Building a Digital City

Challenges, Opportunities, and Lessons from San Francisco

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Commissioned by Bloomberg Philanthropies, The Boston Consulting Group set out to understand the emergence of San Francisco’s technology sector, as well as the challenges and opportunities it presents to the city. The aim is to uncover insights that can help other digital cities—and those aspiring to become digital cities—as they grow.

**Undeniable Benefits, Pressing Challenges**
From an economic standpoint, San Francisco is reaping the rewards of this thriving sector; the Bay Area boasts the highest GDP per capita in the nation and an unemployment rate much lower than the national average. At the same time, real estate affordability is a pressing challenge, for residents and businesses alike, and there is a fear that wealthy technology workers moving to San Francisco are squeezing out other residents—threatening to transform a once-diverse city into an exclusive community.

**A Chance to Set the Example**
How San Francisco addresses its challenges while maintaining its momentum will help chart a path for many other cities with similar aspirations. This includes ensuring that the city infrastructure keeps pace with the growing, changing demands of a leading economy, and it especially involves the issue of affordability.
San Francisco is one of the most dynamic regional economies in the U.S., enjoying robust economic growth and low unemployment because of a booming technology sector. Although the Bay Area has had a significant tech presence for some time, the urban tech boom in San Francisco is a recent phenomenon—one mirrored in other great “digital cities” such as New York and London.

On behalf of Bloomberg Philanthropies, the Boston Consulting Group set out to understand the following core questions: Why did San Francisco’s technology sector emerge? As it grows, what challenges is the city’s tech sector facing? And how can the city continue its momentum as a hub for the technology sector and address these challenges? The aim was to uncover insights that can help other digital cities—and those aspiring to become digital cities—as they grow.

The research included interviews with more than 30 San Francisco–based leaders from technology companies, nonprofit organizations, educational institutions, and companies in other industries. Multiple focus groups and a survey of 619 San Francisco residents also revealed prevailing attitudes toward and perceptions of the local technology sector.

Overall, this study found that San Francisco remains a magnet for technology companies and workers, and as a result the city has seen some of the strongest economic performance in the country. However, along with economic success come certain natural tensions—especially with regard to the affordability of life in the city—which in turn strain the relationship between the tech sector and those city residents who do not work in tech.

These were among the key findings:

- From an economic standpoint, the local San Francisco Bay Area technology sector has been thriving. There are 17 tech companies in the Bay Area that are valued at $1 billion or more, more than CB Insights’ entire nationwide list of 15 for last year; and 79 tech companies in the Bay Area are valued higher than $100 million. An additional 17 San Francisco Bay Area tech companies became public through IPOs in 2013.

- San Francisco is reaping the rewards of this growth. The region has the highest GDP per capita in the nation—nearly twice the national average. And as of February 2014, the San Francisco city unemployment rate was 5.2 percent, versus a California average of 8.0 percent and a U.S. average of 6.7 percent.
The technology sector continues to have highly visible support from the city itself. San Francisco mayor Edwin Lee meets regularly with different tech firms and has spearheaded the Central Market Strategy to encourage urban development while providing companies with incentives to locate and remain in San Francisco.

Real estate affordability is the most pressing and prevalent challenge. The average cost of housing in San Francisco is $764 per square foot, and this has grown 20 percent year over year.6

The average rent in San Francisco as of 2013 was $3,396 per month, which is a 2 percent premium versus New York, 6 percent versus Boston, 26 percent versus Washington, and 56 percent versus Los Angeles. On this measure, San Francisco rent is the most expensive compared with any city in the nation.7 Furthermore, only 14 percent of homes in San Francisco are considered affordable to the middle class, compared with 63 percent on average across U.S. metropolitan areas.8

It comes as no surprise that 96 percent of those polled said that the cost of living was a challenge for people living in San Francisco. The number-one reason they give for this problem is “many wealthy people here who are willing to spend more on housing and other things.”

Approximately half of those polled see themselves moving out of San Francisco over the next decade, and the main reason given was quality and availability of housing and cost of living.

Businesses are also finding it difficult to find affordable commercial office space with the transportation links they and their workers need. For example, owing to its proximity to Caltrain, the SoMa (South of Market) neighborhood has the highest commercial rent and lowest commercial real estate vacancy in San Francisco.9, 10

Education is a dominant concern: of those polled, only 13 percent said that they believe that San Francisco public schools are preparing young residents for jobs in the growing tech sector.

Despite the many high-profile displays of tensions resulting from the affordability crisis, 73 percent of those surveyed believe that technology companies are good for San Francisco, and 60 percent feel technology workers are good for San Francisco.

When it comes to the “Google buses” controversy, 77 percent of residents believe that the buses help reduce the number of cars on the road, and 59 percent believe the buses are being blamed for issues they did not directly create.

More than half—56 percent—believe that San Francisco city government should help attract technology companies and help them grow.
• On a more personal level, 68 percent of those polled fear that wealthy technology workers moving to San Francisco are squeezing out other residents and threaten to transform a once-diverse city into an exclusive community. And only 36 percent believe the growth of technology companies in San Francisco has created new job opportunities for people like them.

• San Franciscans do not believe that tech companies have become the good corporate citizens that they want them to be. Although 83 percent believe the tech companies in San Francisco have a responsibility to give back to the city, two out of every three San Francisco residents either disagree or are unsure that “technology companies currently give back meaningfully to San Francisco and the Bay Area.”

A Magnet for Technology Companies and Workers
For many years, the tech industry’s center of gravity has been in Silicon Valley, among the headquarters of the large semiconductor, computer, software, and first wave of Internet companies. Recently, however, technology leaders such as Salesforce.com, Twitter, and Zynga have chosen to be based in San Francisco, and companies like Google and Yahoo! are opening large offices in the city as well. Changes in venture-capital (VC) investment further illustrate this trend: as of 2012, San Francisco boasted $7 billion in VC investment, compared with $4 billion in Silicon Valley.11

Judging by resident interviews and focus groups, it appears that this move to the city is largely talent driven. With its vibrant social and cultural scene, San Francisco is simply a more attractive place to live for the creative technical talent that fuels many of these companies. And while this is not a new phenomenon, the increasing emphasis on design-centric “interface” skills—especially among consumer Web and mobile-app companies—is serving to further accelerate the shift.

The Keys to Continuing This Economic Momentum
Drawing on previous research examining both New York City and San Francisco, BCG developed a five-point framework for understanding the foundation necessary for supporting the growth of the tech sector in a city economy. Not surprisingly, San Francisco excels on many of these dimensions—but not quite all of them.

San Francisco exhibits its foundational strength in the following areas:

• A Strong Talent Pipeline. With more than 50,000 engineers, San Francisco has one of the largest concentrations of engineering talent in the world.12 San Francisco also tops the list in college degrees per square mile13 and enjoys proximity to top schools like Stanford University and the University of California, Berkeley. In fact, San Francisco was ranked as one of the top five cities for “tech talent” with respect to attracting and retaining highly skilled technology professionals.14

• A Vibrant Tech Community. Beyond the strong tech culture and networks that stem from the sheer abundance of tech workers, a number of key factors are helping nurture this community:
Technology mentorships (both formal and informal)

Large and integrated networks (such as shared-workspace communities)

Interest groups (such as sf.citi, the Chamber of Commerce, the Bay Area Council, and the Silicon Valley Leadership Group)

Magnet companies (such as Google, Facebook, Salesforce.com, and Twitter)

- **Local, Early-Stage Capital.** San Francisco has the highest VC density in the world, and it is ranked number one for early-stage venture funding. In fact, San Francisco has overtaken Silicon Valley to become the nationwide leader in VC investment, drawing roughly one out of every four dollars spent in the U.S. One interviewee pointed out that the prevalence of VC companies in the San Francisco Bay Area also contributes to deep intellectual “bench strength,” a profusion of people with start-up know-how from building their own companies.

- **Strong Industry Clusters.** With 30 of the Fortune 500 companies based in the San Francisco Bay Area, the local technology sector benefits from the considerable presence of other industries, including energy, retail, health care, and financial services. This is helpful because often technology companies are helping existing industries innovate and develop digital and technological solutions.

One notable factor, however, has proven to be a challenge for the city:

- **A Robust and Affordable Infrastructure.** Infrastructure is definitely an area for improvement in San Francisco and perhaps a natural source of tension in a rapidly growing economy. In many ways, poor infrastructure makes the city a difficult place to live and conduct business. This includes challenges in affordable housing, transit, and education. (See Exhibit 1.)

**Addressing Infrastructure Challenges**

Our research shed light on a variety of infrastructure challenges that have an impact not only on the technology sector but on the broader community as well.

**Real Estate Affordability Is the Most Pressing and Prevalent Challenge**

Although the high cost of housing most directly affects residents, it translates to corporations’ “bottom line” by necessitating higher salaries for employees. In 2012, workers in the San Francisco Bay Area had an average hourly wage of $31.77, which is about 44 percent above the nationwide average of $22.01. With this, residential affordability becomes a challenge to the continued growth of the local San Francisco technology sector, as well as to the growth of other local corporations.

Affordability of space is also an issue for companies looking to establish and expand their presence in San Francisco, as seen in the experience of one rapidly growing technology start-up. The company employs approximately 500 people, and in looking for office space, knew it was constrained by access to public transportation,
which initially led the company to look only in the Mission, SoMa, and the Financial District—all common commercial districts on the BART train line. However, given the cost and competition for offices in these areas, the start-up found it impossible to find an affordable space that could also expand as the company grew. The option that best met these criteria was located in the Central Market/Tenderloin district. While the company leaders and employees are quite pleased with the office design and cultural benefits of being located in the heart of an urban environment, the company faces ongoing challenges—from concerns about street cleanliness and the significant homeless population to high crime levels.

San Francisco is currently taking steps toward real estate affordability. For instance, Mayor Edwin Lee has put forth a seven-point housing plan, with the overall goal of streamlining housing development and a commitment to build or rehabilitate 30,000 units of housing by 2020, with one-third of those permanently affordable and the majority affordable to middle-income workers.

**UNRELIABLE TRANSIT HAS RIPPLE EFFECTS THROUGHOUT THE ECONOMY AND EVERYDAY LIFE**

Interviewees expressed concerns over the state of public transportation in San Francisco.
Francisco, indicating that limited transportation routes across the city have placed artificial constraints on office space availability and pricing. Many San Francisco Bay Area companies have resorted to commissioning their own employee shuttles and buses to places like the Peninsula. However, this solution has proved to be a source of controversy, as discussed previously. (See the sidebar “Understanding the ‘Google Buses’ as a Proxy for Other Issues.”)

Those surveyed also expressed concern over productivity losses for workers and students, given that it can take 45 minutes or more to travel just two miles on public transit. Boys & Girls Clubs of San Francisco claims that time on public transit can take 2.5 hours per day for high-school students—time that is taken away from learning subjects including science and math.

To address the city’s transit needs, Mayor Lee convened the Transportation 2030 Task Force, which developed recommendations including investing in the core systems of the San Francisco Municipal Transportation Agency (Muni) and the city’s

**UNDERSTANDING THE “GOOGLE BUSES” AS A PROXY FOR OTHER ISSUES**

The practice of providing private buses to transport workers from their homes in San Francisco to offices in Silicon Valley and elsewhere has raised some public scrutiny over the past year. The buses, often colloquially referred to as “Google buses,” have been the target of protests, public criticism, and online activism.

Much of the public debate on this issue has focused on the question of whether the practice of providing buses is exacerbating the real estate crunch in many of San Francisco’s more desirable neighborhoods. Activists have suggested that the availability of private buses makes it possible for highly paid tech workers to live in San Francisco rather than in the suburbs of Silicon Valley—resulting in increasing demand for limited housing stock and displacing long-time, non-tech-industry residents.

Some media reports have presented the issue even more starkly—as a fundamental conflict between tech sector workers and San Franciscans who work in other fields. As part of our research, we sought to understand the attitudes of San Franciscans toward the buses and the tech workers who ride them. The results painted a far more complex picture: San Franciscans are broadly aware of the tech company buses, with 92 percent of respondents having heard of the bus services. Although only 5 percent of respondents in our survey personally ride one of these buses, 34 percent know someone who does.

Although 72 percent of respondents believe that tech workers who live and work in the city are good for San Francisco, that number drops to only 43 percent when asked about workers who live in San Francisco but commute to Silicon Valley for their jobs. A significant majority of respondents, 77 percent, agree that the buses help reduce traffic by taking tech company workers’ cars off the road.
streets with a rehabilitated fleet, more vehicles, updated maintenance facilities, critical pedestrian and bicyclist safety improvements, and repavement of many streets. To move forward with these recommendations, the Task Force provided a roadmap to leverage federal, state, and local monies and fund the system in a sustainable way. Mayor Lee has acted on the recommendations and is supporting a $500 million general obligation transportation bond and a measure to increase the local vehicle license fee on the November 2014 ballot.

**Caring for the Homeless and Keeping Streets Clean and Safe Are Priorities for Residents**

San Francisco residents surveyed rate the city 5.4 out of 10 on street cleanliness and 4.0 out of 10 on its care for the homeless population and those living in poverty. There was an overall sense of disappointment that such a “wealthy city” like San Francisco cannot better address the needs of its most visible homeless population, especially when compared with other metropolitan cities, such as New York and Chicago.

**Education Poses Both Near-Term and Longer-Term Challenges**

On average, San Francisco parents surveyed rated the public-school system in San Francisco a 5.4 out of 10. Furthermore, many of the executives interviewed for this study felt that there are limited education options for their employees’ children within the city, raising concerns for their ability to recruit and retain key talent.

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**UNDERSTANDING THE “GOOGLE BUSES” AS A PROXY FOR OTHER ISSUES**

(continued)

Yet, a separate survey of tech workers who ride private buses found that if the buses did not exist, 40 percent would move closer to their job versus 10 percent quitting their job. This suggests that the presence of private buses at least partly contributes to the willingness of tech workers to live in San Francisco—which, in turn, contributes to increased demand for limited housing stock.¹

Placed in the context of the broader study of tech companies, workers, and the San Francisco community, it is probably most accurate to see the private buses as both a symbol of the underlying challenges that have arisen alongside the rapid expansion of the urban tech sector—affordability, transit, housing, education, and others—and as one of many factors contributing to those challenges.

Ultimately, the most telling statistic may be the broad recognition that the buses are a proxy for other challenges facing San Francisco, such as alleviating a supply-constrained housing market so that more people can live there. Half of respondents feel that the buses are getting too much attention, and 59 percent agree that the buses are being blamed for a lot of other issues the city needs to address.

**Note**

Interviewees specifically cited a number of key concerns with K–12 education:

- Lack of critical mass to get much-needed funding in public schools
- Inequality of academic access and exposure across ethnic and wealth groups
- Curriculum rigor, particularly with science, technology, engineering, and math (STEM) disciplines

The STEM curriculum is a common concern in the context of workforce development and building a local long-term talent pipeline for the San Francisco technology sector. At the college level, there was concern over curriculum misalignment with the needs of the local technology job market. Today’s technology companies seek multidisciplinary leaders who not only have programming and coding training but also can effectively lead teams and understand business fundamentals.

Interviewees were also concerned that students were not learning the most up-to-date programming languages, such as Ruby and Python. Currently, three-quarters of Silicon Valley’s highly educated residents are from outside California, and half are foreign-born. Cities around the globe are investing in building their own local technology hubs. This will make global competition for talent even more difficult, and the need for a competitive local talent supply will be increasingly important in maintaining the competitiveness of the local technology sector in the long term.

Since taking office, Mayor Lee has made record investments in the city’s public education system and continues to increase funding with a 2014 budget proposal of $66 million for public schools and $27 million more for universal preschool. This funding is paired with the mayor’s efforts to reauthorize the Children’s Fund and the Public Education Enrichment Fund. Going beyond broad financial support, the mayor has “adopted” San Francisco’s middle schools and is working with private industry to bring technology access and educational support to all of the city’s middle-school students.

Integrating the Technology Sector into the Community

Although the affordability crunch, brought on by the rapid economic growth of San Francisco, has uncovered real tensions between the tech sector and residents, it is important to put these concerns in context.

**Many Residents Recognize the Economic Benefits of the Local Tech Sector...**

San Francisco city residents are generally positive toward the economic benefits of the local technology sector, which may seem counter to some recent events. Although those protesting company-commissioned buses garnered significant media attention, 73 percent of San Francisco residents believe that technology companies are good for San Francisco, and 60 percent feel technology workers are good for San Francisco. (See Exhibit 2.)
In fact, many residents feel that protesting the buses is misdirected and misguided. As one resident explained about technology workers in San Francisco, “They’re here, they’re humans, and they’re working. How could I blame them?”

Indeed, the majority of residents surveyed believe that the economic benefits of having these technology companies in San Francisco outweighed the costs. They cited the boost to local businesses from wealthy tech employees as well as company taxes being poured back into the community among the many benefits. Furthermore, young residents in San Francisco employed outside of the technology industry appreciated living in such a technologically savvy city, with everyday benefits such as mobile apps built for public transit, as well as the prevalence of social media.

**...BUT MANY DO NOT SEE THE COMMUNITY AND PERSONAL BENEFITS**

As the technology industry in San Francisco matures, city residents have begun to expect technology companies to play a greater role in the community. Eighty-three percent believe that tech companies in San Francisco have a responsibility to give
back to the city, and 48 percent believe the tech companies have a special responsibility to give back even more than companies like banks and manufacturers.

Yet two out of every three San Francisco residents either disagree or are unsure that “technology companies currently give back meaningfully to San Francisco and the Bay Area.” In focus groups, most San Francisco residents could not cite examples of tech philanthropy. Furthermore, while residents generally have a favorable view of local technology entities, they also view them as slightly lagging in contributions to the city versus other industries and companies. (See Exhibit 3.)

So, although overall perceptions are positive, with most people believing the benefits outweigh the downsides, there is opportunity for the tech sector to do more for the city and community.

**Stakeholders Agree That the Maturing Local Tech Sector Has a Role to Play in the City**

As expressed in interviews, technology leaders have a strong desire to give back to the community. Many stated that it was simply “the right thing to do” and that community philanthropy is built into their company’s DNA. This is evidenced by the large amount of effort and thought that companies already devote to community outreach.

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**EXHIBIT 3 | Positive Image Is Correlated with Perception of Contributions to San Francisco**

<table>
<thead>
<tr>
<th>Contribution to SF (1–5)</th>
<th>Image (1–5)</th>
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<td>1</td>
<td></td>
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<tr>
<td>Low</td>
<td>Unfavorable</td>
</tr>
</tbody>
</table>

How favorable or unfavorable of an image do you have of the following?

- Kaiser Permanente
- SF health-care companies
- Wells Fargo
- Safeway
- SF banking companies
- SF city government
- SF MTA / Muni
- Tech company CEOs
- Tech company buses
- Tech company workers
- Airbnb
- Facebook
- Twitter
- Google
- Genentech
- Apple
- Tech companies
- Levi Strauss & Co.
- SF retail and grocery stores
- SF health-care companies
- Wells Fargo
- Safeway
- SF banking companies
- SF city government
- SF MTA / Muni
- Tech company CEOs
- Tech company buses
- Tech company workers
- Airbnb
- Facebook
- Twitter
- Google
- Genentech
- Apple
- Tech companies
- Levi Strauss & Co.
- SF retail and grocery stores

Key themes

1. Tech companies and tech workers have a generally favorable image but lag slightly in perception of contribution.
   - For these two groups, image is on par with that of retail and grocery and is more favorable than health care and banking.
   - Google is an exception; it has a positive image and high perception of contribution.

2. Technology company CEOs, San Francisco city government, and MTA/Muni are considered most unfavorable.
   - Despite high-profile philanthropic efforts by tech CEOs, little awareness by SF residents.

3. Overall, there is considerable correlation seen between positive image and perception of contributions to SF.

Source: BCG San Francisco resident survey 2014 (n=619).
Even smaller companies that do not have significant monetary resources encourage and enable their employees to volunteer and do community outreach. Nearly all companies have some engagement with nonprofits and the community, and the larger tech companies (like Salesforce.com) contribute particularly heavily.

**Education Is Seen as an Area Where the Local Tech Sector Should “Give Back”**

There was 100 percent alignment across the interviewees (including those from corporations, education, and nonprofits) on the type of philanthropy that technology companies should focus on: education. Technology companies have innate intellectual, infrastructural, and monetary resources to contribute to education. Additionally, these kinds of contributions are considered a clear “win win,” in that they create qualified homegrown talent for the companies, provide resources and thought partners to the schools, and give students a huge advantage with respect to future opportunities.

In regard to the other infrastructure-related pain points in San Francisco, few residents expect technology companies to lead in addressing housing, transit, and street infrastructure challenges. Nevertheless, residents responded very positively to the idea of local companies using their expertise to develop technologies that make it easier to move around the city, such as public transportation apps, parking spot finders, or even further evolved sharing-economy services. Another approach is for companies to simply contribute directly to infrastructure-related issues, as seen in Google’s recent initiative to provide free youth transportation on Muni.19

There is also great opportunity for local technology companies to contribute in a way that marries their own unique perspective, capabilities, and corporate mission with the needs of the community. The tech sector has an exceptional opportunity to use its resources and abilities to make a lasting and sustainable commitment to the local area.

**Looking Ahead**

As a leading digital city, San Francisco is both reaping the benefits and facing the challenges of being the home to an increasing number of successful technology companies and their employees. How San Francisco addresses these challenges while maintaining its momentum will help chart a path for many other cities with similar aspirations. This includes ensuring the city infrastructure keeps pace with the growing, changing demands of a leading economy, and it especially revolves around the issue of affordability. The rapid pace of job growth has created a demand for real estate that is driving up prices and pressuring longtime residents and new workers, as well as the companies themselves looking for new and expanding space in the city.

While these tensions manifested themselves recently in high-profile flare-ups over private buses taking workers to corporate campuses outside the city, the situation is more complex. Residents, by and large, welcome tech companies and the economic growth that comes with them. Yet many are concerned about affordability and fear that it will force them to eventually leave the city they love.
There is a need and a real opportunity for the city leadership, the technology sector, individual companies, and their employees to come together to tackle many of these challenges. Technology itself is likely to be part of the solution, and the passion, commitment, talent, and growing resources of these companies will be critical to driving the next phase of growth and development in San Francisco.

**NOTES**
1. Survey methodology: BCG conducted a survey from February 28 through March 4, 2014, among an online panel of San Francisco county residents aged 18 or older. The survey received 619 usable responses, and to offset online survey bias and better reflect the city population, responses were weighted by household income, age, and race/ethnicity in the resulting analysis.
3. Capital IQ.
9. CBRE Research, Q4 2013.
16. Capital IQ.
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