



# CORRIDORS AND TECH REGIONS: INTERNATIONAL CASE STUDIES



## SAN FRANCISCO AND SILICON VALLEY

### SAN FRANCISCO AND SILICON VALLEY: THE GLOBAL LEADER IN ENTREPRENEURSHIP, INVESTMENT CAPITAL AND TECHNOLOGY

**The leading global region for entrepreneurship, investment and tech business.** Its highly-skilled talent and ability to develop and commercialise technology and launch businesses is unparalleled. Many of the world's most innovative technological advances have been conceived, incubated and scaled in Silicon Valley, generating economic growth and prosperity for the region's companies and residents.

**The San Francisco / Silicon Valley Area consists of 101 cities, but it is one economy with more than 7 million people living, working and recreating across the region.** If the San Francisco / Silicon Valley area were a country, its economy would rank 23rd in the world. Since 2010, Bay Area employment has grown at nearly double the rate of other US metropolitan areas.

**Corporates and start-ups.** Many world-famous companies have their own campuses in Silicon Valley, but many smaller companies prefer to locate in San Francisco. Many firms start in San Francisco and move to Silicon Valley when they get larger. With 2.33 million square metres of office space, the SoMa (South of Market Street) area is the leading tech centre in San Francisco.

**Labour productivity was 62 per cent higher than the U.S. average in 2013.** The share of science, technology, engineering and maths (STEM) jobs in the region's economy was 2.6 times higher than the national average in 2013. The area's technology industry is highly diverse, spanning hardware, software, biotech, clean tech, communications, and social media.

**Transport is a critical challenge in San Francisco / Silicon Valley.** Although there are high levels of demand, extensive commuter rail and three major airports – the historic under-funding, numerous modes, two-dozen transit operators, and fragmented strategic management – has led to greater congestion and increased commuter journey times.

**Other challenges related to housing, falling R&D spending and lack of effective workforce and skills planning and development.** The San Francisco / Silicon Valley area housing costs and rent prices are at an all-time high, largely as a result of the failure to construct new housing in line with demand. Falling investment in R&D in the region's universities is a growing concern and may affect innovation leadership in the long run. The San Francisco / Silicon Valley area's labour market is regional, but current workforce development efforts are limited and uncoordinated.



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## INTRODUCTION

Silicon Valley is located in the southern part of the San Francisco Bay Area in Northern California. The region is home to many of the world's largest **technology companies** including Apple, Cisco, Google, HP, Intel and Oracle and is world-renowned as a leading centre of innovation. Despite its success, there has been a recognised need for developing a regional approach to competitiveness and quality of life issues in the area given the regional nature of its economy, labour market, housing market, and infrastructure needs.

The San Francisco / Silicon Valley area is the leading **high technology area in the world**. San Francisco provides the big city support services and is the home of many start-ups. Silicon Valley provides the space for the larger companies to develop. The region is known for its attractive lifestyle, residential communities, and amenities (particularly in San Francisco).

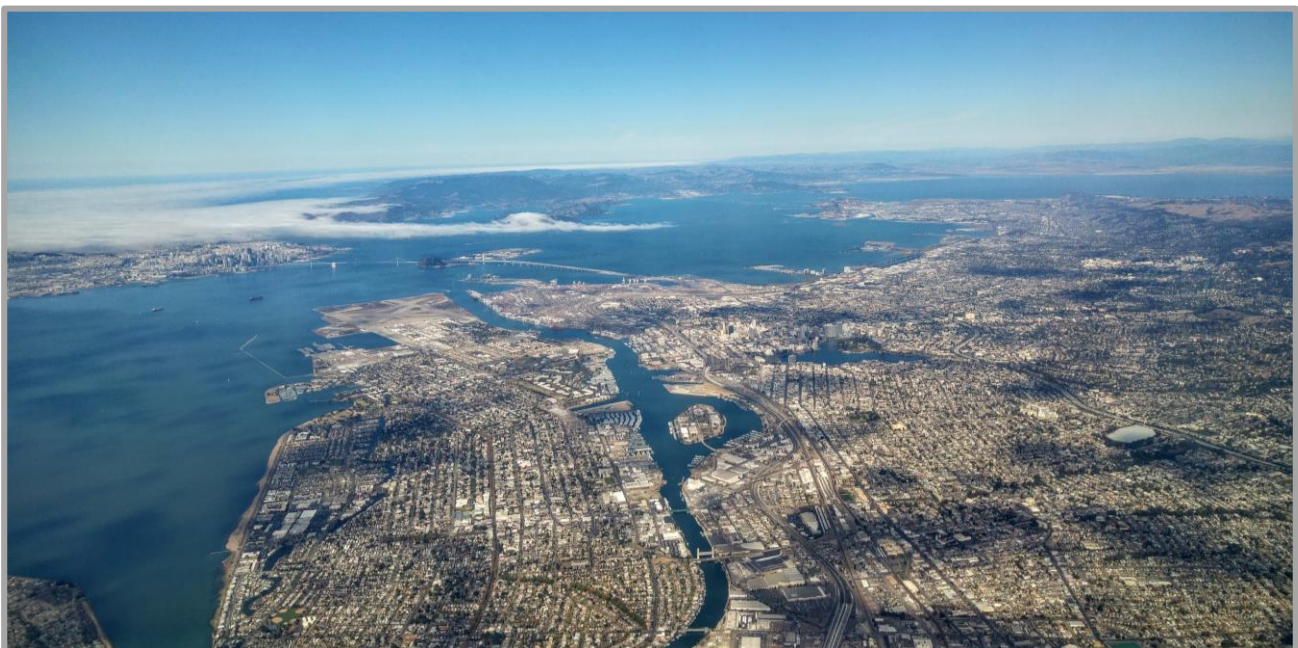
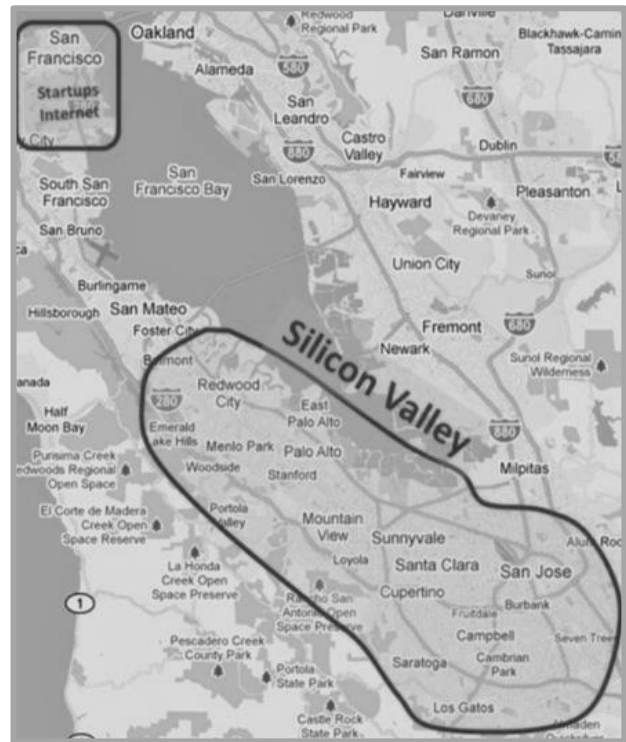


Image courtesy of <https://en.wikipedia.org/wiki/User:Staeiou>



Through these case studies we hope to learn what might drive further growth and prosperity in the London-Stansted-Cambridge Corridor and understand what kinds of priorities and actions might be sensible to consider as a basis for collaboration going forward. You can download the full report [here](#).

**It is also the home of numerous leading science and technology universities, including Stanford, Berkeley, and the University of California San Francisco.** These universities were the original sources of start-ups and tech companies. Now people from all over the US and all over the world come to the San Francisco / Silicon Valley area to start or build high-tech companies. San Francisco / Silicon Valley together lead the US in venture capital and patenting by a wide margin.

## About the area

**Silicon Valley is the name given to the southern portion of the San Francisco Bay Area, which is located in Northern California.** Geographically, it encompasses all of the Santa Clara Valley, the southern half of the San Francisco Peninsula, and southern portions of the East Bay. It includes Santa Clara County, San Mateo County, Alameda County and Santa Cruz County. Silicon Valley covers 1,854 square miles (approx. three times the size of London), and has the University of Stanford at its centre. In 2015, Silicon Valley had a population of 2.63 million (approx. one third of the size of London).

**The wider San Francisco Bay Area** encompasses the major cities and metropolitan areas of San Francisco, Oakland, and San Jose, along with smaller urban and rural areas. The Bay Area's nine counties are Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma. Home to 7.4 million people, and covering approximately 7,000 square miles, the combined statistical area of the region is the fifth-largest in the United States and the 43rd-largest urban area in the world.

**One of the largely overlooked features of Silicon Valley is that it is a sparsely populated region mostly comprising small towns, business parks and campuses.** With a population of 2,642,700, Silicon Valley's largest city/municipality is San Jose (pop. 1,016,500) followed by Sunnyvale (pop. 148,028). Many of the more renowned areas for innovation and tech are based in small towns such as Cupertino (pop. 59,800), Palo Alto (pop. 66,900) and Menlo Park (pop. 33,273)

**Silicon Valley is world-renowned as a leading centre of innovation.** Its highly-skilled talent and ability to develop and commercialise technology and launch businesses is unparalleled. Many of the world's most innovative technological advances have been conceived, incubated and scaled in Silicon Valley, generating economic growth and prosperity for the region's companies and residents. In the 1950s, 60s and early 70s the defence industry was a key driver of growth, followed by semiconductors and integrated circuits in the mid-70s and 80s, personal computers in the 1990s, and the internet in the late 90s and 2000s. The current wave has been led by social media, and has also been accompanied by strong growth in mobile technologies, apps, medical devices and clean energy technology. Each subsequent industry has built upon the expertise, technology, capital, infrastructure and supply chain of the last.

**Silicon Valley was born when several contributing factors intersected, including world-class academic institutions, a skilled STEM research base housed in area universities, plentiful venture capital, steady U.S. Department of Defense spending, and the pleasant climate of Northern California.** The term 'Silicon



Valley' was first used in 1971. The word 'silicon' originally referred to the large number of silicon chip innovators and manufacturers in the region. 'Silicon Valley' eventually came to refer to all high tech businesses in the area. The term gained widespread use in the early 1980s, at the time of the introduction of the IBM PC and numerous related hardware and software products to the consumer market. The 'Silicon' part of the name refers to the high concentration of companies involved in the making of semiconductors and computer industries that were concentrated in the area.

#### SILICON VALLEY POPULATION JULY 2015

Santa Clara County	1,889,638	San Mateo County	753,123
Campbell	41,857	Atherton	6,935
Cupertino	59,756	Belmont	26,748
Gilroy	53,000	Brisbane	4,541
Los Altos	30,036	Burlingame	29,890
Los Altos Hills	8,341	Colma	1,480
Los Gatos	30,505	Daly City	105,810
Milpitas	72,606	East Palo Alto	29,137
Monte Sereno	3,451	Foster City	32,390
Morgan Hill	41,779	Half Moon Bay	12,051
Mountain View	77,914	Hillsborough	11,420
Palo Alto	66,932	Menlo Park	33,273
San Jose	1,016,479	Millbrae	22,898
Santa Clara	120,973	Pacifica	38,551
Saratoga	30,799	Portola Valley	4,527
Sunnyvale	148,028	Redwood City	81,838
		San Bruno	44,409
		San Carlos	29,449
		San Mateo	101,429
		South San Francisco	66,193
		Woodside	5,539

Silicon Valley Population 2,642,761

*SV is a sparsely populated region of mostly small population towns and business parks and campuses*

The region has benefited significantly from the entrepreneurial spirit of people drawn to Silicon Valley and has a very high immigrant population. In 2015, 36.3 per cent of residents were foreign-born<sup>1</sup> and half of the region's population speaks a language other than exclusively English at home – much higher than across the U.S. (21 per cent). Population growth in the area is being entirely driven by foreign immigration. In the year to July 2014, net foreign migration added 17,693 residents to Santa Clara and San Mateo, with a net loss of 7,404 domestic residents who moved out of the region during that time period.

<sup>1</sup> Of all foreign-born residents, 21 per cent were from Mexico, 14 per cent from China, 12 per cent from other Asia, 11 per cent from Philippines, 11 per cent from Vietnam, 11 per cent from India, 9 per cent from Other Americas, 8 per cent from Europe, 1 per cent from Africa, and 1 per cent from Oceania.



## THE ECONOMY AND RATIONALE FOR SPATIAL INTEGRATION

The San Francisco / Silicon Valley Area consists of 101 cities, but it is one economy with more than 7 million people living, working and recreating across the region. If the San Francisco / Silicon Valley area were a country, its economy would rank 23<sup>rd</sup> in the world. Its economic growth rate is outpacing other parts of the state and nation<sup>2</sup> and it has experienced some of the strongest job growth across the U.S. following the Great Recession. Since 2010, Bay Area employment has grown at nearly double the rate of other US metropolitan areas.

Silicon Valley itself is a unique amalgam of academia, private sector and U.S. government research investment coupled with a population of entrepreneurs. It provides a classic example of the benefits of agglomeration economies. Silicon Valley has a regional, network-based industrial system that promotes learning and mutual adjustment among specialist producers of a range of related technologies. The region's dense social networks and open labour markets encourage entrepreneurship and experimentation. Companies compete intensely while at the same time learning from one another about changing markets and technologies through informal communication and collaborative practices.

Silicon Valley has a core area of around 750 square kilometres, the core area encompasses numerous cities (including Palo Alto, Menlo Park, Mountain View, Cupertino, San Jose, and others), had a GDP of approximately US\$221.9 billion (RMB 1,351 billion) in 2014 and contains an enormous concentration of knowledge, innovation, and creativity-based businesses.

Overall, there are 1.5 million people employed in Silicon Valley. The Valley accounted for roughly 1.28 percent of US GDP in 2014. It was awarded 9.7 percent of all US patents in 2013. Many of the residential communities in the area are considered very attractive for tech workers and entrepreneurs.

**Silicon Valley performs extremely well on a number of economic indicators:**

- Labour productivity was 62 per cent higher than the U.S. average in 2013;
- 47 per cent of residents have a bachelor's, graduate or professional degree, compared with only 32 per cent in California and 29 per cent in the U.S.;
- The share of science, technology, engineering and maths (STEM) jobs in the region's economy was 2.6 times higher than the national average in 2013 – a much higher rate than other U.S. innovation regions;
- Job growth has been accelerating since 2010. While employment numbers in Silicon Valley are well above prerecession levels, the state and nation are only slightly above pre-recession levels;
- Average annual earnings were \$116,033 in 2014 Q2, compared to \$70,847 in California and \$61,489 in the U.S.;

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<sup>2</sup> In 2014, San Jose Metro GDP increased 6.7 per cent while San Francisco/Oakland Metro GDP grew by 5.2 per cent, compared to a 2.3 per cent average increase for all U.S. metros.



- Silicon Valley accounted for 46.9 per cent of all California's patent registrations and 12.7 per cent of all patent registrations across the U.S. in 2013;
- Venture capital (VC) investments in Silicon Valley and San Francisco – totalling \$7.4 billion in the first three quarters of 2014 – represented 43 per cent of all investments across the U.S.

**Silicon Valley's top 50 companies in 2015** based on revenue<sup>3</sup>: Apple, Hewlett-Packard, Google, Intel, Cisco Systems, Oracle, Gilead Sciences, eBay, Synnex, Facebook, Applied Materials, SanDisk, Symantec, Sanmina-SCI, Agilent Technologies, NetApp, VMware, Advanced Micro Devices, Netflix, Salesforce.com, Lam Research, Nvidia, Juniper Networks, Yahoo!, Intuit, Electronic Arts, Adobe Systems, Tesla Motors, Varian Medical Systems, SunPower, KLA-Tencor, Equinix, Xilinx, Trimble Navigation, Maxim Integrated Products, Brocade Communications, LinkedIn, Bio-Rad Laboratories, Intuitive Surgical, Synopsys, Altera, VeriFone Systems, Super Micro Computer, JDS Uniphase, Cadence Design Systems, Linear Technology, Fairchild Semiconductor, Omnivision Technologies, Atmel, and Twitter.

**Many world-famous companies have their own campuses in Silicon Valley, but many smaller companies prefer to locate in San Francisco.** San Francisco is home to many start-ups and small companies. Many firms start in San Francisco and move to Silicon Valley when they get larger. The SoMa (South of Market Street) area is the leading tech centre in San Francisco. It has 2.33 million square meters of office space and is home of numerous start-up companies. More than US\$2.4 billion was invested in real estate developments just between 2011 and 2013. The area has many museums and cultural institutions, but is also known for its low income residents. New residential towers serve high-tech employees. Tech companies have been attracted into SoMa through tax breaks on income and stock options that have made the area very attractive to start-ups.

## Key industries and the knowledge-based economy

Healthcare & Social Services and Computer Hardware Design & Manufacturing are Silicon Valley's largest employment sectors, while Internet & Information Services and Software have been the fastest-growing employment sectors since 2007.

### Largest employment sectors (>50,000 in employment in 2014 Q2)

- Healthcare & Social Services 143,562 (9.7 per cent of all SV employment)
- Computer Hardware Design & Manufacturing 138,980 (9.4 per cent)
- Retail 133,587 (9.0 per cent)
- Accommodation & Food Services 120,780 (8.2 per cent)
- Education 116,474 (7.9 per cent)
- Construction 61,808 (4.2 per cent)
- Semiconductors & Related Equipment Manufacturing 50,029 (3.4 per cent)

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<sup>3</sup> [http://www.mercurynews.com/business/ci\\_27932727/sv150-searchable-database-silicon-valleys-top-150-companies?source=infinite-up](http://www.mercurynews.com/business/ci_27932727/sv150-searchable-database-silicon-valleys-top-150-companies?source=infinite-up)



### Fastest growing sectors 2007-2014

- Internet & Information Services +114.8%
- Software +37.9%
- Management Offices +36.0%
- Other Sectors +35.6%
- Computer Hardware Design & Manufacturing +27.8%
- Personal Services+26.0%
- Healthcare & Social Services +25.2%
- Education +24.3%
- Technical R&D (including Life Sciences) +21.1%
- Technical & Management Consulting Services +20.7%

The region's economy benefits from diversity and a high concentration of technology industries. Unlike most technology hubs, the region is not dominated by a single large tech company or sector. In addition to being highly concentrated, the area's technology industry is highly diverse, spanning hardware, software, biotech, clean tech, communications, and social media. This diversity helps drive innovation as different technologies come together to create entirely new products, and it creates resilience despite major shifts in specific technology areas.

### Innovation industries contribute significantly to the San Francisco / Silicon Valley area economy.

Innovation industries – comprising Biotechnology & Pharmaceuticals, Clean Technology, Software Telecommunications Services, Internet & Information Services, Medical Devices, Information Communication Technology Product & Component Manufacturing, Aerospace, Other High-Tech Production & Manufacturing, Other Media & Broadcasting, and Specialised Innovation Services – generated roughly 33 per cent of Silicon Valley's annual output in 2013, and directly employed 26 per cent of the workforce in the first quarter of 2014. Between 1993 and 2013, GDP in innovation industries in Silicon Valley more than doubled while the rest of the economy grew by 45 per cent. In addition, creation of one high-tech job is estimated to help generate roughly five jobs across the service sector.

Innovation industries are comprised of companies that research, develop and/or scale new technologies, uses and processes, or support the development of start-up companies. These industries typically employ a high proportion of workers with STEM educational backgrounds. These innovation industries are heavily reliant on foreign-born talent: 56 per cent of Silicon Valley's STEM workforce and nearly 70 per cent of its software developers were foreign-born in 2013.

**Silicon Valley's ability to develop new technologies and businesses is stronger than other key innovation regions in the U.S.**, based on high levels of VC deals and investments, robust later-stage start-up company valuations and a vast majority of the region's initial public offerings in innovation industries. Silicon Valley is globally recognised as having the best climate for tech start-up businesses. According to the Startup Genome Project, Silicon Valley start-ups raise more money, are more successful, create more jobs and have a larger support system than other locations.



Tracking the areas of VC investment over time provides valuable insight into the region's longer-term direction of development. VC investments in Silicon Valley reached \$7.4 billion in the first three quarters of 2014 – more than in any other year since 2000. More than half (55 per cent) of VC investments were in Software – a share that has risen steadily over the previous five years. Much smaller shares went to Biotechnology (10 per cent), Media and Entertainment (8 per cent), and Medical Devices and Equipment (8 per cent). Cleantech VC investments increased dramatically in 2014, with a large portion of cleantech VC investment going into Energy Efficiency (40.6 per cent).

Patent registrations also track the generation of new ideas, as well as the ability to disseminate and commercialise these ideas. In 2013, Silicon Valley accounted for 46.9 per cent of all California's patent registrations and 12.7 per cent of all patent registrations across the U.S. The largest share of patents was in Computers, Data Processing and Information Storage (40 per cent), with a large share in Communications (24 per cent). 581 patents were granted per 1,000 population Silicon Valley, compared to an average of 95 across California as a whole.

## ENABLING ASSETS, INFRASTRUCTURE AND POLICIES

### Enabling assets

**Talent:** Silicon Valley's strength in innovation industries is derived in large part from having one of the strongest and most specialised talent bases in the world. 71 percent of companies surveyed by Silicon Valley Leadership Group reported that access to skilled labour was a top strength of the region. Silicon Valley has the second largest total number of STEM workers with a Bachelor's degree or higher of innovation regions across the U.S., and the highest STEM share of the workforce within the economy. International talent plays a particularly important part in meeting demand for specialised workers in Silicon Valley – as demonstrated by the region's high immigration rates and a very high share of foreign-born workers in STEM fields.

**Risk Capital:** Risk capital enables scaling and growth of early stage businesses. High-risk investments, such as VC, angel investment and other forms of early stage equity and debt, facilitate start-up company development by providing funding to hire workers and secure necessary assets before companies are able to access traditional bank loans. Silicon Valley has traditionally been a leader in VC investments, and remains dominant among the U.S. innovation regions in terms of levels of funding.

**Research and Development:** R&D activities help to seed technology development in the long term. R&D expenditures represent longer run investments in innovative concepts, process improvements and products. Universities, federal labs, private research institutions and business R&D and design departments comprise the collective research and development assets of the region. Business and institutional R&D activities are an important influence in Silicon Valley, with many companies opting to locate their research, development and/or design centres in the region.

**Innovation Processes:** Innovation processes are at the core of Silicon Valley's leadership in innovation industries. The region has historically been a world leader in commercialisation and entrepreneurship, building on its strong risk capital and talent assets. Silicon Valley continues to demonstrate strength in its





ability to scale technologies, although rapid growth in very early stage funding in recent years has intensified competition among start-up businesses for later rounds of funding. Among companies able to secure follow-on investments, valuations for late stage, pre-exit companies are at recent highs.

## Enabling infrastructure

Transportation in the San Francisco / Silicon Valley area is reliant on a complex multimodal infrastructure consisting of roads, bridges, highways, rail, tunnels, airports, and bike and pedestrian paths. The Bay Area is home to two-dozen primary public transit operators that offer bus, rail, ferry and shuttle services in the region. Together, the Bay Area's transit services carry an average weekday ridership of more than 1.1 million. The combined annual operating budget of the transit agencies was over \$2.5 billion in 2013-14, placing this region among the top transit markets in the nation.

The development, maintenance, and operation of these different modes of transportation are overseen by various agencies, including the California Department of Transportation (Caltrans), the Association of Bay Area Governments, San Francisco Municipal Transportation Agency, and the Metropolitan Transportation Commission.

A 2011 Brookings Institution study ranked the San Francisco Metropolitan Statistical Area (MSA) and the San Jose MSA sixteenth and second, respectively, on transit coverage to job access. Another nationwide study, conducted by the University of Minnesota in 2014, ranked the San Francisco MSA second and San Jose MSA tenth.

**Metro/Heavy Rail:** Bay Area Rapid Transit (BART) is a heavy-rail public transit and subway system connecting San Francisco with cities in the East Bay and suburbs in northern San Mateo County. BART's rapid transit system operates five routes on 104 miles of line, with 44 stations in four counties. BART is the fifth-busiest heavy rail rapid transit system in the U.S. Extension projects are currently underway<sup>4</sup>.

### Commuter Rail

- **Caltrain** provides a commuter rail service on the San Francisco Peninsula, linking the cities of San Francisco, San Jose, Gilroy, and numerous peninsula cities in between;
- The **Altamont Commuter Express** (ACE) provides a commuter rail service from the Central Valley into Silicon Valley, terminating in the San Jose Diridon Station;
- The **Capitol Corridor** connects Bay Area cities to Sacramento, and features BART transfer stations at Richmond and the Oakland Coliseum.

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<sup>4</sup> A 5-mile extension of BART south to Warm Springs / South Fremont station is currently under construction. The Warm Springs extension will bring BART south to the Santa Clara County line. Phase 1 of the Silicon Valley extension is also planned to continue the Warm Springs Extension to the Berryessa neighbourhood station in San Jose, linking the BART system to the Santa Clara VTA light rail. \$900 million in funding by the Federal Transit Administration was awarded in March 2012, and the project officially started construction in April 2012, with this Phase 1 of the extension scheduled to be operational (e.g. for system testing) by late 2016, with revenue service currently scheduled to begin in 2018.



- **Light Rail:** The Bay Area has two light rail systems: **Muni Metro** – run by San Francisco Municipal Railway, which operates within the city of San Francisco, and **VTA Light Rail** – run by the Santa Clara Valley Transportation Authority, which operates within Santa Clara County.

**Bus Services:** A series of overlapping bus agencies provide additional public transit coverage to the San Francisco / Silicon Valley area both served and not served by rail transit. The four largest agencies, Muni, AC Transit, SamTrans, and VTA operate within the City of San Francisco, East Bay, the Peninsula, and South Bay respectively, although their service areas generally overlap with neighbouring agencies and numerous smaller agencies.

**Bridges:** The area has eight trans-bay toll bridges, adding add cohesion to the regional transportation system by connecting communities across the bay.

The following airports are served by commercial airlines. In addition, there are many general aviation airports in the region.

- **San Francisco International Airport (SFO):** The busiest in the region, the seventh leading passenger airport in the U.S., the 19th largest air cargo airport in the U.S. and the twenty-fifth busiest airport in the world by passenger count. In 2012, on-site, off-site and spin-off activities in the region resulted in a total economic footprint of SFO in the Bay Area to almost \$55.8 billion in business sales, including \$19.6 billion in total payroll, and more than 288,000 jobs<sup>5</sup>.
- **Oakland International Airport (OAK):** The second-busiest airport in the region and a major base airport for Southwest Airlines.
- **Mineta San Jose International Airport (SJC):** The third-busiest and fastest-growing airport in the Bay Area.

**Regional Transportation Plan:** Plan Bay Area 2013-2040 is a long-range integrated transportation and land-use/housing strategy for the San Francisco Bay Area – approved by the Association of Bay Area Governments and the Metropolitan Transportation Commission in July 2013. Plan Bay Area’s transportation element specifies how \$292 billion in anticipated federal, state and local funds will be spent through to 2040. Nearly 87 per cent will be used to maintain and operate the existing transportation. Maintenance and operation of the Bay Area’s existing public transit services will receive about 54 per cent of the revenues; 32 per cent will be spent on street, road, highway and bridge maintenance; 7 per cent will be spent on transit expansion; 5 per cent will be spent on roadway and bridge expansion.

## ENABLING POLICIES

### Regional Governance Issues

The San Francisco / Silicon Valley area’s governance structure is complex due to its fragmented system of 26 independent transit operators and individual planning departments in 101 cities across nine

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<sup>5</sup> 2013 Economic Impact Study of San Francisco International Airport



counties. While the Bay Area has no formal regional government with broad powers delegated to it, regional governance exists in the multiple regional agencies with policy-making power.

**The San Francisco / Silicon Valley area's governance structure consists of four pillar agencies, each with a distinct mission and authority.** Transportation is handled by the Metropolitan Transportation Commission (MTC); land use by the Association of Bay Area Governments (ABAG); air quality by the Bay Area Air Quality Management District (BAAQMD); and the bay front by the San Francisco Bay Conservation and Development Commission (BCDC). Each aims to maintain a regional perspective, but often protect the influence of cities and counties in the region through their deliberative processes.

**Sustaining the region's economic competitiveness is not central to the planning efforts and decision-making of any of these regional agencies,** the business community is largely uninvolved, and local leaders have no formal forum to engage in discussions on the economy and job growth at a regional level.

**As identified in the Bay Area Council Economic Institute's<sup>6</sup> regional economic strategy roadmap, the Bay Area would benefit from a regional approach to competitiveness and quality of life issues** given the regional nature of the economy, labour market, housing needs, and infrastructure needs, as well as the quickening pace of change in the global economy.

Finding the appropriate balance between maintaining the influence of local governments while inserting a greater degree of pragmatic regionalism into the Bay Area's governance structure can be a first step in tackling many of the area's regional policy. Parochial interests (at the local level and even within regional agencies) can stunt the progress that is required to sustain economic vitality and grow broad-based opportunity in the region.

## Regional Economic Strategy Roadmap

**Given the regional nature of the area's economy, its labour pool, housing market, job centres and commuter flows, the Bay Area Council Economic Institute recognised the need for a regional economic strategy.** In 2012, it produced 'The Bay Area: A Regional Economic Assessment', a detailed economic analysis of the region, at the request of the Bay Area's regional agencies as well as the region's leading business and economic development organisations. While the region enjoys many economic strengths, issues such as housing cost and availability, congestion, regulatory efficiency, and a lack of strategic focus on regional economic priorities surfaced throughout the analysis. The Regional Economic Assessment

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<sup>6</sup> Since 1990, the Bay Area Council Economic Institute has been the leading think tank focused on the economic and policy issues facing the San Francisco/Silicon Valley Bay Area. It is governed by a Board of Trustees composed of approximately 60 public, private, academic, labour and community leaders. A valued forum for stakeholder engagement and a respected source of information and fact-based analysis, the Institute is a trusted partner and adviser to both business leaders and government officials. Through its economic and policy research and its many partnerships, the Institute addresses major factors impacting the competitiveness, economic development and quality of life of the region and the state, including infrastructure, globalisation, science and technology, and health policy. The Institute is housed at and supported by the Bay Area Council, a public policy organisation that includes hundreds of the region's largest employers.



found that these issues pointed to the need for both a more effective partnership between business and government on economic issues and a stronger sense of shared purpose surrounding the region's growth and development.

**Regional planning and visioning efforts to date have focused primarily on bettering the environment** through reduced vehicle miles travelled and smarter land use patterns, and they have approached the Bay Area's economy through the specific lens of improving career pathways for low and moderate income workers. While these are important and revealing documents, the Bay Area lacked a clear strategy for supporting economic growth and expanding economic opportunity.

The intention of the Bay Area Council Economic Institute in the development of the Regional Economic Strategy Roadmap was to bolster the economic leg of the 'Three E' stool: Environment, Equity, and Economy. Launched in late-2015, the strategy was the product of many in-depth conversations with business leaders and others from the public and independent sectors over the course of a 12-month engagement process to identify the top opportunities for growing broad-based prosperity in the region. The result was a series of cohesive policy recommendations to strengthen the Bay Area's economy and identify tangible actions for regional agencies. The five major areas of recommendations are presented in Appendix A in this report.

## Regional Economic Development Partnership

As above, the current governance structure of the region lacks an agency dedicated first to the **economy**. In its regional economic strategy, the Bay Area Council Economic Institute has recommended that a regional body should be created to focus on how to build and sustain the Bay Area's global economic competitiveness, with a focus on facilitating strategic business growth and job creation. The organisation, with the proposed name 'Bay Area Regional Economic Development Partnership', would have three core missions: marketing the region to businesses and investors, creating a platform for ongoing engagement between business and government on regional economic priorities, and enabling the strategic development of public land. A regional economic development body would also assist with the retention and expansion of existing regional employers and support the attraction of new employers to the Bay Area.

## KEY CHALLENGES FACING SILICON VALLEY / THE BAY AREA

There is much perception that the Bay Area has not prepared for the normal pace of growth over the last several decades. As jobs and population increase and the housing crisis worsens, traffic congestion is growing, and the severity of the region's infrastructure crisis is becoming evident. Disparities in income and employment opportunities also remain. The Bay Area Council Economic Institute's Regional Economic Strategy Roadmap Findings and Recommendations suggested five major challenges and solutions facing the region that required collaboration in order to succeed. These have been augmented and added to below (totalling 7 major challenges), using a range of sources of information and analysis.

**1. Infrastructure:** The San Francisco / Silicon Valley area needs to facilitate best-in-class infrastructure investment to support the growth of the regional economy. A recent California Forward analysis has



found that California faces an infrastructure finance requirement of \$853 billion over the coming decade. The greater part of this deficit – nearly \$300 billion – is in transportation, which remains a critical need as the state’s population expands and businesses continue to grow. Addressing these challenges in the Bay Area is compounded by three factors: a decline in state and federal investment in transportation, a fragmented local governance system for infrastructure, and the lack of a sufficiently empowered regional authority that can manage and invest in infrastructure on a comprehensive level. The Bay Area Council Economic Institute recommends solutions such as regional restructuring, reform of existing public institutions, funding tools and more efficient and effective joint infrastructure planning.

**2. Housing:** The San Francisco / Silicon Valley area housing costs and rent prices are at an all-time high, and are highest in Silicon Valley and San Francisco. The ongoing failure to construct new housing in line with demand is primarily responsible for extraordinarily high housing prices: The Bay Area region permitted just 193 housing units per 1,000 new residents from 2012 to 2013, compared to the national average over this period of 384 new units per 1,000 new residents.

With the region having the most expensive housing costs of the key U.S. innovation regions, it has lost some ground in terms of attracting people to relocate there, particularly U.S.-born talent. Continuing to draw and retain talent within the region requires re-examining barriers to housing development in order to help address soaring housing prices.

High housing costs in the San Francisco / Silicon Valley area have reached a crisis level, and regional policies need to address this issue by incentivising sustainable growth and combating resistance to development. The region’s strong economy has contributed to runaway housing costs and an inability for the Bay Area to increase its housing stock – especially for affordable rental units – has exacerbated a supply and demand mismatch. The various carrots, sticks, and levers that were supposed to incentivise sustainable growth are either not being employed or they are not sufficient to combat restrictive planning and zoning standards and resistance to new development at the local level. The target-setting and planning processes of Plan Bay Area also do not sufficiently recognize or consider the many economic factors that drive demand for housing and where it should be situated.

**3. A regional focus for economic development.** Unlike most economic regions that concentrate around a single major city, the San Francisco / Silicon Valley area economy consists of three major cities, nine counties, and nearly 100 smaller cities. Each local government in the region has its own strategy for attracting and retaining jobs, with little coordination across the region and competition between jurisdictions at many times. Many of these local efforts have been successful in creating an environment more conducive to economic growth though a more regionalised approach can serve to complement and strengthen these initiatives. One solution has been mooted to create a Bay Area Regional Economic Development Partnership, a regional body that would sustain the Bay Area’s global economic competitiveness, as well as providing local governments with concrete planning and other support to unlock development potential.

**4. Skills and workforce development.** As tools and industries change, jobs and the skills required for those jobs also change. Increasingly, these changes are creating mismatches between the skill sets of workers and those required by the region’s employers. This is the case for growing technology



companies as well as for established employers in the public and private sectors. The growing skills gap has major implications for middle-wage opportunities, where employers are challenged to fill available positions. Many sectors also face an ageing workforce with large numbers of key employees nearing retirement, and the pipeline for skilled replacement workers is not sufficient.

The San Francisco / Silicon Valley area's labour market is regional, but current workforce development efforts are limited to specific places within the region. Particularly in the area of technical training, a lack of regional vision creates duplicative programming and gaps in the region's workforce investment programs. The Bay Area's high cost of housing also contributes significantly to the recruitment and retention challenges faced by employers.

Immigration restrictions are also causing difficulties for employers. Silicon Valley's strength in innovation industries is derived in large part from having one of the strongest and most specialised talent bases in the world, in large part driven by immigration of high-skilled workers. At present, U.S. immigration laws restrict the number of high-skill entrants to the U.S., and involve long periods of delay and uncertainty in processing. While the region's universities, companies and start-up culture are magnets for foreign talent, each year thousands of tech workers and other professionals return home because of immigration restrictions and delays.

**5. Lack of investment in transportation systems.** Housing supply constraints and high prices have forced many San Francisco / Silicon Valley area residents to look for housing outside of high-demand areas, where lower housing costs are accompanied by longer commutes. This has strained the Bay Area's transportation systems, including its highways and public transit operations, and led to greater congestion and longer commute times<sup>7</sup>. Traffic within gateway corridors to the nine-county region is adding to congestion, as 587,000 vehicles travelled between the San Francisco / Silicon Valley area and neighbouring counties daily in 2013 – the highest level in seven years and a 34 per cent increase since 1992<sup>8</sup>. With more people on the move, traffic congestion has increased and average speeds have fallen.

Lack of investment in the region's aging and overcrowded transportation systems is undermining the Bay Area's future prosperity. In addition, a lack of strong linkages across transit agencies inhibits a systemic approach to addressing the region's growing and changing transportation needs. The San Francisco / Silicon Valley area's current transportation system is increasingly plagued by congestion and delays, creating lost time for Bay Area workers and lost dollars for the region's businesses. The region's transportation systems are overcrowded and becoming a limiting factor for the Bay Area's future economic prosperity. Vehicles in key highway corridors leading to job centres in San Francisco and

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<sup>7</sup> In 2013, nearly one in six commuters travelled two hours or more each day, rising from one in eight in 2011. The BART system is also at capacity during peak commute times, as its ridership has grown by 55 per cent since 1998.

<sup>8</sup> From 2011 to 2013, average daily vehicle hours of delay on I-580 in the East Bay grew by 26%, now making it one of the most congested freeways in the region. In Alameda County, the crossroads of the Bay Area, time spent delayed in traffic jumped from 12 per cent to 22 per cent of total commute time between 2009 and 2013.



Silicon Valley are at a near standstill during rush hour and the region's two major commuter railways - BART and Caltrain—are carrying 'crush loads' and confronting maintenance issues at a growing rate.

**6. Falling R&D investment:** Falling investment in R&D in the region's universities is a growing concern and may affect innovation leadership in the long run. Federal funding for R&D in the U.S. fell by a total of 9 per cent between 2012 and 2013, and by 5 per cent specifically for non-defence R&D to its lowest level since 2001. Simultaneously, other countries are investing heavily in R&D: over 4.3 per cent of South Korea's overall GDP went to R&D in 2012, and Finland, Germany, Sweden, Taiwan and Japan all invested more heavily as a proportion of GDP than the U.S., which invested just 2.8 per cent.

While Silicon Valley's universities and national labs have high levels of R&D expenditures compared to other innovation regions, the growth in those expenditures has lagged behind. Total R&D expenditure growth among Silicon Valley universities grew by just 9 per cent between 2004 and 2012, while other regions expanded by between 14 and 42 per cent.

**7. Income and educational inequality:** Gains in income following the recession have been uneven. Income disparities are exacerbated by a growing skills gap. In California, middle-skill jobs account for 50 per cent of California's labour market, but only 40 per cent of the state's workers are appropriately qualified. Wage disparity in Silicon Valley is higher than in other key innovation regions and is linked to educational attainment. While the Bay Area has been successful in preparing youth for success in comparison to state-wide averages, these educational outcomes are not widely shared across income levels or ethnicity. Roughly 30 per cent of Hispanic and African-American students meet entrance requirements for the University of California and California State University systems, well below Bay Area averages. The region must continue to invest in high-quality early education and STEM programs, to ensure that U.S.-born residents are able to access opportunities in innovation industries.

**8. Business costs:** The high cost of doing business is a long-term strategic issue in the area. Although Silicon Valley is an unequivocally strong location for commercialising technology and starting a business, it is also a comparatively expensive location in terms of high labour, real estate and business operations costs.

The Bay Area Economic Forum proposes a number of responses, which are of interest as prospective future solutions in the London-Stansted-Cambridge Corridor. These are detailed in Appendix A.



## LESSONS FOR THE LSCC AREA

Whilst the experience of San Francisco / Silicon Valley is not directly transferable elsewhere – there are a number of lessons which are worth taking on board:

**The San Francisco / Silicon Valley area is vibrant in terms of entrepreneurship, investment finance and marketing as much as innovation, tech and research.** What makes it successful is the ability to combine great business acumen and business models with leading edge technologies. The key lesson here is that, whilst important, being good at technology and R&D on their own will not deliver a significant scale of jobs and growth.

**Whilst San Francisco is a large metropolitan area, Silicon Valley is a relatively more sparsely populated region that is more rural in nature than urban.** The development of the world's pre-eminent technology region would seem to contradict the current trend in thinking that 'densification' and 'agglomeration economies' are the key to realising productivity gains, and encouraging the growth of knowledge based industries. Like the LSCC area's situation adjacent to, and overlapping with London, Silicon Valley comprises a semi-rural area with dispersed towns and small cities, and lies next to / overlaps with a major metropolitan area.

**The 'start up' focus of San Francisco complements the more corporate focus of Silicon Valley.** San Francisco / Silicon Valley can offer a range of business and community environments to suit different sizes and vintages of tech businesses within the same industries, markets and value chains. As well as the campus offers of Palo Alto and Menlo Park, the SoMa area in San Francisco serves the tech start-up community.

**The rail network has attracted the location of new tech start-ups,** as they have clustered around the Caltrain station which provides services to Silicon Valley.

**Many of the challenges of growth are familiar to the London Stansted Cambridge Corridor and other major tech regions which have experienced high rates of growth over recent years:** housing affordability and supply, stressed and often inadequate transport infrastructure, access to talent and skills and workforce deficiencies.

**The lack of a coherent regional coordinated approach** to strategic infrastructure, land use and services holds back future growth and prosperity in San Francisco / Silicon Valley.

**The lack of integration of economic and business needs into land use planning, transport and public services** has exposed weaknesses in transport systems, land availability and servicing, and public services such as education.



## REFERENCES

Bay Area Council Economic Institute (2015) 'A Roadmap for Economic Resilience: The Bay Area Regional Economic Strategy'

Saxenian, A. (1996) 'Inside-Out: Regional Networks and Industrial Adaptation in Silicon Valley and Route 128'

Silicon Valley Institute for Regional Studies (2015) '2015 Silicon Valley Index'

Silicon Valley Leadership Group (2015) 'Silicon Valley Competitiveness and Innovation Project – 2015'



## APPENDIX A: BAY AREA FORUM'S PROPOSED SOLUTIONS TO CHALLENGES FACING THE SAN FRANCISCO / SILICON VALLEY AREA ECONOMY

Sourced from: Bay Area Council Economic Institute (2015) 'A Roadmap for Economic Resilience: The Bay Area Regional Economic Strategy'

### *ISSUE 1: INFRASTRUCTURE - The Bay Area needs to facilitate best-in-class infrastructure investment to support the growth of the regional economy.*

**PROBLEM:** California faces an infrastructure finance requirement of \$853 billion over the coming decade, \$300 billion of which is in transportation, which remains a critical need as the state's population expands and businesses continue to grow.

Addressing these challenges in the Bay Area is compounded by three factors:

1. a decline in state and federal investment in transportation
2. a fragmented local governance system for infrastructure
3. the lack of a sufficiently empowered regional authority that can manage and invest in infrastructure on a comprehensive level.

#### PROPOSED SOLUTIONS

##### **Restructure the financing of public infrastructure through the creation of an empowered regional planning, finance, and management entity.**

- Reform existing public institutions. New mechanisms and processes are needed to expedite critical infrastructure development.
- Give the empowered regional entity authority to gain financial support. Funding tools such as expanded tolling on bridges, highway corridors, and express lanes can be leveraged and allocated to key projects.
- Drive project delivery. Improve efficiency in the planning and permitting of infrastructure development. Facilitating public-private partnerships can be helpful, as private sector capital and management expertise can deliver superior value for the public.

##### **Develop new sources of traditional and alternative finance to augment public resources.**

- Bring a regional funding mechanism to the voters. There is opportunity for a realignment of tax structures related to transportation in the region. A shared regional sales tax, gas tax, or vehicle license fee can supplement existing county transportation sales tax measures.
- Prioritize spending on key regional infrastructure. Projects such as the connection of BART to San Jose, Highway 101 and Caltrain corridor improvements, a new transbay BART tube, and expanded water transit services should have access to shared regional funds.

### *ISSUE 2: HOUSING - High housing costs in the Bay Area have reached a crisis level*

**PROBLEM:** The region's strong economy has contributed to runaway housing costs and an inability for the Bay Area to increase its housing stock – especially for affordable rental units. This has exacerbated a supply and demand mismatch. The various carrots, sticks, and levers that were supposed to incentivise sustainable growth are either not being employed or they are not sufficient to combat restrictive planning and zoning standards and resistance to new development at the local level. The target-setting and planning processes of Plan Bay Area also do not sufficiently recognize or consider the many economic factors that drive demand for housing and where it should be situated.

#### PROPOSED SOLUTIONS

##### **Build sufficient housing stock to meet the demands of a growing regional population and help to fill historic deficits.**

- The Regional Housing Needs Allocation (RHNA) process needs real teeth. Connecting state and regional government transportation funding allocations to housing production goals can provide an incentive for cities to meet their RHNA obligations. Actual housing production needs to be consistent with local and regional plans within a reasonable timeframe. Otherwise there needs to be real consequences, such as loss of local approval authority, state mandated 'by right' approvals of housing projects, the creation of more 'by right' zoning districts, or the creation of a regional hearing body to approve housing developments.
- The Bay Area must expand the stock of secondary units or 'in-law' units. Legislation should be drafted to expand and simplify approval of 'in-law' or Accessory Dwelling Units (ADUs) so more density can be accommodated throughout residential areas in the region, not just on large development sites. A regional fund should be created to help homeowners finance ADU projects.



- The fiscalization of municipal land use decisions needs to change. Current tax policy encourages local governments to zone for commercial over residential land uses and must be modified to expand sites for housing.

**Reduce the cost of new home construction across the Bay Area.**

- Encourage streamlined approvals for lower-cost construction types and new building technologies. Streamlining building permitting and codes to allow for mid-rise vs. high-rise and for new innovations in construction, such as Factory Built Housing, can lower building costs.
- Cap impact fees region-wide. The impact fees assessed by cities on new housing are increasingly preventing construction, and new options should be explored for funding community infrastructure so that the costs of promoting livable communities and affordable housing are shared among both existing and new residents.
- Reform the California Environmental Quality Act (CEQA). CEQA litigation has become a significant barrier to infill development. A CEQA exemption for new home construction meeting transit-oriented development goals should be created to limit costly lawsuits.

**ISSUE 3: REGIONAL SCALE SOLUTIONS FOR THE ECONOMY - The region's economic development requires focus and a regional perspective.**

**PROBLEM:** Unlike most economic regions that concentrate around a single major city, the Bay Area economy consists of three major cities, nine counties, and nearly 100 smaller cities. Each local government in the region has its own strategy for attracting and retaining jobs, with little coordination across the region and competition between jurisdictions at many times. Many of these local efforts have been successful in creating an environment more conducive to economic growth though a more regionalised approach can serve to complement and strengthen these initiatives.

**PROPOSED SOLUTIONS**

**Create the Bay Area Regional Economic Development Partnership, a regional body that would sustain the Bay Area's global economic competitiveness.**

- Create a platform for public-private collaborative action across jurisdictions on regional economic strategy. Creating consistent business permitting guidelines across jurisdictions and aggregating zoning, tax incentive, and local development plans can assist businesses looking to expand their operations in the Bay Area.
- Facilitate the growth of Bay Area companies within the region and support the entrance of new companies. A regional partnership could provide a unified voice for communicating the diversity of development opportunities in the region, internally and externally.
- Provide local governments with concrete planning and other support to unlock development potential. Due to limited resources, local governments often do not have the capacity to launch major projects that could be of significant benefit locally and regionally. For example, a regional partnership could offer planning and other resources to local development projects around transit hubs and former military bases.

**ISSUE 4: WORKFORCE SKILLS - The Bay Area requires regional collaborative action on workforce development in order to improve programming and funding efficiencies and better span the growing skills gap.**

**PROBLEM:** The Bay Area's labour market is regional, but current workforce development efforts are limited to specific places within the region. Particularly in the area of technical training, a lack of regional vision creates duplicative programming and gaps in the region's workforce investment programs. The Bay Area's high cost of housing also contributes significantly to the recruitment and retention challenges faced by employers.

**PROPOSED SOLUTIONS**

**Establish the Bay Area Collaboration on Workforce Development, a regional public-private collaborative to better connect employers' skills needs and workforce training programs and improve resource alignment.**

- Create a system for ongoing communication between the region's employers and educator/training community. A collaboration of employers, educators, trainers, and other stakeholders can enable highly adaptive and cost-effective planning for competency development programs driven by the changing needs of employers.
- Provide public education and inform public policy. Inform the public and key stakeholders about current economic trends and promising certificates, credentials, and career pathways.



**ISSUE 5: TRANSPORTATION NEEDS** - Lack of investment in the region’s aging and overcrowded transportation systems is undermining the Bay Area’s future prosperity. In addition, a lack of strong linkages across transit agencies inhibits a systemic approach to addressing the region’s growing and changing transportation needs.

**PROBLEM:** The Bay Area’s current transportation system is increasingly plagued by congestion and delays, creating lost time for Bay Area workers and lost dollars for the region’s businesses. The region’s transportation systems are overcrowded and becoming a limiting factor for the Bay Area’s future economic prosperity. Vehicles in key highway corridors leading to job centres in San Francisco and Silicon Valley are at a near standstill during rush hour and the region’s two major commuter railways—BART and Caltrain—are carrying ‘crush loads’ and confronting maintenance issues at a growing rate. While gridlock continues to worsen, Bay Area transportation operations and improvement remain driven more by adherence to past practice, outdated agency boundaries, and institutional convenience than by a customer-focused imperative with urgency to improve mobility.

**PROPOSED SOLUTIONS**

**Improve the efficiency of transportation systems in order to support the current economic growth cycle and prepare for the next.**

- Align the region’s 26 transit agencies. A single Short Range Transit Plan for all regional transit services in the Bay Area would enhance regional planning for the transit system, which otherwise could only be accomplished through transit agency consolidation. Given the nature of growth, a regional super agency will be necessary in the long term.
- Utilize funds to implement Corridor Operation and Investment Plans. Collaborative planning will ensure that corridor operational and investment strategies are consistent and mutually supportive across jurisdictions in key transportation corridors.
- Create an Innovation Incentive Program. Funds should be set aside for grants to Bay Area transportation agencies, cities and counties that propose the most promising applications of technology, incentives, entrepreneurship, and market mechanisms to improve transportation performance.