

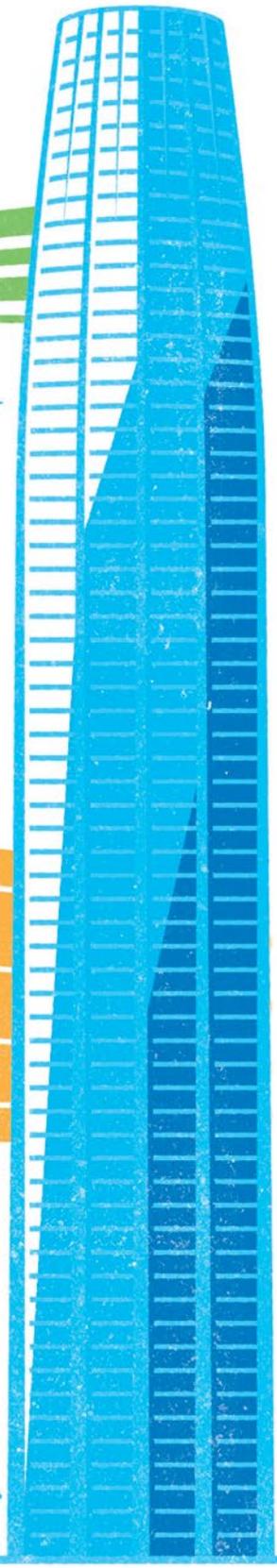
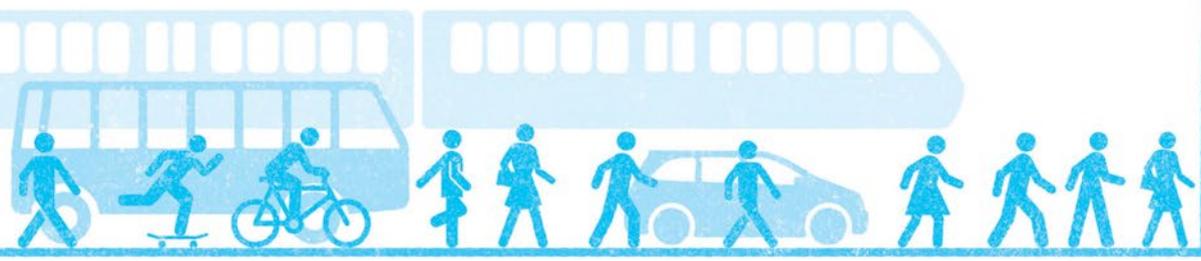


RETHINKING THE

Corporate Campus



The Next Bay Area Workplace



Contents

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Rethinking the Corporate Campus

The next Bay Area workplace

Executive Summary



Rethinking the Corporate Campus presents the findings of more than a year of interviews, discussions, convenings and research about Bay Area workplaces, with an emphasis on the fast-growing knowledge sector. It reflects contributions from a range of experts in planning, transportation, real estate, architecture, design and economics in addition to numerous private-sector employers. A multidisciplinary task force met regularly over the course of the effort to generate ideas, provide feedback and review draft findings. The SPUR Executive Board adopted this report as SPUR policy in March 2017.¹

Rethinking the Corporate Campus has three overarching objectives:

1. To understand how employers in the innovation economy make decisions about workplace location and form;
2. To recommend useful, achievable best practices for both employers and policymakers;
3. To improve the performance of a range of workplaces with respect to SPUR's policy agenda, including transportation, land efficiency, environmental impact and quality of life.

While the Bay Area has become one of the strongest economies in the world, it has been in spite of, not because of, our built environment. Now, as growth adds pressure to a problematic land use pattern and inadequate transportation and housing, an

¹ This effort builds on and connects several earlier SPUR policy reports, including *The Urban Future of Work* (2012), *Getting to Great Places* (2013), and the *Caltrain Vision Plan* (2017), as well as reports on the future of downtown San Francisco (2009), downtown San Jose (2014) and downtown Oakland (2015).

overlooked challenge to the economic competitiveness of the Bay Area derives from our sprawling employment geography.

The Bay Area economy has rebounded from the Great Recession and has added 640,000 jobs between 2010 and 2015. The unemployment rate in San Francisco and San Mateo counties was 3 percent in the fourth quarter of 2016.

Job growth is strongest in the knowledge sector, including technology. These jobs represent 22 percent of Bay Area jobs but account for 36 percent of 2010–2016 job growth.

Most new jobs are not near transit. Despite efforts by regional planners to incentivize transit-accessible locations, only 28 percent of new office development has occurred within a half-mile of regional transit. If San Francisco is removed, this figure declines to nine percent. Part of the reason more office development has not taken place in regional transit station areas is that local politics does not allow growth there.

Private automobiles account for 28 percent of the region's greenhouse gas emissions, the largest single source in the Bay Area.

Most people still drive to work. Recent data put the rate of commuting by single-occupant vehicle at 75.7 percent. In Santa Clara County, the most populous and job-rich county in the Bay Area, that figure is 86.4 percent.

In sum, recent growth is not reshaping the region – it is reinforcing existing patterns. Despite the efforts by some tech companies to grow in San Francisco, the post-recession boom is reinforcing the dominant suburban pattern where most jobs



Nvidia photo courtesy Nvidia; Adobe photo courtesy MKAZ; Twitter photo by SPUR.

are in auto-dependent places away from rail. Notwithstanding policy efforts to shape the region's growth toward a more efficient and sustainable form, recent expansion looks very much like the existing pattern, with familiar and disappointing results for the region's performance on key planning, transportation and environmental measures.

However, the Bay Area contains a wide range of job centers. They perform very differently with respect to transportation and land efficiency. We examine eleven different employment districts with data on their travel patterns, walkability, employment density and urban form.

The suburbanization of work in the Bay Area has a distinct history, closely bound to the emergence of information technology. Most Bay Area workplaces evolved in the postwar period, and reflect the cheap land, abundant roadway capacity and suburban preferences of the time. They also embody the Silicon Valley's culture of rapid "churn" — or firm growth and decline. This has resulted in commercial spaces that are highly flexible but also "disposable": standardized modules of undistinguished buildings and dedicated parking with little connection to surrounding uses, designed to be acquired and dispensed with quickly, and completely dependent on the private automobile.

A wide range of factors inform employer decisions about workplace location and form, but **four major factors emerged as key drivers:**

1. **Talent acquisition and retention**, including the provision of transportation, employee location preferences, and a variety of perks and amenities.
2. **Security and intellectual property**, from the desire for remote locations to the placement of buildings and the willingness to incorporate public-facing amenities.

3. **Floorplate size**, or the square footage of usable space on one floor of a building. Many firms seek to maximize floorplate size in order to create highly flexible environments that facilitate team interaction.
4. **Growth and exit strategy**, which encourage expansion into standardized, modular buildings and sites that are widely available and can be sold or leased easily.

SPUR's recommendations for Bay Area workplaces cover three major subjects:

Location

How to accommodate growth in station areas and downtowns, identify suburban locations for transformative intensification, and encourage firms to select transit- and amenity-rich locations.

Commute

How to reduce drive-alone commuting to employment locations, improve other transportation modes, and create effective policies and partnerships to address transportation issues.

Form

How to improve the site selection and building design of Bay Area workplaces, particularly those in car-dependent locations, in order to support a walkable and transit-accessible environment.

A full list of recommendations begins on page 32.

INTRODUCTION

21st Century Work, 20th Century Workplaces

Over the past half-century, technology and innovation have become the lifeblood of the San Francisco Bay Area economy. Most of the region's new jobs are in the knowledge sector of the economy.² The Bay Area leads the nation in patents, and most of the giants of the digital world are based here. But the office environments where this work takes place do not reflect the innovation occurring within. The success of these industries has so far relied on a pattern of land use and development that comes with high environmental and social costs. The suburban corporate campus remains the predominant real estate solution for the region's employers. With isolated single-use buildings set behind vast parking lots, far away from the public street, it is a model that reinforces dependence on cars and pushes sprawl development into open spaces and agricultural lands.

This environment emerged in an era of wide-open spaces, cheap land and easy mobility by car — an era that is long past. Today that same environment, built for near-term expedience, is expensive, congested and ubiquitous. Nightmarish commutes and soaring home prices are taking a toll on the Bay Area's prized quality of life, challenging its long-term competitiveness. We have reached the limits of our 20th-century landscape, and our

physical environment — so disposable and yet so persistent — is holding us back.

Employers have not necessarily chosen this landscape. Companies are competing fiercely to attract and retain highly qualified workers, and many would prefer (or at least are amenable to) places that are walkable, amenity-rich and well-served by transit.³ But despite being popular among many employees, such settings are in short supply, and other factors — including the available building stock, the need to be in close proximity to clusters of specialized firms and workers, and the pressure to address space needs quickly — often prevail.

Downtowns and areas near transit stations — the most appropriate locations to accommodate new growth — are often the most difficult places to build. Many local zoning codes are highly restrictive, and new development can be contentious and costly. As a result, most job growth occurs “out of sight, out of mind” in remote single-use campuses.

These suburban job centers consume far more land, include far more pavement and generate far more car trips, and thus have a much higher environmental footprint than more compact settings. Jobs in sprawling, low-density settings produce more air pollution, water pollution and heat impacts than their urban counterparts. Workers drive more miles, use less mass transit and are far less likely to walk or bike, and thus are subject to the health impacts of a sedentary lifestyle. And above all, these environments result in much greater emissions of heat-trapping greenhouse

² Since the 1990s, the fastest-growing portion of the Bay Area economy has been the highly specialized and diverse knowledge sector, which includes the jobs of software developers, designers, consultants, financial analysts, publishers and managers of companies. Our definition of knowledge services includes professional, scientific and technical services; finance; information and management of companies (NAICS codes 51, 52, 54 and 55). Knowledge jobs were responsible for 36 percent of the growth in regionwide jobs from 2010 to 2014.

³ Many global technology firms locate in dense urban centers worldwide but choose suburban locations in the Bay Area. One example is Google. See: <https://www.theguardian.com/technology/2016/nov/15/google-commits-to-massive-new-london-hq>



Samsung.

gases, worsening the region's contribution to climate change just as ambitious state reduction targets are taking force.

But there are other types of job centers that, measured empirically, perform significantly better. This distinction has significant ramifications for the region and its ability to compete over the long term. Job centers that are denser, include a mix of different uses, encourage people to walk rather than drive and are well-served by public transit are sustainable, efficient and high-performing. They offer a range of important advantages:

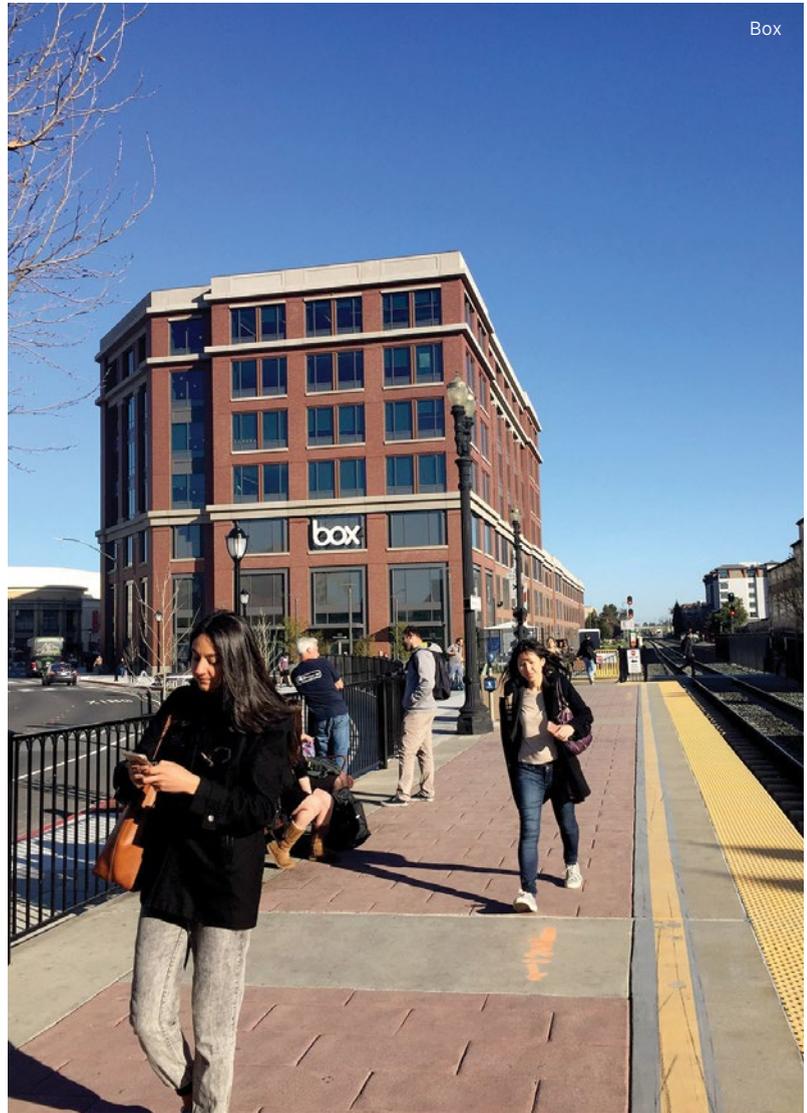
- Allow the region to accommodate growth, supporting a resilient regional economy
- Reduce drive-alone commuting, limiting the impacts of congestion
- Reduce greenhouse gas emissions, air pollution and urban stormwater runoff
- Make efficient use of scarce land, reducing sprawl
- Create active, engaging places that sustain the Bay Area's unique identity and quality of life

Rethinking the Corporate Campus examines the forces that shape our employment landscape, highlights the implications of different models and recommends policies and practices to tackle two key questions:

1. **How do we encourage employers to choose efficient, sustainable, high-performance locations?**
2. **How do we create locations that are *more* efficient, sustainable and high-performing?**

The good news is that with the traditional office-park model under pressure, new solutions are proliferating. They offer lessons for how to reduce congestion and carbon emissions while increasing competitiveness and quality of life, providing a toolkit for the region. By illuminating these lessons, we hope to accelerate their widespread adoption.

Changing the Bay Area's employment landscape will not be easy. It will require us to challenge assumptions and practices that are deeply embedded in our policies, professional practices and market expectations. It will require physical, regulatory and cultural retooling. But it is essential work if the Bay Area is to continue functioning — both practically and culturally — as the preeminent global center of innovation. We would do well to apply our innovative spirit to this challenge.



Box

Photo by Laura Ordonez, Bay News Now

Growing Great Places: A Vision for Bay Area Job Centers

The Bay Area can achieve a future where our economy continues to grow while our development patterns become more efficient, effective and sustainable. We envision a Bay Area where:

- Growing companies in search of real estate find that the path of least resistance is also the path to walkable neighborhoods, easy commutes and enthusiastic workers.
- A constellation of lively, well-connected urban centers rings the Bay, each bustling with people sharing ideas and energy, each a memorable place to live, work and play.

When Box outgrew its Palo Alto headquarters, it moved to this Redwood City location just steps from the Caltrain station.



Bishop Ranch Office Development

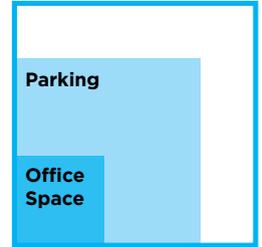
Building area: 2 million square feet
Site area: 100 acres

Parking: 4,500 surface parking spaces

Transit ridership: Under 5 percent

FIGURE 1

Building Out vs. Building Up: Two Looks at 2 Million Square Feet of Office Space



Portion of 100-acre site filled by building and parking footprint

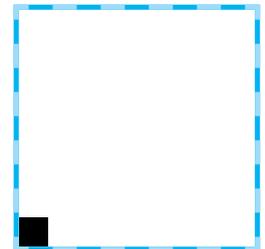


Downtown San Francisco Office Buildings

50 Fremont Street
Building area: 740,000 square feet
Site area: 1.14 acres
Parking: Below-grade

425 Market Street
Building area: 960,000 square feet
Site area: 1.08 acres
Parking: below grade

Total: 1.7 million square feet
Transit ridership: More than 50 percent



Portion of a hypothetical 100-acre site filled by building footprint (parking underground)

A Word About Economic Diversity

This report focuses on directing the growth of our most dynamic industries to create efficient, sustainable and high-performance job centers. It does not address the overall balance of different sectors and job types in the region, in particular:

- The role of manufacturing and other industrial jobs in a region under intense cost pressure in which otherwise viable enterprises struggle to afford land and labor.
- The implications for social equity and inclusion of a regional economy in which the bulk of new jobs require a college degree.
- Global competition in the knowledge sector from other locales and rapid technological changes that may pose unforeseen challenges to the Bay Area's economic strength.

In several jurisdictions, the preservation of industrial land and jobs has been identified as an important local priority. By targeting specific locations for knowledge-sector (i.e., office jobs) and encouraging higher job densities in those locations, we would hope to reduce pressure on other industries appropriate to peripheral locations.

These are significant concerns worthy of consideration. SPUR has published numerous reports on the nature of the Bay Area economy and strategies for creating pathways for low-income people into the region's growth industries, including the *Economic Prosperity Strategy* (2014).

- Young creatives and entrepreneurs can find — and afford — the space to take risks.
- Today's residents can find a place in the region's economy — and expect that their children can too.
- Workers can easily fit activities like running errands, exercising, taking care of their families and meeting their friends into a typical work day — all without getting into a car.
- The best inventions of the past and future — from streetcars and sidewalks to bullet trains and self-driving shuttles — are pressed into the service of a new urban future.
- Silicon Valley the idea becomes Silicon Valley the place: beautiful, engaging, dynamic and diverse.
- We connect our innovative capacities with our environmental leadership to become a national model of inclusive, low-carbon prosperity.

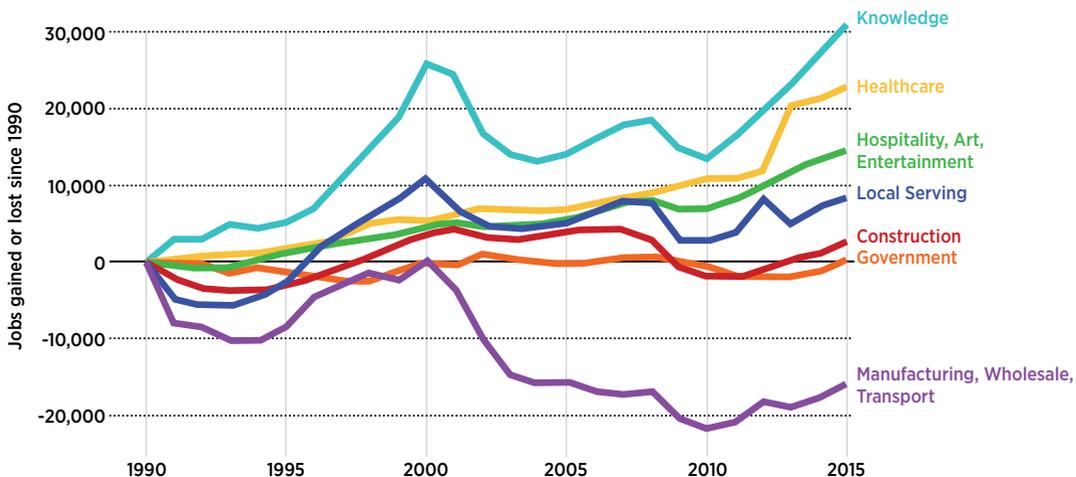


FIGURE 2

The Knowledge Sector Leads Bay Area Job Growth

In recent decades, Bay Area job growth — and corresponding new commercial development — has been led by the knowledge sector, the focus of this report's recommendations.

Source: SPUR analysis of Bureau of Labor Statistics Quarterly Census of Employment and Wages. Assessed August, 2016. <http://www.bls.gov/cew/datatoc.htm>



Photo courtesy NBBJ

Photo courtesy NBBJ

Amazon's NBBJ-designed campus in downtown Seattle. When the campus is

complete, Amazon will have more than 10 million square feet of office space in the city.

Project Scope and Geography

This report examines broad regional employment and commute patterns in the nine-county San Francisco Bay Area. It considers the location of nonmilitary jobs in relation to commute patterns and regional transit. It then examines several job centers in terms of land use, density and physical form, and assesses their performance on several important measures of efficiency and sustainability.

Because new job growth in the Bay Area is strongly led by the knowledge sector⁴ — including technology, professional and technical services, design and management — this report emphasizes the location and form of employment in these industries. It is the growth in these jobs that is sustaining, shaping and also straining the region. However, recommendations in this report can also apply to the location, commute patterns and form of employment centers more broadly.

⁴ In this report, we use the terms “knowledge sector,” “innovation economy” and “Silicon Valley” interchangeably.

Which Bay Area Job Centers Perform Best?

Some types of job centers perform significantly better than others on a variety of parameters, from transportation access to spatial efficiency to the percentage of employees who drive alone. This section presents analysis of 11 Bay Area job centers, their physical form and their performance on metrics that measure efficiency, performance and sustainability. The locations chosen represent a range of conditions typical of the Bay Area but are not intended to provide a comprehensive analysis of the region.

In each case, we defined a three-quarter-mile square area around a center point, typically a transit station or major employer. Metrics for the number of jobs, number of transit stations and percentage of commuters who drive alone are based on the census tracts that most closely coincide with the geography. Walk Score²⁸ data is assigned based on the center point and provides a shorthand for walkability based on a variety of pertinent factors, including network density (the frequency of intersections) and proximity of amenities and services. Although Transit Score provides a similar tool for transit accessibility, it is not available in all locations so it was omitted.

The results of this analysis are unsurprising: denser, more walkable employment districts result in considerably less driving than dispersed suburban locations with large blocks and few amenities. The recommendations in this report are directed at reinforcing and replicating these more efficient environments for the benefit of the region's long-term livability and competitiveness.

Downtown San Francisco

Center: 575 Market Street



3/4 mile x 3/4 mile

 **WALK SCORE**
95 out of 100

 **TRANSIT STOPS**
108
4 regional rail, **101** high frequency bus serving 45 routes, **3** ferry

 **EMPLOYEE DRIVE ALONE RATE**
24%
County Rate: **36%**

 **TOTAL JOBS**
202,484
51% Knowledge Jobs: **103,267**

 **TOTAL OFFICE SPACE**
57,319,827 sf
3.5% New Office Space: **1,982,290 sf**

Downtown Redwood City

Center: Caltrain Redwood City Station



3/4 mile x 3/4 mile

 **WALK SCORE**
93 out of 100

 **TRANSIT STOPS**
11
1 regional rail, **10** high frequency bus serving 2 routes

 **EMPLOYEE DRIVE ALONE RATE**
76%
County Rate: **73%**

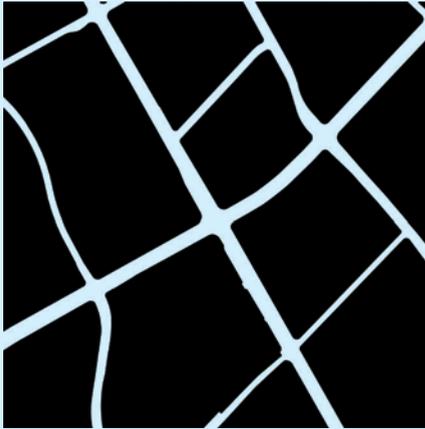
 **TOTAL JOBS**
11,729
20% Knowledge Jobs: **2,346**

 **TOTAL OFFICE SPACE**
1,901,042 sf
18.3% New Office Space: **347,209 sf**

²⁸ <https://www.walkscore.com/methodology.shtml>

North San Jose

Center: North First Street and West Trimble Street



3/4 mile x 3/4 mile

-  **WALK SCORE**
38 out of 100
-  **TRANSIT STOPS**
3
3 light rail
-  **EMPLOYEE DRIVE ALONE RATE**
84%
County Rate: **77%**
-  **TOTAL JOBS**
14,465
26% Knowledge Jobs: **3,761**
-  **TOTAL OFFICE SPACE**
4,403,443 sf
0% New Office Space: **0 sf**

Soma

Center: Fourth Street and Harrison Street



3/4 mile x 3/4 mile

-  **WALK SCORE**
95 out of 100
-  **TRANSIT STOPS**
75
5 regional rail, **70** high frequency bus serving 36 routes
-  **EMPLOYEE DRIVE ALONE RATE**
35%
County Rate: **36%**
-  **TOTAL JOBS**
50,644
33% Knowledge Jobs: **16,713**
-  **TOTAL OFFICE SPACE**
4,906,283 sf
8.4% New Office Space: **411,680 sf**

Downtown San Jose

Center: West San Fernando Street and South Almaden Boulevard



3/4 mile x 3/4 mile

-  **WALK SCORE**
93 out of 100
-  **TRANSIT STOPS**
38
3 regional rail, **7** light rail, **28** high frequency bus serving 8 routes
-  **EMPLOYEE DRIVE ALONE RATE**
76%
County Rate: **77%**
-  **TOTAL JOBS**
19,734
55% Knowledge Jobs: **10,854**
-  **TOTAL OFFICE SPACE**
8,512,937 sf
0% New Office Space: **0 sf**

North Bayshore

Center: Space Parkway and North Shoreline Boulevard



3/4 mile x 3/4 mile

 WALK SCORE
40 out of 100

 TRANSIT STOPS
0

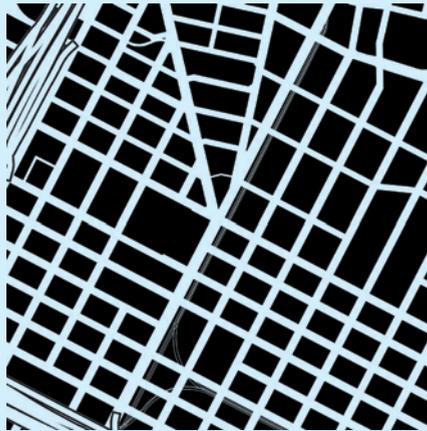
 EMPLOYEE DRIVE ALONE RATE
75%
County Rate: **77%**

 TOTAL JOBS
8,511
77% Knowledge Jobs: **6,553**

 TOTAL OFFICE SPACE
3,330,964 sf
6.8% New Office Space: **226,317 sf**

Downtown Oakland

Center: 14th Street and Broadway



3/4 mile x 3/4 mile

 WALK SCORE
99 out of 100

 TRANSIT STOPS
44
4 regional rail, **39** high frequency bus serving 11 routes, **1** ferry

 EMPLOYEE DRIVE ALONE RATE
57%
County Rate: **71%**

 TOTAL JOBS
48,573
29% Knowledge Jobs: **14,086**

 TOTAL OFFICE SPACE
2,748,084 sf
0% New Office Space: **0 sf**

Emeryville Amtrak Corridor

Center: Emeryville Amtrak Station



3/4 mile x 3/4 mile

 WALK SCORE
86 out of 100

 TRANSIT STOPS
15
1 regional rail, **14** high frequency bus serving 4 routes

 EMPLOYEE DRIVE ALONE RATE
68%
County Rate: **71%**

 TOTAL JOBS
11,693
43% Knowledge Jobs: **5,028**

 TOTAL OFFICE SPACE
4,108,756 sf
2.5% New Office Space: **100,900 sf**

Santa Clara

Center: Central Expressway and San Tomas



3/4 mile x 3/4 mile

 WALK SCORE
20 out of 100

 TRANSIT STOPS
0

EMPLOYEE DRIVE ALONE RATE
84%

 County Rate: **77%**

 TOTAL JOBS
7,887
13% Knowledge Jobs: **1,025**

TOTAL OFFICE SPACE
5,978,686 sf

 0% New Office Space: **0 sf**

Bishop Ranch

Center: 2600 Camino Ramon



3/4 mile x 3/4 mile

 WALK SCORE
38 out of 100

 TRANSIT STOPS
0

 EMPLOYEE DRIVE ALONE RATE
84%

County Rate: **75%**

 TOTAL JOBS
12,040
58% Knowledge Jobs: **6,983**

 TOTAL OFFICE SPACE
3,766,274 sf

0% New Office Space: **0 sf**

Bay Meadows

Center: East 26th Street and Paddock Way



3/4 mile x 3/4 mile

 WALK SCORE
67 out of 100

 TRANSIT STOPS
7

2 regional rail, 5 high frequency bus serving 1 route

 EMPLOYEE DRIVE ALONE RATE
77%

County Rate: **73%**

 TOTAL JOBS
4,592
29% Knowledge Jobs: **1,332**

 TOTAL OFFICE SPACE
580,035 sf
0% New Office Space: **0 sf**

Workplace Types



Urban Brick-and-Timber

Since the 1990s, many technology firms have located in repurposed 19th and early 20th-century industrial buildings in San Francisco. Their relative availability and flexible open plans provided an urban alternative to the low-slung tilt-ups of Silicon Valley. Airbnb, above, is one example.



Urban Co-work/Incubator

Co-working spaces like WeWork, above, emerged in response to the prevalence of freelance workers, but have also proved important to launching new companies, supplementing the traditional garages and “hacker hostels” and providing infrastructure and in some cases, incubation and support for new ventures who are not ready to lease dedicated space. These spaces have tended to locate in amenity-rich urban areas, often providing ground-floor cafes and gathering spaces.



Downtown Tower

For many years the prevailing wisdom held that tech firms would not go into traditional office towers, due to the small floorplates and cultural association with other industries. But more recently, several notable companies have leased or built vertical space in downtown San Francisco, notably the 60-story Salesforce Tower (above). Other examples include Yelp at 140 New Montgomery and Adobe in downtown San Jose.



Subcenter Transit-Oriented Development

With transit representing a significant amenity, several employers have built or leased space in station area developments, both along the Caltrain corridor and elsewhere in the region. These include Bay Meadows (SurveyMonkey, shown above) Downtown Redwood City (Box) and Downtown San Leandro (ISOsoft). In each case, developers combined transit-adjacency with purpose-built structures geared toward the needs of innovation-sector firms.



Suburban premium cloister

Recent years have seen several highly visible corporate campuses designed by well-known architects, built from the ground up. These forego the flexibility of most tech campuses in favor of a statement of permanence and brand identity. They include the Apple “Spaceship” (designed by Sir Norman Foster) the Facebook West Campus (designed by Frank Gehry, above) and the NVidia Headquarters in Santa Clara (designed by Gensler). This approach echoes early suburban campuses and “corporate estates” (see p. 24) common in the northeast and Midwest.



Suburban Retrofit

In some locations innovation-sector employers are engaging with local planners or developers to help transform auto-dependent suburban locations into urban centers. The Samsung Semiconductor headquarters in San Jose, designed by NBBJ, embraced the city’s vision of an urban transit corridor, with ten-story towers built to the street, and ground floor retail and open space accessible to the public.



Suburban Disposable/Modular

Other large campuses are explicit expressions of flexibility and exit strategy, with modular buildings, parking, and landscaping in a repeated pattern that can be easily parceled off and sold or leased. Cisco’s North San Jose campus (above) is the most well-known example.



Suburban multi-use

Increasingly, companies already ensconced in suburban locations are looking for ways to create new hybrid models that mix public/private use and prioritize iconic architecture and landscape sensitive to environmental habitat. Some companies, such as Google (the design for its Charleston East campus designed by BIG and Thomas Heatherwick Studios is above) are even exploring ways to incorporate housing into the mix.

Bay Area Employment Patterns and Their Consequences

Jobs in the Bay Area are spread throughout the region in a decentralized spatial pattern that comes with high costs to quality of life and the region's long-term economic competitiveness. We refer to this lower-density employment pattern as "job sprawl" and have argued that its consequences are dire:⁵

- It is resource intensive. Low-density environments have higher per capita land consumption and increase the distance between uses, requiring more overall infrastructure (roads, transit, electricity, water, sewers) to serve a larger area.⁶
- It lengthens commutes and produces auto-dependence and congestion, as alternatives to driving alone for many are impractical.⁷
- It increases regional greenhouse gas emissions, especially from driving, contributing to climate change and poor air quality.⁸

- It contributes to economic losses in the form of hours lost in traffic.⁹
- It threatens long-term economic competitiveness by making it more difficult for employers to access, attract and retain talent; isolating workers from the benefits of density to productivity and innovation.¹⁰ It also increases company costs of doing business by introducing the pressure to provide transportation programs and amenities that are typically available in cities.
- It is costly for lower-income households. When more jobs locate in auto-dependent locations, more households are forced to buy one or more automobiles in order to reliably commute to work. This pattern also isolates poorer people from opportunity since jobs in areas not accessible by transit are not available to those who don't own a car.

Despite some high-profile examples companies like Twitter, Salesforce, Uber and Box locating and expanding adjacent to transit stations, most regional employment is still located away from transit.

FIGURE 3

Most Jobs Are Not Near Transit

Job density in 2015
Only 21 percent of Bay Area jobs are within a half-mile of a regional rail station.

Source: SPUR analysis and rendering of jobs data provided by the Metropolitan Transportation Commission

⁵ See SPUR, *The Future of Downtown*, 2009, http://spur.org/publications/library/report/future_downtown; Egon Terplan, "Job Sprawl in the Megaregion," *The Urbanist*, September 2009, http://www.spur.org/publications/library/article/job_sprawl_megaregion; and SPUR, *The Urban Future of Work*, 2012, https://www.spur.org/sites/default/files/publications_pdfs/SPUR_The_Urban_Future_of_Work_SPREADS.pdf

⁶ Todd Litman, Victoria Transport Policy Institute and the New Climate Economy, *Analysis of Public Policies that Unintentionally Encourage and Subsidize Sprawl*, 2015, <http://static.newclimateeconomy.org/wp-content/uploads/2015/03/public-policies-encourage-sprawl-nce-report.pdf>

⁷ Joe Cortright, *Driven Apart*, CEOs for Cities, September 2010, http://cityobservatory.org/wp-content/uploads/2015/08/Cortright_Driven_Apart_2010.pdf

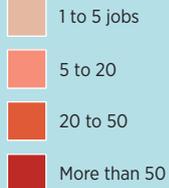
⁸ R. Ewing, R. Pendall and D. Chen, "Measuring Sprawl and Its Impacts," *Smart Growth America*, 2012, <http://www.smartgrowthamerica.org/sprawlindex/MeasuringSprawl.PDF>

⁹ In 2015, time wasted in commuting by San Franciscans amounted to more than \$5.3 million in lost value, a 55 percent increase over 2011. Regionwide losses over time can be assumed to be significantly larger. Source: BLS QCEW, Census, analyzed by the San Francisco Controller's Office. Aggregate value of time defined as total QCEW employment in San Francisco, multiplied by average commute time of workers to jobs in San Francisco, multiplied by average QCEW wages in San Francisco, weighted at 50 percent to reflect the value of commuting time.

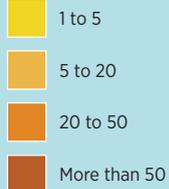
¹⁰ Antonio Ciccone and Robert E. Hall, "Productivity and the Density of Economic Activity," *The American Economic Review* 86, no. 1, 1996. http://www.crei.cat/files/filesPublication/87/090505103655_productivity20and20the20density20ciccone%5B1%5D.pdf



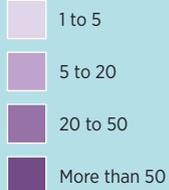
**Jobs per acre within
1/2 mile from BART
+ Caltrain**



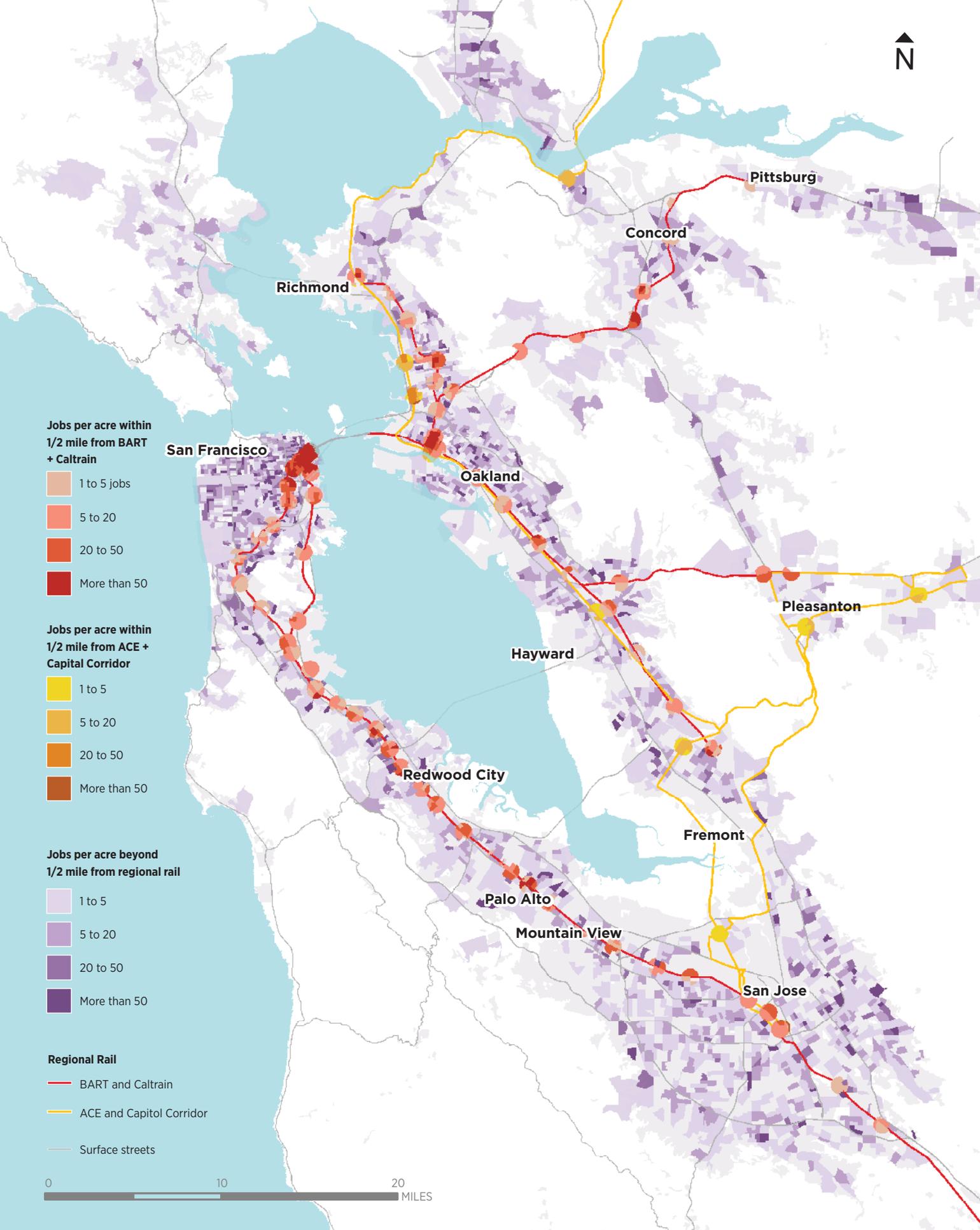
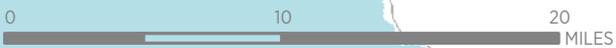
**Jobs per acre within
1/2 mile from ACE +
Capital Corridor**



**Jobs per acre beyond
1/2 mile from regional rail**



Regional Rail



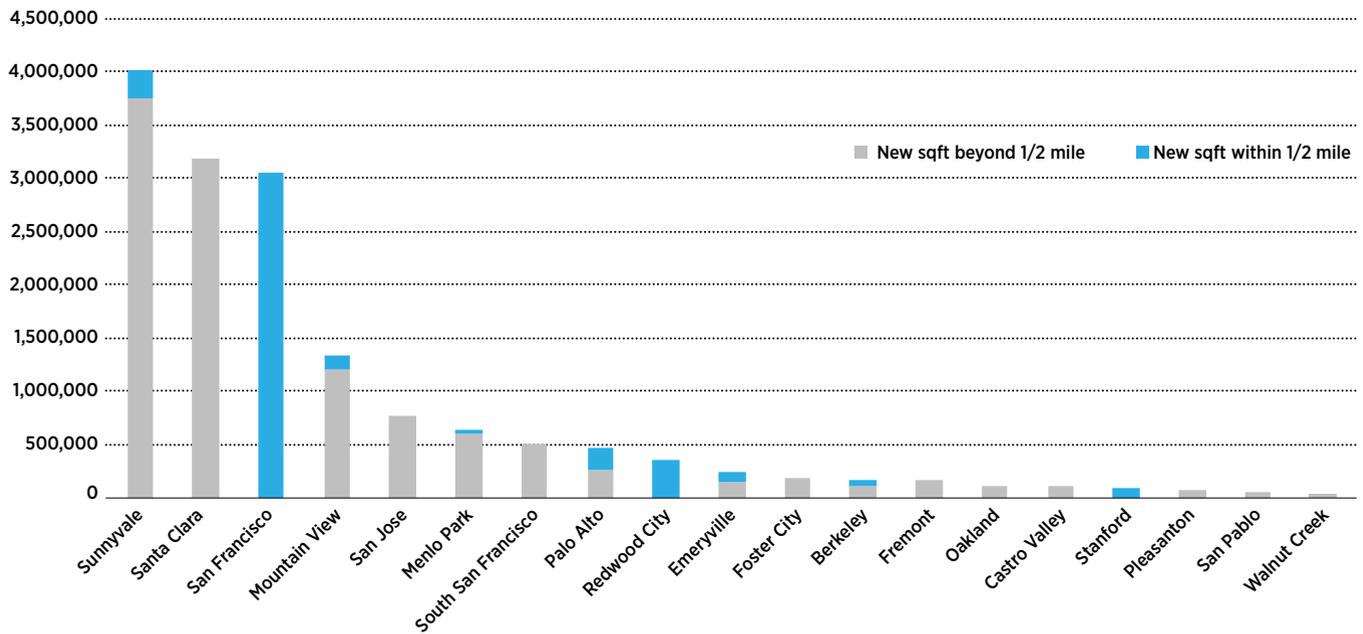


FIGURE 4

The Knowledge Sector Is Growing Near Rail

Square feet of office space added by Bay Area cities between 2011 and 2015

Of all the Bay Area’s new square footage within a half-mile of a regional rail station, 71 percent is in San Francisco.

SPUR analysis of building data provided by the Metropolitan Transportation Commission

In fact, even during the economic boom from 2010 to 2015, the overall pattern did not change. The majority of new office space was added in car-dependent places that are not near regional transit,¹¹ reinforcing the dominant and problematic suburban pattern of Silicon Valley. The result is familiar and disappointing for the region’s performance on transportation, health and environmental measures as consumption of land, car congestion and time wasted in traffic all continue to rise.

suburbs.¹² The spread-out geography of work poses a challenge for today’s firms and employees, as it requires residents to own automobiles and commute in congested conditions.

Constant innovation is key to the ongoing success of Bay Area companies, and innovation happens faster in dense areas where people can exchange ideas efficiently. Proximity benefits firms by increasing productivity, stimulating new business formation and fostering innovation.¹³ Without access to the benefits of density, today’s employers are at a disadvantage.

The majority of Bay Area jobs are in car-dependent locations that are not walkable or well-served by transit.

Almost 80 percent of the jobs in the Bay Area are located in auto-dependent areas, beyond walking distance from regional rail (see Figure 3).

Jobs have been spreading out across the region for decades, following highway construction and residential sprawl and facilitated by lower land costs and political and regulatory barriers in the

Knowledge-sector jobs appear to be concentrating around rail relative to other sectors.

Without denying the obvious fact that Silicon Valley grew up in auto-oriented suburbia, there is at least some evidence that certain parts of the modern innovative economy are seeking more walkable urban areas.

¹¹ For purposes of analysis, this report defines “regional transit” as grade-separated rail transit that crosses county lines, which includes BART, Caltrain, Amtrak Capital Corridor and ACE systems. More than half of Bay Area workers cross a county boundary to get to work. Transit that crosses county lines is the kind that supports the regional labor market.

¹² A region’s urban form is mostly based on its dominant transportation mode at the time of the greatest expansion. As our region has grown since the 1940s, the dominant transportation mode has been the car.

¹³ M. E. Porter, “Clusters and the New Economics of Competition,” *Harvard Business Review*, November/December 1998.

Knowledge sector jobs are growing more significantly around transit than any other industry (transit-proximity is a good proxy for urban density). While they accounted for a third of job growth since 2010, knowledge sector companies accounted for over half of all jobs added near transit.

A comparatively dense urban fabric makes it more efficient for people to meet face-to-face for the exchange of ideas and collaborations that fuel the knowledge economy. Constant innovation is key to the ongoing success of firms within this sector, and innovation happens faster in dense environments that offer proximity to other firms, workers, suppliers, funders and specialized information. In business economics, this is called agglomeration.¹⁴ Research on the benefits of business agglomerations finds that proximity to companies in the same industry can benefit businesses by fostering innovation and also by increasing productivity and stimulating business formation.¹⁵

In particular, urban environments have more spaces for interactions between people among multiple firms, not just within a single firm.

Despite of San Jose and Oakland's positions in the region — the first and third largest cities, respectively — they have added relatively little office space, and none of it is near rail transit.

Commuting is still done primarily by car.

The way people get to work has not significantly changed in our region in half a century. Three-quarters of Bay Area commuters drive to work (including carpools). Yet there is great variation in travel modes by location. Citywide, only 41 percent of San Francisco commuters arrive in a car; this is the lowest percentage by far regionally. In the other eight counties of the region, between 73 percent (Alameda) and 90 percent (Solano) of people drive or carpool in to work.

¹⁴ M. E. Porter. Clusters and the New Economics of Competition." Harvard Business Review (November/December) 1998.

¹⁵ Productivity is enhanced because companies have greater access to employees, suppliers, specialized information, institutions, public goods, and complementary firms and services. Innovation is fueled by competitive pressure from nearby firms and facilitated by having a better window on the market. New business formation takes place as a result of these other benefits: Individuals working within a dense network of businesses can more easily understand gaps in products or services, and barriers to entry are lower because financing, assets and staff are easier to come by.

Bay Area transit service remains highly uneven. In transit-accessible areas such as San Francisco, Oakland and portions of the San Francisco Peninsula near Caltrain, more people arrive by transit, but capacity is stretched to the breaking point. For six years, average monthly riders on both BART and Caltrain increased compared to the same month the previous year.¹⁶ Investments are planned for both systems but not at a level consistent with demand.

As a result, many companies have found themselves becoming transportation providers, running employee shuttles to many parts of the region. The Metropolitan Transportation Commission's 2014 shuttle census reported nearly 37,000 daily boardings on 765 shuttle buses.¹⁷ If private employee shuttles were a public transit operator, they would be the seventh largest in the region.¹⁸

Drivers are subject to worsening commute times and record congestion.

Time spent in highway congestion has reached all-time highs, increasing by 22 percent for a typical commuter in 2015. This marks the Bay Area's highest recorded level of congestion delay for commuters and a nearly 70 percent increase over 2010 levels. Bay Area cities now have the second highest total delay and commuter stress of any major metro area nationwide.¹⁹ (Los Angeles is the highest). A recent analysis found that the annual value of time wasted in congestion was more than \$5 billion in San Francisco

¹⁶ Caltrain and BART ridership grew to record levels between 2011 and 2016. In 2016, ridership began to decrease on both routes compared with the same months in the previous year. Crowding on trains may be discouraging riders.

¹⁷ The actual numbers are likely somewhat higher because this data is self-reported, during a period of rapid shuttle program growth.

¹⁸ When coupled with a broader transportation program, employee shuttles can generate impressive results, comparable to those of far more urban locations. However, they are generally exclusive to employees and serve only a subset of jobs in a given location (i.e., not service workers or contractors and only to/from a limited number of origins).

¹⁹ The Commuter Stress Index is a measure developed by the Texas A&M Transportation Institute. Researchers compare how long it takes to travel the most-popular routes at peak travel times against how long those routes would take when roads aren't congested. In the Bay Area by 2014, the most travelled routes were take 57 percent longer than they do during off-peak times. This yields a congestion stress rank of 1.57, the second highest of any region in the country. <https://mobility.tamu.edu/ums/congestion-data/>

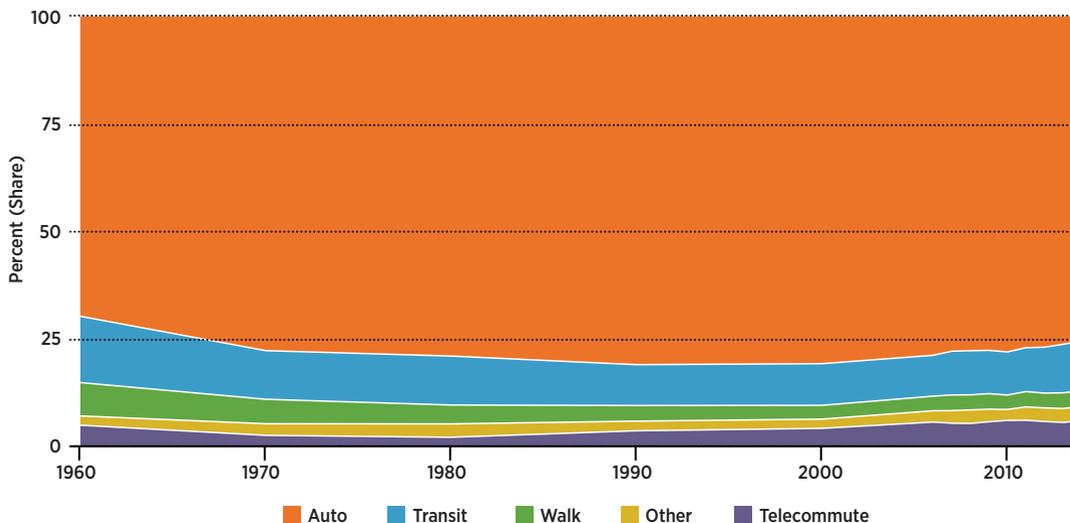


FIGURE 5

Trends in Bay Area Commuting

Despite a slight uptick since 2000 in transit, walking and other alternatives, the vast majority of commuters continue to drive to work. The region's suburban job locations make it a challenge for more people to switch to other alternatives.

Source: Metropolitan Transportation Commission, Vital Signs, December 2015, www.vitalsigns.mtc.ca.gov/commute-mode-choice

alone, an increasing economic drag on the city and the region.²⁰

Auto-dependent locations generate more congestion and are more harmed by it than those that are served by multiple modes of transportation. Such areas are more sensitive to the impacts of congestion, because viable alternatives are lacking. In contrast, car traffic impacts a smaller percentage of commutes in urban areas. Congestion is a routine fact of life in most transit-rich downtown locations, but employers and commuters are less sensitive to its impacts because many workers can bike, walk, carpool or use transit. Sensitivity to congestion (rather than simply the presence of congestion) is an important consideration for both employers and policymakers. Transportation network companies (such as Uber and Lyft) and autonomous vehicles may eventually reduce car use, but at present the former are *increasing* the number of cars on the road in San Francisco, and the time scale of the latter remains an open question.

Private auto use is the region's largest source of greenhouse gas emissions.

Passenger cars accounted for 28 percent of the Bay Area's greenhouse gas (GHG) emissions in 2014, making them the region's largest single contributor to climate change. The region's refineries — whose

largest product is automotive fuel — represent another 17 percent of regional emissions.

Locating jobs in auto-dependent areas worsens our contribution to climate change just as ambitious state reduction targets are taking force. State climate policy explicitly targets the relationship of transportation and land use to GHG emissions through SB 375, which requires regions to complete Sustainable Communities Strategies (like Plan Bay Area) that direct growth to appropriate locations.

Jobs near transit result in less driving and fewer GHG emissions.

While not the only factor in the decision on how to get to work, employer location plays a major role in commuting patterns and in the resulting GHG emissions. Jobs within a half mile of regional transit give employees a real alternative to driving. There is a spatial correlation between lower drive-alone rates and proximity to BART and Caltrain stations.

A better employment geography is within reach.

Despite the trend of job sprawl and the dearth of jobs within walking distance of regional rail transit, the region's employment geography is relatively concentrated. While just 20 percent of the region's jobs are a half-mile from regional rail transit, a 2012

²⁰ City and County of San Francisco Office of the Controller, MFAC 2016 Annual Economic Briefing.

SPUR report found that more than 40 percent of jobs in the region would be considered transit-accessible if high-capacity local transit such as light rail and buses are counted.²¹

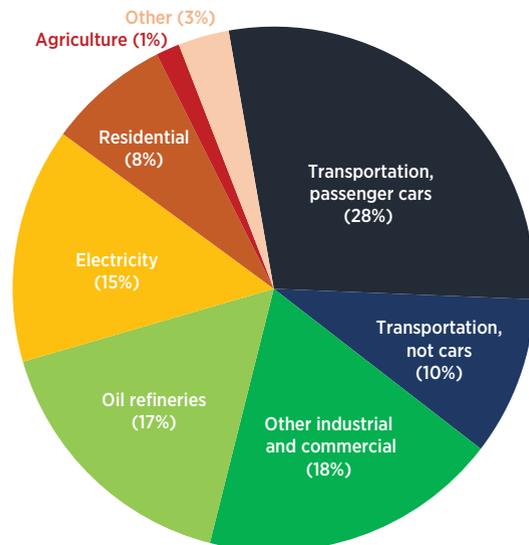
Almost all jobs in the region are within three miles of a regional rail station. If we could concentrate more jobs within a half-mile of rail stops and provide links between transit and jobs that are just a few miles away, we could vastly expand the number of jobs accessible by transit. In short, a more compact and connected region is within reach.

²¹ SPUR, *The Urban Future of Work*, January 2012, https://www.spur.org/sites/default/files/publications_pdfs/SPUR_The_Urban_Future_of_Work_SPREADS.pdf

FIGURE 6
Sources of Greenhouse Gases
Share of 2014 greenhouse gas emissions (million metric tons of CO₂-equivalent)

Personal auto use is the single largest contributor to greenhouse gas emissions in the Bay Area.

Source: Bay Area Air Quality Management District's Table V: Bay Area Greenhouse Gas Emission Inventory Projections: 1990 - 2029. <http://www.baaqmd.gov/research-and-data/emission-inventory/maps-data-and-documents>



The Strain of Housing Costs

Housing costs in the Bay Area are among the highest in the nation, putting a strain on residential and economic diversity. As the region has become too expensive for workers, a growing number of employers are moving jobs elsewhere.

The cause of the crunch is simple: For decades, our region has failed to build enough housing for the number of people who want to live here, creating a chronic housing shortage. During economic booms the pressure is amplified. From 2011–2016, the nine-county region added 546,000 jobs but only 62,600 housing units.²² Tens of thousands of new people are competing with existing residents for a fixed number of homes, and this drives up prices.

Housing prices have a huge effect on a company's cost of doing business because they affect labor costs and access to talent. With a regional median home price of \$665,000 — and San Francisco's median home price at \$1.3 million (according to 2016 Zillow data) — the wages necessary to attract and retain workers are exceptionally high. Housing costs also make it difficult for people to move within the region, creating housing insecurity and displacing lower-income residents. More broadly, there is mounting evidence that housing costs in places like the Bay Area are putting the brakes on national economic growth.²³ Largely because of the costs stemming from housing their labor forces, firms in industries such as financial services, manufacturing

²² Jobs numbers were analyzed using Bureau of Labor Statistics Quarterly Census of Employment and Wages: <http://www.bls.gov/cew/datatoc.htm>. Housing units were analyzed using US Census Bureau American Community Survey 1-year estimates, table B25001: <http://factfinder.census.gov/faces/nav/jsf/pages/searchresults.xbhtml?refresh=t>

²³ See Enrico Moretti and Chang-Tai Hsieh, "Why Do Cities Matter? Local Growth and Aggregate Growth," April 2015, <http://faculty.chicagobooth.edu/chang-tai.hsieh/research/growth.pdf>

and warehousing have been moving out of the region. In recent years, longtime Bay Area employers have transferred middle-income jobs to other locations. Now, many of the tech firms that have helped drive Bay Area economic growth are choosing to grow their presence in cities such as Austin, Nashville, Phoenix, Salt Lake City and Denver,²⁴ where lower costs of living allow companies to save money on labor costs.

Correcting the supply imbalance requires a massive investment and strong political will, and it will take time. The cities of the Bay Area have underproduced housing for decades. Many have instituted complicated local regulations that make it virtually impossible to add supply in sufficient quantities to bring down housing costs in the region. Recent housing growth has been modest — and far from job centers. And many of the localities adding the most jobs are the most resistant to building more housing.

The region's seemingly intractable housing shortage has motivated at least a few companies to explore the possibility of housing their employees.²⁵ In a hot employment market where many companies already provide private transportation shuttles, three organic meals a day and onsite services ranging from haircuts to medical care, housing might be the ultimate amenity. But for a variety of reasons — including community opposition and challenging local land use regulations — it's not one most employers are ready to provide.

²⁴ In our conversations with more than 100 major employers in 2016, many of them shared that their companies had made decisions not to increase headcount in the Bay Area and to expand instead in more affordable markets. Further, a growing number of startups are being created across the country — and they're cropping up outside of Silicon Valley. <https://www.axios.com/the-next-start-up-havens-2335458587.html>

²⁵ Facebook is building just under 400 units in Menlo Park, and Google has made numerous attempts to generate new housing in Mountain View. <http://www.nbcbayarea.com/news/local/Google-Proposes-Housing-Project-in-Mountain-Views-East-Whisman-Neighborhood-403680716.html>

How We Got Here: A Brief History of the Corporate Campus



To understand how the current models of innovation-sector workplaces came to be, it's important to examine how they have evolved over time.

The American workplace grew up in tandem with the American city, which by the late 19th century was often perceived as hopelessly polluted, congested and riven by social and economic strife. Although the American city continued its rise until the mid-20th century, the forces that would spell its decline had been gathering steam over many decades. Commuter rail, streetcars and eventually the automobile allowed a widening segment of Americans to move out of city centers. While at first most people commuted back to industrial and commercial jobs downtown, eventually many employers followed suit, moving to suburban communities in search of educated workers, cheap land, fewer unions and a leafy suburban image. The now-familiar commercial landscape of office parks and corporate campuses was born.

In her definitive history of the suburban workplace, *Pastoral Capitalism: A History of Suburban Corporate Landscapes*, Louise Mozingo proposes three distinct types of suburban workplaces:²⁶

²⁶ Louise Mozingo, *Pastoral Capitalism: A History of Suburban Corporate Landscapes*, The MIT Press, 2011.

The corporate campus, modeled on the university campus, helped lure top-notch researchers from academic settings into the private sector with parklike grounds meant to facilitate collaboration and creativity.

The corporate estate provided headquarters for the top management of major companies, set in vast landscapes designed to convey power and prestige.

The office park was built by developers to house numerous smaller companies or branch offices. Multiple tenants could lease, buy or build one or more buildings with a desirable suburban character.

In Silicon Valley, the office park model has prevailed, as has its variant the research park, which combines elements of the corporate research campus with a more flexible, multitenant format. Typified by the Stanford Industrial Park (1951, later rebranded as Stanford Research Park), the New England Industrial Center (1952) and North Carolina's Research Triangle Park (1958), these facilities were located near major research universities to capture a highly educated workforce for companies that would commercialize academic innovation, develop new technologies and conduct government and defense research. It was a winning formula: Academics and technology entrepreneurs formed formidable clusters of companies, opportunities and ideas.

Research parks replicated the suburban planning and design controls pioneered in the city of Menlo Park in 1948, deliberately presenting an alternative to industrial factories, where most research and development functions had traditionally been housed. Each of these three suburban office types aimed to create an insular world where employees were "captured" for the entire workday and had minimal contact with the public realm. (Each also provided abundant surface parking for all employees.) Over time, variations emerged that would blur the distinctions among

these models. Today, the term "corporate campus" has become general shorthand for a range of suburban office types, including most of the formats we explore in this report.

California Tech: Fairchild, Stanford and Silicon Valley

Many of the earliest, most influential American suburban workplaces were located in the Northeast and Midwest. Bell Labs is the most important early example. It hosted some of the world's top engineering talent during and after World War II, and is credited with major contributions to radio astronomy, the laser, the solar cell, information theory and the transistor. Built in Murray Hill, New Jersey, in 1942, Bell set the template for the corporate research campus, with comfortable lab buildings replete with sociable lounge spaces in a parklike setting.

Many suburban residents were skeptical of commercial and industrial buildings setting up shop nearby. After all, these were precisely the urban activities they had moved to get away from. On the other hand, suburban residential communities faced fiscal pressures and needed revenue-generating commercial activity to support services for their new residents.

To overcome incipient local opposition, suburban enterprises were vigorously marketed as "smokeless" industries. Zoning was created to facilitate commercial uses while safeguarding suburban character. Suburban commercial zoning required that buildings be set back from the street behind landscaped buffers, limited building heights and lot coverage and, critically, required parking ratios of 2.5 to 3 spaces per 1,000 square feet. This suburban office park template would come to dominate the national landscape.

In 1956, William Shockley, inventor of the transistor — the foundation of the digital



revolution — moved from New Jersey's Bell Labs to Mountain View, California, in order to commercialize silicon-based transistors. Shockley was a notoriously difficult leader, and in short order eight of his talented young engineers — famously dubbed the “traitorous eight” — left to form Fairchild Semiconductor. Fairchild set the stage for the explosion of Silicon Valley technology companies, both in its technology, by commercializing silicon transistors and integrated circuits, and in its entrepreneurial culture of fast, collaborative innovation and limited hierarchy. Less auspiciously, the firm also presaged an attitude about workspace as a disposable container: modest, unassuming and unworthy of investment.

The Fairchild model also included a propensity to jump ship and start new enterprises, which, though commonplace today, was quite radical in the “company man” business culture of the 1950s. In its first 12 years, Fairchild and its employees spun off more than 30 major companies, including Intel, Advanced Micro Devices (AMD) and venture capital firm Kleiner Perkins.

Meanwhile, the Stanford Research Park found traction, housing more established firms like Varian, General Electric, Lockheed, Eastman Kodak and, later, local heroes Hewlett-Packard in an environment of increasingly stringent suburban planning controls. Many of these companies were the research and development arms of larger firms that grew up on military and aerospace contracts, some affiliated with nearby Moffett Field and Ames Research Center. They would be joined in the 1970s by Xerox PARC, which would develop (but never commercialize) the mouse, graphical user interface, laser printer and local area network.

It became increasingly important for national technology firms to establish a presence in Silicon Valley. The Peninsula was primed for its explosive growth as the global center of technological innovation — in a postwar suburban environment that was socially homogeneous, spatially

dispersed and utterly dependent on the private automobile.

The Innovation Machine: Venture Capital and the Disposable Landscape

With all the basic ingredients in place, the only thing left, to use tech industry parlance, was to “scale.” As examples mounted of startup companies transforming new technologies into immense financial returns, a new financial mechanism — venture capital — sprang up to accelerate and standardize the process. Firms like Kleiner Perkins began to set up shop along Sand Hill Road in Menlo Park. Today, Sand Hill's unassuming suburban offices are the financial engine of Silicon Valley, hosting more than 40 such firms, and are some of the most expensive commercial real estate in the United States.

Abundant capital, inexpensive land and a seemingly endless flow of new ideas allowed Silicon Valley (so named in the early 1970s) to flourish. The physical module of one- and two-story tilt-up concrete buildings, surrounded by surface parking and buffered from streets by landscaping, became a standard product, delivered on spec by developers for a surging new industry that grew from transistors to chips to personal computers to software. Large contiguous floors and open-plan spaces could be quickly occupied and reconfigured by fast-moving teams. This building strategy allowed companies to grow quickly in discrete and predictable units and then contract just as quickly by shedding them.

This sense of real estate as something cheap, interchangeable and basically disposable was a distinctive feature of the Silicon Valley culture and suited its churn of explosive growth and frequent failure. But it took a toll on a once-beautiful and livable landscape. Santa Clara County's Valley of Heart's Delight, named for its stunning expanses of spring-blooming fruit trees, was rapidly paved over, and the quaint commuter towns on the San Francisco Peninsula were engulfed by an expanse of astonishingly prosperous but largely indistinguishable office parks.

From left, a 1954 meeting to plan North Carolina's Research Triangle Park; in 1955 there were

about 50 technology companies located around the Boston's Route 128; Fairchild, shown here

in the 1950s, spun off more than 30 major companies in its first 12 years.



Fairchild campus



The Traitorous 8

The suburbanization of work in the Bay Area was hardly limited to Silicon Valley. In the 1970s and '80s, new technologies and corporate structures allowed many back-office functions like accounting departments to be relocated away from expensive downtown headquarters (and closer to many workers' homes) in suburban "edge cities" and office parks located east of Silicon Valley, such as Hacienda Business Park in Pleasanton and Bishop Ranch in San Ramon.

The Prestige Campus

In the 1990s, as some Silicon Valley companies grew to be widely known and highly visible, a few began to invest in large, distinctive headquarter campuses that were meant to convey permanence and sophistication.²⁷

In 1995, Sun Microsystems built an 11-building, 1-million-square-foot campus in Menlo Park, oriented toward an interior

²⁷ Mazingo, *Pastoral Capitalism*.

Above, William Shockley, one of the "Traitorous 8" left Bell Labs in New Jersey (below) for Mountain View in 1956.

Research Triangle Park (above, right) helped set the stage for the suburban corporate campus, a model that persists

today as seen with the new Norman Foster-designed Apple headquarters (at right), in Cupertino.



Bell Labs

green; in 2011, Facebook converted the then-moribund space into an ersatz urban main street. Networking giant 3Com invested heavily in its Santa Clara campus in the late 1980s, with increasingly splashy architectural and landscape gestures connecting its fairly standard buildings.

But many observers point to the short-lived Silicon Graphics Mountain View campus (now the core of Google's headquarters), designed in 1997 by Studios Architecture and SWA Group, as a turning point in tech campus design. The designers tucked the parking largely out of sight and arranged the whimsically detailed campus buildings — linked by bridges — around central gathering spaces. The campus also won kudos for its relative openness to the public and connection to an adjacent park. Silicon Graphics, with its visual culture and connection to the consumer-facing film industry, wanted a distinctive visual presence, a departure from the generally inward-looking and staid Silicon Valley standard.

Both Sun/Facebook and Silicon Graphics/Google typify what has been called the "hermit crab" model, in which a dying company leaves behind a "shell" that is reinhabited by a rapidly growing one. From a market point of view, the bigger and more customized the shell, the fewer the crabs that can make it fit. From a policy point of view, the location and form of the shells has important implications for the shape of regional growth. Remote, low-density campuses put heavy burdens on crowded

roadways, exacerbating congestion and greenhouse gas emissions, and they cannot be served effectively by public transit.

The typical site plan of buildings surrounded by surface parking and landscape buffers means that the leafy interiors of a campus are often unconnected. In order to attend meetings or connect with colleagues, employees have to navigate awkward expanses of asphalt designed for cars.

The Lure of Downtown

The dot-com boom of the late 1990s was in no small part centered in the brick-and-timber warehouses of San Francisco's South of Market neighborhood, which had been largely abandoned by industry after the city's industrial heyday. Their appropriation by commercial ventures was controversial, as it began edging out the immigrants, artists, gays and lesbians, and bohemians who had found a home in these marginal places. The tech sector's appetite for urban settings echoed the broader American cultural shift back toward the center city.

In recent years, a significant number of technology companies are choosing to locate in central locations in cities such as San Francisco, Los Angeles, Seattle and Oakland. Although San Francisco's dot-com-era startups favored SoMa, today major firms are locating — and even building from the ground up — downtown. Twitter, Airbnb and others occupy large former industrial buildings, while Yelp, LinkedIn and Salesforce are doing the once-unthinkable by building or moving into vertical downtown office buildings with modestly sized floorplates (the square footage of usable space on each floor). In a business culture born in large, flexible horizontal spaces, this creates real anxieties, with some firms going to considerable expense to open up internal stairs or otherwise ease circulation to encourage the "serendipitous encounters" so valued in the innovation culture.

In Seattle's South Lake Union neighborhood, Amazon created a huge New York University-style campus with public gathering spaces among the buildings, apparently valuing the bustle of city life more than high-security isolation. In Oakland, Uber is transforming the old Sears

Research Triangle Park

*Aerial View of the Research Triangle Institute's central campus*

department store on Broadway into offices. Given the building's immediate proximity to BART, Uber sees the location as an extension of its San Francisco headquarters, just a short train ride away. This kind of integration — predicated on public transit and urban amenities — is a departure for many employers.

This urban turn is also a step forward from a policy point of view. These workplaces capture the inherent advantages of dense urban environments: They make efficient use of land, provide little or no parking and are readily accessed by foot, bike and transit.

But with only a few small parts of the Bay Area offering the kind of urban life many increasingly prefer, urbanism has turned into a scarce resource, available largely to those on the winning side of uneven prosperity. There is a palpable sense that both San Francisco's social diversity and its unconventional culture — both accommodated by 20th-century urban decline — can't survive its intense

resurgence. Policymakers face a basic challenge: accommodate the growth of tech employment in the scarce urban core or push it out to the suburbs with all the inefficiencies that implies.

Doubling Down on Suburbia

Despite the moves of high-profile companies like Salesforce, Twitter and Airbnb, most Bay Area firms are not moving into or adding jobs in downtowns (see MAP TK). As much as planners and policymakers would prefer that employers locate in urban centers near transit, many of the biggest firms continue to bank on the enduring cachet of the Peninsula — or are simply stuck there with irreplaceable real estate holdings.

To compete for talent, these companies must contend with formidable transportation and housing challenges, as well as the urban preferences of many

workers. In 2015, Facebook expanded into its Frank Gehry-designed West Campus, connected by tunnel to its existing facility. Essentially a warehouse for engineers, the West Campus's 430,000-square-foot interior is the ultimate open office, topped by a massive roof garden, its ground floor all parking. Facebook may have adopted the tenets of New Urbanism for its first Menlo Park campus, but the Gehry building's only nod to the city is its edgy interior design.

Apple, whose culture is famously secretive and insular, is nearing completion of the most expensive office building in history. (Estimates are currently at \$5 billion.) The so-called "spaceship" — 2.8 million square feet, with nearly 11,000 parking spaces — was designed by architect Sir Norman Foster. Both a memorial to founder Steve Jobs, who conceived of it, and a potent symbol of Apple's devotion to design, it is a return to the corporate estates of the 1950s — and likely to their problems. The irony is that fixed megastructures like this one forgo one of the main virtues of the Silicon Valley model: the flexibility and ready exit strategy that come with the standardized suburban product.

Although the trend toward iconic architectural campuses is relatively new in Silicon Valley, it represents a return to the traditional suburban corporate campus of the mid-20th century. Even as work proceeds on the Apple HQ in Cupertino, for example, developers are struggling to transform large, purpose-built campuses that have been vacated elsewhere into spaces desirable to today's workforce. Bell Labs in Holmdel, New Jersey, abandoned after the decline of its corporate founder, is now being reimaged as a multiuse "innovation center," adding a hotel, retail and co-working space surrounded by suburban housing. Raleigh's Research Triangle Park is similarly rebranding itself as a mixed-use community, with housing, retail and other amenities added to the office mix. General Electric has decamped from its suburban Connecticut headquarters to central Boston, where it can take advantage of a highly educated workforce and an ecosystem of innovative startup companies. As these examples attest, the fate of the suburban campus is unresolved.



Apple

Workplace Location and Design: Understanding Employer Decisions

A wide variety of factors affect employer decisions about where to locate and how to design their workplaces. Through scores of conversations, interviews and ongoing discussions with a working group composed of employers, brokers, developers and related experts, SPUR identified numerous factors, from the location of the CEO's home to the age of company employees. But the four factors examined here emerged as driving preoccupations in virtually every conversation. Not every employer emphasizes them equally or solves them in the same way, but virtually all employers grapple with them in some way. Understanding these issues and how they affect regional priorities is essential to developing effective and meaningful workplace policies.

Four major drivers:

1. Talent Acquisition and Retention

The most valuable asset in the Bay Area's innovation economy is talent: It's what draws companies to locate here in spite of the astronomical costs. The competition to attract and retain top workers is fierce — especially when the economy is surging. Many decisions about where workplaces are located and how they are designed are driven by the preferences, location and convenience of skilled workers.

One growing factor in these equations is the cultural preferences of younger workers, many of whom want an urban lifestyle and are less willing to endure long commutes to car-dependent locations. Partly in response to these preferences, innovation-sector companies are increasingly locating in urban settings, including downtown San Francisco. Salesforce, Twitter, Yelp, Airbnb, Uber (in Oakland) and Amazon (in Seattle) are examples of a significant but by no means universal shift. Other firms, including Box and SurveyMonkey, have located in smaller, transit-rich downtowns.

Many — if not most — innovation-sector companies continue to locate in isolated suburban locations with few amenities and little or



no transit service. And, increasingly, workers expect to be provided with transportation solutions as part of their compensation. The most visible of these are the employee shuttles that have become a ubiquitous — and sometimes controversial — presence on Bay Area roads. To retain a competitive workforce, companies also provide perks and amenities like high-end meal services, laundry, haircuts, pet care, massages and more. All of these amenities reflect intense competition to retain workers by catering to their needs and desires, and also a desire to increase the amount of time employees spend in the workplace. In order to attract top talent, companies will continue to contend with the performance characteristics of their campuses, the lifestyle consequences of grueling commutes in auto-dependent settings and the extent to which they must make up, through private investment, what well-planned cities offer intrinsically.

2. Security/Intellectual Property

Protecting intellectual property is a top priority in highly competitive industries where even a small edge in technology or



Photo by Allison Arreff.

Google



timing can make the difference between becoming the industry standard or an also-ran. Security is often given as an explanation for workplace designs like the low-slung, multibuilding campus in a suburban location. It is also one motivation for providing worker amenities on campus, reducing workers' time spent in public spaces (and away from work). This aligns with some firms' desire to create an insular and cohesive corporate culture in a cloistered setting.

Responses to security needs and concerns vary widely. Even in urban locations, some companies have created sealed vertical campuses with little connection to their surroundings such as Adobe's headquarters in downtown San Jose. Others, like Amazon with its mix of high-rise and midrise buildings in central Seattle, deliberately encourage workers to engage with the surrounding street life as a source of inspiration.

Some suburban campuses are quite open, more in line with the university campus model (like Google in Mountain View and Microsoft in Redmond, Washington), while others are pointedly closed (such as Apple and Facebook). These decisions have important ramifications for transportation and public space. Workplaces that address security concerns by orienting away from streets and public spaces degrade the surrounding pedestrian environment, limit accessibility to a range of services on foot and hamper the viability of public transit. It is possible, however, for even highly secure environments to connect effectively to surrounding streets. Traditional urban office buildings — often home to banks, legal offices and other sensitive functions — provide an excellent model of highly secure workplaces that work within a functional, walkable public realm.

3. Floorplates

Large, flexible floorplates (buildings with at least 60,000 square feet of usable space on each floor) are a significant part of Silicon Valley's corporate culture. These spaces are considered

valuable for quickly assembling and reconfiguring large teams that can interact easily and spontaneously.²⁹ They are in some ways the spatial expression of the flatter, less-hierarchical management structure associated with Silicon Valley. It is notable that this culture emerged in the low-slung commercial and industrial spaces of the postwar suburbs. Vertical circulation between floors, in contrast, is widely seen as an impediment to seamless collaboration.

As one executive put it, "the minute you have to choose whether or not to get in an elevator is the minute you don't."

Offices are also getting denser and more open. The cubicles and perimeter offices of earlier generations have rapidly given way to varied work settings, from clusters of informal tables to more secluded workspaces where individuals can do head-down work or collaborate with their project team. Offices built to accommodate three workers per thousand square feet now commonly host six or more in the same amount of space, with significant implications for parking, restrooms and site design.

In a culture that prizes innovation and seeks to facilitate it in every way possible, it is no surprise that for some companies, the largest possible amount of contiguous square footage is a major organizing principle. Facebook's new West Campus consists of a single immense second-floor workspace of nearly 430,000 square feet. (The first floor is parking, the third a roof garden.) Similarly, Nvidia's Santa Clara headquarters, designed by Gensler, was built on two contiguous 250,000-square-foot floors. While these are extreme examples, they are indicative of a larger trend affecting workplace design and location.

A desire for large, open floors is one reason technology companies have favored repurposed industrial buildings in places like San Francisco's South of Market and Oakland's Jack London Square. Some notable location decisions are driven by exceptional buildings that combine large floorplates with urban amenities and culture. Twitter's move to the San Francisco Furniture Mart in the Mid-Market neighborhood and Uber's to the former Sears building in Uptown Oakland are two such examples. These opportunities are scarce, and savvy developers and planners have been exploring sites, building types and policies that will allow new construction to serve these demands.

4. Growth and Exit Strategy

In the innovation economy, today's startup might be tomorrow's "unicorn" billion-dollar company. The physical landscape of Silicon Valley reflects this churn. New companies, fueled by venture capital, need to scale up at dizzying rates, acquiring whatever office space is readily available at the time. Alternately, should a company close, fail or be acquired, it must extricate itself from that space quickly. The most common template for the Silicon Valley workplace is not a campus per se but a repeated module of

²⁹ How much interaction the worker on one side of a floor has with someone on the opposite end is an open question. In addition, the very large horizontal structures required for such floorplates create significant problems for pedestrian access. They limit pedestrian circulation, which depends on a fine-grained network of paths. They present monotonous street frontages that provide little visual interest, and they do not define street edges as taller structures do.



two or more buildings with some landscaping and surface parking, often part of a larger office park. The model is standardized and predictable so it can be financed, built, leased and reinhabited quickly. The need for an exit strategy is a common driver of the form and location of Bay Area jobs. Each building (or group of buildings) includes its own exclusive parking, so it can be easily sold or leased.

But that modular form can have serious downsides from a policy and urban form perspective. Surrounded by parking, these employment centers not only lock in auto commuting, but they can never coalesce into the kind of contiguous, walkable environments that make other travel modes possible. The expectation of rapidly repurposing buildings in the marketplace makes any deviation from the norm — and hence any innovation in the Silicon Valley landscape — very much the exception.

But as real estate costs have increased, denser, multistory buildings with attached garages have proliferated, with a similar modular site plan. This might represent an opportunity to retool auto-oriented job centers into a more efficient pattern that can be accessed by other modes of travel. With careful site planning, it is possible, though difficult, to create a more efficient, walkable environment with these elements. Auto-dependent environments at these higher densities also test the limits of the road network's capacity, resulting in grueling congestion and regulatory challenges. In addition, expensive parking structures have disadvantages. They cannot be readily repurposed the way surface parking — often used for “land banking” — can be, and their value in the emerging era of autonomous vehicles is uncertain.

Large companies often have a core campus and then lease other buildings nearby. The prevalence of surface parking and auto-oriented street networks results in a dispersed and discontinuous workplace, even within these companies. This model provides a degree of flexibility so long as the company is bigger than its core campus. But if it shrinks, it risks being saddled with stranded assets that are difficult to subdivide.

The traditional urban multitenant office building provides an excellent model of market resilience and can be securely repurposed on the module of a single floor or less. Transportation and public amenities are held constant, apart from the real estate

transaction, so the place can accrue value and efficiency over time. Creative leases can provide a hedge against uncertainties of growth.

New Forms: Can Smart Hybrids Yield a More Efficient Middle Ground?

Some of the most interesting new workplaces in the innovation sector are in neither the urban core nor the suburban campus. Driven by intense demand, new hybrids are springing up, some of which point the way toward solutions that can serve industry needs while better aligning with the planning and policy imperatives of the 21st century.

Completed in 2015, Samsung's Silicon Valley headquarters embraces the City of San Jose's urban vision for its North First Street tech corridor, decisively meeting the sidewalk in front of the adjacent light rail station. Designed by NBBJ and SWA Group, the two 10-story towers with ground-floor retail, linked by outdoor walkways, represent a vertical alternative to the one-to-three-story tilt-ups that predominate in this less-prestigious corner of Silicon Valley. Because Samsung owns the property, it was not subject to the speculative calculus that has prevented many other projects from embracing the urban ideal.

In downtown Redwood City, cloud-storage firm Box leased two seven-story towers directly above the Caltrain station. The project, developed by Kilroy Realty, was subject to Redwood City's ambitious urban design standards, which emphasize pedestrian-friendly ground floors. To address its future growth potential, Box leased both buildings; it currently occupies one and is subleasing the second for one- to three-year durations that provide the company the flexibility to expand and contract over time. Parking is shared with the public on a timed basis, and employees are encouraged to patronize local businesses. Samsung and Box demonstrate the untapped potential of thinking more urbanistically about corporate campus design and location.

At Bay Meadows, a former racetrack in San Mateo, the developer Wilson Meany has also bet on Caltrain as an organizing amenity, building a complete, walkable urban neighborhood that

combines housing, retail, open space, a private high school and office buildings with large floorplates clustered at the rail station. The concept is paying off: in 2015, SurveyMonkey made the decision to move here from downtown Palo Alto, where limited zoning capacity precluded its expansion. With the Central & Wolfe Campus, HOK envisioned a futuristic new hybrid when transforming an existing 20-acre business park in Sunnyvale. To the east, Bishop Ranch, the venerable suburban office park in San Ramon, is seeking to reinvent itself as an urban center in the suburbs with a Renzo Piano-designed shopping mall and 5,000 units of multifamily housing.

These projects are rare examples of developers pushing a smart alternative to the standard speculative product, which has to date paid handsome and predictable dividends. These examples offer a toolkit that can address the challenges facing Bay Area job centers, if they can be broadly replicated and made the norm rather than the exception.



Rendering courtesy HOK

Firm Lifecycles

The expansions and contractions of fast-growing tech companies have had a major influence on the Bay Area commercial office landscape. The priorities of a quickly evolving company shift considerably over its life span from startup to growing company to established player. At each stage, firms must make decisions about real estate location, space format and transportation, optimizing for different imperatives, resource constraints and risks.

Startup

An early-stage company typically locates where it does because of the availability of key resources such as venture capital seed funding, incubators and accelerators, labs and talent – and importantly – proximity for the CEO. Since young companies rarely have much revenue and need to spend what capital they do have on growth, startups look for cheap, flexible spaces they can lease on a short-term basis, such as flex or class-C office space set up for live/work, co-working or shared or subleaseable space. Startups in early stages generally spend just one to two years in each office.

Funded and Growing

As the company shifts from an idea to a going concern with investor interest and the capital to grow, it will go through multiple stages of maturity: seed funding, series A, series B, series C and, for some, eventually going public. In the venture funding life cycle, series B is the building round, when companies often seek out their first larger office to accommodate 100 or 200 people. This series-B round is an opportune time for a company to try to influence decisions about real estate.

It is at the stages of rapid growth (series C and D) that companies might bring in a real estate team to make decisions

about location and form. These decisions are guided by the battle for talent, cost, scalability, company culture and moves made by peer companies. In this stage, some very high-growth companies expand so fast that they cobble together whatever space they can. They might spread out in any space they can grab within proximity — or they may have leased more space than they need and begin subletting. In an up economy, a strong sublet market provides flexibility and mitigates risk: In most markets, companies can sublease space to others on a staggered basis until they need it. Only a tiny minority of companies will ever build a new office from the ground up. Given that real estate costs are one of the biggest items on a company's books, the chief financial officer will be deeply involved in these decisions.

Established

At some point, companies move beyond the innovative high-growth phase and into operations. At this point, there are increasing pressures to become more efficient, show revenue and pay back investors. Once they're mature, companies may not need the best C-suite, product development and engineering talent — and maybe can't afford it. Then they may decide to forgo the location that can get the best people and grow operations in a more economical place. At this phase, the best spaces are those that can be broken off and sold.

When in a company's life cycle is it most likely to be open to ideas for creating a better campus? Companies are best equipped to make significant choices just as they begin to grow. Brokers and investors have a big influence at this stage — but so do employees, given that competition for talent is such a significant driver. If talent wants transit and urbanism, companies will be motivated to move to and grow in these sorts of locations.

Recommendations

This section presents SPUR's recommendations for creating a more efficient, sustainable and high-performance pattern of employment growth in the Bay Area. Our recommendations aim to answer two key questions:

1. How do we encourage employers to choose efficient, sustainable, high-performance locations?

2. How do we create more efficient, sustainable, high-performance locations?

The recommendations address these questions in three categories:

Location: Where should new commercial and employment centers be located, and what considerations and policies can be used to shape location decisions made by developers and employers?

Commute: How can we reduce drive-alone commuting to jobs in all locations, thereby reducing greenhouse gas emissions, air quality impacts and time wasted in congestion?

Form: How can workplaces be designed to meet the needs of employers while creating great places, supporting a range of transportation choices and contributing to the region's long-term health, efficiency and competitiveness?

Location

Goal: Locate jobs in accessible places that reduce drive-alone commuting, make more efficient use of land and reduce greenhouse gas emissions.

1

Locate jobs in areas well served by regional transit and basic amenities.

Who: Private sector employers, landowners and developers, brokers

- Evaluate the costs of providing transportation, including private buses, last-mile shuttles, bicycle infrastructure and transportation benefits.
- Evaluate the location-related impacts on talent acquisition and retention of commute patterns, amenities and lifestyle.
- For developers and owners, consider the long-term value of urban locations as growth proceeds.

Employers — specifically heads of real estate and human resources — should consider the full ramifications of location choices. This means not only building stock and cost, but also the costs of providing transportation services, and the effect on employee lifestyle, convenience, taste, and morale. In addition, employers that are buying or building workplaces should be aware of the way suburban environments are often hampered by subsequent development, where urban settings accrue both economic and functional value with increasing density.

2

Update zoning to allow for more growth near transit

Who: Local government

- Update zoning codes to allow dense employment growth within walking distance of regional transit stations. Identify key development opportunities in these locations.
- Reduce impediments to new development in downtowns and station areas through specific plans and proactive environmental review, and by streamlining the permit process for projects that meet clearly defined parameters, including minimum densities and walkable urban design.

Careful location of employment growth is critically important to the future of the region. One of the most significant impediments to locating new employment in transit-rich urban settings is the lack of zoned growth capacity in these locations. In some cases, areas well-served by transit are also older, smaller-scale downtowns, which may be reluctant to accommodate new employment growth or may be subject to local political pressure to reject, delay or shrink proposed development projects in precisely the locations that will perform the best. These issues have emerged repeatedly along the Caltrain corridor in places like downtown Palo Alto and downtown Mountain View.

Plan Bay Area identifies these areas as critical for new growth, but the necessary land use controls lie at the local level. Political and policy leadership at the local level is essential to creating capacity for growth. Local governments can support these efforts by passing infill-oriented specific plans and zoning codes, and subjecting them proactively to environmental review under the California Environmental Quality Act. That regulatory cover should be supplemented by political cover for planners and permitting agencies who seek to implement projects that comply with these policies.

Historically, land use planning for Bay Area employment centers, especially outside downtown areas, consisted simply of designating large swaths of land as “commercial” or “industrial,” mandating a large amount of parking and then letting the private market do the rest. This *laissez-faire* approach facilitated the rapid and inexpensive development of Silicon Valley and other suburban workplaces (and, simultaneously, the urbanization of large areas of orchards and baylands). More recently, market pressures have led to denser development at many suburban employment centers — without a clear vision of how to serve them with housing, transportation and services. While this growth reflects a robust economy and is fiscally beneficial to city budgets, it contributes to congestion, puts intense pressure on limited available housing and creates counterproductive anti-development sentiment.

Proactive local land use planning is essential to accommodating job growth in the right locations and facilitating the successful transformation of low-density, single-use job centers into efficient, sustainable, high-performance places. Once cities establish clear expectations and zoned capacity, new development can occur quickly and play a role in reshaping the region.

3

Retrofit single-use employment centers to provide a mix of housing, retail and jobs.

Who: Local government, regional agencies, transit operators, landowners and developers, business and civic groups (chambers of commerce, think tanks, leadership groups)

- Create specific plans for retrofitting single-use suburban job centers to enable a mix of housing, retail and employment. Revise zoning codes to reflect specific plan goals.
- Include detailed implementation strategies, including phasing plans, impact fees, private assessment districts, developer agreements and collaborative transportation management.
- Invest in coordinated street network, public realm and transportation improvements.

Although it is critical to accommodate more of the region’s employment growth in existing efficient, sustainable, high-performance locations, it is also critical to focus on creating *more* locations that meet that description. This will require a move away from single-use employment districts toward a dense, mixed-use pattern of development with a balance of jobs, housing, services and amenities. Creating mixed, walkable districts can begin to deliver the efficiencies of an urban setting sooner than comprehensive improvements in public transportation — which often take decades to implement.

Not all employers can or want to move to downtowns and station areas; many are settled or even stuck in more suburban locations. Some of these suburban areas face intense market pressure to add new, denser commercial development, and many include fast-growing companies looking to expand. Under these conditions, cities can take actions to make job centers more efficient and functional, even without an immediate expansion in public transit service on the horizon.

Some landowners or employers may view this as a significant value-add to their properties, which may become destinations and activity centers. Success requires many components — and many actors — to work collaboratively:

- Changing zoning codes to allow or encourage a denser mix of jobs, housing, retail and open space
- Investing in infrastructure improvements, including a densely connected network of multimodal streets, bike facilities and pedestrian connections
- Incentivizing private-sector transportation programs, including long-haul and last-mile shuttles, parking management, etc. (See Recommendation 10 on transportation demand management)
- Setting conditions on new development that require investments in infrastructure, transportation and public space
- Instituting trip caps, charging fees based on employee driving or other policies that incentivize creative private-sector transportation solutions

RECOMMENDATION #2 CASE STUDY:



The Warm Springs/South Fremont Community Plan

With BART set to open a new station at Warm Springs and with great uncertainty about its job base, the City of Fremont decided to create a strong vision for the area around the station. The plan is centered on an “innovation district” and is exceptional in that it pairs the development of a dense, walkable core with strong support for its existing advanced manufacturing and industrial uses, which include the Tesla electric vehicle factory. The plan includes:

- **Capacity for 10,000 to 20,000 jobs** in 11.6 million square feet of development
- **Up to 4,000 housing units**
- **A full array of complementary uses**, with a strong emphasis on industrial jobs. Other uses include market-rate and affordable housing, as well as a mix of hotel, retail, entertainment, office and research and design spaces, mostly within a half-mile of BART.
- **A walkable station area**, with a dense network of streets and public spaces and clear pedestrian connections.
- **A comprehensive transportation strategy**, with BART access and walkability at the core, supported by parking maximums, demand management requirements, commuter and community shuttles, and bikable, walkable streets that are well-served by transit.
- **Clear design standards for building and site design**, focused on engaging pedestrian experiences.
- **Implementation and phasing strategies**, which include approaches to infrastructure funding and gradual intensification as market conditions mature.

- Instituting collaborative public-private frameworks to finance and implement these changes, including TMAs, business improvement districts, Mello-Roos districts, etc.
- Setting clear, binding urban design standards that use new development to shape a walkable environment

4 Levy a regional per-square-foot fee on commercial development, based on vehicle miles traveled (VMT), and use the revenues for transportation and other improvements in areas that commit to growth.

Who: Metropolitan Transportation Commission (MTC)

A regional VMT fee on commercial development, levied on a per-square foot basis and based on each project’s projected trip generation, would accomplish several important things. First, it would require that development in less-efficient settings and formats bear more of the costs it imposes on the region’s public infrastructure. In so doing, it would make development in less efficient locations more expensive relative to development in more appropriate and sustainable locations. Second, it would create a source of revenue that could be used to support multimodal transportation improvements, including public transit, pedestrian improvements, last-mile solutions, etc.

New commercial development of significant scale is already subject to analysis of its transportation impacts as part of environmental review under the California Environmental Quality Act (CEQA). Increasingly,³⁰ this includes analysis of the vehicle miles traveled that will be generated by the project.

Fees can be assessed based on whether a project is likely to increase or decrease average VMT. Walkable locations with excellent transit access would not trigger a fee while those in remote auto-dependent locations would. Such a fee can include mechanisms for projects to “buy their way out” of a portion of the fee by investing in transportation demand management programs that reduce drive-alone commuting³¹.

Fee revenues could be used for:

- Transportation and public realm improvements in station areas that commit to accommodate growth
- Transportation and public realm improvements in suburban job centers committed to a compact, walkable future
- Regional affordable housing development

³⁰ California Senate Bill 743, passed in 2013, is reforming the way in which transportation impacts are measured under CEQA, moving toward vehicle miles traveled (VMT) in place of congestion-based measures that rewarded more suburban locations.

³¹ San Francisco has recently approved such a fee, along with a program that allows new development to meet TDM credits by selecting from a variety of measures to reduce auto-dependence. <http://sf-planning.org/transportation-sustainability-program>

RECOMMENDATION #3 CASE STUDY



Bishop Ranch

Bishop Ranch has been a quintessentially suburban office park since the late 1970s, with 10 million square feet of commercial space, including several major corporate headquarters, adjacent to Interstate 680 in San Ramon. But today the suburban stalwart is reinventing itself as a mixed-use destination, with plans for a 350,000-square-foot shopping and entertainment complex designed by architect Renzo Piano. The new City Center Bishop Ranch will sit in the middle of a 2.1-million-square-foot “downtown” with multifamily housing, hotel rooms and civic uses. The project’s owners view intensification as a way to create new interest in a fairly typical office park while adding new revenues and new customers with fewer car trips than is typical for the area.

5 Create a “smart employment district” designation for locations that commit to policies for suburban retrofitting and VMT reduction. Make revenues available to support these efforts.

Who: MTC, Association of Bay Area Governments (ABAG)

Resources should be targeted to station areas and downtowns, to leverage existing transit services by improving connectivity and increasing ridership. However, we also recommend the creation of a new designation: a “smart employment district.” This designation would apply to a relatively auto-dependent job center where employers, landowners and local government commit to an ambitious and transformative package of policies aimed at creating a dense, mixed-use and high-performance built environment. This would include private-sector investment, collaborative governance, trip caps or other benchmarks for reducing driving, binding urban design standards and regulatory reform. These areas would then become eligible for revenues from the VMT fees described in Recommendation 4, which could be awarded to fund infrastructural, programmatic and public realm improvements. This “opt-in” program would be restricted to the most committed jurisdictions

and be aimed at transforming single-use employment districts into high-performance urban settings.

Designating specific locations for intensification could help relieve pressure on the region’s infrastructure and natural systems. It could also relieve pressure on industries — like manufacturing and logistics — that are space-intensive and appropriate to peripheral, lower-density settings.

6 Develop transit-oriented development (TOD) policies that maximize growth in limited station-area locations.

Who: MTC, ABAG, Caltrain, BART

- Develop station-area growth targets based on regional needs and available land.
- Define performance metrics to assess the effectiveness of local land use planning and permitting against targets.

Although facilitating dense, compact development in the areas around transit stations is critical to making transit work and reducing dependency on cars, transit operators and regional agencies like the Metropolitan Transportation Commission have been relatively hands-off when it comes to station-area planning and development. While BART has implemented several transit village projects on its parking lots and adjacent parcels, the scope and ambition of these projects has been fairly limited when compared with the regional need. State agencies should also participate through streamlining regulatory and appeal processes and empowering regional planning agencies. Local development politics and priorities have generally prevented transit-oriented development of a meaningful scale in the Bay Area. This is not the case in many regions, including the Seattle-Tacoma region and the Virginia suburbs of Washington, D.C.

Regional and state agencies, along with transit operators, should adopt TOD policies with measurable outcomes that will result in significantly more growth in transit-rich locations.

Commute

Goal: Shift Bay Area commuting away from solo driving in all locations. Reduce commute times, congestion and greenhouse gas emissions while supporting walking, biking and transit.

Bay Area employers have a unique position in the regional economy and hence in policy dialogue. Leaders in the Bay Area innovation economy could have considerable influence on policy decisions if they developed consensus and an agenda around a more efficient and sustainable approach to growth and transportation. Specifically, they can help advocate for a public transit system worthy of the region’s global economic significance, ambitious enough to serve the region’s pressing needs and aligned with its identity and values.

It was this kind of civic engagement by major Bay Area businesses in the 1950s that helped bring BART to fruition. Industry should be engaged in civic advocacy and in articulating a long-term vision for the region. By aligning with regional policymakers and global best practices, employers can help articulate and realize a positive regional vision and cultivate public support.

7 Invest in significant long-term improvements to public transit service.

Who: MTC, state, transit operators

- Improve Caltrain service through electrification.
- Build out a bus rapid transit network on major corridors, with dedicated rights-of-way.
- Complete BART to Silicon Valley, with well-integrated station-area development planning.
- Upgrade transit in the Dumbarton corridor.
- Implement the Statewide Rail Modernization California program, including building high-speed rail and making improvements to Capital Corridor and Altamont Commuter Express.
- Study a second transbay rail tunnel and other next-generation projects.
- Complete extension of Caltrain to downtown San Francisco.

Public transit must be improved regionwide. While numerous important transit projects are planned or under way, the Bay Area is nowhere near providing transit service that is competitive with driving for most commuters. This is particularly true in areas that were developed around the automobile in the last 70 years, such as the South Bay, the Interstate 680 corridor and the Interstate 580 corridor. Sprawling single-use development patterns, which are very difficult to serve effectively with transit, deserve much of the blame, but expanded transit service, seamlessly integrated across jurisdictions and operators, is essential as well.

New investments should emphasize dedicated rights-of-way, rapid service and easier transit connections. BART should complete its extension to downtown San Jose, coordinated with dense development around station areas. As SPUR has recommended elsewhere,³² Caltrain's current electrification effort is only the first step in maximizing the capacity of that system, which should be operated in tandem with high-speed rail and connected to San Francisco's Transbay Transit Center. Looking further into the future, a second transbay rail tunnel should be considered to expand existing service and shape the Bay Area's growth for future generations.

8 Provide near-term improvements to transit operations and passenger experience.

Who: MTC, transit operators

- Develop seamless information, maps, payment systems, signage, schedules and fare coordination across transit operators.
- Innovate last-mile solutions and connections to job centers.
- Create a regional express bus system across operator jurisdictions.

While long-term investments are essential, numerous near-term improvements to transit service and usability can be implemented quickly if rider experience is put at the center of decision making. These include coordinating information, mapping, signage, scheduling and fare payment across operators. A regional express bus system, supported by high-occupancy toll lanes and dedicated transit lanes, could be implemented much more quickly than major capital upgrades, and at a relatively low cost.

9 Develop collaborative, place-based partnerships such as transportation management associations (TMAs) to manage transportation proactively.

Who: Local government, transit operators, private sector employers, landowners and developers, business and civic groups, TMAs

Transportation is a complex, multidimensional challenge, especially in rapidly changing locations far from regional transit. Public agencies are highly constrained and slow-moving, while private entities often lack expertise, perspective and scale. Effective solutions require sustained focus and the ability to draw resources and insights from different actors in different sectors. Transportation management associations, which are typically public-private partnerships between businesses and local government, provide a mechanism to deliver these solutions. TMAs can provide transportation services to commercial districts and business parks, among other locations, and can allow smaller employers to offer the types of commute-trip reduction services often only available to larger companies.³³

TMAs should:

- Develop shuttle routes between regional transit hubs and employment centers that are open to the public.
- Provide clear and accessible transportation information.
- Monitor transportation behavior and revise service to improve commute options other than driving alone.

³² See SPUR, *The Caltrain Corridor Vision Plan*, 2016, <http://www.spur.org/publications/spur-report/2017-02-23/caltrain-corridor-vision-plan>

³³ Victoria Transport Policy Institute, *TDM Encyclopedia*, <http://www.vtpi.org/tdm/tdm44.htm>

RECOMMENDATION #9 CASE STUDY



The Emeryville Transportation Management Association

The Emeryville TMA is a public-private partnership funded by a citywide property-based business improvement district. Businesses in the district pay dues to fund and operate services, primarily the Emery-Go-Round, a free public bus system providing Emeryville commuters and residents with a “last-mile” connection between the MacArthur BART Station in Oakland and their final destinations.

Emeryville, situated on the bay shore between Berkeley and Oakland, is home to a significant cluster of technology, biotech and life sciences companies. Despite its central location, it is beyond easy walking distance from BART and subject to some of the region’s worst traffic congestion. Amtrak Capital Corridor provides an important regional connection to Emeryville but is relatively infrequent and expensive.

The Emeryville TMA is governed by a board of directors representing employers, city agencies and others, and is funded by fees on real property.

The Emery-Go-Round runs several shuttle lines to and from MacArthur BART seven days a week, effectively integrating this significant job center into the regional transit network. Because Emeryville has also accommodated the development of considerable infill housing, the free shuttles are well-used in both directions. In 2014, the Emery-Go-Round had almost 1.7 million boardings.

- Work with local jurisdictions to identify and contribute to key transit, bike and public realm improvements to better integrate employment centers with regional transit.
- Aggregate demand from smaller employers to provide private commuter shuttles to high-demand areas. Allow public access to commuter shuttles with payment via Clipper or monthly passes to serve a broader base of commuters and ensure adequate utilization.
- Create and promote a toolkit of best practice solutions for transportation demand management for employers,

developers, and policymakers. TMAs around the region should also share technical resources and tools with one another.

10

Institute transportation demand management programs.

Who: Local government, private sector employers, landowners and developers, TMAs

Transportation demand management (TDM) is a set of tools designed to reduce driving in a specific area by limiting subsidies like free parking and making other modes of travel more competitive. TDM programs that include paid parking have been shown to reduce auto trips by 15-30 percent depending on the availability of transit³⁴ and in some cases much more. TDM programs can be mandated as conditions of approval for new commercial development and may be provided by landowners, employers, TMAs or other institutions. Wherever possible, TDM programs should define measurable outcomes like trip caps or driving reduction targets, and let employers or TMAs create the specific package of solutions.

TDM programs can include the following tools:

- Financial disincentives to drive such as parking fees or parking cash-out programs, which offer employees the cash equivalent of their parking space if they choose not to drive
- Discounted transit passes that employers can buy in bulk, passing the savings on to employees
- Bike parking, lockers and showers
- Last-mile circulator shuttles that connect to transit stations and local services all day, not just during commute hours
- Carpool and vanpool programs, including coordination, parking and incentives
- Guaranteed ride home programs that cover the cost of a ride home in case of an emergency or unexpected change of plans

11

Implement regional transportation pricing mechanisms.

Who: Regional agencies, state, private sector employers, landowners and developers

- Create high-occupancy toll (HOT) lanes³⁵ on congested freeways in order to reduce drive-alone commuting and improve performance for buses, shuttles and carpools. Consider a low-income exemption to reduce impacts on low-income people.

³⁴ National Evidence on TDM Program Impacts Vehicle Trip Reduction from Background Conditions Source: Cambridge Systematics, 2010 (Fairfax County, VA)]

³⁵ These lanes are available free of charge to transit and high-occupancy vehicles but require a variable fee from other vehicles.

RECOMMENDATION #10 CASE STUDY



Google

Although the “Googleplex” campus in Mountain View in many ways epitomizes the suburban corporate campus, the company’s ambitious transportation programs have overcome the challenges of its location and site design to a remarkable degree. Only 46.3 percent of employees drive alone to work.³² That’s lower than the City of Oakland’s drive-alone rate and far lower than the regional average. This is due to aggressive and innovative TDM programs that include:

- Long-haul commuter shuttles
- A last-mile shuttle from the Mountain View Caltrain station
- Carpool and vanpool programs and incentives
- On-site amenities including food and childcare
- Shared campus bikes and on-site car-sharing services

All of these programs are in part driven by a powerful incentive from the City of Mountain View, which used its North Bayshore Specific Plan to impose a cap on the number of car trips allowed in the North Bayshore area, where Google is located. The trip cap allows increases in office development only if transportation programs can keep the total number of trips below stipulated numbers.

- Price parking to incentivize commuters to drive less and encourage transit ridership.
- Levy a regional VMT fee (see Recommendation 4) to encourage companies to choose locations, design and programmatic measures that reduce drive-alone commuting.

One of the most powerful ways to shift behavior is to send a price signal that favors a socially desirable behavior. Tolls and fees on roadways, parking and auto-oriented development

can simultaneously discourage problematic behavior and raise revenue to support alternatives and offset any regressive effects.

12

Make local shuttles and other last-mile connections to corporate campus settings accessible to visitors, contractors and the public.

Who: Private sector employers, TMAs

Employer-provided commuter shuttles are often treated as extensions of the workplace and for this reason, they are unlikely to be open to a broader public. However, last-mile shuttles are substantially different and should serve everyone, as do Stanford’s Marguerite shuttle system and Emeryville’s Emery-Go-Round. As employment centers become denser and more mixed, last-mile shuttles can also serve contractors, residents and workers in other businesses, ensuring that shuttles are well-utilized and reinforcing these areas as efficient, well-connected origins and destinations.

13

Implement programs and policies to support innovative transportation solutions.

Who: Local government, state, private sector employers, TMAs

- Explore the use of autonomous shuttles and other emerging technologies to support low-cost commute alternatives to driving alone.
- Support or remove impediments to emerging transit options that are publicly accessible and that reduce driving alone, including aggregated shuttles, on-demand and micro-transit, carpools, vanpools, private transit and autonomous shuttles.

Solving the Bay Area’s transportation challenges requires an all-in approach organized around a shift away from drive-alone commuting. This means combining traditional investment in public transportation with a wide variety of other approaches, regardless of their sources. Private commuter shuttles, road pricing, ride-hailing services, bike sharing, on-demand transit, autonomous vehicle technologies and many other elements can all play a role. Many emerging technologies could have both positive and negative impacts. For example, autonomous vehicles can reduce car ownership and free up urban areas from the blight and cost of parking, but they can also facilitate sprawl by enabling more cars on freeways. Ride-hailing services can back up a car-free lifestyle and commute, but they can add emissions, contribute to congestion and compete with transit. Policymakers should articulate their criteria for new programs (reducing auto trips, lowering greenhouse gas emissions, increasing safety) and err on the side of permissiveness when it comes to emerging solutions.

14

Manage parking to reduce drive-alone commuting and adapt to changing conditions.

Who: Cities, counties, transit operators, private sector employers, landowners and developers

- Eliminate the requirement that developers provide a minimum number of parking spaces. Limit the maximum number of parking spaces in urban locations. In transitional locations, consider parking maximums augmented by district parking solutions.
- Allow parking requirements to be met through in-lieu fees.
- Tax parking facilities or their use. Unbundle (separate) parking fees from building lease costs.
- In high-density areas, encourage the replacement of existing stand-alone parking garages with new office buildings.
- Revise codes to require that new parking structures be designed for disassembly or conversion to other uses, with adequate floor-to-floor dimensions and level floors.
- Avoid major investments in parking infrastructure.

One of the most important factors affecting workers' decision to commute by driving alone is whether they have to pay for parking.³⁶ A 2000 survey of Bay Area commuters found that while 77 percent of commuters drove alone when free parking was available, only 39 percent drove alone when they had to pay to park.³⁷

Once considered a given in suburban settings, free parking has become more difficult to offer as existing buildings are used more intensively, sites are developed at higher densities requiring expensive structured parking and severe congestion makes drive-alone commuting less desirable. Many employers no longer provide free parking and rely on TDM measures and private transit services to reduce drive-alone commuting.

The role of parking is likely to change in unpredictable ways with the widespread adoption of autonomous vehicles. If vehicles can park themselves in peripheral locations or go on to serve other passengers instead of parking, then parking no longer needs to drive built form or development economics. Although the nature and pace of autonomous vehicle adoption is uncertain, it has the potential to render obsolete the parking facilities being built today. Coupled with the existing rationale for parking management (that it is critical to reducing drive-alone commuting) this suggests that the provision of parking should be limited to a few approaches:

³⁶ 41 TDM Case Studies from Best Workplaces for Commuters; Transportation Elasticities from VTPI; Moving Cooler report; Implementations by Stanford, 20th Century Corp, and CH2M Hill.

³⁷ RIDES for Bay Area Commuters, Inc., "Commute Profile 2000, a Survey of San Francisco Bay Area Commute Patterns," August 2000. Regionwide telephone survey of 3,600 commuters sponsored by the Metropolitan Transportation Commission.

- "Land-banking" surface parking lots for future development (with careful attention to impacts on site planning and urban design);
- The use of garages designed for deconstruction or conversion to other uses;
- The use of district garages that can be shared and managed to serve intensifying land uses over time.

15

Build streets that are comfortable and safe for pedestrians, cyclists and transit users, both within employment centers and between them.

Who: Cities, counties, landowners and developers, architects and designers

Job growth inevitably leads to pressure on transportation infrastructure, often in the form of congested streets. Under these circumstances it can be tempting to fall back on outmoded solutions that emphasize widening streets to carry more cars at the expense of pedestrians, bicycles and transit. But as repeated studies have shown,³⁸ you cannot pave your way out of congestion. This approach only reinforces dependence on cars and prevents a shift to the kind of multimodal transportation system that can accommodate long-term growth.

Streets, especially those linking transit hubs and job centers, should be designed to serve transit, cycling and pedestrians and to serve as venues for public life and commerce. Dedicated lanes for transit, shuttles and high-occupancy vehicles can serve key access routes and ensure that transit users are not delayed by congestion.

Form

Goal: Create walkable, high-performance places that support transportation choices; offer a variety of services and amenities; support public life, health and sustainability; and accrue long-term economic value.

The built environment sends strong cues about how people should behave, interact and get around. Most Bay Area jobs are located in settings that are designed around driving and parking — and simultaneously make pedestrians and cyclists feel uncomfortable and unwelcome. These recommendations are directed at retooling employment districts to serve a broader range of transportation choices and functions, all while addressing employer needs and market expectations.

³⁸ "Increasing Highway Capacity Unlikely to Relieve Traffic Congestion," by Susan Handy, Department of Environmental Science and Policy University of California, Davis (2015) http://www.dot.ca.gov/research/researchreports/reports/2015/10-12-2015-NCST_Brief_InducedTravel_CS6_v3.pdf

Walkability is an excellent proxy for good urban design. A good walking environment is generally compact and offers a mix of uses, serving a variety of needs within a short distance. It is also low emission and transit supportive, since all transit riders are also pedestrians. Making our employment centers more walkable is essential if the region is to continue growing and thriving.

The recommendations presented here are designed not to create an optimal urban condition but rather to strike a balance between the priorities of today's employers and the imperatives of the region's future. With sustained focus and clear policies, we can create hybrid environments that perform much better but are achievable under real-world conditions.

16 Retrofit suburban job centers by investing in streets, plazas, paths and other spaces as an integrated, pedestrian-friendly public realm.

Who: Cities, counties, transit operators, private sector employers, landowners and developers, architects and designers, business and civic groups, TMAs

- Introduce a street pattern with small blocks and/or through-block pedestrian access to support walking and cycling.
- Design circulation, transit facilities and drop-off areas to activate streets and public spaces.
- Identify key public realm improvements to support walkability and implement them collaboratively with employer and local government participation.
- Employ developer agreements and impact and mitigation fees to require developers and employers to contribute to public improvements that support walkability, public life and transit use.

Streets are our most important public spaces, and their design dictates whether pedestrians, cyclists and transit riders feel safe and comfortable or marginalized. The pedestrian experience sends a powerful signal about expectations for transportation behavior. Critical decisions occur at several levels: the street network, the apportioning of the right-of-way to different travel modes and functions, and the relationship of buildings and their functions to public streets.

17 Design workplaces to support an active, walkable public realm.

Who: Cities, counties, private sector employers, landowners and developers, architects and designers

- Place buildings adjacent to and oriented toward public streets.
- Define key public frontages. Provide active uses and publicly accessible amenities like retail, lobbies and community space at ground level.
- Provide clear pedestrian entrances to buildings and campuses.
- Contribute activity to the surrounding public realm through retail, public plazas and other community spaces designed to support walkability and public life.
- In urban areas with existing amenities, offer employees subsidies for patronizing local businesses in lieu of providing internal amenities.
- Create enforceable development standards that codify baseline walkability and urban design practices. In addition, provide expedited permitting, density bonuses or fee waivers to projects that meet more ambitious, aspirational guidelines and contribute to the public realm.
- Place parking behind buildings or in well-placed garages. Do not use parking to buffer interior spaces from public streets.

Buildings should connect directly to streets and public spaces, create comfortable edges that address the human scale and encourage walking, cycling and transit use. This does not mean abandoning the idea of a multibuilding campus or giving up concerns about security or internal cohesion, only that the boundaries of such settings should occur at the sidewalk.

18 Balance the desire for large, open floorplates with the need for good urban design.

Who: Cities, counties, private sector employers, landowners and developers, brokers, architects and designers

Research has shown that the most important factor in walking behavior is a densely interconnected network of streets and paths.³⁹ The extremely large floorplates favored by some firms can degrade the walking environment by precluding small blocks and frequent connections. Large, low-slung buildings also present a relentless sameness at a walking pace. But a variety of architectural and site-planning techniques can mitigate this impact or reduce the square footage requirements.

³⁹ Travel and the Built Environment: A Meta-Analysis, R. Cervero/R. Ewing, JAPA, 2010.

- Limit building footprints in new construction in urban or urbanizing settings to the scale of a city block or less.
- Consider the tradeoffs between maximum interior flexibility and a walkable, amenity-rich environment for employees and the public.
- Use architecture and site planning to limit floorplate scale and impact where large, contiguous floorplates are a priority.
 - Connect adjoining buildings at upper levels and allowing pedestrian circulation beneath, or place large-floorplate buildings in campus interiors, away from public streets.
 - Orient the shorter frontages of large-floorplate buildings to public rights-of-way and pedestrian routes.
 - Use interior stairs and atria to link smaller floorplates and ease vertical circulation.
 - Use side loading of circulation and utilities and open floor plans to moderate floorplate needs.

The appropriate upper limit for floorplates varies with context. In a dense, fine-grained urban center like downtown San Francisco, floorplates rarely exceed 30,000 square feet. In areas with larger blocks and buildings, codes enforcing that scale would likely prevent any market interest. However, allowing massive floorplates in employment centers that are growing quickly can lock in negative patterns, preventing the future retrofit of these settings to more walkable and transit-supportive environments. The scale of a traditional city block (between 80,000 and 120,000 square feet) evolved because it works for pedestrian access. Creative design strategies may allow larger floorplates by spanning pedestrian routes or otherwise addressing the need for a dense pedestrian network.

19

Manage security in a manner that supports the public realm.

Who: Private sector employers, landowners and developers, architects and designers

- Establish security boundaries within building lobbies rather than at campus edges. Invite public access to and through campus open spaces.
- If secure outdoor space is a priority, establish a hierarchy of spaces from public to private, expressed clearly through landscape design.
- Place less sensitive functions — such as office space for consultants and service providers, amenities, etc. — along public frontages.
- Make some campus amenities, such as retail, dining and entertainment venues, accessible to the public.

Some of the conventional means of addressing security involve turning away from public streets and spaces in a manner that undercuts walkability, public life and transit use. However, there are numerous ways to establish highly secure work environments while supporting a healthy, robust public realm and the benefits and efficiencies it affords. Indeed, the traditional multitenant office tower provides a secure and flexible work environment. Where a campus environment is preferred, public pedestrian circulation should be carefully addressed.

Urban office buildings and university campuses are often situated in highly walkable settings. Many manage to establish strong security barriers in building lobbies or at gateways but still allow the public into lobbies, atria, ground-floor retail and public plazas or gardens. Some create a clear and distinct campus setting while others are dispersed into the urban fabric. A wide range of approaches also exists in more suburban settings. Much of the Google campus, for example, is accessible to the public as open space by city requirement and is connected to local parks and trails. Even a barrier or security cordon may be a feature of the public realm, in the form of a gateway or lobby oriented to sidewalks or public space, in contrast to buildings set behind parking and turned away from streets.

20

Bring employment centers to life with events, activity and amenities.

Who: Cities, counties, private sector employers, landowners and developers, architects and designers, business and civic groups

- Create complementary uses at campus edges and gateways, including street-facing retail, co-work and incubator spaces, hotels and housing. These uses should be organized to create active, welcoming nodes that support walking and transit use.
- Require active uses along public streets, especially those that connect to transit and amenities.
- Update zoning to allow for smaller commercial spaces, co-working and maker spaces.
- Provide temporary activation of underutilized land such as setback zones with programming like food trucks, pop-up retail and arts and cultural uses with an eye toward making these uses permanent.

For single-use employment districts to evolve into accessible compact hubs, it is essential to introduce both complementary land uses (especially housing) and a range of amenities including retail, entertainment, restaurants and services into the mix. If workers and residents can add errands and social activity to their commute trips, other travel modes can become more competitive with driving alone. Adding smaller commercial spaces and services like co-working, startup incubation and maker spaces can bring a complementary but distinct population that can support the innovation economy and nearby amenities.

21

Address sustainability and resilience through campus site design and building systems.

Who: Local government (cities, counties), regional agencies, private Sector Employers, Landowners and Developers, Architects/Designers

- Efficient, high-performance buildings
- District heating, cooling, energy, and stormwater systems
- Restoration of habitat and natural areas
- Planning for adaptation to sea-level rise

Most of the recommendations in this report address the challenges of Bay Area job centers through the lens of reducing driving, which is the Bay Area's largest contributor of greenhouse gas emissions, not to mention the cause of congestion and air-quality impacts. However, campus buildings and landscapes are also critical to sustainability and resilience. Many building systems can become more efficient and sustainable if they are developed across a multibuilding campus. These include high-efficiency standards and centralized monitoring of building systems like lighting and HVAC, as well as shared energy generation, water recycling and stormwater management.

The landscapes of large campuses often provide opportunities to restore ecological systems and habitat. Campus landscapes, both public and private, should make use of climate-appropriate, drought-tolerant and native vegetation wherever possible, and the management of stormwater should be integrated into the local watershed. Outdoor landscapes, particularly waterways, wetlands and shoreline features, provide an excellent opportunity to highlight and interpret natural features and create opportunities for exercise, reflection and wellness.

All new development, but particularly that in low-lying bayfront locations where Silicon Valley firms are concentrated, should reflect comprehensive planning to adapt to climate change over time. Sea-level rise, king tides and storm surges are likely to pose significant threats to these areas by the mid-21st century: We all should be planning for resilience.



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