overcome other location considerations.

3. Livability

While great swaths of Long Beach are suburban, it has an urban core, and having an urban environment is a significant plus for a prospective tech center as two recent reports state:

- "Inventive capacity and activity—including R&D investment, a science-oriented workforce, collaboration, and patented output—are realized most completely in the nation's metropolitan areas. Metropolitan areas facilitate the matching of workers to firms, learning between specialists, and the sharing of suppliers, customers, and regional assets."[10]
- "Many startups have emerged in New York and other big cities, as that's where the primary talent pools and customer bases for these industries are. This broad urbanization of startup ecosystems has been visible not only in the rise of New York and other big cities that had not previously been major technology innovation centers – including London, Berlin, Beijing, Shanghai, and São Paulo – but also in the shift in the center of gravity of established technology ecosystems toward urban centers."[11]

Tech entrepreneurs and employees have families too, and if there's one group that appreciates the value of education it's tech workers. Long Beach's award-winning educational infrastructure – Long Beach Unified, LBCC and CSULB – is also an important asset.

Long Beach – a coastal city with significant cultural, educational and recreation assets – should market itself as an Active Urban Lifestyle city; that's the kind of city that attracts Millennials, a key component for any tech center.

<u>Component Two: Manage Expectations</u>

Start here: Long Beach is not a tech center now and will not become a tech center in six months. Unrealistic appraisals and raising unreasonable expectations lead to disappointment. Managing expectations increases the chance of long-term success.

<u>Component Three: Provide Information and Support</u>

The City can use Long Beach's assets – location, affordability and livability – to develop a larger high tech presence, but only if that information is available, accessible and communicated successfully. Up to date listings of existing tech firms, a database of available – and affordable – real estate and on-going marketing of Long Beach's livability assets are a start. Until it is able to handle this responsibility effectively, the City should consider contracting out this task to an entity whose single purpose is tech development.

[10] Jonathan Rothwell, José Lobo, Deborah Strumsky, and Mark Muro, op. cit., p. 14
[11] Beim, op. cit., p. 4

Component Four: Develop a Reasonable Plan and Plug Away.

Long Beach should develop a reasonable, long-term implementation plan to increase tech development, adopt the plan, and then stick with it. The basis of that plan should be accurate information, clear-eyed assessments, reasonable objectives and a realistic philosophy. *And then plug away.*