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SPECIAL REPORT ON THE EAST BAY

WORKFORCE






EastBay
EDA

ABOUT THIS REPORT

The **East Bay Economic Development Alliance** (East Bay EDA) is a public/private partnership serving the San Francisco East Bay (Alameda and Contra Costa Counties) whose mission is to establish the East Bay as a world-recognized location to grow businesses, attract capital and create quality jobs.

One of East Bay EDA's core strategies is to provide valuable information about the trends impacting the East Bay economy. This year, in addition to producing our 2013 Annual Economic Outlook, which is both a forecast and summary of key economic indicators for the East Bay, East Bay EDA and its partners commissioned a companion report entitled, Special Report on the East Bay Workforce.

This Special Report is an in-depth analysis of the major shifts in both the demand for and supply of the region's most valuable asset: its human resources. The impact of the Great Recession on the region continues to be felt and perhaps nowhere more so than by the working men and women of the East Bay. The East Bay's education and workforce development institutions are making every effort to understand and adapt to these shifts and to be better connected with regional employers to ensure a dynamic, adaptive workforce development system that ensures the competitiveness of workers and employers alike.

This report was commissioned in partnership with and financial contributions from:

Alameda County Workforce Investment Board
Contra Costa Community College District
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INTRODUCTION

Building upon the *2013 Annual East Bay Economic Outlook*, this study looks to delve deeper into the fundamental questions driving the nexus of employment, education and the economy in the East Bay, including:

- How are the region's employers changing and how does that impact the demand for jobs by industry, occupation and skills?
- How are the region's residents prepared to work in the East Bay economy and what can be done to better prepare residents for the jobs of tomorrow?
- How are the region's educational programs succeeding in training people for work and what can be learned to continually improve how we prepare students for the jobs of tomorrow?

To explore these fundamental questions, the report is organized into the following sections;

1. **Employment in the East Bay**: this initial section describes the changing demands of regional employers by industry and occupation as well as comparable changes in other regions, statewide and across the country.
2. **The East Bay's Human Capital**: profiles the residents of the region and examines any potential gaps in residents' skills and the needs of the East Bay's employers.
3. **Preparing the East Bay for the Jobs of Tomorrow**: considers the importance of education in the regional economy and evaluates the region's education and workforce development efforts.
4. **Workforce Profiles within the East Bay**: provides a workforce summary of the East Bay's six sub-regional communities; Central, Eastern and Western Contra Costa County and Northern and Southern Alameda County and the Tri-Valley.

Much of the analyses in this study focus on the changes in the East Bay and the surrounding regions that occurred from 2007 through the end of 2012. This time frame allows us to look at the economy right before the great recession and ask how this significant downturn in the economy impacted the region's workforce and the needs of employers.

SUMMARY OF KEY FINDINGS

The nature of work and employment is changing and the East Bay's employers and workers are experiencing those changes firsthand. Regional fluctuations in the mix of industries and technologies, new occupational responsibilities and training requirements as well as the changing skills and abilities that employers need to grow, all point to a labor market that is in a

state of flux. Some of these changes can be discussed in the context of the cyclical impact of the great recession that began in 2008 while other more structural differences have been developing over a longer time and were often strengthened by the recession.

Assessing East Bay's workforce development systems requires an in-depth analysis of the behaviors and interactions between the region's employers, education and training providers, available labor force and their interactions with the outside world. The key findings from this study that describe those interactions include:

- The East Bay's employment strengths are built upon research and innovation institutions,[1] Oakland's world class port and the region's connectivity to the greater Bay Area and Silicon Valley in particular. These unique economic assets have a substantial impact on industry clusters that define the East Bay.

- The impact of the great recession is still having a considerable impact on overall employment in the East Bay. The region suffered larger proportional overall employment losses from 2007 to 2012 than San Francisco, Silicon Valley or even California as a whole. As of the end of 2012, Silicon Valley and San Francisco have overall employment levels that are at least a few percentage points above where they were in 2007 while the East Bay at the end of 2012 was approximately three percent below 2007 employment.

- While the great recession had a considerable overall impact upon East Bay employment, its influence on employment in different industries varied significantly. Industries such as the Management of Companies and Enterprises, Health Care and Social Assistance and Professional, Scientific and Technical Services actually saw increases in total East Bay employment from 2007 to 2012 of over five percent. Whereas industries such as Manufacturing, Information, and Transportation and Warehousing saw overall East Bay employment decline by at least 10 percent for each of those industries. All three of the declining East Bay industries saw employment decrease as a percentage that was more substantial than what California experienced as a whole.

- Industry clusters offer an opportunity to go beyond traditional industry definitions to identify occupations and skill sets that are valuable to shared groups of employers. In the East Bay, industry clusters such as Life Sciences, Information and Communications Technologies (ICT) and Energy all provide relatively high wages, have an above average employment concentration in the East Bay and are expected to grow from 2012 to 2017. From an occupational perspective these industries will require a considerable number of qualified engineers, scientists and analysts who have at least a four-year degree in Science, Technology, Engineering and Mathematics (STEM) disciplines. Other industry clusters such as Arts, Entertainment and Hospitality as well as Food Preparation and Manufacturing offer employment growth from 2012 to 2017 in occupations that typically do not require a four-year college degree.

- Occupations in a given region can be delineated into three tiers. Tier 1 occupations are made up of higher skill, higher wage professional positions that typically require at least a four year degree. Tier 2 occupations are made up of middle skill, middle wage positions that often require training or education beyond a high school degree but not up

[1] These institutions include the University of California, Berkeley, Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory and Sandia National Laboratory in Livermore.

to or beyond a Bachelor's degree. Tier 3 occupations are those lower skill, lower wage positions that typically require a high school diploma or less. An analysis of East Bay occupational employment shows that Tier 1 and Tier 3 occupations had a slight dip in overall employment in 2009, but are well above their 2007 employment level whereas Tier 2 occupations have shown substantial declines, consistent with the national trends associated with Tier 2 occupations.

- Just over half of all Tier 1 occupations in the East Bay are found in Professional, Scientific and Technical Services (25%), Health Care & Social Assistance (16%) and Government (9%).

- Within the East Bay, those communities with lower educational attainment and higher unemployment before the recession (2007) were also the same communities that saw a larger sustained increase in unemployment resulting from the recession in 2012. The great recession increased the differences in unemployment rates between East Bay communities. Those communities that were suffering from above-average unemployment and lower levels of educational attainment were also more likely to see sustained increases in the unemployment rate, whereas those communities with lower unemployment before the recession and higher educational attainment levels saw little to no lasting impact on local unemployment rates.

- Proportional population growth in the East Bay from 2001 to 2012 was below the rate of growth in California as a whole but just above what was experienced in Silicon Valley and San Francisco. Ethnically, the region's Hispanic and Asian populations have been the drivers of the population growth from 2001 to 2012 whereas White, Non-Hispanics have actually declined by over 10 percent over that same time period.

- Immigrants (individuals born outside the country) make up over a quarter of all residents in the East Bay. Immigration from outside the country accounted for a considerable portion of the region's population growth from 2001 to 2012 and this population actually had a lower unemployment rate when compared to the non-immigrant population in the East Bay.

- An analysis of the East Bay's occupational skills gaps shows that the largest gap between the skills of the region's resident workforce and those sought after by the region's employers is in sales and office occupations – emphasis should be on the sales and administrative positions that are expected to grow such as Securities, Commodities and Financial Services Sales Agents, Insurance Sales Agents and First-Line Supervisors of Office and Administrative Support Workers. A more detailed analysis of wage pressure and employment growth shows that healthcare practitioners and technical occupations as well as architecture and engineering occupations are seeing the most substantial regional wage pressure and provide a valuable indication of where regional job training and education should be focused moving forward.

- Replacement jobs represent an important opportunity for workforce development in the East Bay: for every two job openings associated with a "new" job there are three replacement job openings. This is a greater ratio of replacement jobs as a percentage of total job opportunities than found in San Francisco, Silicon Valley or California as a whole. Replacement jobs are most likely to be found in sales, the skilled trade positions, and production positions.

- Education remains the foundation of regional workforce and economic development. All of the national research clearly demonstrates that higher levels of educational attainment results in higher labor force participation, lower rates of unemployment and higher wages. The East Bay has a higher proportion of adult residents (25 years and older) with a Bachelor's degree or higher than California as a whole (39% vs. 30%) but trails Silicon Valley and San Francisco.

- In examining the East Bay's K-12 education system using standardized tests on English, Math and Science, the region typically outperformed California averages at most grade levels and in all three disciplines but consistently trailed Santa Clara County's K-12 educational performance.

- Career Academies and Linked Learning Pathways offer a valuable bridge between college and career readiness. With student outcomes that are generally outperforming comparison groups when comparing, standardized test scores, earnings and enrollment in postsecondary institutions.

- Community colleges are a critical partner in any region's ability to quickly and effectively train people for new career opportunities. A database of Bay Area colleges reveals that 57 percent of East Bay community college students completed their education or training objectives in the 2009-2010 academic year. East Bay colleges such as Contra Costa, Diablo Valley and Chabot achieved completion ratios at or close to 60 percent.

- Overall educational attainment is important, but more valuable from an expected wage perspective is the area of study or type of education that is being sustained. In looking at Bachelor's degrees, education in a STEM discipline or business or health degrees will typically result in higher wages and greater employment opportunities. Increased employment and wages from certificates are even more dependent on the field of study and the background of the individual.

For a workforce summary of East Bay's six sub-regions, please refer to page 73 of this report.

REGIONAL WORKFORCE CONCLUSIONS & RECOMMENDATIONS

The term "demand-driven" is often used in the workforce development world to indicate the importance of developing and providing programs and services that are responsive to the needs of regional employers. To provide a workforce development system that is truly demand-driven, that foundation must be built upon a comprehensive understanding of our regional employers and their ever-changing needs as they relate to recruiting, hiring and developing talent. However, to create a more effective regional workforce system, we must combine our understanding of employers' needs with a comprehensive assessment of East Bay's job-seekers or the "supply-side" of the talent equation to develop regional strategies that connect or at least develop qualified and productive job-seekers for the region's employers.

With the goal of creating a more effective regional workforce system, the following conclusions and recommendations are offered.

1. **At least one explanation for the substantial drop in employment in the East Bay from the great recession is due to its occupational profile**. The analysis of the three occupational tiers provides a valuable indication why the East Bay saw a larger proportional decline in employment than California or any of its regional neighbors. The East Bay has a larger relative proportion of Tier 2 occupational employment. As the report describes, Tier 1 and 3 occupations have seen increases in overall employment from 2007 to 2012 while Tier 2 occupations have dropped considerably. This is not only true for the East Bay; it is a national phenomenon. Jobs that could be outsourced, automated or were closely tied to the housing industry, which are largely found among Tier 2 occupations, have been declining for 20 years, but the great recession just catalyzed that long run trend and the East Bay experienced the decline first hand.

2. **Focus on job training and education strategies that teach job-seekers how to continually learn new skills and move into Tier 1 and well-paying, secure Tier 2 occupations**. Tier 2 occupations still make up a plurality of the occupations that are available in the East Bay and the surrounding regions and should not be ignored from workforce development and education strategies just because components within that broad occupational category have declined and are expected to continue to decline. Other areas within Tier 2 occupations, such as technical sales positions, teachers and certain healthcare positions have strong growth expectations and develop skills that allow for expanded responsibilities and increased pay. Job development strategies should be focused on developing skills that eventually move job-seekers into Tier 1 or growing Tier 2 occupations.

3. **Increase educational attainment in high unemployment communities by expanding use of appropriate certificate and degree programs that can be completed incrementally**. The great recession only exacerbated the growing divide in employment opportunity inequality within the East Bay, as communities like Oakland and Richmond currently suffer from 12 to 13 percent unemployment while Livermore and San Ramon have an unemployment rate at or below five percent. If we accounted for underemployment and the differences in labor force participation, the differences between East Bay communities would be even more stark. To increase educational attainment in those high unemployment communities, training and education strategies should focus on moving someone along a career pathway incrementally and in areas of study that maximize the opportunity for increased wages. Work-based learning experiences can help students better understand the employment context of their certificate or degree programs and offer real-world examples that can improve their learning outcomes. Opportunities to assist job-seekers in moving up the educational attainment ladder while focusing on incremental strategies that allow them to work and increase educational attainment can be successful.

4. **Expand programs that improve functional English language skills in the context of industry work experience**. Given the East Bay's large educated immigrant population and the growing demand for occupations that require strong communication skills (both written and spoken), the region should continue to expand or create programs that develop English language skills within the work environment at levels that vary by degree of competency. This could include programs like the Unity Council's Vocational English as a Second Language (VESL) that emphasizes English language development focused on transportation and logistics, or Catholic Charities of the East Bay's project

ACCESS which provides training, career and support services for non-native speakers of English who want to work in the early childhood education field.

5. **Continue to facilitate increased connectivity and collaboration within the East Bay and across the Bay Area between employers, educators and job-seekers**. The East Bay's workforce and economic development institutions largely recognize the value of regional collaboration, both within the context of leveraging limited resources and understanding the complexities of economic transactions that often go beyond regional or sub-regional borders. Any analysis of the local economy quickly highlights the value of connecting partners and collaborators in the East Bay to other Bay Area economic strengths, such as the Silicon Valley and San Francisco County, as well as resources in the Northern part of the Bay Area. The findings of this study should only strengthen the value of continuing to invest in regional connectivity and collaboration.

6. **East Bay's education and training programs should expand those offerings that provide training and education within the context of industry skills, combine work experience with skills development and offer students a better understanding of the world of work**. This is not to say that a comprehensive and robust academic foundation should be sacrificed at the k-12 level; in fact a strong body of research shows that California's Partnership Academies(CPA's) and Linked Learning Pathways that largely follow this model have better student outcomes in both graduation rates and in preparing students for college and university education[2]. These findings, along with the East Bay's continual churn in employer demand for new skills, point to the need for a regional education and training system that emphasizes both the goal of increasing educational attainment levels while expanding students connections to growing industries and employment opportunities associated with strong career pathways.

7. **Prioritize regional commitments to data and quantitative assessments that measure the effectiveness of programs and strategies for workforce and economic development.** The East Bay is an important hub for innovation, both in the research and development of new products and services as well as the research and development of new workforce and economic development programs and strategies. One of the critical requirements to learning from any new strategies or programs is the underlying feedback that allows measurement of success and/or failure of those experiments. Developing metrics and indicators that allow the region to continually assess the effectiveness of regional strategies is critical to building upon their success or failure. Partnerships such as Cal-PASS Plus (California Partnership for Achieving Student Success) offer collaborative models for staying engaged in this type of effort.

[2] This is shown by the percentage of students that complete "a-g" courses required for admission to the University of California or California State University systems.

The East Bay employs more people than the entire State of Nebraska or Maine. In fact, if the East Bay were its own state, it would have more nonfarm payroll employment than 15 of the nation's states as well as higher employment than the District of Columbia.[3] The East Bay's employment strengths are built upon the region's economic assets, including; research & innovation institutions, Oakland's world class port and connectivity to the Greater Bay Area & Silicon Valley economy.

Research & Innovation Institutions

The East Bay is home to world-class research institutions, like the University of California, Berkeley and national research laboratories including; Lawrence Berkeley National Laboratory, Lawrence Livermore National Laboratory and Sandia National Laboratories in Livermore. These national innovation resources not only provide considerable direct employment in the region, they also have a substantial spill-over effect, with job multipliers conservatively calculated at just over three[4] for every one job at a national laboratory like Lawrence Berkeley. These institutions and their work help explain the region's relative concentration in industries such as Life Sciences, Information and Communications Technologies (ICT) and Energy.

Oakland's World Class Port

The Port of Oakland plays a critical role in facilitating international trade, not only for the East Bay but the entire Northern California economy. According to a recent analysis,[5] the Port of Oakland directly accounts for over 10,000 jobs and another 18,000 jobs through indirect and induced impacts. This valuable resource in the East Bay also plays a considerable role in industries that have grown during the recession, like the Management of Companies and Enterprises that are often involved in importing and exporting products as well as some of the Advanced Manufacturing employers in the region.

Connectivity to the Greater Bay Area & Silicon Valley Economy

The East Bay's economic ties with the rest of the Bay Area and Silicon Valley in particular provide a symbiotic economic relationship that allows each region to play to its strength. This can be seen in the new firms borne out of the research conducted at one of the East Bay's national laboratories funded by a Silicon Valley venture capitalist, or a Berkeley alumni working with a Silicon Valley contract manufacturer to design and create a new product. Inter-regional connectivity on research initiatives, new product introductions and the commercialization of new technologies are evidence of the East Bay's central role in the Bay Area's innovation eco-system.

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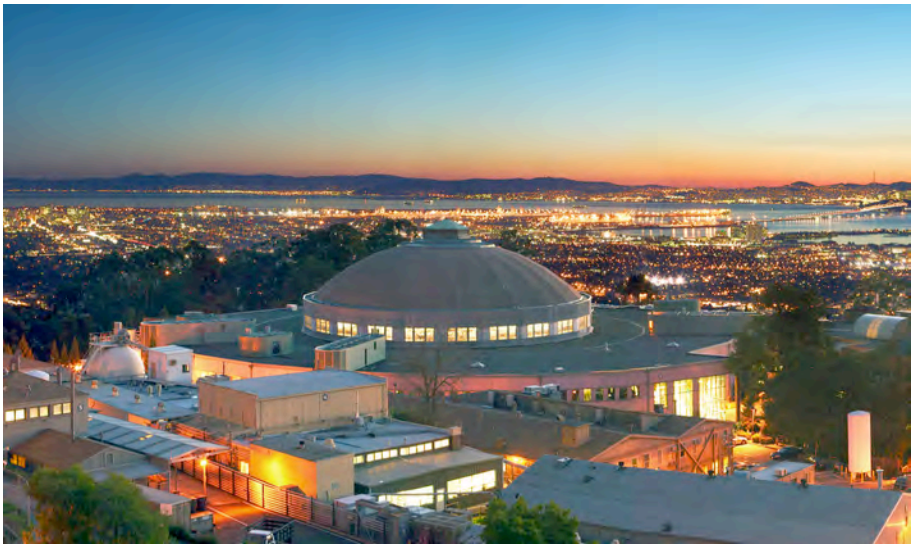
[3] Source: http://www.bls.gov/news.release/laus.t05.htm

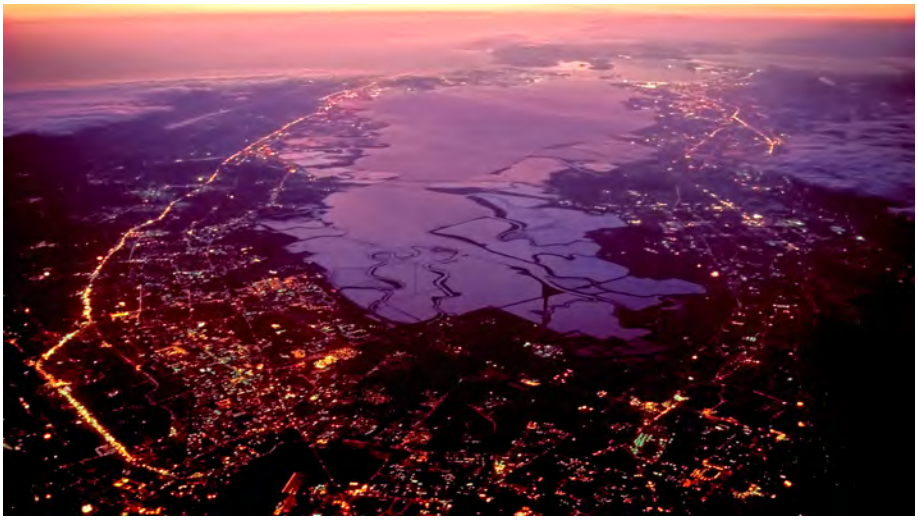
[4] Source: Economic Impact Study: Lawrence Berkeley National Laboratory. March 2010, prepared by CBRE Consulting.

[5] Source: Economic Impacts of the Port of Oakland. September 2011, prepared by Martin Associates.



Source: www.es2eng.com

Source: imgur.com



Source: everystevejobsvideo.com

KEEPING UP WITH THE BAY AREA ECONOMY

The East Bay sits at the center of one of the most dynamic economic mega regions in the country – the Bay Area. This nine-county economy has over seven million people and accounts for one in every five California jobs (22%) while representing just over 30 percent of the state's total output.[6] The East Bay imports and exports talent from across the greater Bay Area and provides East Bay employers access to a deep labor pool.

Regional Income a Function of Regional Productivity and a Changing Industry Mix

In 2010, median household income in the Bay Area was $82,500 – 41% higher than in the country as a whole and 37% higher than statewide. This is consistent with the region's reputation for supporting a large number of innovative, highly productive, frontier technology companies – a reputation that is well deserved and has become increasingly true over time. Trend analysis of regional Gross Domestic Product (GDP) per person shows significant growth in the region's economic output. In nearly every year since 2002, growth in per capita GDP has outpaced the nation.

Key finding from **The Bay Area: A Regional Economic Assessment, October 2012,** by the Bay Area Council Economic Institute.

Within the Bay Area's nine-county economy, the East Bay represents over one in every three people (36%) and three in every 10 Bay Area jobs (30%). While the East Bay's average annual earnings[7] ($63,300) are higher than California's as a whole ($57,300), they are lower than the entire Bay Area's ($74,800). The East Bay's unemployment rate in the first quarter of 2013 also falls below the state average by a percentage point or two, but it is a percentage point or two above the average for the entire Bay Area. From a big picture perspective, these indicators present a picture of an economic region that is doing better than California as a whole, but that is also lagging behind the larger surrounding economic mega region.

RECOVERING FROM THE GREAT RECESSION

Over the last 10 years (2002-2012), the East Bay's annual average unemployment rate has remained consistently below the state average, not surprising given the economic assets that are unique to the East Bay. However, the macroeconomic impact felt by the great recession has had a more detrimental impact on overall employment in the East Bay than either of its neighbors to the South or the West or even statewide.

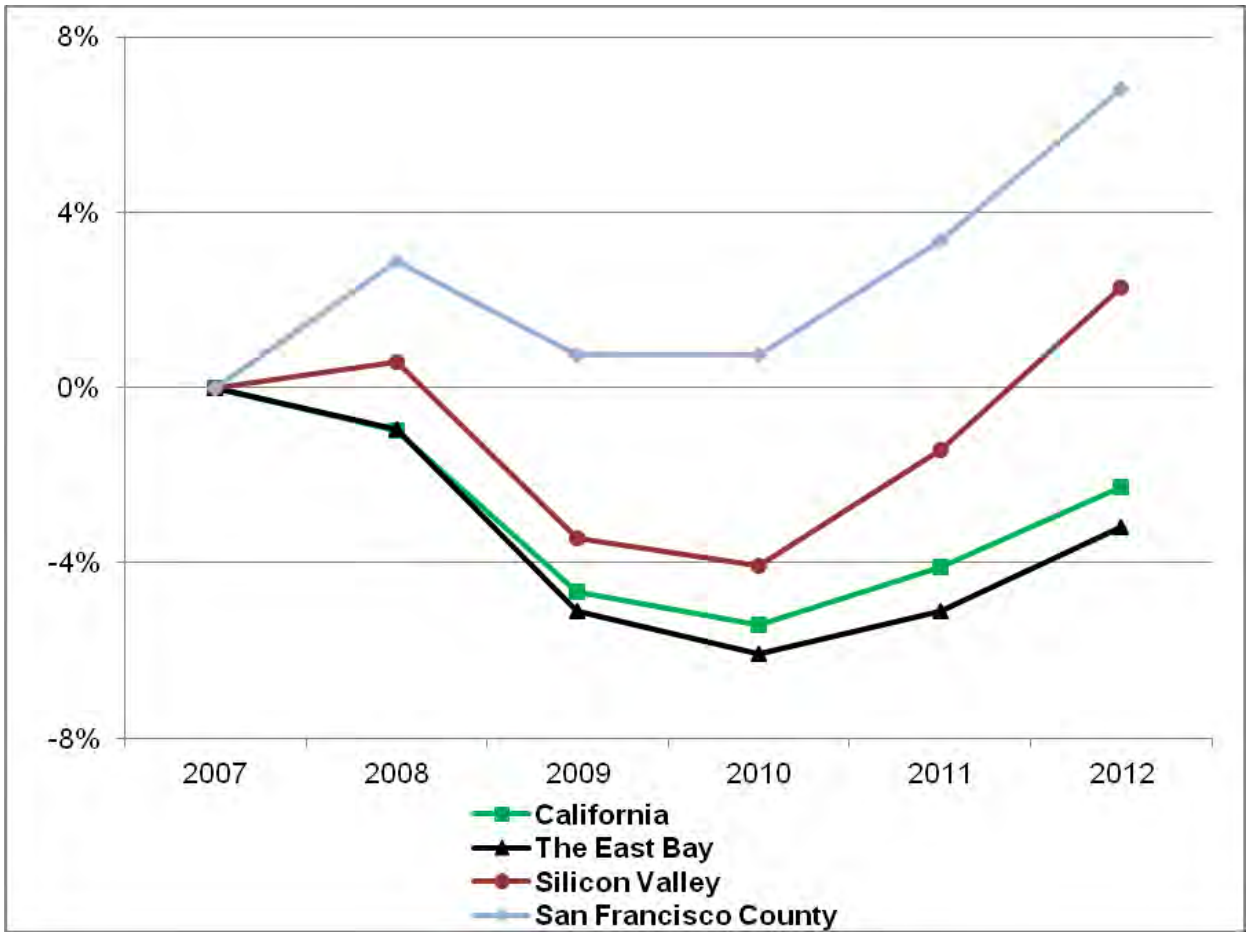
As shown in the figure below, at the highest period of unemployment resulting from the great recession, 2010 and 2011, the East Bay's overall decline in regional employment from 2007 was proportionally higher than Silicon Valley, San Francisco, or California as a whole. As the *2013*

[6] Output is defined as Gross Regional Product and data source is taken from EMSI 2013 Q1.

[7] Average Annual Earnings data are taken from EMSI Q1.2013.

Annual East Bay Economic Outlook pointed out, the more recent picture of recovery in the region is improving but the impact from this sizable recession on the East Bay was considerable.

Figure 1: Overall Change in Employment by Region from 2007 to 2012



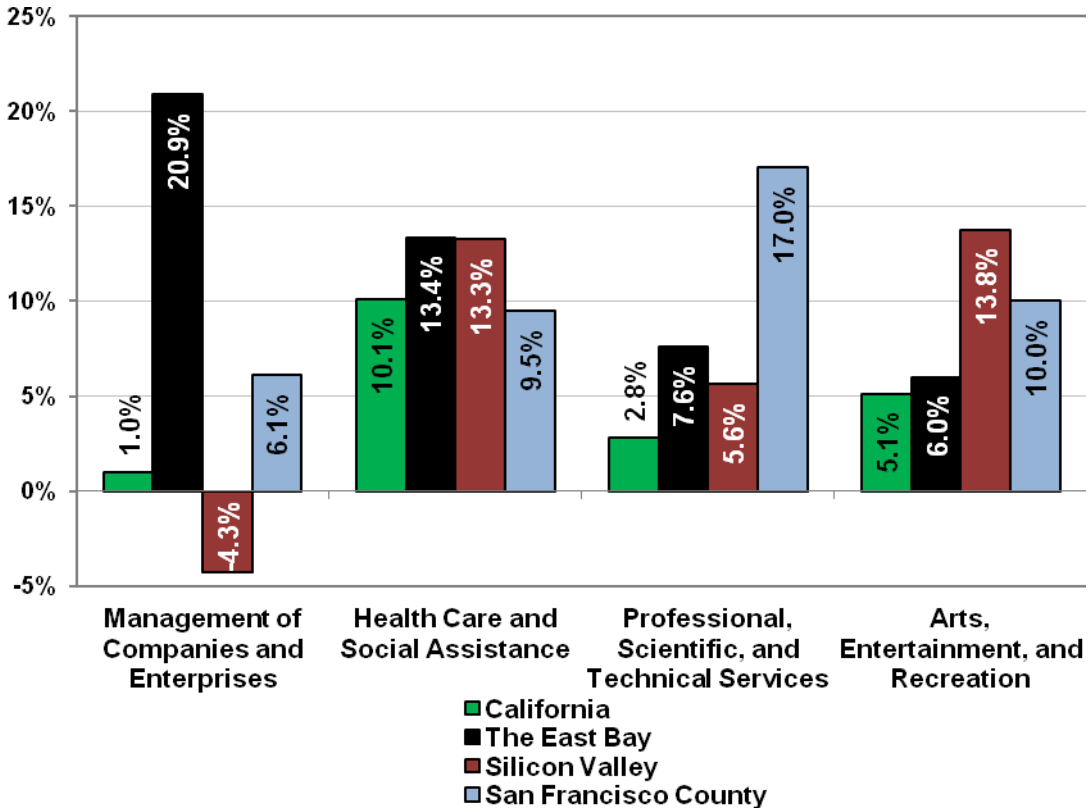
The impact of the great recession could be felt across the world, but the size and strength of that impact varied considerably by industry. Even within the East Bay, the repercussions that rippled through the economy after 2008 were quite different.

A comparison of the East Bay's key industries reveals that while the region as a whole may have lost about three percent of its total jobs from 2007 to 2012, some industries were growing considerably or at least seeing business as usual while other industries experienced losses in total employment of over 10 percent.

The figure below shows four major industries from the *2013 Annual East Bay Economic Outlook* that experienced increases in employment over a time period that saw losses in total regional employment. Management of Companies and Enterprises was the one industry group that saw large increases, especially in Alameda County, but also had some considerable declines in regions such as the Silicon Valley. It is also not surprising that Healthcare showed the most consistent growth across regions as its growth is more driven by demographic factors than the larger macroeconomic factors that have more influence in other industries. Professional, Scientific and Technical Services experienced regional gains in employment that were higher than either California or Silicon Valley and were only dwarfed by the substantial increase in San Francisco.

What industry is the Management of Companies & Enterprises? *The industry Includes equity holding companies and management enterprises. The largest of these firms fall into three main categories: bank holding companies (such as Credit Suisse Holdings, Ally Financial, etc.); investment, private equity firms and other holding companies (such as Blackstone Group, Bain Capital, Golden Gate Capital, etc.) and parent holding companies (AMR, Sears Holding Company, etc.). The large growth in this sector is potentially due to the increase in private equity and venture capital investment in the region.*

Figure 2: Regional Comparison of Change in Employment from 2007 to 2012 for the East Bay's Growing Industries[8]

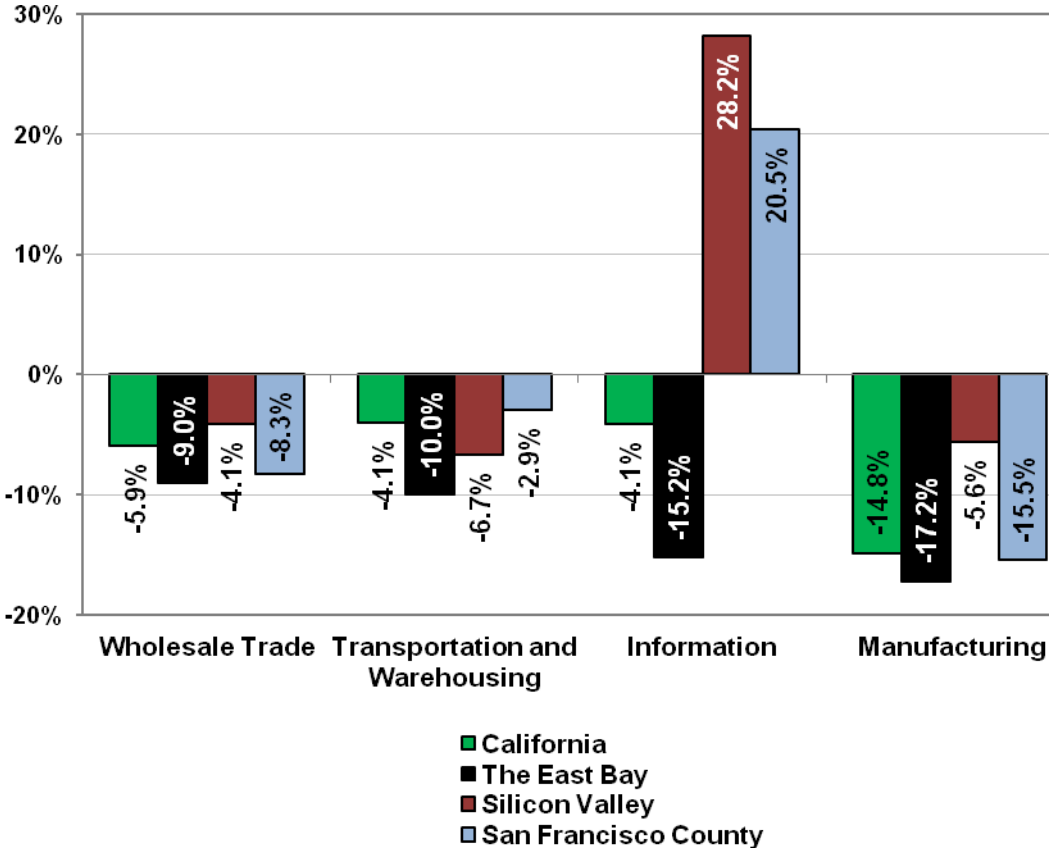


[8] Source: EMSI Complete Employment 2013.1

A comparison of some of the East Bay's key industries that lost employment from 2007 to 2012 again revealed that generally those industries that declined consistently declined in comparable Bay Area regions and for California and the country as a whole. As the figure below reveals, the Information industry is the one industry that saw considerable differences in employment experience from 2007 to 2012. Other Bay Area regions such as Silicon Valley and San Francisco County saw considerable increases in Information employment while the East Bay along with California as a whole saw considerable declines in employment for this industry. Manufacturing is an industry that the East Bay has seen considerable declines in employment from 2007 to 2012 while it has seen some recovery in other regions from 2010 to 2012.

Why did the Information industry decline in the East Bay? *A great deal of employment decline in the region occurred within Telecommunications Resellers (loss of 3,262 jobs) and Wireless Telecommunications Carriers (except Satellite) (loss of 967 jobs). The East Bay's largest Telecommunications Resellers include Airnex Communications, Kodiak Networks and Hurricane Electric LLC.*

Figure 3: Regional Comparison of Change in Employment from 2007 to 2012 for the East Bay's Declining Industries[9]

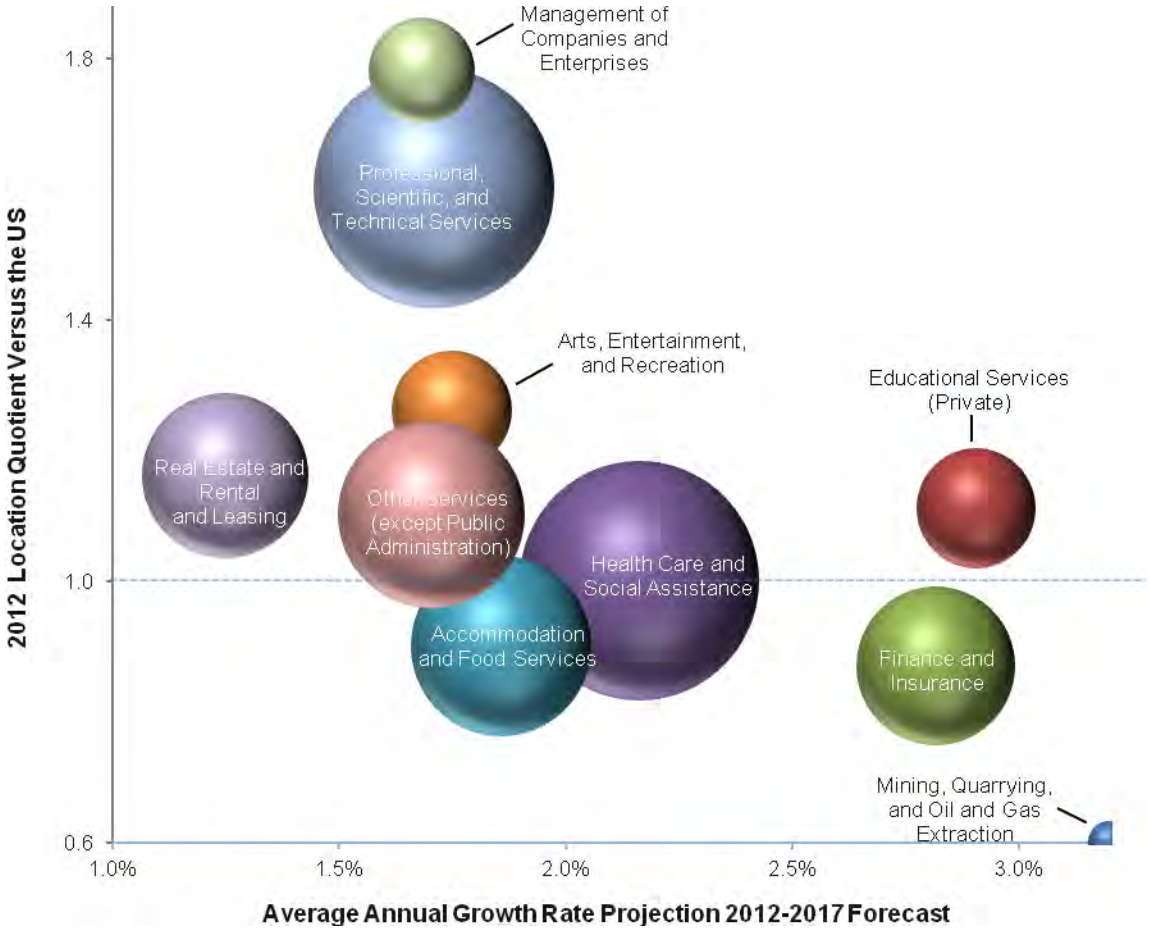


[9] Source: EMSI Complete Employment 2013.1

The charts on the following pages reveal several pieces of key information regarding The East Bay's industries that have grown from 2007 to 2012. The size of the sphere shows the relative size of the industry, in terms of total employment. The vertical axis indicates the relative employment concentration of the industry in comparison to the average national region.[10] The horizontal axis indicates the expected growth in overall industry employment from 2012 to 2017.

As shown in the figure below, Management of Companies and Enterprises has the highest industry concentration of the industries shown but is smaller overall in terms of employment than industries such as Healthcare.

Figure 4: East Bay Industry Concentration & Employment Expectations (Top 10 by Growth)[11]

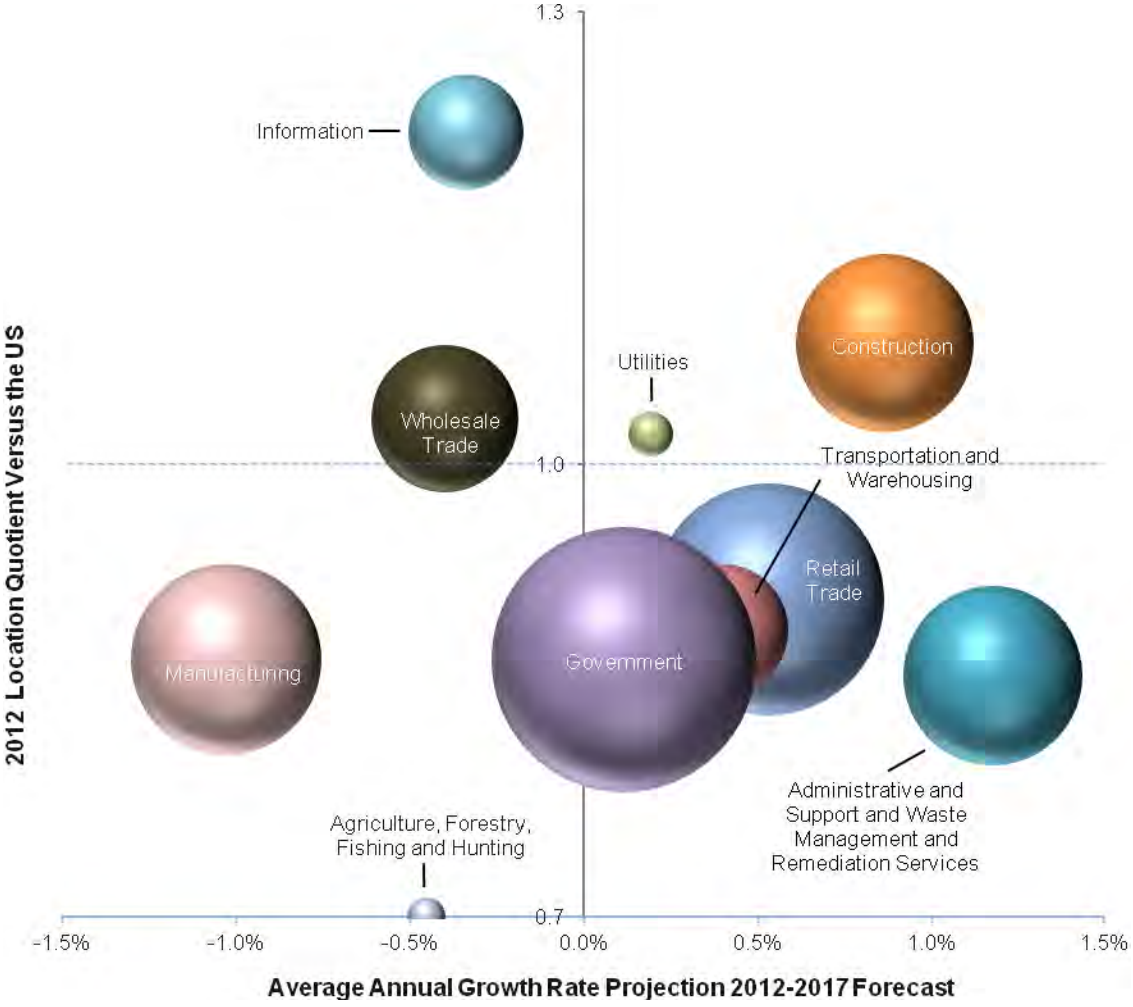


[10] An LQ (Location Quotient) of 1.0 indicates that a region has the average employment for a given industry in comparison to the national economy. An LQ of 2.0 indicates the regional has twice the average employment for a given industry in comparison to the national economy.

[11] Source: EMSI Complete Employment 2013.1

The figure below illustrates that several of the industries that have suffered employment declines from 2007 to 2012 are expected to continue to lose employment over the next five-year period. These industries include; Information, Manufacturing and Wholesale Trade. Other industries like Construction and Retail Trade are expected to see some employment gains through 2017.

Figure 5: East Bay Industry by Concentration & Employment Expectations (Bottom 10 by Growth)[12]



[12] Source: EMSI Complete Employment 2013.1

EAST BAY INDUSTRY CLUSTERS

Industry clusters offer another approach to organizing and examining East Bay employers. Unlike industries that fit into a traditional industry segmentation, typically provided by a NAICS (North American Industry Classification System) or SIC (Standard Industry Classification) structure, industry clusters aggregate different industry segments based on shared customers, technologies, supply chains and/or comparable human capital requirements.

An emphasis on industry clusters in a given region has several advantages – they allow us to move beyond the general industry assessment to identify regional economic drivers, the shared training and educational resources that are needed particularly for human capital development and a better understanding of the markets in which employers compete and cooperate.

For this analysis, the industry clusters were used to identify relevant occupations among comparable industries as well as develop a better understanding of the skills, educational requirements and career opportunities that described the changing employment opportunities within the East Bay. For this report, seven industry clusters were defined building off of previous East Bay Assets research as well as the work done in this study. These industry clusters include;

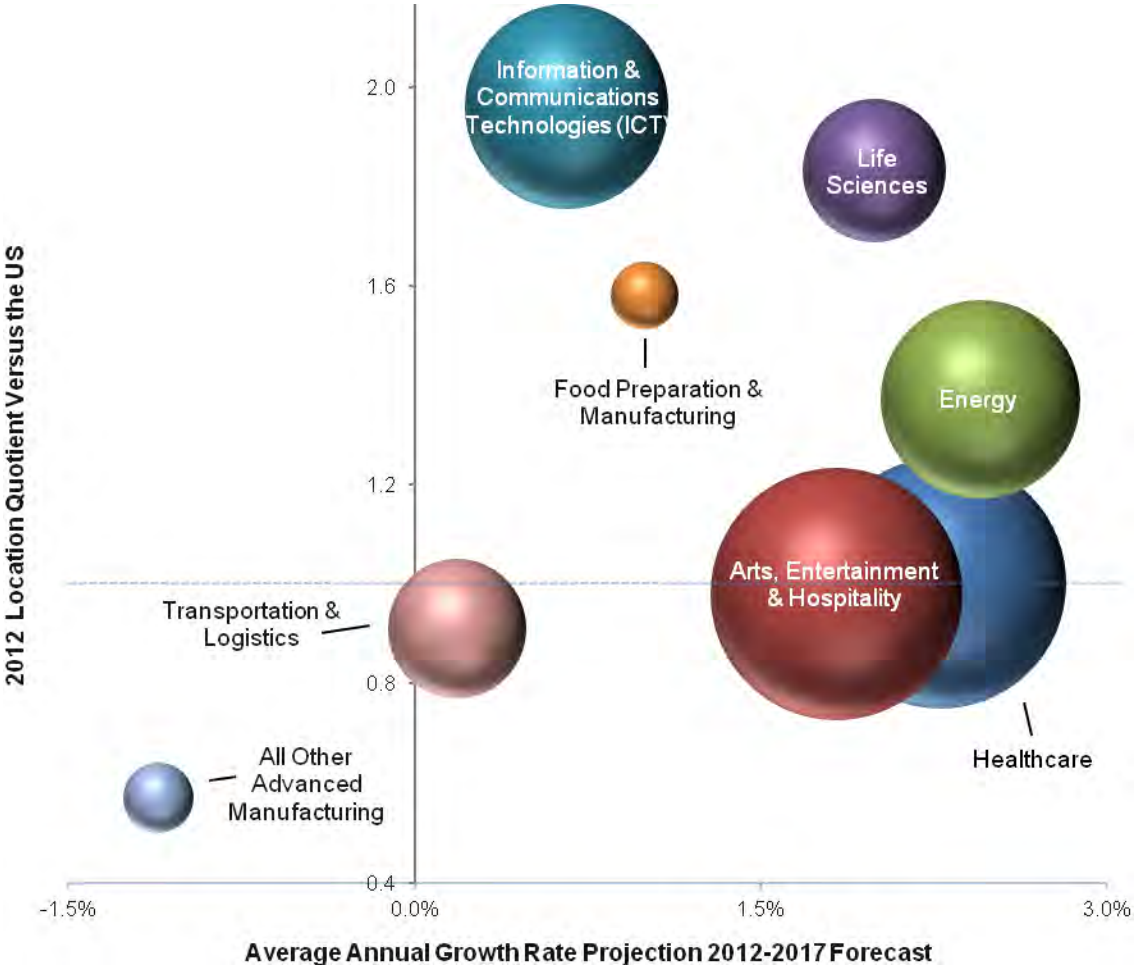
- **Art's, Entertainment & Hospitality**: This service driven cluster includes artistic and sports performances, recreation and leisure activities, as well as food, bars and accommodation services.
- **Energy**: This cluster includes both the extraction, production and distribution of both fossil and renewable energies as well as the manufacturing of products that emphasize energy usage.
- **Food preparation & manufacturing**: This cluster includes East Bay firms that are preparing and manufacturing food and beverages.
- **Healthcare**: This service oriented cluster includes offices of physicians, outpatient centers, community clinics, medical laboratories, hospitals and residential care facilities.
- **Information & Communications Technologies (ICT**): This cluster includes the technology employers associated with the research, development and production of software, hardware and telecommunications products.
- **Life Sciences**: This cluster includes the biotechnology and biomedical employers engaged in research, development and manufacturing of related products.
- **Transportation & Logistics**: This service oriented cluster includes those firms that provide transportation, distribution and warehousing services through, air, freight, water and rail.

The research also examines advanced manufacturing in the East Bay and its connection to those industry clusters already identified as well as advanced manufacturing that is not connected to an industry cluster.

Like the bubble charts earlier in the report, the size of the sphere shows the relative size of the industry, in terms of total employment. The vertical axis indicates the relative employment

concentration of the industry in comparison to the average California region.[13] The horizontal axis indicates the expected growth in overall industry employment from 2012 to 2017. The figure below reveals that the East Bay has a high concentration of Life Sciences, ICT, Food Preparation and Manufacturing and Energy. The average annual growth rate for Life Sciences, Healthcare and Energy is expected to be at or above two percent for the next five years.

Figure 6: East Bay Industry Clusters by Concentration & Employment Expectations[14]



Advanced Manufacturing has been portrayed as a single broad industry cluster. As a whole, advanced manufacturing incorporates the manufacturing elements of other industry clusters including ICT, Energy and the Life Sciences clusters in the East Bay. Extracting the Advanced Manufacturing elements from each of these larger clusters results in specialized manufacturing sub-sectors and one sub-sector containing the remaining industries not otherwise classified ("All Other" Advanced Manufacturing[15]).

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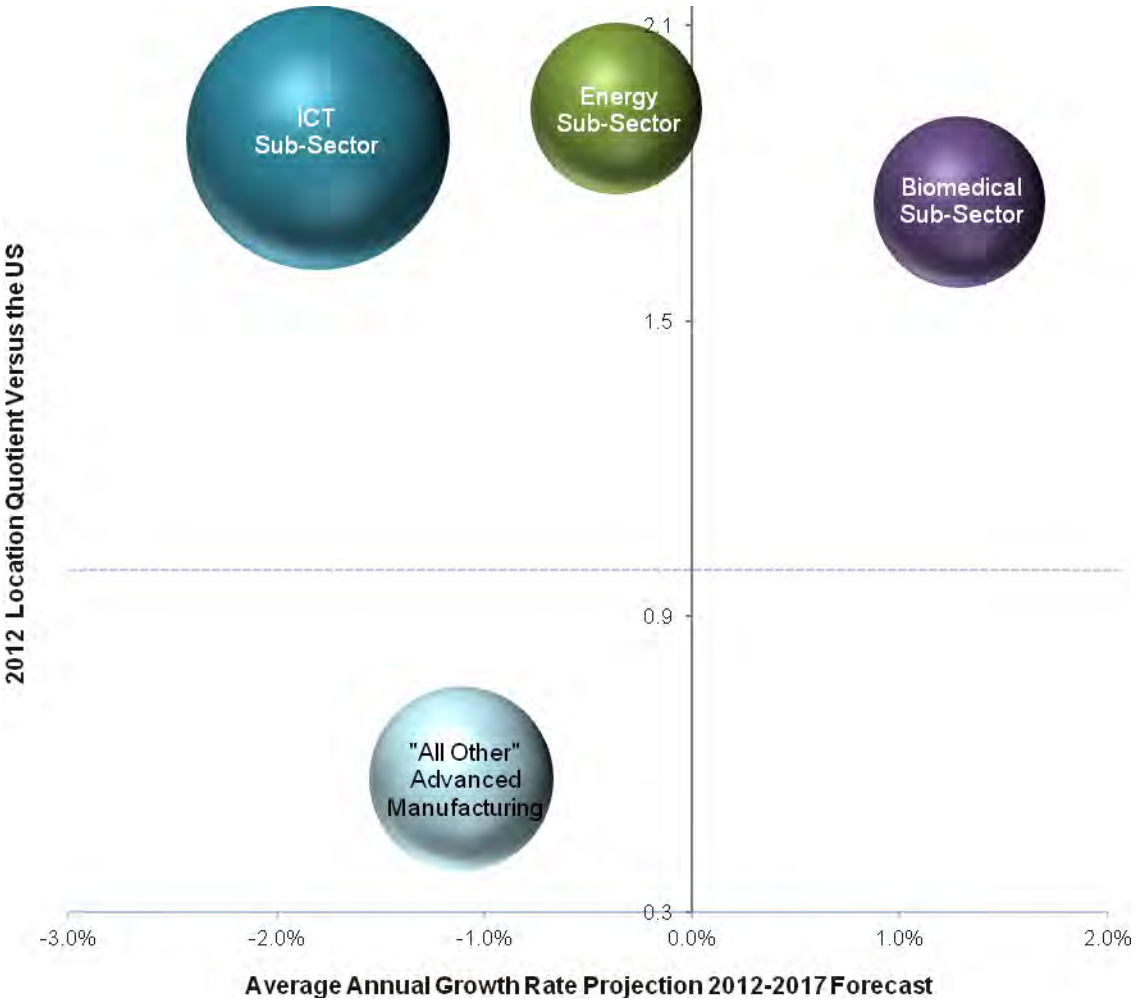
[13] An LQ (Location Quotient) of 1.0 indicates that a region has the average employment for a given industry in comparison to the California economy. An LQ of 2.0 indicates the regional has twice the average employment for a given industry in comparison to the California economy.

[14] Source: EMSI Complete Employment 2013.1

[15] This includes industries such as Asphalt Paving Mixture and Block Manufacturing, Machine Shops, Textile Machinery Manufacturing, Gasoline Engine and Engine Parts Manufacturing, and Boat Building.

The ICT, Energy and Biomedical Advanced Manufacturing sub-sectors are all highly concentrated in the East Bay, with only the Biomedical sub-sector expected to grow (1.3% annual growth) over the next five years.

Figure 7: East Bay Advanced Manufacturing Sub-Sectors & Employment Expectations[16]



EAST BAY OCCUPATIONS

Occupational Tiers

General statistics such as the unemployment rate, number of jobs created, number of people employed and number of people unemployed, all have some value when looking at the East Bay's overall economy, but they also hide some critical information as well, starting with the **reality that not all jobs are equal**. A part-time job that pays minimum wage with limited training and on-the-job skill development is considerably less valuable than a high-paying, full-time

[16] Source: EMSI Complete Employment 2013.1

position with full benefits that continually develops and trains an individual for increasing levels of responsibility.

A recent study by David Autor[17] revealed the changes in the nation's occupational profile. Autor provided an in-depth examination of the quality and quantity of the jobs that employers have demanded over the last 30 years. In his analysis, Autor developed an occupational segmentation that BW Research has also used in regional occupational analyses. This occupational segmentation technique delineates all occupations into one of three tiers. The occupational tiers are broadly defined as follows:

> **Tier 1 Occupations** include managers (Chief Executives, Financial Managers and Sales Managers), professional positions (Lawyers, Accountants and Physicians) and highly-skilled technical occupations, such as scientists, computer programmers and engineers. These occupations are typically the highest-paying, highest-skilled occupations in the economy. In 2012, the average earnings for Tier 1 occupations in California was $38.17 an hour or approximately $79,400 a year (assuming a 40 hour work week for the entire year).
>
> **Tier 2 Occupations** include sales positions (Sales Representatives), teachers and librarians, office and administrative positions (Accounting Clerks and Secretaries) and manufacturing, operations and production positions (Assemblers, Electricians and Machinists). These occupations have historically provided the majority of employment opportunities and could be referred to as middle-wage, middle-skill positions. In 2012, the average earnings for Tier 2 occupations in California was $21.22 an hour or approximately $44,100 a year (assuming a 40 hour work week for the entire year).
>
> **Tier 3 Occupations** include protective services (Security Guards), food service and retail positions (Waiters, Cooks and Cashiers), building and grounds cleaning positions (Janitors) and personal care positions (Home Health Aides and Child Care Workers). These occupations typically represent lower-skilled service positions with lower wages that require little formal training and/or education. In 2012, the average wage for Tier 3 occupations in California was $11.96 an hour or approximately $24,900 a year (assuming a 40 hour work week for the entire year).

Dr. Autor's research on occupational tiers revealed that Tier 2 occupations have been declining considerably since the mid 1970's as many of these jobs have been lost to automation or more recently offshored to less expensive labor markets. The great recession only expedited this long run trend as nationally and regionally Tier 1 and Tier 3 jobs increased during the recession while Tier 2 jobs declined. While this trend is true for the country as a whole, it is also accurate in the East Bay, as the following pages of data reveal.

The table below reveals that almost 45 percent of the East Bay's jobs can found among Tier 2 occupations, with just over a quarter in Tier 3 and just under a quarter in Tier 1. The East Bay has more Tier 1 occupations proportionally than California as a whole, but slightly less than the entire nine-county Bay Area.

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[17] The Polarization of Job Opportunities in the US Labor Market; Implications for Employment and Earnings, April 2010.

Table 1: Overall Occupational Tiers by Region[18] for 2012

Overall	Occupational Tiers		
	Tier 1	Tier 2	Tier 3
The East Bay	22.4%	44.1%	25.1%
Bay Area	23.2%	41.1%	25.0%
California	20.1%	43.3%	28.2%

It should be noted that approximately 10 percent of employment does not fall into one of the three occupational tiers.

Occupational Tiers by Traditional Industries

Just over one half of all Tier 1 East Bay occupations are found in one of three industries: Professional, Scientific and Technical Services (25%); Health Care & Social Assistance (16%) and Government (9%). Industries such as Manufacturing and Finance and Insurance have a relatively small portion of Tier 1 occupations when compared to other regions such as Santa Clara County or San Francisco.

> ***Arts, Entertainment & Recreation, the Tier 1 occupational outlier:*** *The relatively high proportion of creative and administrative occupations associated with Arts, Entertainment & Recreation typically have high education requirements but often have relatively low salaries. This helps explain the high percentage of Tier 1 occupations with the low industry Earnings per Job Index[19] figure.*

Table 2: Overall Occupational Tiers for East Bay Industries[20]

2-digit NAICS Description	Occupational Tiers			Earnings Per Job Index
	Tier 1	Tier 2	Tier 3	
Agriculture, Forestry, Fishing and Hunting	0.0%	0.1%	0.5%	0.55
Mining, Quarrying, and Oil and Gas Extraction	0.5%	0.4%	0.0%	1.16
Utilities	0.3%	0.5%	0.0%	2.45
Construction	2.7%	9.9%	0.9%	1.07
Manufacturing	5.8%	8.5%	1.7%	1.76
Wholesale Trade	2.0%	5.6%	1.9%	1.30
Retail Trade	2.2%	8.6%	18.1%	0.59
Transportation and Warehousing	0.9%	4.9%	1.8%	0.94
Information	2.8%	2.0%	0.6%	1.64
Finance and Insurance	7.7%	6.4%	0.2%	1.20
Real Estate and Rental and Leasing	5.4%	7.8%	1.7%	0.49

[18] Source: EMSI Complete Employment 2013.1

[19] The ratio of average industry earnings per job to the East Bay average earnings per job ($63,302/yr). Earnings per job is defined as total earnings (wage and salary disbursements, other labor income and proprietors' income) divided by total employment.

[20] Source: EMSI Complete Employment 2013.1

Professional, Scientific, and Technical Services	24.7%	7.4%	0.6%	1.26
Management of Companies and Enterprises	3.5%	1.7%	0.3%	2.10
Administrative and Support and Waste Management and Remediation Services	2.7%	3.8%	10.8%	0.60
Educational Services (Private)	2.0%	3.7%	0.9%	0.50
Health Care and Social Assistance	16.3%	7.4%	13.8%	1.18
Arts, Entertainment, and Recreation	6.4%	0.7%	3.7%	0.47
Accommodation and Food Services	2.1%	0.7%	21.6%	0.35
Other Services (except Public Administration)	2.5%	4.1%	15.7%	0.44
Government	9.2%	15.5%	5.0%	1.28

The table below illustrates the East Bay's occupational composition by industry. One of the strengths of the East Bay's economy is found in the continued expected growth of industries like Professional, Scientific and Technical Services and Management of Companies and Enterprises, which are expected to continue to grow and provide high paying occupations with a relatively large portion of Tier 1 positions.

Table 3: Within Industry Occupational Tier Composition for the East Bay[21]

2-digit NAICS Descriptions	Occupational Tiers		
	Tier 1	Tier 2	Tier 3
Professional, Scientific, and Technical Services	61.7%	36.6%	1.8%
Arts, Entertainment, and Recreation	53.7%	12.0%	34.3%
Management of Companies and Enterprises	48.8%	47.2%	4.0%
Mining, Quarrying, and Oil and Gas Extraction	41.6%	55.6%	2.9%
Information	38.0%	53.0%	9.0%
Finance and Insurance	37.5%	61.5%	1.0%
Health Care and Social Assistance	35.3%	31.4%	33.3%
Utilities	24.8%	73.3%	1.8%
Manufacturing	23.9%	68.2%	7.9%
Real Estate and Rental and Leasing	23.7%	67.9%	8.4%
Government	20.2%	67.5%	12.3%
Educational Services (Private)	19.7%	70.6%	9.7%
Wholesale Trade	13.3%	72.9%	13.9%
Administrative and Support and Waste Management and Remediation Services	12.2%	33.9%	53.9%
Construction	11.6%	84.0%	4.3%
Other Services (except Public Administration)	8.8%	28.9%	62.3%
Accommodation and Food Services	7.6%	5.0%	87.5%
Transportation and Warehousing	7.1%	76.9%	16.0%
Retail Trade	5.6%	43.0%	51.4%
Agriculture, Forestry, Fishing and Hunting	5.2%	15.8%	79.0%

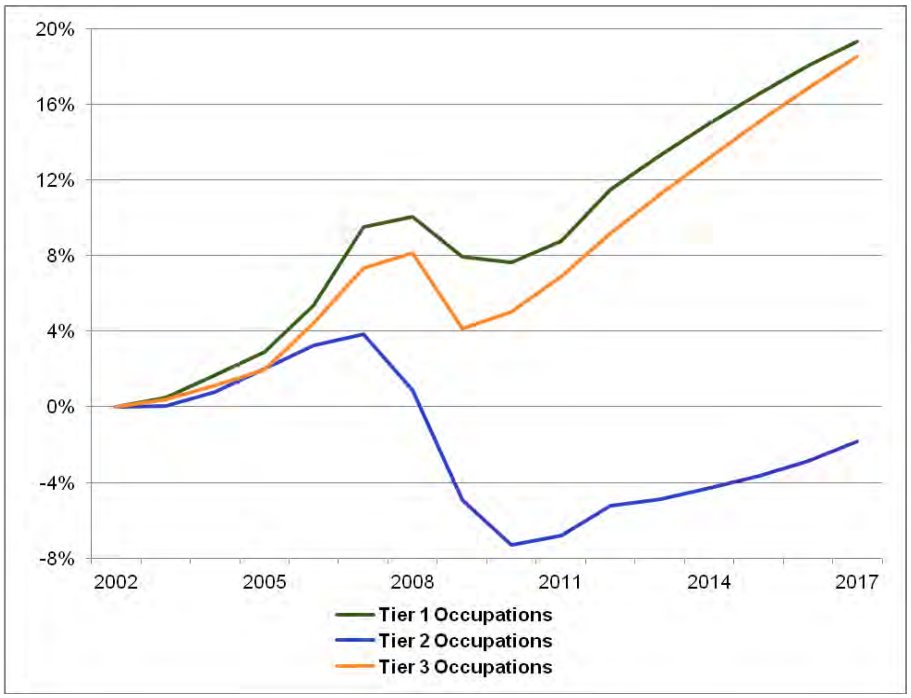
[21] Source: EMSI Complete Employment 2013.1

The following table reveals a valuable trend in understanding overall occupational demand, both regionally, as well as within California and the country as a whole. Tier 1 occupations that typically fall under the broad category of management, business, science and arts occupations have consistently grown in the East Bay, the Bay Area and California over the last 15 years and are expected to continue to grow over the next five years. This is also true for Tier 3 jobs, those low skill and low wage positions, that are a portion of low skill service occupations, but have grown and are expected to continue to grow over the next five years. Meanwhile, Tier 2 jobs, which declined over the last 10 years, are expected to continue to decline through 2017.

Table 4: Tier Occupation Share of Total Employment by Region from 2002 to 2017

Occupational Tiers	Year	East Bay	Bay Area	California
Tier 1	2002	20.5%	21.6%	18.9%
	2007	21.3%	22.4%	19.3%
	2012	22.4%	23.2%	20.1%
	2017	22.7%	23.3%	20.2%
Tier 2	2002	47.6%	44.6%	46.2%
	2007	46.8%	43.4%	45.4%
	2012	44.1%	41.1%	43.3%
	2017	43.2%	40.3%	42.6%
Tier 3	2002	23.5%	23.5%	26.3%
	2007	23.9%	24.1%	27.1%
	2012	25.1%	25.0%	28.2%
	2017	25.7%	25.8%	29.0%

Figure 8: Change in East Bay Tier Employment from 2002 to 2017



Key Occupations by Occupational Tiers for the East Bay

The tables on the following three pages identify the East Bay occupations in each tier with the most job openings (new jobs + replacement jobs) expected from 2012 to 2017. The table includes both the growth percentage, which indicates the proportional increase in demand for that occupational category in the East Bay, as well as the wage index,[22] which indicates the proportional median wage for each occupation in comparison to the 2012 median annual wage in the East Bay, $22.29 an hour or $46,353 annually. For example, a wage index of 1.00 indicates that occupational category has a median wage of $46,353 annual median wage while a wage index of 2.0 indicates an annual median wage of $92,706 for that occupational category.

Table 5: Key Tier 1 Occupations for the East Bay[23]

Description	2012 Jobs	Change 2012-2017	Growth %	Job Openings (New + Repl.)	Wage Index
Personal Financial Advisors	12,029	3,319	28%	6,127	1.37
Registered Nurses	21,232	2,141	10%	4,921	2.37
Managers, All Other	13,562	1,145	8%	3,101	2.59
Management Analysts	13,328	1,624	12%	2,715	2.03
Property, Real Estate and Community Association Managers	11,489	978	9%	2,665	1.53
Writers and Authors	4,489	393	9%	1,291	1.42
Accountants and Auditors	12,552	506	4%	1,172	1.62
Interpreters and Translators	3,637	270	7%	1,080	1.13
Financial Managers	6,378	497	8%	1,054	2.74
Civil Engineers	4,518	349	8%	1,020	2.18
Financial Analysts	4,172	322	8%	979	1.92
Medical and Health Services Managers	3,012	282	9%	777	2.39
Marketing Managers	2,722	270	10%	682	2.83
Lawyers	8,652	308	4%	619	2.78
Sales Managers	4,263	188	4%	550	2.69
Medical Scientists, Except Epidemiologists	1,880	407	22%	547	2.16
Graphic Designers	4,479	206	5%	540	1.07
Clinical, Counseling and School Psychologists	4,599	177	4%	535	1.83
Public Relations Specialists	2,019	196	10%	490	1.42
Meeting, Convention and Event Planners	1,123	179	16%	403	1.16

[22] The wage index is derived from dividing occupational wage by overall average wage as reported by the California Employment Development Department's (EDD) Occupational Employment Projections for 2012.

[23] Source: EMSI Complete Employment 2013.1 & California Employment Development Department (EDD) Occupational Employment Projections 2012.

Table 6: Key Tier 2 Occupations for the East Bay[24]

Description	2012 Jobs	Change 2012-2017	Growth %	Job Openings (New + Repl.)	Wage Index
Securities, Commodities and Financial Services Sales Agents	9,371	1,970	21%	4,886	1.57
Self-Enrichment Education Teachers	6,671	1,211	18%	2,532	1.06
Office Clerks, General	21,048	1,024	5%	2,304	0.80
Licensed Practical and Licensed Vocational Nurses	5,751	675	12%	1,848	1.25
Real Estate Brokers	6,400	425	7%	1,842	1.63
Insurance Sales Agents	6,402	827	13%	1,696	1.56
Heavy and Tractor-Trailer Truck Drivers	11,500	756	7%	1,575	0.88
Customer Service Representatives	15,689	528	3%	1,515	0.85
Receptionists and Information Clerks	7,007	498	7%	1,388	0.72
Medical Secretaries	6,036	672	11%	1,362	0.88
First-Line Supervisors of Office and Administrative Support Workers	12,266	436	4%	1,269	1.29
Bookkeeping, Accounting and Auditing Clerks	14,964	668	4%	1,138	0.96
Elementary School Teachers, Except Special Education	9,370	414	4%	1,013	1.39
Sales Representatives, Services, All Other	8,136	331	4%	823	1.39
Executive Secretaries and Executive Administrative Assistants	11,971	434	4%	768	1.17
Plumbers, Pipefitters and Steamfitters	2,755	329	12%	725	1.32
Construction Laborers	10,864	496	5%	687	1.08
Photographers	10,174	433	4%	606	0.64
Secretaries and Administrative Assistants, Except Legal, Medical and Executive	13,674	329	2%	594	0.89
Taxi Drivers and Chauffeurs	2,912	369	13%	586	0.58

[24] Source: EMSI Complete Employment 2013.1 & California Employment Development Department (EDD) Occupational Employment Projections 2012.

Table 7: Key Tier 3 Occupations for the East Bay[25]

Description	2012 Jobs	Change 2012-2017	Growth %	Job Openings (New + Repl.)	Wage Index
Waiters and Waitresses	14,118	1,788	13%	5,708	0.41
Combined Food Preparation and Serving Workers, Including Fast Food	18,168	2,196	12%	4,998	0.42
Cashiers	24,149	1,147	5%	4,909	0.49
Maids and Housekeeping Cleaners	20,365	2,226	11%	4,321	0.49
Retail Salespersons	32,471	1,304	4%	3,958	0.52
Home Health Aides	8,805	2,022	23%	3,680	0.49
Personal Care Aides	9,243	2,147	23%	3,674	0.49
Childcare Workers	19,209	1,285	7%	3,427	0.46
Hairdressers, Hairstylists, and Cosmetologists	7,019	1,240	18%	3,248	0.57
Nursing Aides, Orderlies and Attendants	10,045	1,539	15%	2,795	0.74
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	18,015	1,090	6%	2,435	0.67
Landscaping and Groundskeeping Workers	10,449	933	9%	2,254	0.61
Nonfarm Animal Caretakers	5,196	564	11%	1,948	0.43
Cooks, Restaurant	6,975	971	14%	1,887	0.55
Security Guards	8,470	954	11%	1,793	0.61
Food Preparation Workers	5,951	567	10%	1,566	0.43
Dishwashers	5,131	401	8%	1,214	0.42
Medical Assistants	5,994	490	8%	1,061	0.79
First-Line Supervisors of Food Preparation and Serving Workers	5,914	508	9%	1,016	0.62
Recreation Workers	4,152	395	10%	999	0.54

[25] Source: EMSI Complete Employment 2013.1 & California Employment Development Department (EDD) Occupational Employment Projections 2012.

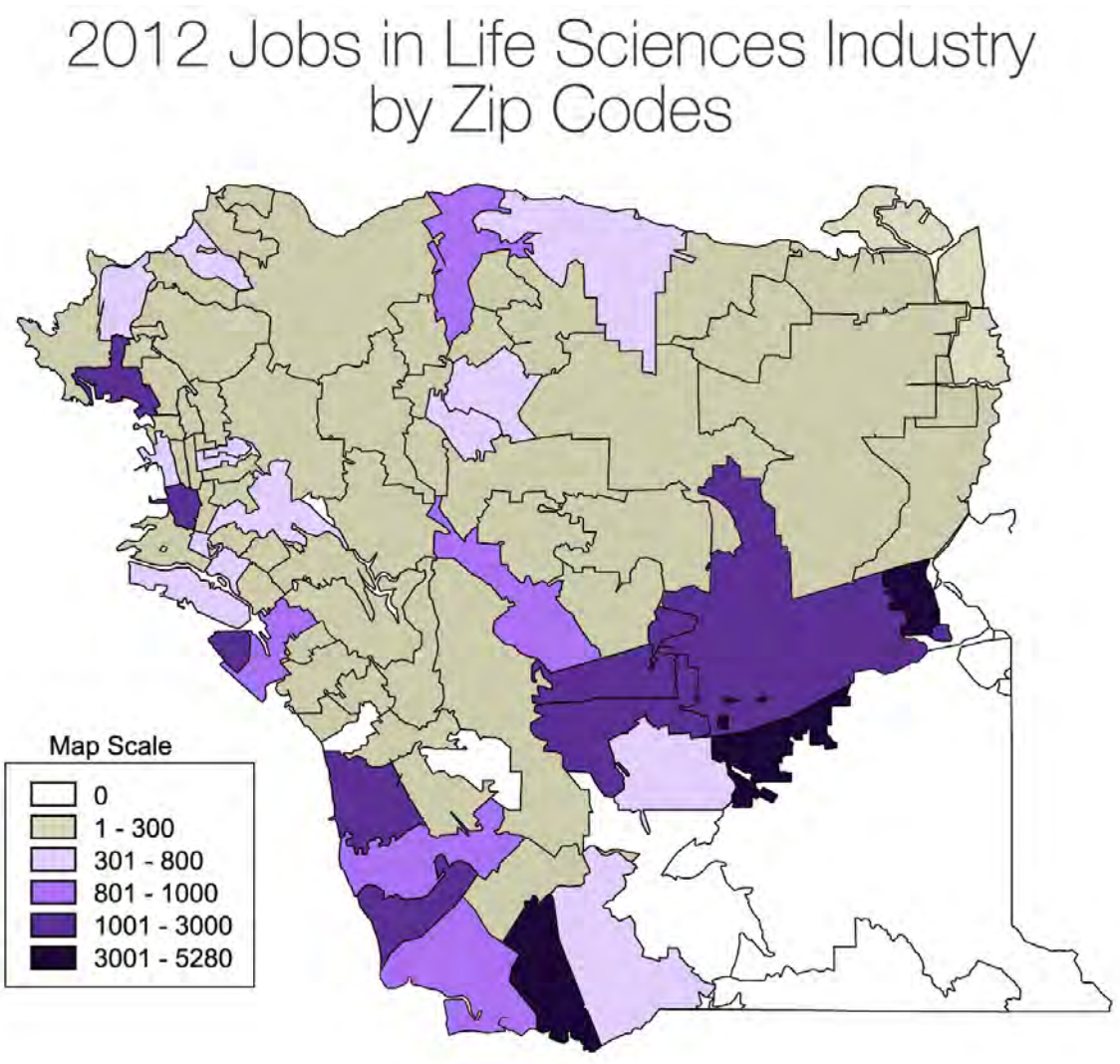
INDUSTRY CLUSTER OCCUPATIONS

This section of the study provides a brief summary of each of the East Bay industry clusters and the top five occupations, in terms of expected job openings for each of the occupational tiers.

Life Sciences Industry Cluster

The Life Sciences industry cluster includes firms that are in bio-medical advanced manufacturing as well as those organizations associated with research and development in biotechnology and related life sciences. As shown in the figure below, employment in this cluster is concentrated in Emeryville, Berkeley, Richmond, the Tri-Valley and Southern Alameda County.

Figure 9: Distribution of Life Sciences Employment within the East Bay (2012)



As the tables below show, most job openings in Life Sciences will be found in Tier 1 and Tier 2 occupations that often typically require higher levels of education and job experience.

Table 8: Key Life Sciences Tier 1 Occupations for the East Bay

Description	2012 Jobs	Change 2012-2017	% Growth	Job Openings (New + Repl.)	Wage Index
Medical Scientists, Except Epidemiologists	1,306	408	31%	547	2.16
Aerospace Engineers	1,320	245	19%	517	2.29
Biomedical Engineers	287	114	40%	418	2.14
Biochemists and Biophysicists	470	140	30%	305	1.57
Software Developers, Applications	569	89	16%	117	2.21

Table 9: Key Life Sciences Tier 2 Occupations for the East Bay

Description	2012 Jobs	Change 2012-2017	% Growth	Job Openings (New + Repl.)	Wage Index
Biological Technicians	848	127	15%	445	1.10
Pharmacy Technicians	1,173	139	12%	307	0.93
Inspectors, Testers, Sorters, Samplers and Weighers	473	56	12%	182	0.85
Executive Secretaries and Executive Administrative Assistants	644	81	13%	143	1.17
Office Clerks, General	458	56	12%	126	0.80

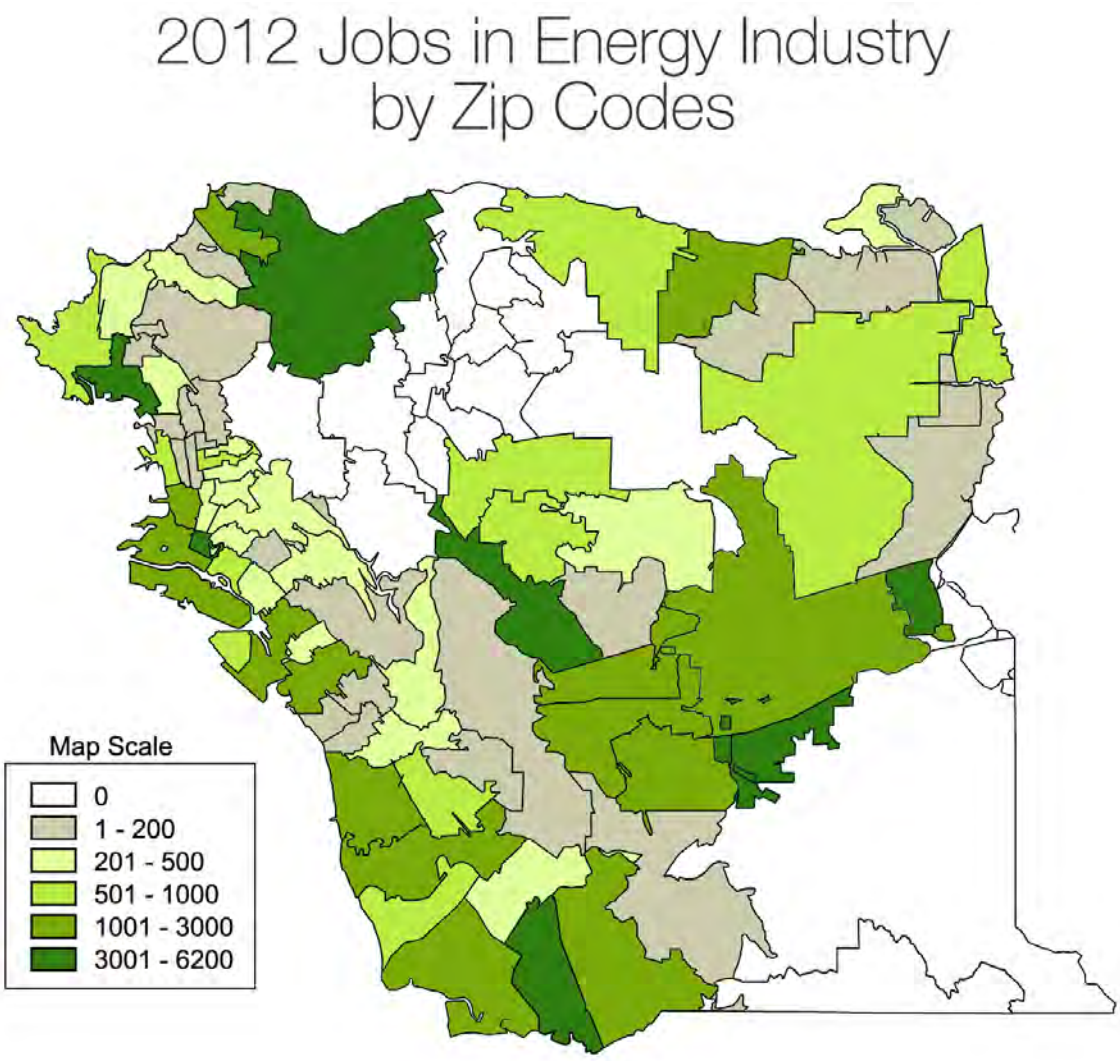
Table 10: Key Life Sciences Tier 3 Occupations for the East Bay

Description	2012 Jobs	Change 2012-2017	% Growth	Job Openings (New + Repl.)	Wage Index
Retail Salespersons	1,433	86	6%	261	0.52
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	101	14	14%	31	0.67
Packers and Packagers, Hand	140	12	9%	29	0.47
Pharmacy Aides	178	13	7%	26	0.54
Security Guards	64	12	19%	23	0.61

Energy Industry Cluster

The Energy industry cluster includes firms that are engaged in fossil fuel extraction, refineries and renewable energy production as well as the manufacturing of products related to the energy industry, such as petrochemicals, heat exchangers and oil and gas field machinery and equipment. As shown in the figure below, about half of the East Bay jobs in this cluster are found in the Tri-Valley and Western Contra Costa County areas of the region.

Figure 10: Distribution of Energy Industry Jobs in the East Bay (2012)



Like Life Sciences, most occupational opportunities in Energy will be found in Tier 1 and Tier 2 occupations with Management Analysts standing out as a growing occupational opportunity within the Energy industry.

Table 11: Key Energy Tier 1 Occupations for the East Bay

Description	2012 Jobs	Change 2012-2017	% Growth	Job Openings (New + Repl.)	Wage Index
Management Analysts	4,689	1,329	28%	2,219	2.03
Civil Engineers	2,732	476	17%	1,390	2.18
Market Research Analysts and Marketing Specialists	986	339	34%	719	1.72
Personal Financial Advisors[26]	1,042	387	37%	716	1.37
Medical Scientists, Except Epidemiologists	990	321	32%	430	2.16

Table 12: Key Energy Tier 2 Occupations for the East Bay

Description	2012 Jobs	Change 2012-2017	% Growth	Job Openings (New + Repl.)	Wage Index
First-Line Supervisors of Construction Trades and Extraction Workers	750	284	38%	568	1.79
Securities, Commodities and Financial Services Sales Agents	641	224	35%	556	1.57
Office Clerks, General	1,007	204	20%	459	0.80
Executive Secretaries and Executive Administrative Assistants	1,193	249	21%	441	1.17
Construction Laborers	1,133	204	18%	282	1.08

Table 13: Key Energy Tier 3 Occupations for the East Bay

Description	2012 Jobs	Change 2012-2017	% Growth	Job Openings (New + Repl.)	Wage Index
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	194	68	35%	152	0.67
Laborers and Freight, Stock and Material Movers, Hand	496	26	5%	80	0.61
Telemarketers	82	32	39%	71	0.70
Security Guards	77	18	23%	34	0.61
Excavating and Loading Machine and Dragline Operators	39	9	23%	27	1.41

[26] Personal Financial Advisors is listed as an ONET (www.onetonline.org) Green Occupation. This occupation works winthin the research, design and consulting services sector of the energy industry and is responsible for informing clients about tax benefits, environmentally responsible investments, etc.

The ICT industry cluster includes firms that are engaged in telecommunications, software design and development, technical services and manufacturing of products that are involved in information technology. Over half of the East Bay jobs in this cluster are found in the Tri-Valley and Southern Alameda County areas of the region. Very few occupational opportunities are found in Tier 3 jobs in this cluster.

Figure 11: Distribution of ICT Jobs in the East Bay (2012)

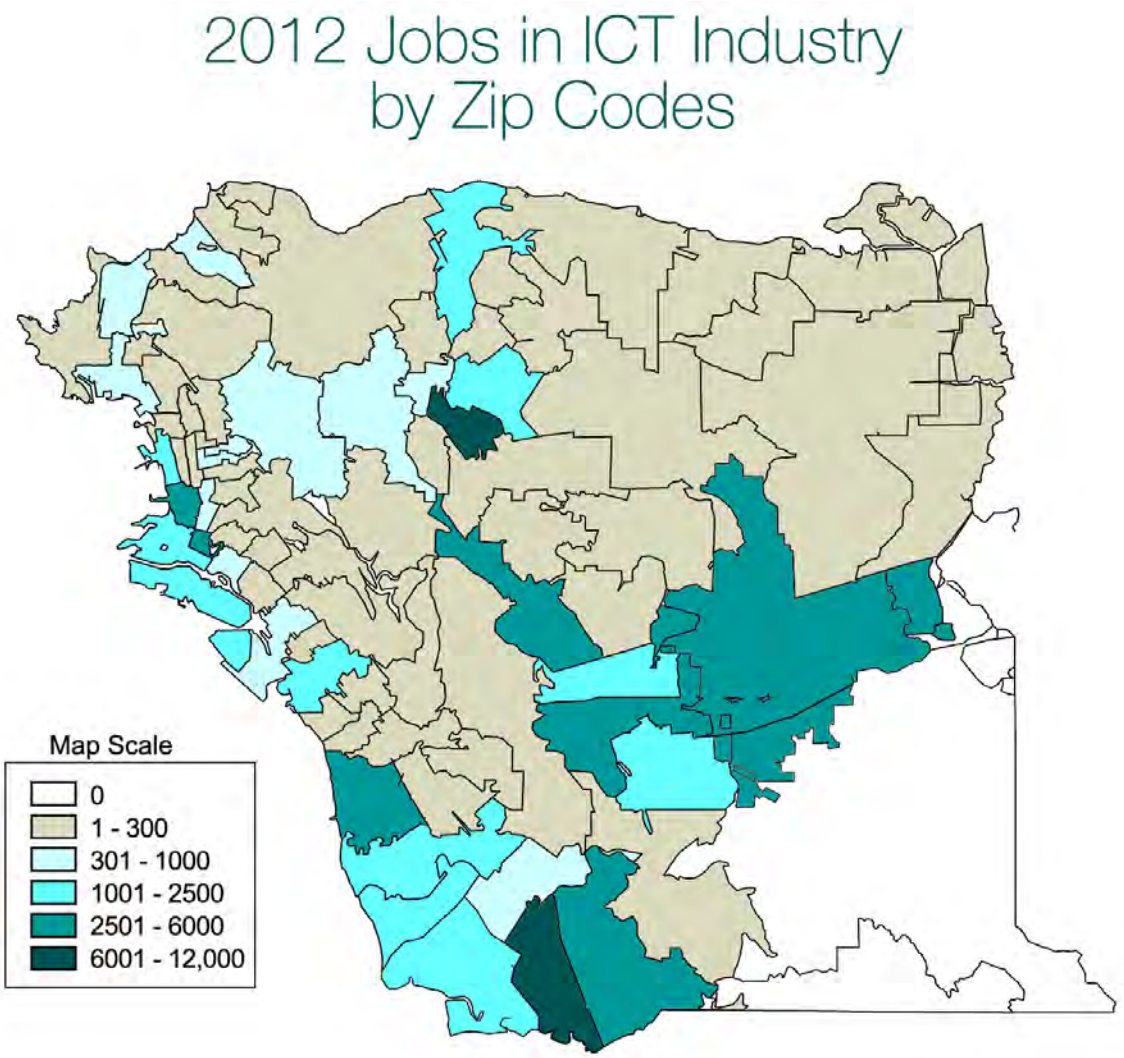


Table 14: Key ICT Tier 1 Occupations for the East Bay

Description	2012 Jobs	Change 2012-2017	% Growth	Job Openings (New + Repl.)	Wage Index
Medical Scientists, Except Epidemiologists	286	93	33%	125	2.16
Civil Engineers	211	37	18%	108	2.18
Biomedical Engineers	46	20	43%	73	2.14
Biochemists and Biophysicists	97	30	31%	65	1.57
Aerospace Engineers	518	28	5%	59	2.29

Table 15: Key ICT Tier 2 Occupations for the East Bay

Description	2012 Jobs	Change 2012-2017	% Growth	Job Openings (New + Repl.)	Wage Index
Biological Technicians	196	30	15%	105	1.10
Life, Physical and Social Science Technicians, All Other	52	10	19%	40	1.06
Chemical Technicians	167	17	10%	35	1.02
Executive Secretaries and Executive Administrative Assistants	321	13	4%	23	1.17
Secretaries and Administrative Assistants, Except Legal, Medical and Executive	154	8	5%	14	0.89

Table 16: Key ICT Tier 3 Occupations for the East Bay

Description	2012 Jobs	Change 2012-2017	% Growth	Job Openings (New + Repl.)	Wage Index
Security Guards	29	3	10%	6	0.61
Veterinary Assistants and Laboratory Animal Caretakers	<10	--	--	--	0.94
Medical Equipment Preparers	<10	--	--	--	0.94
Landscaping and Groundskeeping Workers	<10	--	--	--	0.61
Medical Assistants	<10	--	--	--	0.79

Food Preparation and Manufacturing Industry Cluster

The Food Preparation and Manufacturing industry cluster includes firms that manufacture and prepare seafood products, bakeries and tortilla manufacturing as well as beverage manufacturing, including breweries, wineries and distilleries. As shown in the figure below, employment in this cluster is largely concentrated in the Northern and Southern Alameda County areas of the region.

Figure 12: Distribution of Food Preparation & Manufacturing Industry Jobs in the East Bay (2012)

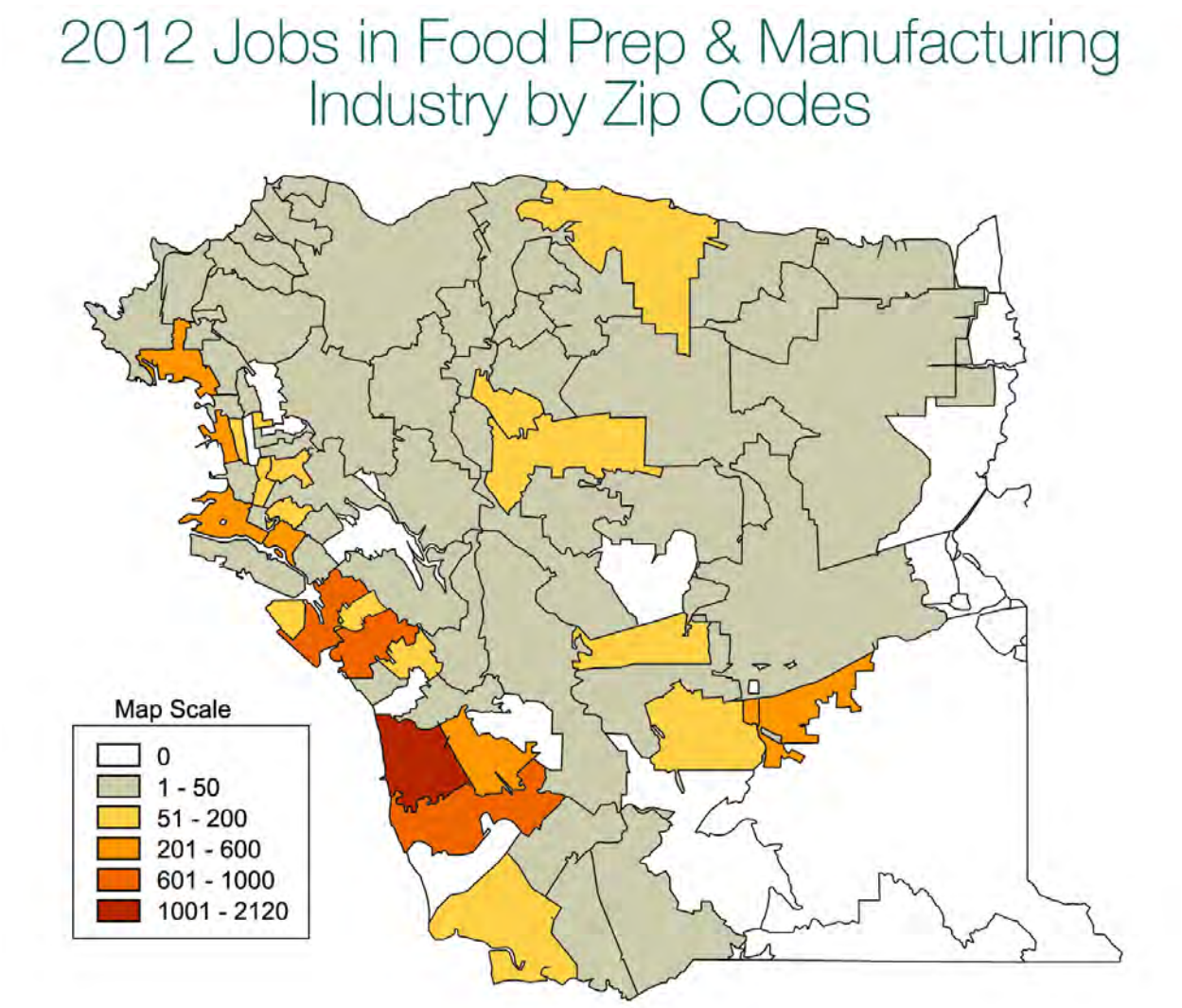


Table 17: Key Food Preparation and Manufacturing Tier 1 Occupations for the East Bay

Description	2012 Jobs	Change 2012-2017	% Growth	Job Openings (New + Repl.)	Wage Index
Managers, All Other	179	35	20%	95	2.59
Industrial Production Managers	85	13	15%	76	2.41
Sales Managers	45	7	16%	21	2.69
General and Operations Managers	140	9	6%	19	2.49
Accountants and Auditors	37	8	22%	19	1.62

Table 18: Key Food Preparation and Manufacturing Tier 2 Occupations for the East Bay

Description	2012 Jobs	Change 2012-2017	% Growth	Job Openings (New + Repl.)	Wage Index
Industrial Machinery Mechanics	108	27	25%	252	1.46
Packaging and Filling Machine Operators and Tenders	666	55	8%	140	0.51
Separating, Filtering, Clarifying, Precipitating and Still Machine Setters, Operators and Tenders	179	38	21%	91	1.12
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	220	23	10%	90	1.36
Bakers	1,012	26	3%	63	0.55

Table 19: Key Food Preparation and Manufacturing Tier 3 Occupations for the East Bay

Description	2012 Jobs	Change 2012-2017	% Growth	Job Openings (New + Repl.)	Wage Index
Laborers and Freight, Stock and Material Movers, Hand	251	28	11%	86	0.61
Industrial Truck and Tractor Operators	213	19	9%	62	0.86
Retail Salespersons	223	20	9%	61	0.52
Cleaners of Vehicles and Equipment	76	11	14%	43	0.46
Packers and Packagers, Hand	412	13	3%	31	0.47

Healthcare Industry Cluster

The Healthcare industry cluster includes physicians' offices and outpatient centers as well as hospitals and long-term care facilities. Employment in this cluster is spread throughout the region with the highest concentration of jobs found in Northern Alameda County.

Figure 13:Distribution of Healthcare Jobs in the East Bay (2012)

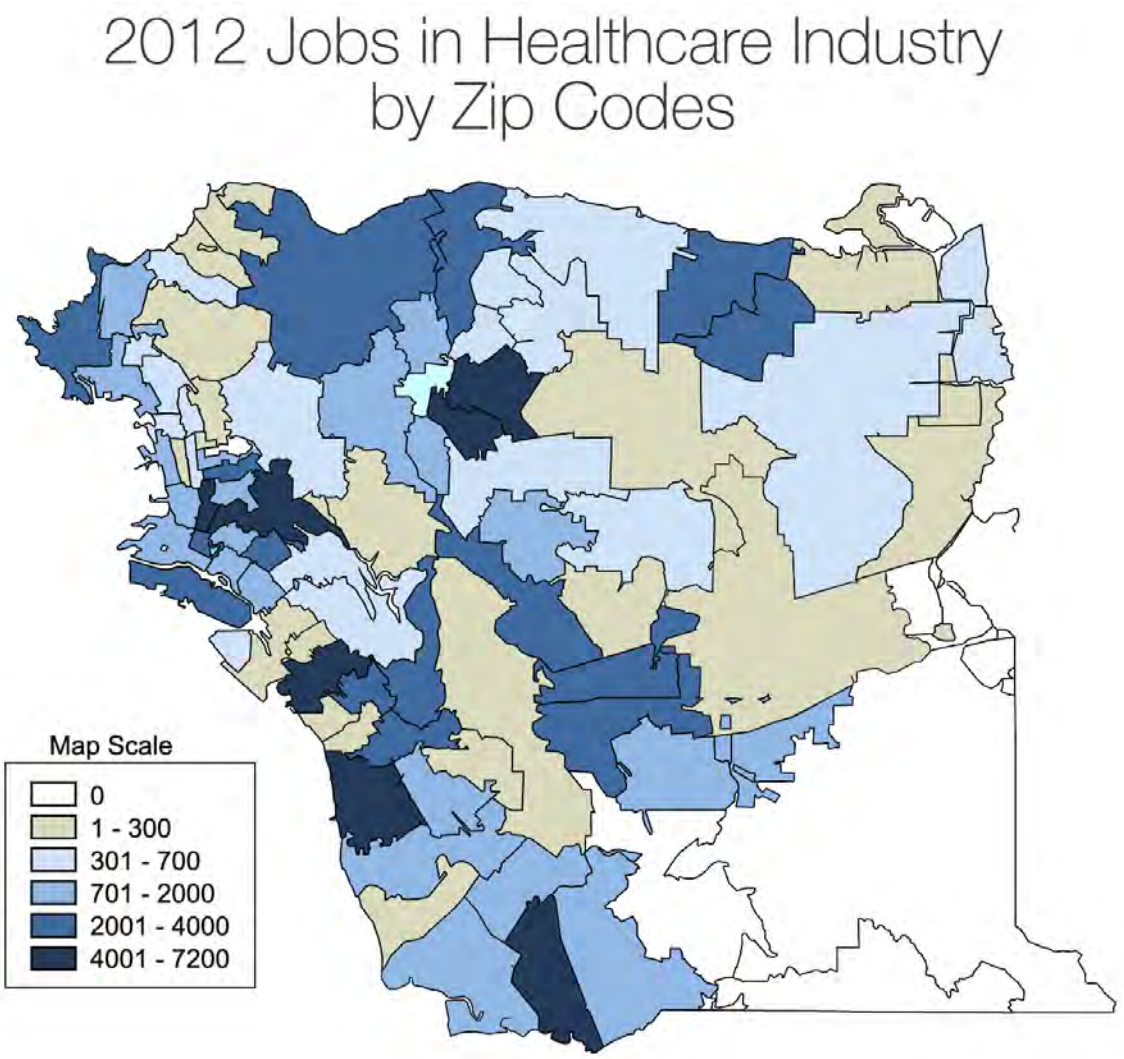


Table 20: Key Healthcare Tier 1 Occupations for the East Bay

Description	2012 Jobs	Change 2012-2017	% Growth	Job Openings (New + Repl.)	Wage Index
Registered Nurses	15,873	2,801	18%	6,442	2.37
Medical and Health Services Managers	2,296	348	15%	960	2.39
Clinical, Counseling and School Psychologists	3,207	230	7%	697	1.83
Dental Hygienists	2,220	239	11%	617	2.16
Physicians and Surgeons, All Other	2,835	228	8%	588	3.82

Table 21: Key Healthcare Tier 2 Occupations for the East Bay

Description	2012 Jobs	Change 2012-2017	% Growth	Job Openings (New + Repl.)	Wage Index
Licensed Practical and Licensed Vocational Nurses	4,380	817	19%	2,239	1.25
Medical Secretaries	5,407	958	18%	1,945	0.88
Receptionists and Information Clerks	2,589	521	20%	1,454	0.72
Office Clerks, General	1,706	275	16%	619	0.80
Medical and Clinical Laboratory Technicians	969	206	21%	521	1.06

Table 22: Key Healthcare Tier 3 Occupations for the East Bay

Description	2012 Jobs	Change 2012-2017	% Growth	Job Openings (New + Repl.)	Wage Index
Home Health Aides	6,656	2,195	33%	3,995	0.49
Nursing Aides, Orderlies and Attendants	7,903	1,531	19%	2,786	0.74
Medical Assistants	5,375	796	15%	1,719	0.79
Personal Care Aides	2,386	925	39%	1,582	0.49
Dental Assistants	2,780	245	9%	654	0.85

Arts, Entertainment and Hospitality Industry Cluster

The Arts, Entertainment and Hospitality industry cluster includes restaurants and hotels as well as museums, amusement parks and professional sports venues. Employment in this cluster is spread throughout the region with the highest concentration of jobs found in Northern Alameda County.

Figure 14: Distribution of Arts, Entertainment and Hospitality Jobs in the East Bay (2012)

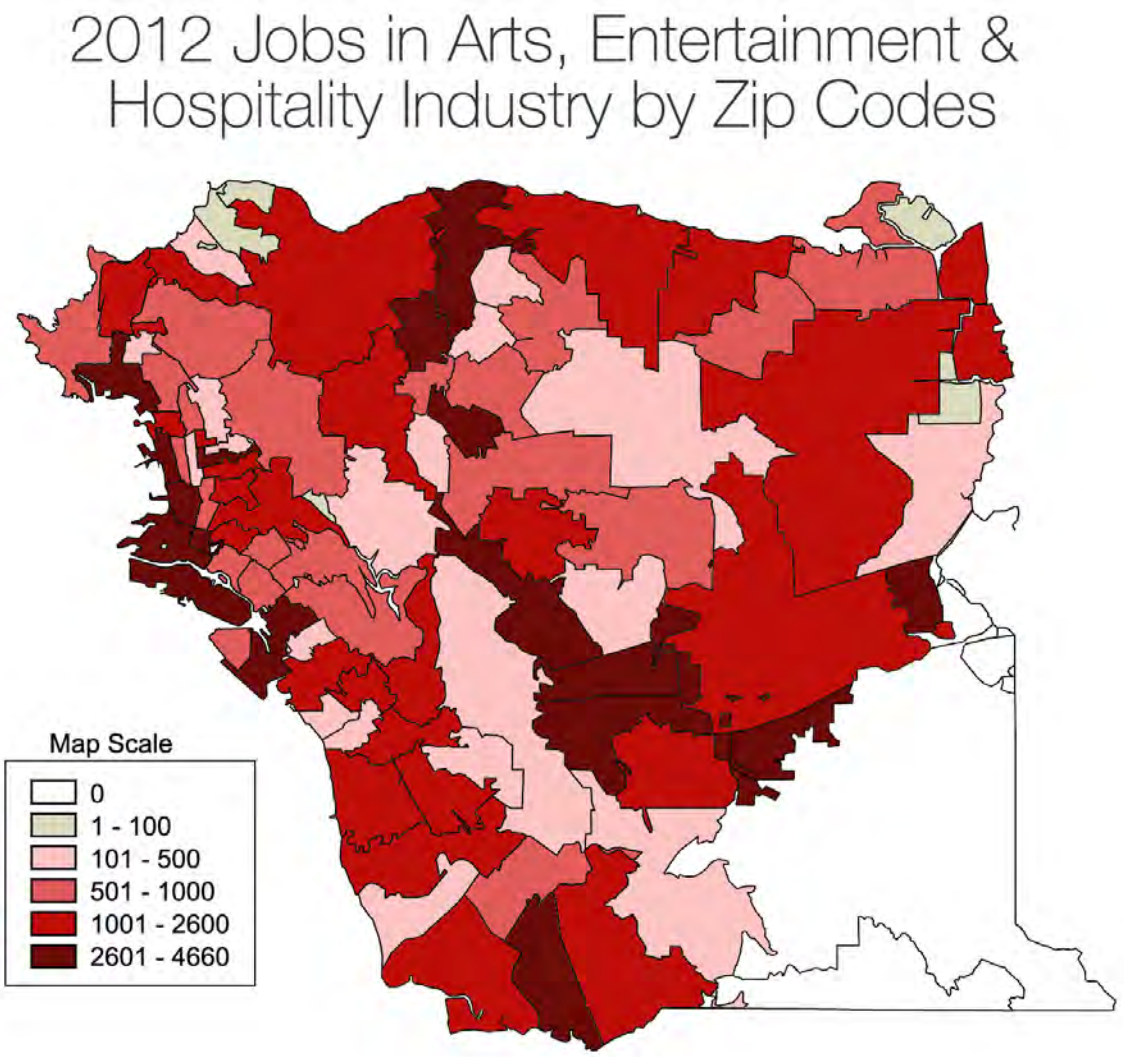


Table 23: Key Arts, Entertainment and Hospitality Tier 1 Occupations for the East Bay

Description	2012 Jobs	Change 2012-2017	% Growth	Job Openings (New + Repl.)	Wage Index
Musicians and Singers	4,395	553	13%	3,318	2.16
Writers and Authors	3,276	281	9%	924	1.42
Art Directors	1,529	113	7%	641	1.82
Multimedia Artists and Animators	1,168	88	8%	264	0.85
Actors	742	101	14%	231	0.84

Table 24: Key Arts, Entertainment and Hospitality Tier 2 Occupations for the East Bay

Description	2012 Jobs	Change 2012-2017	% Growth	Job Openings (New + Repl.)	Wage Index
Hotel, Motel and Resort Desk Clerks	1,077	138	13%	385	0.50
Photographers	1,203	260	22%	364	0.64
Driver/Sales Workers	1,012	126	12%	248	0.55
Office Clerks, General	372	53	14%	119	0.80
Bookkeeping, Accounting and Auditing Clerks	418	43	10%	73	0.96

Table 25: Key Arts, Entertainment and Hospitality Tier 3 Occupations for the East Bay

Description	2012 Jobs	Change 2012-2017	% Growth	Job Openings (New + Repl.)	Wage Index
Waiters and Waitresses	13,548	2,160	16%	6,890	0.41
Combined Food Preparation and Serving Workers, Including Fast Food	15,715	3,007	19%	6,856	0.42
Cooks, Restaurant	6,673	1,168	18%	2,266	0.55
Food Preparation Workers	3,403	621	18%	1,714	0.43
First-Line Supervisors of Food Preparation and Serving Workers	4,886	641	13%	1,282	0.62

Transportation and Logistics Industry Cluster

The Transportation and Logistics industry cluster includes commercial and passenger transportation services associated with air, rail, boat and trucking as well as warehousing and distribution services. Almost half of all employment in this cluster is found in Northern Alameda County.

Figure 15: Distribution of Transportation and Logistics Jobs in the East Bay (2012)

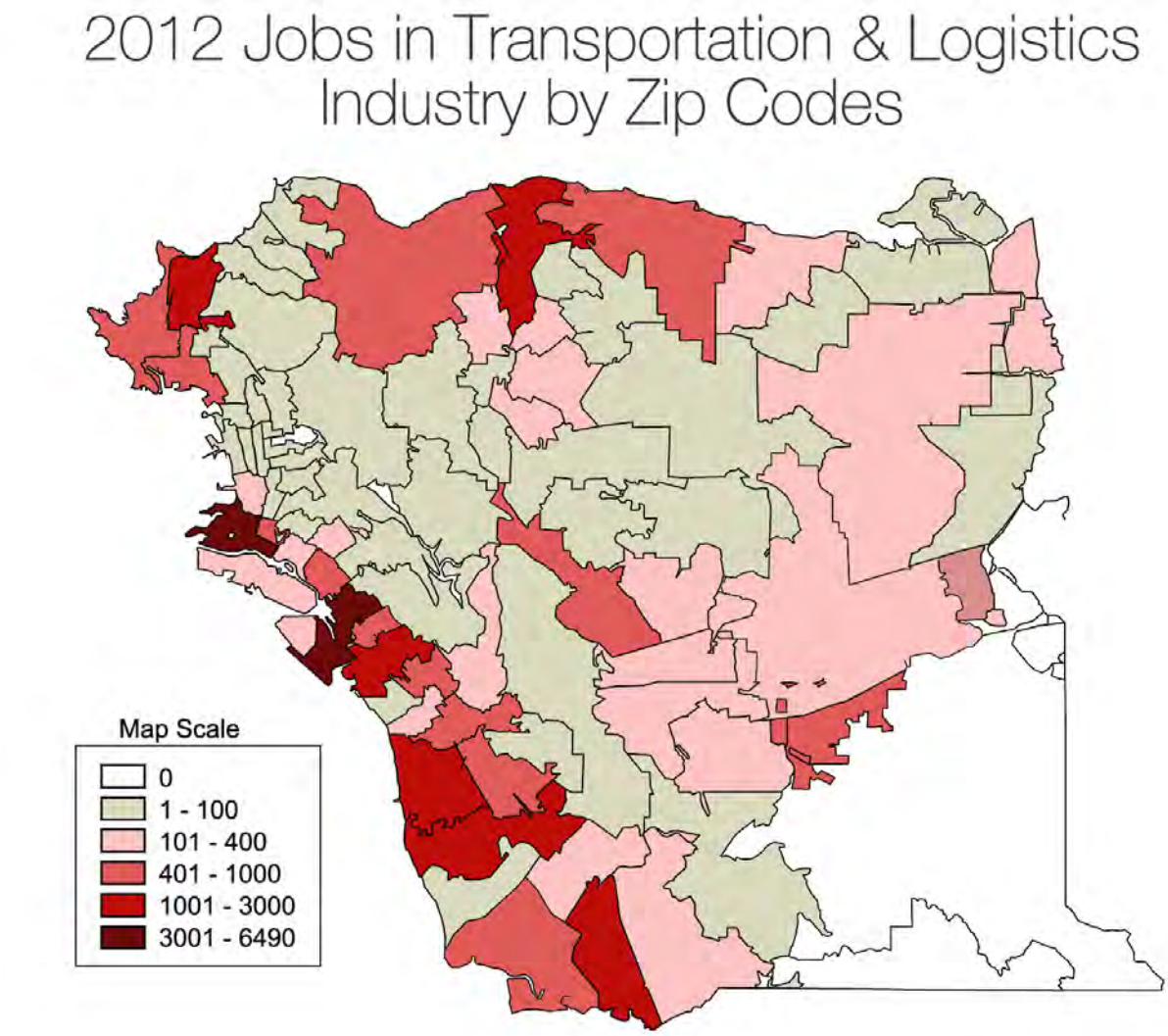


Table 26: Key Transportation and Logistics Tier 1 Occupations for the East Bay

Description	2012 Jobs	Change 2012-2017	% Growth	Job Openings (New + Repl.)	Wage Index
Managers, All Other	728	146	20%	396	2.59
Management Analysts	358	51	14%	85	2.03
Transportation, Storage and Distribution Managers	341	13	4%	49	2.15
Accountants and Auditors	162	8	5%	19	1.62
Marine Engineers and Naval Architects	51	8	16%	17	2.29

Table 27: Key Transportation and Logistics Tier 2 Occupations for the East Bay

Description	2012 Jobs	Change 2012-2017	% Growth	Job Openings (New + Repl.)	Wage Index
Heavy and Tractor-Trailer Truck Drivers	7,752	666	9%	1,385	0.88
Cargo and Freight Agents	374	49	13%	112	1.12
Bus Drivers, Transit and Intercity	328	46	14%	109	1.05
Sales Representatives, Services, All Other	427	39	9%	97	1.39
Taxi Drivers and Chauffeurs	162	48	30%	76	0.58

Table 28: Key Transportation and Logistics Tier 3 Occupations for the East Bay

Description	2012 Jobs	Change 2012-2017	% Growth	Job Openings (New + Repl.)	Wage Index
Laborers and Freight, Stock and Material Movers, Hand	3,670	53	1%	163	0.61
Industrial Truck and Tractor Operators	910	15	2%	49	0.86
Crane and Tower Operators	72	19	26%	46	1.68
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	90	9	10%	20	0.67
Hoist and Winch Operators	46	6	13%	10	0.98

The skills, abilities and ultimately the productivity of East Bay residents will determine not only the success of the region's businesses but the long-run health and economic vitality of Alameda and Contra Costa counties. In 2011, approximately three out of every four East Bay workers[27] lived in the region and while demographic forecasts vary, most agree that the overwhelming majority of the region's workers will live within the two counties.

This section of the report examines the state of the Easy Bay's resident workforce and the supply of its human capital[28]. This includes; analyzing the region's current usage of available labor resources, identifying changes to the demographic profile of the region's residents and identifying any potential gaps between resident skills and the needs of East Bay employers.

Current Use of Labor Resources

The following maps show the unemployment rate by city or community (CDP) in the East Bay in 2007, well before any significant increase in unemployment occurred due to the recession that began in late 2008. The second map shows the change in the unemployment rate by city or community from 2008 to the end of 2012. As the second map reveals, those communities that had a below-average unemployment rate in 2007 saw less of a lasting impact from the great recession while communities that started with average or greater unemployment were still feeling unemployment rates that remained three percent or higher than they were when the recession began.

[27] Source: ACS 2007-2011 5-year estimates, calculations by BW Research.

[28] Human capital is defined as a measure of the economic value of an employee's skill set . The term was originally coined in 1961 by the economist Theodore Schultz to recognize that we could no longer assume the basic production input of labor as a fixed constant. The concept of human capital recognizes that not all labor is equal and that the quality of employees can be improved by investing in them. The education, experience and abilities of an employee have an economic value for employers and for the regional economy.

Figure 16: Unemployment Rate by East Bay City or Community (2007, Pre-Recession)

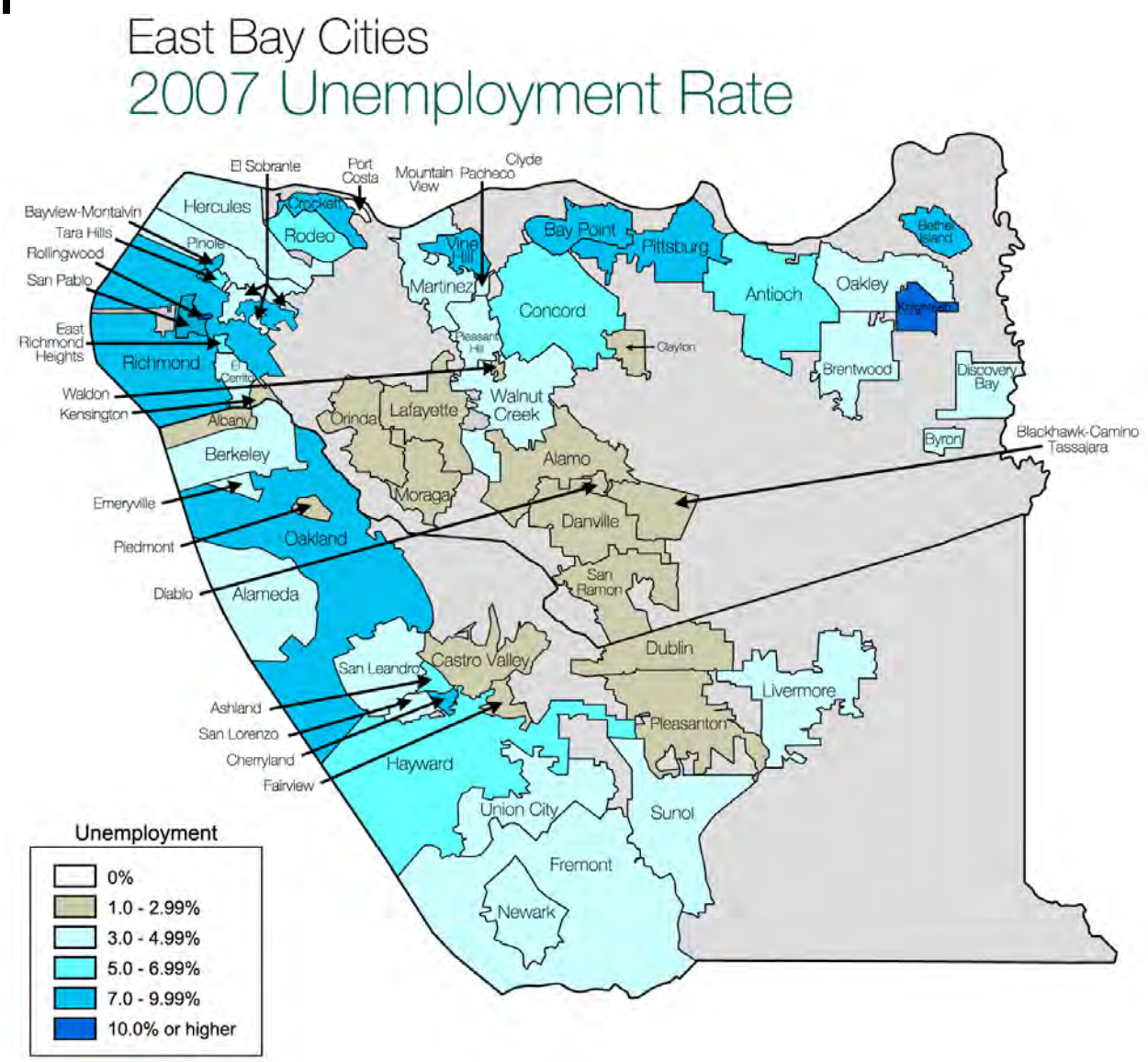
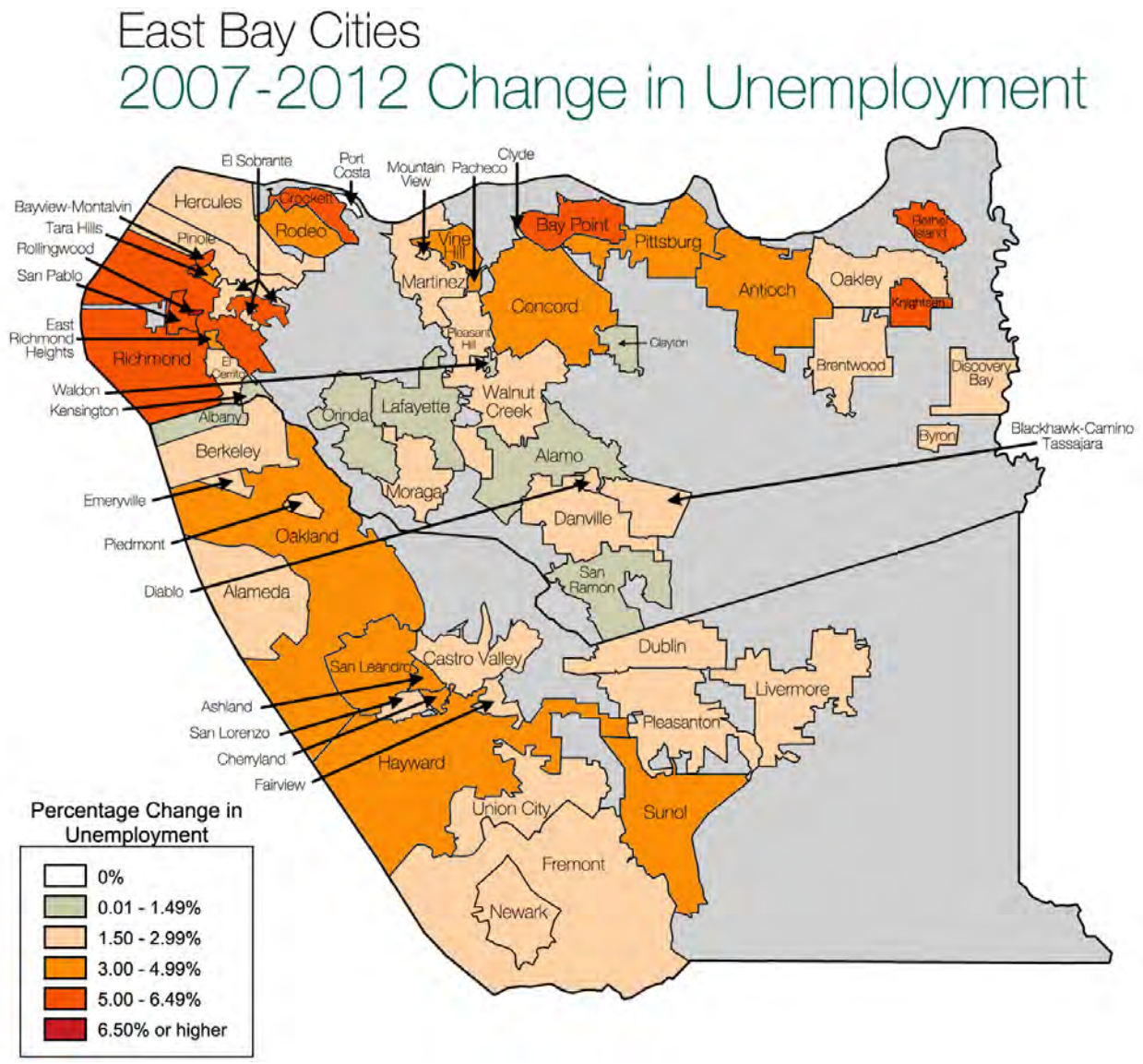


Figure 17 Increase in Unemployment Rate by East Bay City or Community (2007 to 2012)



The communities that saw the largest increase in the unemployment rate from 2007 to 2012 were likely to be those that also had the highest percentage of residents with relatively low levels of educational attainment, including:

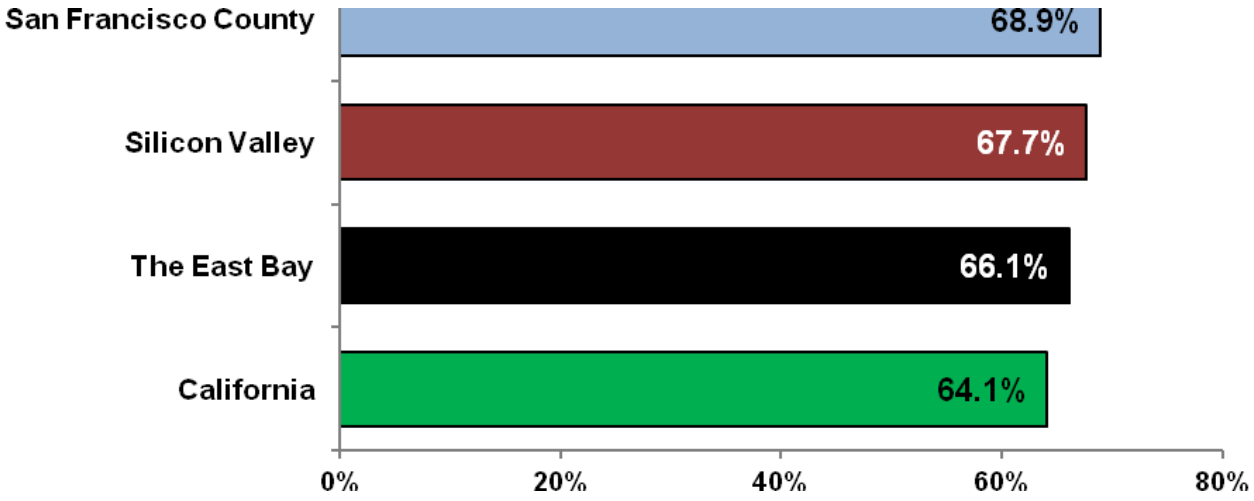
- **City of Richmond**; 45 percent of adult residents 25 years and older have a high school degree or less as their highest level of formal education.
- **The Community of Bay Point**; 58 percent of adult residents 25 years and older have a high school degree or less as their highest level of formal education.
- **City of San Pablo**; 63 percent of adult residents 25 years and older have a high school degree or less as their highest level of formal education.

It was also true that those communities that saw the smallest increase in the unemployment rate from 2007 to 2012 were likely to be those that also had the lowest percentage of residents with relatively low levels of formal educational attainment, including:

- **Town of Lafayette;** 10 percent of adult residents 25 years and older have a high school degree or less as their highest level of formal education.
- **City of San Ramon**; 13 percent of adult residents 25 years and older have a high school degree or less as their highest level of formal education.

The unemployment rate does not tell the entire story regarding usage of available labor resources. Labor force participation rate is driven by several factors, including age distribution of the adult population (a larger percentage of older residents is likely to drive down total participation) and workers' confidence in finding the employment opportunities they are looking for. It is therefore not surprising that regions with lower unemployment would also have higher labor force participation rates, mitigating what could be even more substantial differences in regional unemployment. The figure below reveals the adult labor force participation rate for the East Bay and comparable regions. Both the East Bay and the other Bay Area communities have higher labor force participation rates than either the country or California as a whole.

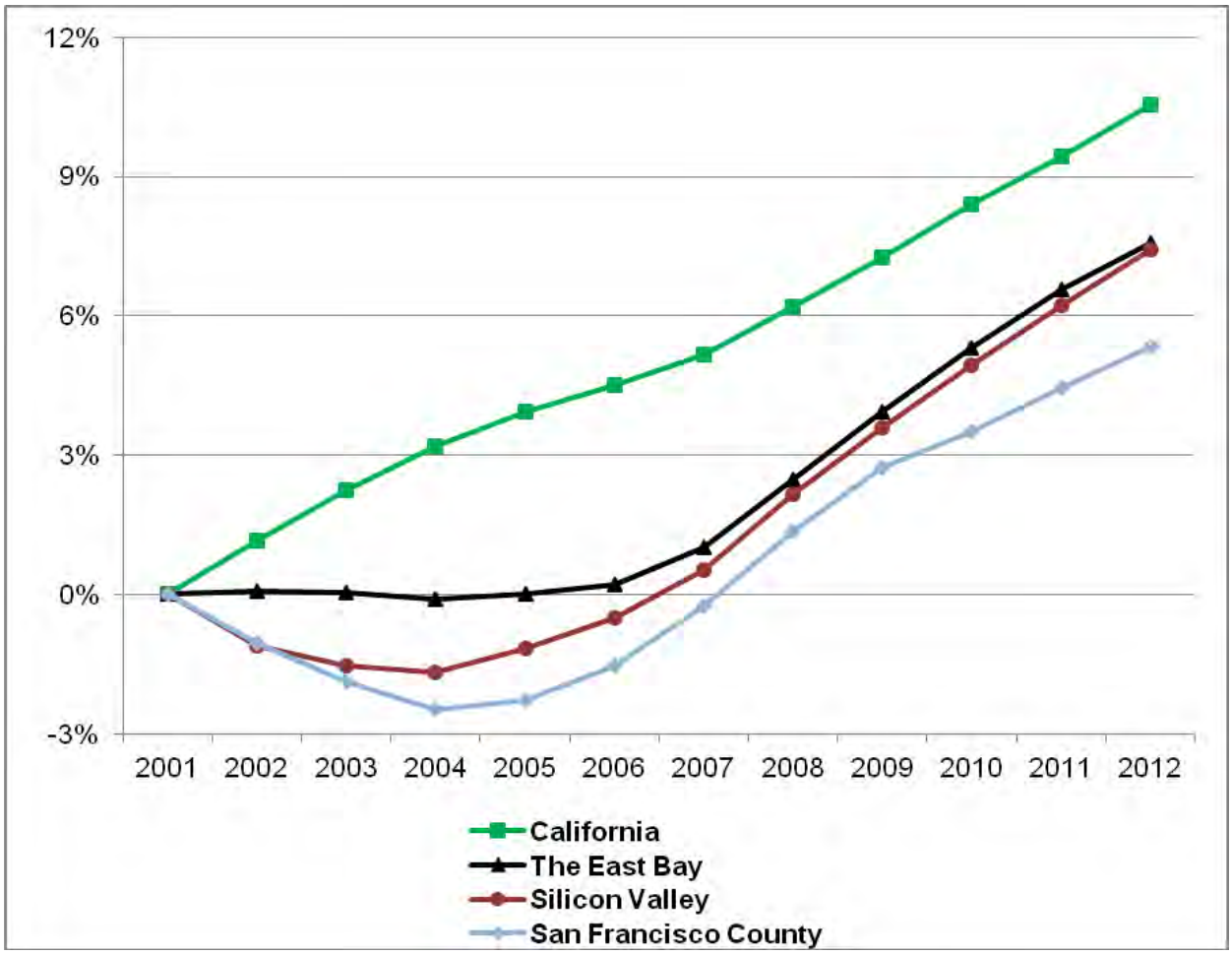
Figure 18: Overall Labor Force Participation by Region (2011)[29]



[29] Source: ACS 2007-2011 5-year estimates.

The East Bay's overall population size has a direct impact upon the available labor force in the region. From 2001 to 2012, California has experienced consistent growth – greater than either the East Bay or its Bay Area neighbors. In the East Bay, growth in the region's population has been largely driven by people moving here, either from outside the region (regional migration) or outside the country (immigration) rather than an increase in the native population (birth rate over the death rate). This has a considerable impact on the profile of the available labor force.

Figure 19: Overall Change in Population by Region 2001-2012[30]



[30] Source: EMSI Complete Employment 2013.1

Immigration in the East Bay[31]

According to the University of Southern California's (USC) Center for the Study of Immigrant Integration (CSII), there were approximately 700,000 immigrants[32] living in the East Bay in 2010. Of these, a quarter originated in Mexico while 12 percent hailed from the Philippines, a tenth from China and eight percent from India. Of immigrant households, 27 percent were linguistically isolated, which meant that no person over the age of 14 in the household spoke English at least "very well." Since 2000, only two-fifths of immigrants could speak English "very well," a decline from 48 percent in the decade between 1990 and 1999.

While the East Bay labor force participation (for individuals ages 25 to 64) was four percent lower for the immigrant population than the U.S. born population in 2010, the unemployment rate for the immigrant population was three percent lower. Well over two-thirds of the immigrant labor force aged 25 to 64 worked in professional and related services (24%), retail trade (15%), manufacturing (14%), business repair services (10%) and construction (8%). Nearly one in five immigrant workers was over-skilled for their occupation in 2010, meaning that they possessed a Bachelor's degree or higher while working in a low skill (Tier 3) occupation, indicating that language skills may be a barrier for more appropriate levels of employment, based on educational attainment.

According to the CSII report, the East Bay region has done an excellent job of immigrant integration compared to nine other California regions.[33] Only Santa Clara County ranked ahead of the East Bay for the overall statewide outlook scorecard created by CSII.[34] The overall rankings took into account economic data (housing, workforce preparation, workforce strength, income), regional openness to immigrants (high school preparation of English learners, coverage of immigrant-serving organizations, etc.) and civic engagement (language, citizenship rates, etc.).

The authors also identified areas in which regions could improve on immigrant integration. Suggestions for the East Bay include:

- Strengthening K-12 education so that English learners can be more successful academically and strengthen their language skills at an early age as well as increasing the attainment of high school degrees.
- Expanding opportunities for full-time immigrant workers to find career pathways that allow for higher paying employment.
- Looking for opportunities to increase home ownership for immigrants.

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[31] Immigration data from the University of California's Center for the Study of Immigrant Integration's (CSII) 2012 publication, California Immigrant Integration Scorecard, was used for this section.

[32] Defined as someone born outside the United States

[33] Santa Clara County, San Diego County, Sacramento County, Orange County, San Francisco County, The Inland Empire, Los Angeles County, San Joaquin County, and Fresno County.

[34] For more information on this research go to: http://csii.usc.edu/documents/California_Immigrant_Integration_Scorecard_web.pdf

The East Bay's Ethnic Profile

When reviewing the regional analysis of population change by ethnicity, it's clear that the growth in Hispanic and Asian, Non-Hispanic cohorts in Contra Costa County has driven its overall population growth. Intra-cohort growth for each ethnicity from 2001 to 2012 was over 40 percent, compared to only six percent growth for Black, Non-Hispanics and a nearly 12 percent decrease in White, Non-Hispanics.

Similar growth patterns were experienced by Alameda County, albeit at a lower magnitude for Hispanic and Asian, Non-Hispanic populations. Also, instead of a growing Black, Non-Hispanic population, Alameda County saw a dip of over 15 percent while White, Non-Hispanics decreased in number by nearly 16 percent by 2012 when compared to 2001 levels

The East Bay's Language Profile

Overall, three out of five residents in the East Bay speak English only while nearly 17 percent speak English less than "very well." While the percentage of the East Bay population that speaks English less than "very well" is lower than Silicon Valley, San Francisco County, and California as a whole, its proportion is likely to increase in the coming years given the rise in immigrants to the East Bay since 2000 that have difficulty with the English language (39%).[35]

An above-average percentage of the population that speaks English less than "very well" does not necessarily indicate that the region will experience difficulty economically. For example, San Francisco County and the Silicon Valley each had higher proportions of their population that speak English less than "very well" (over one fifth of the population in each case) when compared to the East Bay in 2011; however, both San Francisco County and the Silicon Valley had lower unemployment rates in 2012.[36] Furthermore, the East Bay's per capita income was $36,250 in 2011, lower than both that of Silicon Valley ($42,035) and San Francisco County ($46,777).[37]

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[35] Source: The University of California's Center for the Study of Immigrant Integration (CSII), California Immigrant Integration Scorecard, 2012.

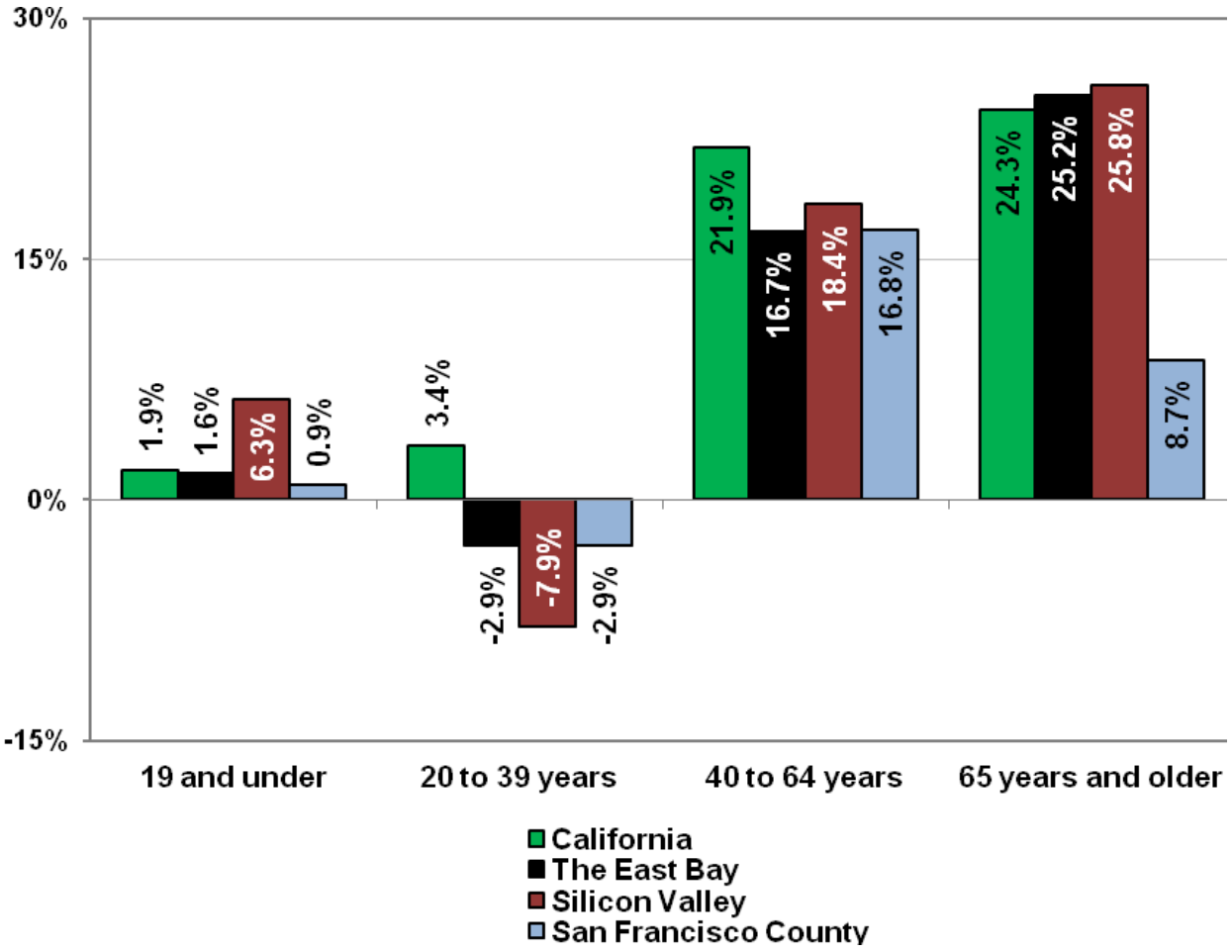
[36] 2012 annual unemployment rates; San Francisco County: 7.3%; Silicon Valley: 7.9%; The East Bay: 9.0%. Unemployment rates were sourced from the California Employment Development Department's (EDD) website: http://www.labormarketinfo.edd.ca.gov.

[37] Source: ACS 2007-2011 5-year estimates.

The East Bay's Age Profile

The East Bay's 19 and under population grew by two percent over 12 years while the 20 to 39 age cohort declined by nearly three percent. Over the same time period, the population aged 40 to 64 grew by nearly 17 percent while the 65 and older population increased by over 25 percent. The population in the East Bay (and all other regions included in the analysis) is gradually becoming older and according to numerous projections, this trend is likely to continue for several decades.

Figure 20: Regional Change in Population by Age from 2007 to 2012[38]



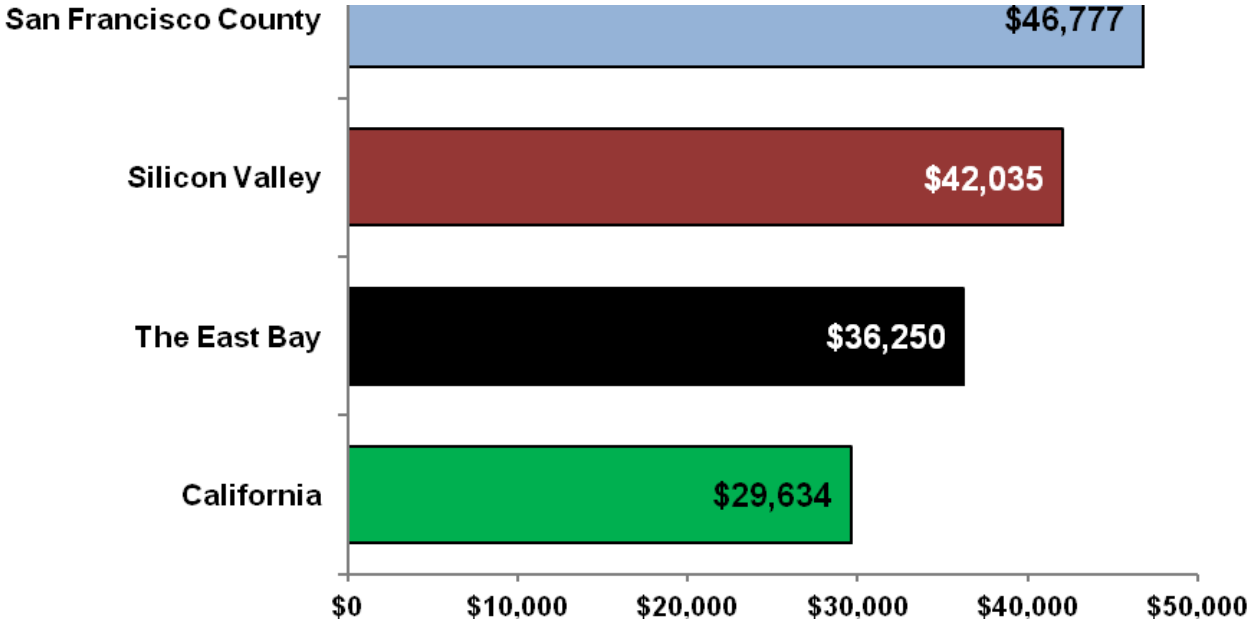
The "graying" of the population in the East Bay has occurred at a rate greater than both California and the United States between 2001 and 2012. The 25 percent growth in the East Bay's 65 and older cohort was helped along by Contra Costa County's nearly 30 percent growth for the same demographic group. Only the Silicon Valley experienced a greater expansion of the oldest population segment.

[38] Source: ACS 2007-2011 5-year estimates.

East Bay Wealth & Poverty

Like many other employment related indicators, the East Bay finds itself in a better situation than California as a whole in per capita income, but not as strong as some of its Bay Area neighbors. The combined East Bay ($36,250) per capita income was above both California ($29,634) and the United States ($27,915), but below Silicon Valley ($42,035) and San Francisco ($46,777) in 2011.

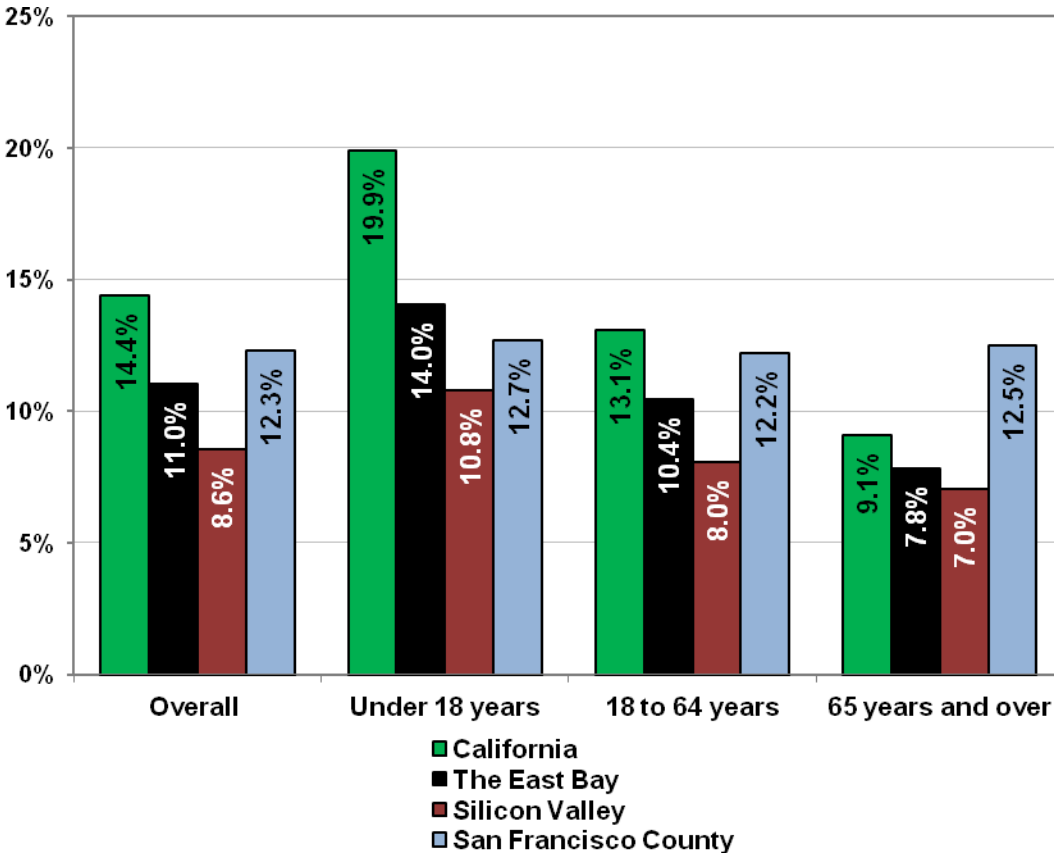
Figure 21: Per Capita Income by Region for 2011[39]



When compared to the United States and California, the East Bay had a consistently lower proportion of its population living beneath the poverty level in 2011. Fourteen percent of the population under the age of 18 in the East Bay area lived below the poverty level according to American Community Survey (ACS) 5-year estimates in 2011, nearly six percentage points lower than both the United States and California. The overall poverty level and poverty levels within each age cohort for Alameda County were approximately two percentage points higher in each case than those for Contra Costa County.

[39] Source: ACS 2007-2011 5-year estimates.

Figure 22: Overall Poverty and Poverty by Age Cohort by Region for 2011[40]



The East Bay saw just over 11 percent of its family households[41] with total income and benefits below $25,000 dollars in 2011. This was lower than the United States (16%) and California (15%) and considerably lower than San Francisco County (21%). Silicon Valley (9%) had the least amount of familial households below the income and benefit mark of $25,000.

When splitting the East Bay (11%) into its component counties, Alameda County has a higher proportion of family households beneath the listed income and benefit level (12%) than Contra Costa County (10%).

[40] Source: ACS 2007-2011 5-year estimates.

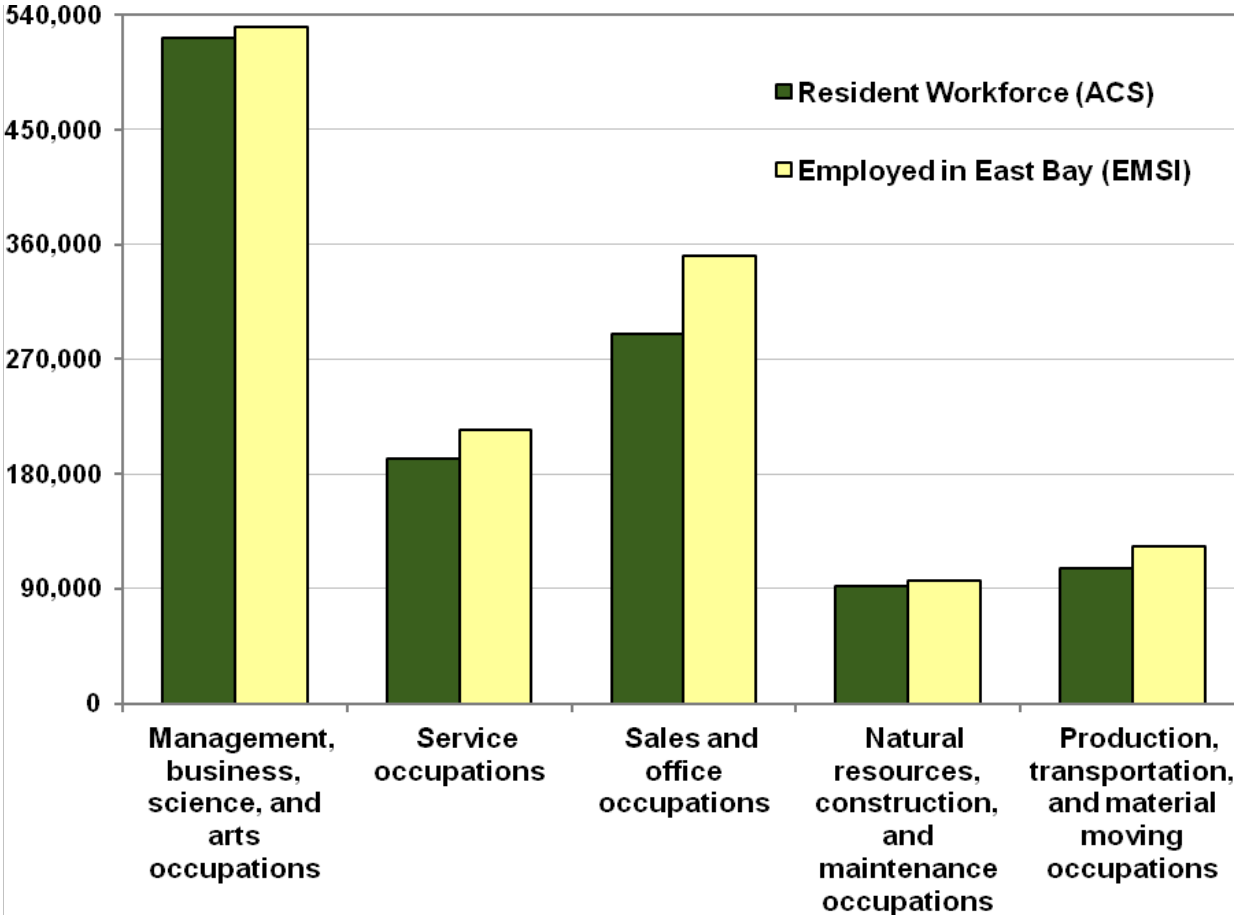
[41] Defined as households with two or more related persons.

OCCUPATIONAL SKILLS GAP

There are several ways of examining how the region's residents are prepared to work for regional employers. One way is to compare how residents of the East Bay in the labor force (identified as the resident workforce) and those working or employed in the East Bay (regardless of where they live) look in terms of the general occupational categories and skills that they provide.

As the figure below reveals, the East Bay employs more workers than it has in its resident workforce; as those employed in the East Bay is greater than the resident East Bay workforce in every general occupational category shown below. The largest gaps between the resident workforce and those employed in the region are found in sales and office occupations, a difference of over 60,000 employed positions or over 20 percent of the resident workforce in that occupational category. The sales and office occupations are often found among the higher paying Tier 2 positions and include employment opportunities such as Securities, Commodities and Financial Services Sales Agents, Insurance Sales Agents and First-Line Supervisors of Office and Administrative Support Workers.

Figure 23: The East Bay: Resident Workers (2011) vs. Employer Workforce (2012)[42]



[42] Source: EMSI Complete Employment 2013.1 and ACS 2007-2011 5-year estimates.

Another approach to examine the regional skills gap in the East Bay is to assess how occupational demand has changed in the last few years, both in terms of the total growth in the number of people employed in a given occupational category and their relationship with median wages over time. Those occupations that have seen a considerable increase (more than twice the regional average) in the median wage provide a good indication that employers have had to resort to increased wages to attract and retain qualified employees.

There are two ways of examining occupational categories. One is to look at general occupational categories that combine occupations with similar training, education and skill requirements. The other is to look at specific occupational classifications that have more detailed requirements. An analysis of both provides different but equally interesting results.[43]

The tables below reveal how demand for general occupational categories changed from 2007 to 2011. The top five occupational categories grew by eight percent and the median wages increased by a weighted average of 15 percent, well above the regional average of 10 percent. Of the five occupational categories with the biggest increase in median wages from 2007 to 2011, the four that saw a general increase in total employment also paid well above the regional median wage in 2011 ($45,750). The one outlier in this general occupational category, building and ground cleaning and maintenance occupations, saw an increase in median wages of 14 percent (above the regional average of 10%) but one of the smaller nominal increase in wages because the median wage was so low.

Table 29: Top Five General Occupational Categories in the East Bay by Increase in Median Wage from 2007 to 2011

East Bay - General Occupational Categories	2007 Employment	2011 Employment	% Change in Employment from 2007	% Change in Median Wages from 2007	2011 Median Wage
Healthcare Practitioners and Technical Occupations	45,010	57,130	27%	17%	$93,170
Architecture and Engineering Occupations	26,490	28,100	6%	15%	$89,880
Building and Grounds Cleaning and Maintenance Occupations	29,530	25,130	-15%	14%	$29,060
Legal Occupations	6,280	6,850	9%	14%	$96,830
Business and Financial Operations Occupations	52,290	54,680	5%	12%	$74,090
Total - Top 5 General Occupational Categories	**159,600**	**171,890**	**8%**	**15%**	**$77,336**

[43] Source BLS: http://www.bls.gov/oes/oes_dl.htm - Note this dataset does not include self-employment

Table 30: Bottom Five General Occupational Categories in the East Bay by Increase in Median Wage from 2007 to 2011

The East Bay – General Occupational Categories	2007 Employment	2011 Employment	% Change in Employment from 2007	% Change in Median Wages from 2007	2011 Median Wage
Sales and Related Occupations	108,120	96550	-11%	7%	$31,860
Food Preparation and Serving Related Occupations	74,900	76,500	2%	6%	$19,500
Community and Social Services Occupations	13,530	16,350	21%	4%	$49,650
Installation, Maintenance, and Repair Occupations	37,480	33,330	-11%	2%	$51,130
Personal Care and Service Occupations	22,340	21,940	-2%	-4%	$23,000
Total - Bottom 5 General Occupational Categories	**256,370**	**244,670**	**-5%**	**6%**	**$36,338**

The general occupational analysis for the East Bay from 2007 to 2011 shows the growth in total employment is largely connected to the median increase in wages and is more likely to be found in high skill, high wage occupational categories. Whereas, the bottom five occupational categories by increase in median wage (even a decline in median wages) were largely categorized as low skill, low wage positions.

An analysis of specific occupational classifications and the change in employment from 2007 to 2011 identified several specific occupation classifications that are likely being undersupplied in the East Bay, as they saw increases in median wages of at least three times the regional average (10%) and saw either a small increase or a decline in their total employment. It should be noted that the list below does not include every occupation that experienced large increases in median wages; some of those occupations that are likely to be employed in the public sector had small overall employment (less than 150) or had incomplete or small sample sizes in the dataset were not included in the list.

Table 31: East Bay Specific Occupational Classifications with at Least Three Times the Regional Median Wage Increase from 2007 to 2011

The East Bay – General Occupational Categories	2007 Employment	2011 Employment	% Change in Employment from 2007	% Change in Median Wages from 2007	2011 Median Wage
Molders, Shapers and Casters, Except Metal and Plastic	350	240	-31%	87%	$41,330
Property, Real Estate and Community Association Managers	2480	1,570	-37%	65%	$69,950
Dietetic Technicians	360	360	0%	62%	$42,850
Chemical Engineers	240	200	-17%	61%	$127,930
Molding, Coremaking and Casting Machine Setters, Operators and Tenders, Metal and Plastic	810	450	-44%	41%	$34,230
Landscape Architects	620	180	-71%	37%	$88,840
Mechanical Drafters	490	240	-51%	32%	$71,940
Environmental Engineers	640	670	5%	31%	$101,030

REPLACEMENT EMPLOYMENT IN THE EAST BAY

Labor market analyses typically emphasize the growth in new jobs and the needs of those employers that are adding new positions and different types of employment. However***, in the East Bay, for every two job openings associated with a "new" job there are three replacement job openings***. The occupational analysis presented earlier in this study that identified fastest growing occupations in each of the occupational tiers, combined both new job openings and replacement job openings to give a more complete assessment of where job openings exist.

As a percentage of regional job opportunities, replacement job needs are a larger portion of the East Bay's total job opportunities than California as a whole or neighboring counties such as Santa Clara, San Mateo and San Francisco counties. According to the 2010-2020 occupational projections put out by the California Employment Development Department, Santa Clara, San Mateo and San Francisco Counties are closer to one replacement job need for every new job opportunity and California has about 1.4 replacement job needs for every new job.

The table below identifies the four broad occupational categories in the East Bay that are expected to have more than twice as many replacement job opportunities as new job opportunities through 2020. Approximately one in five jobs in the East Bay is categorized in one of these four occupational categories and they include two classifications that are below the East Bay's median wage of approximately $46,000 a year – sales and related occupations and production occupations – and two that are above it – protective service occupations and installation, maintenance and repair occupations.

It should be noted that approximately half of the employment in sales and related occupations is in two massive occupations, Cashiers and Retail Sales Workers. These two occupations with a large proportion of replacement jobs also have median wages that are roughly half the regional average, thereby pulling down the median wage for the entire occupational category.

Table 32: The East Bay's Occupational Categories with High Replacement Opportunities[44]

Occupational Groups	East Bay Employment (2010)	Annual New Job Openings	Annual Replacement Job Openings	Median Annual Wages
Sales and Related Occupations	104,420	1,350	3,209	$32,352
Installation, Maintenance, and Repair Occupations	36,180	365	818	$51,848
Production Occupations	49,350	464	1,014	$34,571
Protective Service Occupations	20,130	240	516	$47,072
Total	**210,080**	**2,419**	**5,557**	**$37,641**
% of East Bay Workforce	**20.1%**	**15.0%**	**22.8%**	**81.2%**

While the overall occupational categories provide some indication of the type of replacement jobs that can be found in the East Bay, they do not provide a good indication of the higher

[44] Source: California Employment Development Department LMID, 2010 to 2020 East Bay Occupational Projections.

skilled, higher paying replacement job needs that require additional training and education to develop within the region. The table below examines and finds occupations that meet following three key criteria:

- Occupations where annual replacement job opportunities more than doubled those job opportunities associated with new job openings.
- Median annual wages that are above East Bay's median wage of approximately $46,000.
- Total annual job openings (new + replacements) that are above 60.

A review of the table below illustrates that most of the high quality replacement occupations fall into one of three categories: managers and sales professionals, public service and safety professional and high skilled technicians, scientists and analysts. These positions typically require strong communication and people skills and/or extensive STEM (Science, Technology, Engineering & Mathematics) education and training.

Table 33: East Bay's Top 15 Replacement Opportunities

East Bay's Replacement Occupations	East Bay Employment (2010)	Annual New Job Openings	Annual Replacement Job Openings	Median Annual Wages
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	8,670	70	204	$63,181
Automotive Service Technicians and Mechanics	4,990	53	129	$49,002
Police and Sheriff's Patrol Officers	3,920	23	115	$87,726
Clinical, Counseling and School Psychologists	2,580	40	81	$84,633
First-Line Supervisors of Mechanics, Installers and Repairers	2,790	30	73	$74,671
First-Line Supervisors of Non-Retail Sales Workers	2,990	22	75	$82,217
Production, Planning and Expediting Clerks	2,750	25	72	$52,802
Mechanical Engineers	1,640	26	53	$94,129
Financial Analysts	2,310	24	49	$89,094
Firefighters	1,910	14	53	$81,311
Chemists	1,550	16	50	$76,526
Dentists, General	1,490	22	44	$150,606
Natural Sciences Managers	850	13	52	$140,923
Biological Technicians	1,350	18	45	$51,168
Electronics Engineers, Except Computer	1,730	20	42	$95,004

Education and training remain the foundation for understanding both the reality and the possibilities for regional workforce and economic development. One of the central themes of this and previous East Bay Assets research is the inherent value both to the individual and the region of a more educated workforce. Over the last 20 years, any historic or current analysis of educational attainment of the workforce shows that those with higher levels of formal education are more likely to be employed, have higher wages and are more likely to participate in the labor force than their counterparts with lower levels of education.[45]

EDUCATION'S WAGE DIFFERENTIALS

The ability to get and stay employed is one part of the education pay-off assessment. Just as important though are the wages and wage differentials that can be expected between different levels and types of education. An analysis of national data shows that individuals with advanced degrees have on average earned anywhere from $2.25 to $1.95 for every one dollar earned on average from all workers. For individuals with a Bachelor's degree the earnings differential has been a $1.33 to $1.43 for every one dollar earned on average from all workers. Individuals with some college or an Associate degree fell just below the average earning anywhere from $0.92 to $0.80 for every one dollar earned on average from all workers.

EAST BAY EDUCATIONAL ATTAINMENT

In terms of educational attainment, the East Bay as a whole has a considerably higher percentage of residents 25 and over with at least a Bachelor's degree than both California and the United States. The East Bay (39%) trends behind the two comparison regions in the Bay Area when comparing residents 25 and over with a Bachelor's degree or higher: San Francisco County (52%) and Silicon Valley (45%).

Within the East Bay, Alameda County has a higher percentage of residents 25 years of age or older with at least a Bachelor's degree and a high school diploma or less when compared to Contra Costa County.

Early childhood education enrollment for the East Bay was just over one-third for three to five year olds in 2009 according to UCLA's Center for Health Policy Research's California Health Interview Survey (CHIS). The East Bay and its component counties enrolled a higher ratio of three to five year olds in preschool than San Mateo County, Santa Clara County and California as a whole.

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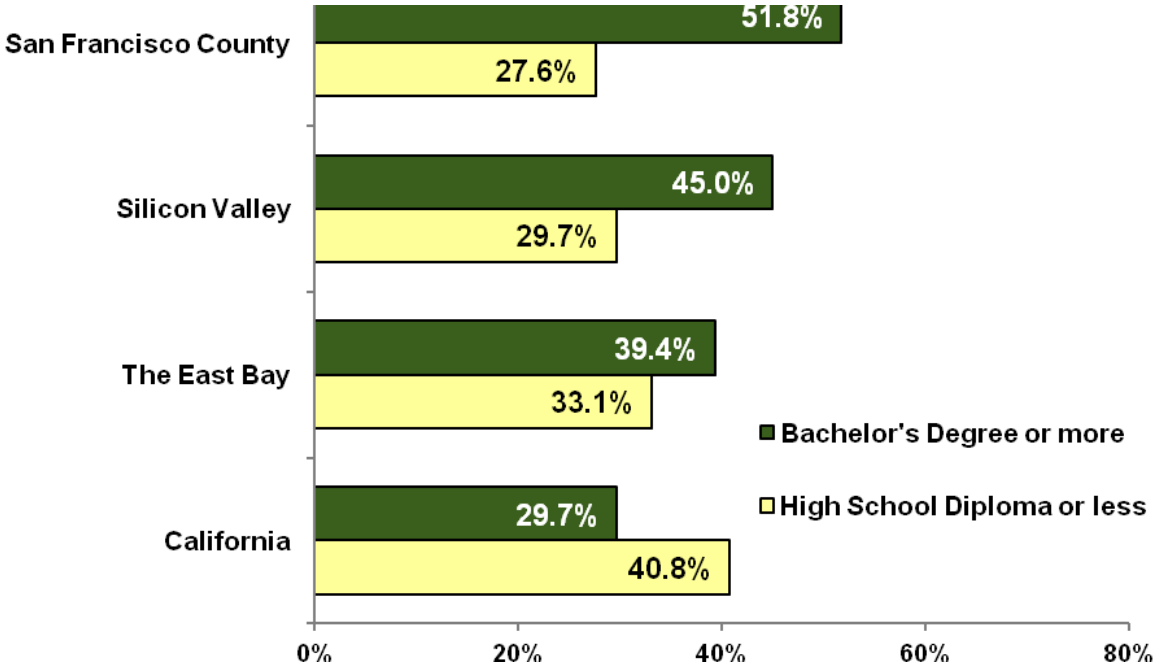
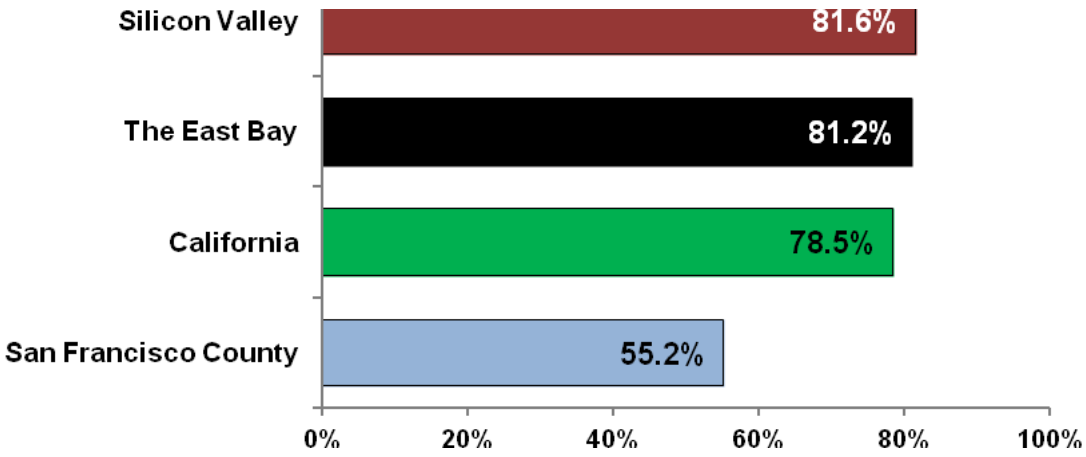
[45] For more information on educational attainment and employment outcomes go to the US Census Bureau, Current Population Survey: Table A-3. Mean Earnings of Workers 18 years and over, by Educational Attainment: 1975 to 2011 or Georgetown Center on Education and the Workforce. http://cew.georgetown.edu.

Figure 24: Educational Attainment of the Population 25 and older by Region for 2011[46]



Silicon Valley had the highest high school graduation rate while the East Bay had the lowest dropout rate (12%) for the most current reported cohort when compared to other Bay Area regions and California. The East Bay's graduation rate was above the California average and just above 81 percent for the 2011-2012 graduating cohort. San Francisco County had the lowest high school graduation rate and highest dropout rate among the comparative regions (36%).

Figure 25: Cohort High School Graduation Rates by Region for 2011-2012[47]



[46] Source: ACS 2007-2011 5-year estimates.

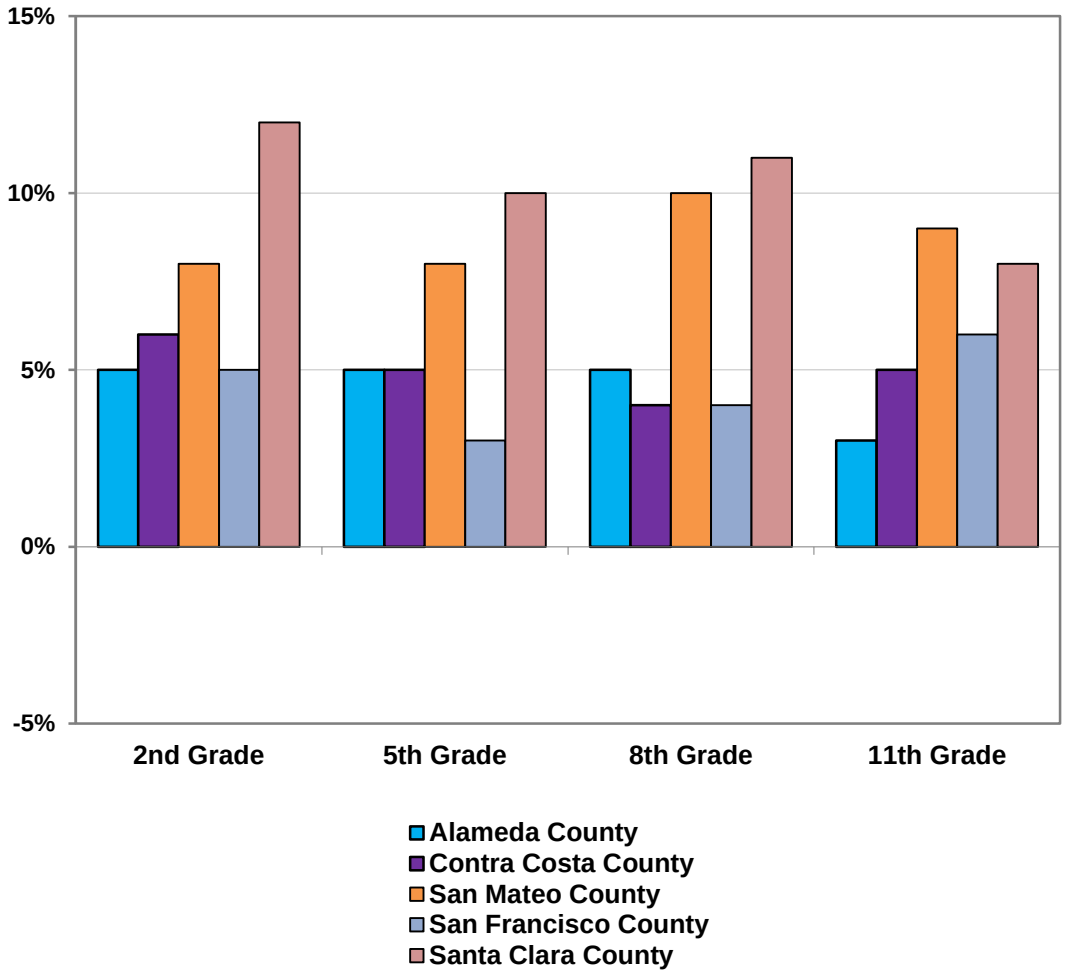
[47] Source: California Department of Education's California Longitudinal Pupil Achievement Data System (CALPADS), 2013 – Data for the United States not included.

EAST BAY EDUCATION PERFORMANCE: K-12

Education remains the foundation for the accumulation of regional human capital and workforce development. While employers and the workforce development community will often focus on the programs and opportunities available through the regional colleges and universities, the importance of the K-12 system cannot be overstated.

The following charts reveal how five counties in the Bay Area, including the two East Bay counties performed on English, Math and Science standardized tests in comparison to the averages for California as a whole. Each chart reveals how much better (+) or worse (-) each county did in the proportional comparison of students who achieved an advanced or proficient score in comparison to the state averages. As the chart below demonstrates, East Bay schools did better than the state average for each of the grades shown, but generally did not do as well Santa Clara or San Mateo counties. Overall, over 60 percent of East Bay students that completed the California Standardized Tests (CST) for English – Language Arts received an advanced or proficient score for 2nd, 5th and 8th grades and just over 50 percent (52%) for 11th grade East Bay students.

Figure 26: CST Scores 2012: English-Language Arts (% Advanced + % Proficient), Differential to California Average

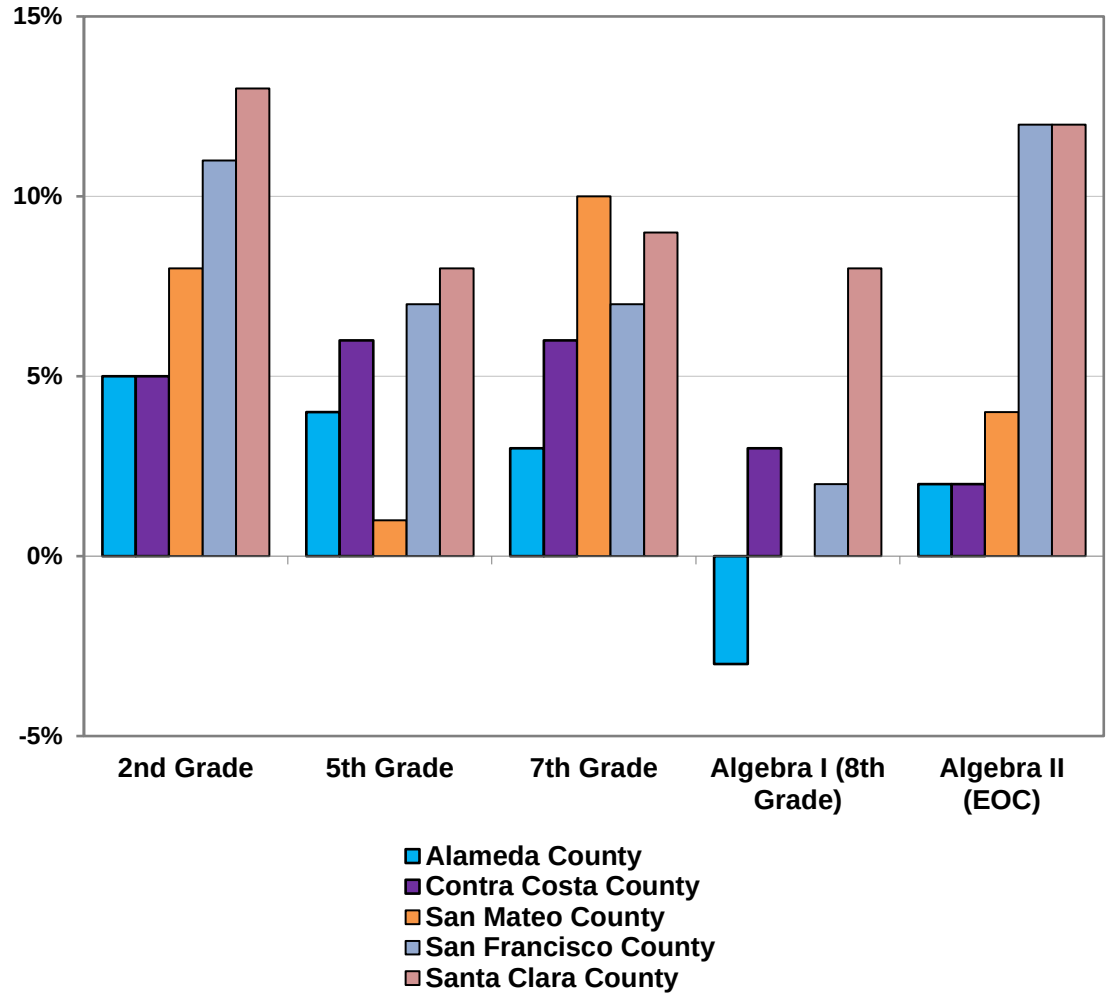


The figure below, like the previous chart, compares countywide California Standardized Test (CST) scores to statewide percentages for those students that performed at an advanced or proficient level. The figure below reveals the scores for mathematics, with 8th grade being Algebra I and the final column being the end-of-course scores for Algebra II. In general, East Bay standardized test scores in mathematics were better than the state average, but consistently not as high as Santa Clara County, the highest performer of the five counties.

It should be noted that Alameda County's enrollment percentage in Algebra I for 7th & 8th grade was 84 percent, 17 percent higher than the state average and higher than every other county examined, except for San Francisco, which was at 89 percent. This provides some explanation why Alameda was lower than the state average for the percentage of students who performed at an advanced or proficient level in the 8th grade.

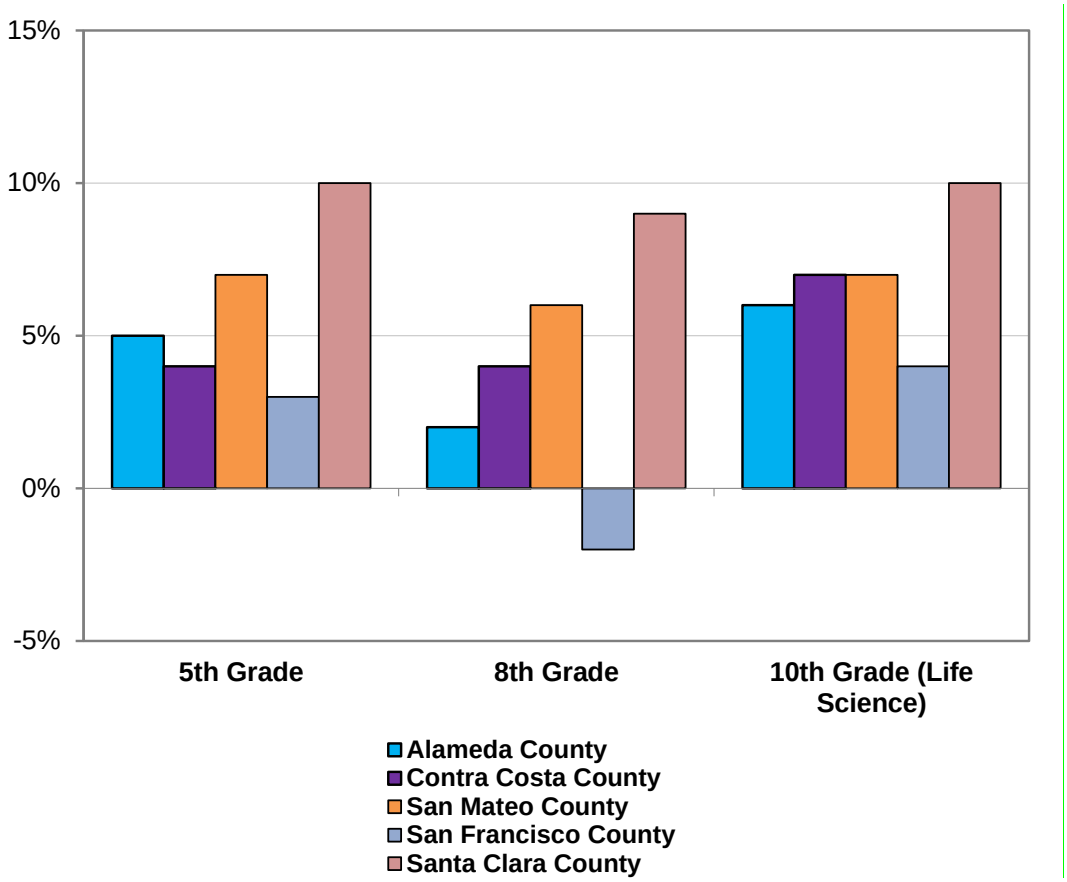
The overall results for mathematics again point to East Bay schools doing better than the state average at most grade levels but still not keeping up with the high scores found in Santa Clara County and to a lesser degree in San Francisco and San Mateo Counties.

Figure 27: CST Scores 2012: Math (% Advanced + % Proficient) – Differential to California Average



The figure below reveals the CST scores for science, with 10th grade focusing on life science. In general, East Bay standardized test scores in mathematics were better than the state average, but consistently not as high as Santa Clara County, the highest performer of the five counties. The East Bay counties were also largely behind San Mateo at most grade levels, but typically ahead of San Francisco County.

Figure 28: CST Scores 2012: Math (% Advanced + % Proficient) - – Differential to California Average



Overall, the analysis of 2012 CST scores shows that East Bay's K-12 institutions are generally ahead of the state as a whole on standardized test scores in English, Mathematics and Science, but also slightly below the highest performing counties in the Bay Area, namely Santa Clara and San Mateo.

CONNECTING HIGH SCHOOL AND COLLEGE TO CAREER DEVELOPMENT

Bridging East Bay's education and training efforts with the world of work has become a central priority for both regional educators as well as workforce and economic development stakeholders. Given the need for higher educational attainment, the focus is on ensuring that any educational efforts that emphasize career and industry training do not sacrifice the opportunities for students to thrive in a college or university setting but rather improve their ability to succeed in any academic environment after high school.

A recent study[48] of Oakland Unified School District indicated that "far too many Oakland students perform not months, but years, behind more advantaged peers. Overall, 41 percent of 8th graders in Oakland scored proficient or above on the California Standards Test, and just five percent of English language learners reached that bar." As the most populous City in the East Bay, Oakland's educational challenges present important opportunities for educational advancement across the East Bay. This opportunity for East Bay's educational system is to find educational models that both improve college and career readiness for all students, but emphasize programs that improve outcomes for the particular cohorts, such as English language learners, economically disadvantaged, Hispanic/Latino, and African American students that were typically less proficient than the average Oakland student on most measures of academic performance.

Programs such as Career Academies and Linked Learning Pathways offer contextualized educational models connected to the industries and employment opportunities of today while emphasizing a robust college preparatory curriculum. These programs have largely been set up to meet the needs of communities like Oakland that are working to improve all student outcomes while emphasizing improvements in those cohorts that are most challenged.

> ***What are Career Academies:*** *Career Academies are organized as small learning communities, typically between 150 and 200 students between 9th and 12th grades. The academies combine academic and technical curricula around a career theme, and establish partnerships with local employers to provide work-based learning opportunities[49]. Other comparable approaches such as the* ***Linked Learning*** *model can work within career academies and has students follow one of several industry themed pathways in fields such as engineering, arts and media, biomedicine and health[50].* ***Career Advancement Academies*** *at California Community Colleges offer another similar approach to the Career Academies and Linked Learning Pathways that unlike the other two, focuses on students after they have completed high school.*

The following findings summarize some of the key results from research and evaluation studies of student outcomes at Career Academies and Linked Learning Pathways, they include;

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[48] Source: Teacher Quality Roadmap: Improving Policies and Practices in Oakland Unified School District. March 2013. National Council on Teacher Quality.

[49] Definition is paraphrased from Career Academies: Long-Term Impacts on Work, Education and Transitions to Adulthood. James J. Kemple, June 2008

[50] Definition is paraphrased from A Model for Success: CART's Linked Learning Program Increases College Enrollment. John Forbes, January 2011, Center for Advanced Research and Technology.

- According to a study of Career Academies from 1993 to 2006[51], of 1,400 young people, approximately 85 percent of which were African American or Hispanic, revealed that they produced sustained earnings gains of 11 percent (or $2,088) annually compared to a similar non-academy control group.

- California Partnership Academies[52] (CPA's) provide a career academy model for high school students that was initiated by state legislation in 1984. By law, at least 50% of the students in each incoming class of CPA participants must meet some criteria of being "at-risk." In the 2009-2010 reporting period, CPA students performed well above the state average for high school graduation (95% for CPA students vs. 85% statewide average) as well as the percentage of students that met "a-g" course requirements for admission to the University of California or California State University system (57% CPA students vs. 36% statewide average). The results also showed that when students were compared within racial/ethnic categories, Hispanic CPA students were 6 to 7 percent more likely to pass the California High School Exit Exam for mathematics (7 percent) or English (6 percent).

- A Linked Learning program[53] that was implemented in a High School in Clovis California, the Center for Advanced Research and Technology (CART), has demonstrated strong student outcome results. CART students were evaluated against a comparable student group from 2002-03 through 2008-09 and the summarized seven years of reporting data showed that CART students were eleven percent more likely to be enrolled in community college after graduating from high school, and were two percent more likely to be enrolled in a university after graduating from high school. Just as important, a year after graduating from high school those enrollment differences were maintained.

[51] Source: Career Academies: Long-Term Impacts on Work, Education and Transitions to Adulthood. James J. Kemple, June 2008

[52] Source: Profile of California Partnership Academies, 2009-2010. Charles Dayton, Candace Hamilton Hester, and David Stern. October 2011. University of California, Berkeley. Career Academy Support Network.

[53] Source: A Model for Success: CART's Linked Learning Program Increases College Enrollment. John Forbes, January 2011, Center for Advanced Research and Technology.

EAST BAY EDUCATION PERFORMANCE: COMMUNITY COLLEGES

Community colleges are a critical partner in any region's ability to quickly and effectively train people for new career opportunities. One of the fundamental strengths of the community college system are the low barriers to entry and the convenient access to one of 10 colleges in the East Bay. The colleges remain an inexpensive option to attaining vocational career training, education towards completion of an Associate degree or certificate, or the ability to complete coursework to transfer to a university to complete a 4-year degree. However, open access to community colleges can also create a challenge as the colleges continue to experience a large percentage of students who drop out, do not complete a degree, a training program or the requirements to transfer to a university.

Role of Community Colleges in the East Bay

Critical to understanding the role of the community colleges is the size of the system compared to the rest of California's higher education system. 2.4 million students in California attend community college compared to 536,000 for the entire enrollment of the University of California and California State University systems combined. In Alameda, Contra Costa, and Solano Counties alone, over 171,000 students attend community college. If you took the combined community college enrollment of these three counties with the total number of high school seniors in the same three county area (138,000), the combined total (309,000) is over 75% of the entire undergraduate enrollment of the California State University System.

As the open access higher education system in California, community colleges serve diverse constituencies including high school graduates seeking general education leading to transfer to a 4 year college, students seeking a vocational certificate or degree, adults seeking retraining to enter a new career, or working adults seeking new skills leading to wage or career advancement. For the vast majority of adults out of high school, community college is the fundamental gateway to gaining new skills leading to higher wage employment and middle skill jobs in California and the nation.

> ***Design it-Build it- Ship it in the East Bay:*** *The East Bay is home to one of the Department of Labor's key grants to strengthen the role of community colleges as the backbone of America's workforce development system. Over the next 12 months, this initiative, "Design it-Build it-Ship it" will engage as many as 600 East Bay employers in advanced manufacturing, transportation and logistics, and engineering industry sectors and subsectors to increase the alignment of career path training programs with the needs of industry and the East Bay Economy.*

The 11 colleges in Solano, Alameda, and Contra Costa County include training pathway programs aligned to the needs of the East Bay economy and workforce, including:

- Career on-ramp or gateway programs such as the East Bay Career Advancement Academies that provide basic training in high demand, high wage growth career pathways for low income adults with educational and personal barriers to employment, a significant population in the East Bay's concentrated urban communities and over 70% of the population served by the college.

- Direct access to 1 and 2 year Career and Technical Educational training programs aligned to high wage middle skill jobs in health care, advanced manufacturing, transportation, logistics, and information communication technologies,
- Increasing development of stackable certificate training programs aligned to career development in high growth industries in the East Bay and that are accessible to both adults seeking new or first time employment and working adults seeking skills upgrades leading to career or wage advancement.

Understanding Completion

Completion, within the community college system, includes completion of vocational certificates, AA/AS degrees, and transfer to 4 year colleges and universities, however, it does not capture significant categories of students who attend community colleges, for other purposes including "skill builders" – working students who take a few courses to advance in their current career or occupation. Additionally, completion data is complicated by the fact that that community colleges are an open access system in California which accepts students on a primarily first-come/first-serve basis. This is a fundamental strength and weakness of the state system, and as a result, over 70% of community college students enter with less than college level skills in English and mathematics, and on average statewide, complete at just over 41% compared with 71% of students who enter prepared for college level materials. Additionally, over 60% of students who start out in remedial coursework do not progress to transfer level math and English, a rate remarkably consistent across the state system.

Seven East Bay Colleges are part of a state demonstration project, the Career Advancement Academies, or CAA, which provide integrated programs of study for low income students who assess below college level upon entry to college. This effort focuses on increasing completion for these students in career pathway areas such as manufacturing, healthcare, transportation and logistics, and public and human services among others. A draft evaluation report due out soon has found completion rates in the East Bay to be 15% to 20% higher for these students compared to their peers along with significantly higher course success and retention.

The results on the following pages compare the proportion of community college students that, on an annual basis, continue to work towards completing their academic or training objectives to those students that left before completing their academic or training goals.

The table below reveals the annual completion rate of those community college students at areas within the Bay Area from the 2008 to 2009 academic year as well as the 2009 to 2010 academic year. The results show that East Bay community colleges did better than colleges in Santa Clara County in maintaining those students that continued to work toward completion of their academic or training objectives, but not as high as colleges from San Francisco County and San Mateo County.

Table 34: Bay Area Regional Community College Completion Ratio for 2008-2009 & 2009-2010

Community College	2008-2009 Completion Ratio	2009-2010 Completion Ratio	Improvement / (Decline) from 2008-2009 to 2009-2010
The East Bay	56%	57%	1%
Santa Clara County	53%	53%	0%
San Mateo County	65%	63%	-2%
San Francisco County	60%	60%	0%

The table below reveals the annual completion rate of those community college students at specific colleges in the East Bay from the 2008 to 2009 academic year as well as the 2009 to 2010 academic year. The results show high-performing colleges such as Contra Costa, Chabot and Diablo Valley had the highest student completion ratio, above or near 60 percent over the two year period.

Table 35: East Bay Community College Completion Ratio for 2008-2009 & 2009-2010

East Bay Community Colleges	2008-2009 Completion Ratio	2009-2010 Completion Ratio	Improvement / (Decline) from 2008-2009 to 2009-2010
Contra Costa	61%	66%	5%
Chabot	62%	58%	-4%
Ohlone	56%	54%	-2%
Los Medanos	59%	53%	-6%
Merritt	53%	58%	5%
Alameda	49%	55%	6%
Berkeley City	53%	53%	0%
Diablo Valley	58%	59%	1%
Laney	47%	48%	1%
Las Positas	46%	57%	11%
THE EAST BAY: Total	**56%**	**57%**	**1%**

The table below reveals the annual completion rate by the ethnicity of the student at East Bay colleges from the 2008 to 2009 academic year as well as the 2009 to 2010 academic year. The results reveal that the ethnicity of the students did not demonstrate substantial differences in whether students continue to work towards completing their academic or training objectives in college or leaving the college system.

Table 36: East Bay Community College Completion Ratio for 2008-2009 & 2009-2010 by Ethnicity

East Bay Community Colleges	2008-2009 Completion Ratio	2009-2010 Completion Ratio	Improvement / (Decline) from 2008-2009 to 2009-2010
African-American	52%	56%	3.4%
Asian	59%	58%	-0.4%
Hispanic	55%	57%	1.2%
White	55%	55%	0.3%
THE EAST BAY: Total	**56%**	**57%**	**1%**

THE EDUCATION EQUATION FOR THE WORLD OF WORK

Overall educational attainment is only part of the equation for understanding the differences in employability and wage differentials. Another critical part of the equation is the area of study and how it relates to the type of degree and the work experience of the worker. Recent research done by Georgetown's Center on Education and the Workforce has shown that whether you are looking at Bachelor's degrees or certificates, the area of study matters and it has a considerable impact on expected earnings.

Bachelor's or Advanced Degrees

For Bachelor's degrees, the area of study or major can mean the difference between wages that are below the national average for all workers regardless of educational level, to median wages that are close to double the national average. The table below shows the median wage for individuals who have completed a Bachelor's degree in one of the 15 generalized areas of study. Degrees in STEM (Science, Technology, Engineering & Mathematics) account for four of the top six areas of study by median wage. The only STEM area of study that is not in the top half of median wages is Biology and Life Sciences, which instead has the highest earning boost from a graduate degree, which over of half of all graduates in this area of study obtain.

Table 37: Median Wages by Area of Study for Bachelor's Degree for 2011[54]

Major Group	Median Wages	Wage Differential Compared to Average Bachelor's Degree	Earnings Boost for Graduate Degree
Engineering	$75,000	36%	32%
Computer & Mathematics	$70,000	27%	31%
Business	$60,000	9%	40%
Health	$60,000	9%	50%
Physical Sciences	$59,000	7%	70%
Social Sciences	$55,000	0%	57%
Agriculture & Natural Resources	$50,000	-9%	35%
Communications & Journalism	$50,000	-9%	25%
Industrial Arts & Consumer Services	$50,000	-9%	35%
Law & Public Policy	$50,000	-9%	45%
Biology & Life Sciences	$50,000	-9%	101%
Humanities & Liberal Arts	$47,000	-15%	48%
Arts	$44,000	-20%	23%
Education	$42,000	-24%	33%
Psychology & Social Work	$42,000	-24%	43%

Certificates[55]

In a labor market that is constantly evolving and rewarding new skills and the ability to effectively use new technologies, educational programs that can provide contextualized training in a specific area of expertise whether that be in a specific industry or occupational grouping or both, should be a valuable tool in developing skills that employers value. Certificate programs can do exactly that and include completion of coursework typically focused on an area of learning associated with specific industries and/or occupations. The use of certificates has increased substantially over the last 30 years. Those indicating certificates are their highest level of educational attainment comprise a larger percentage of the labor force (12%) compared to Associate degrees (10%).

> ***What are certificates?*** *Certificates, much like Associate or Bachelor's degrees, are earned through classroom time and depending on the certificate can be earned in less than a year or take up to four years or somewhere in between. Unlike industry-based certifications, such as a Microsoft certification, that are based on the performance of a given test, certificates are awarded based on class time and completion of coursework.*

[54] Source: Georgetown Center on Education and the Workforce http://cew.georgetown.edu/219725.html.

[55] Information and data from this section are taken from - Certificates: Gateway to Gainful Employment and College Degrees, June 2012. Georgetown University, Center on Education and the Workforce.

The overall wage differential for certificates is 20 percent higher than those with just a high school degree as their highest level of education. However, this does not tell the whole story. The type of certificate, whether the degree holder is working in a related field that they have completed the certificate for and even the gender of the certificate holder all help explain the considerable variability on the wage differentials associated with certificates. Some of the key findings from the Georgetown study on certificates include:

- Just over one-third (34%) of certificate holders also have a college degree (graduate (3%), Bachelor's (12%) or Associate degree (19%)).
- Academically, certificate holders are similar to high school graduates, but on average have earnings like those with some college but no degree.
- Men earn certificates that provide a wage differential that is 27 percent higher than those males with just a high school degree while for women that same wage differential for certificates is only 16 percent.
- Women with certificates who work out of the field that they completed their certificate in, on average, earn less than women with high school diplomas as their highest level of education.
- A male-certificate holder in computer and information services who is working in his field, earns on average approximately $72,500 per year, which is almost the median wage for Bachelor's degree holder with an engineering degree.
- Male dominated certificate programs in construction, police/protective services and electronics all provide median earnings above $44,000 per year while female dominated certificate programs in healthcare and cosmetology on average earn less than $30,000 per year.
- California is the ninth highest state in the Country for awarding certificates per every 10,000 of the population (37).

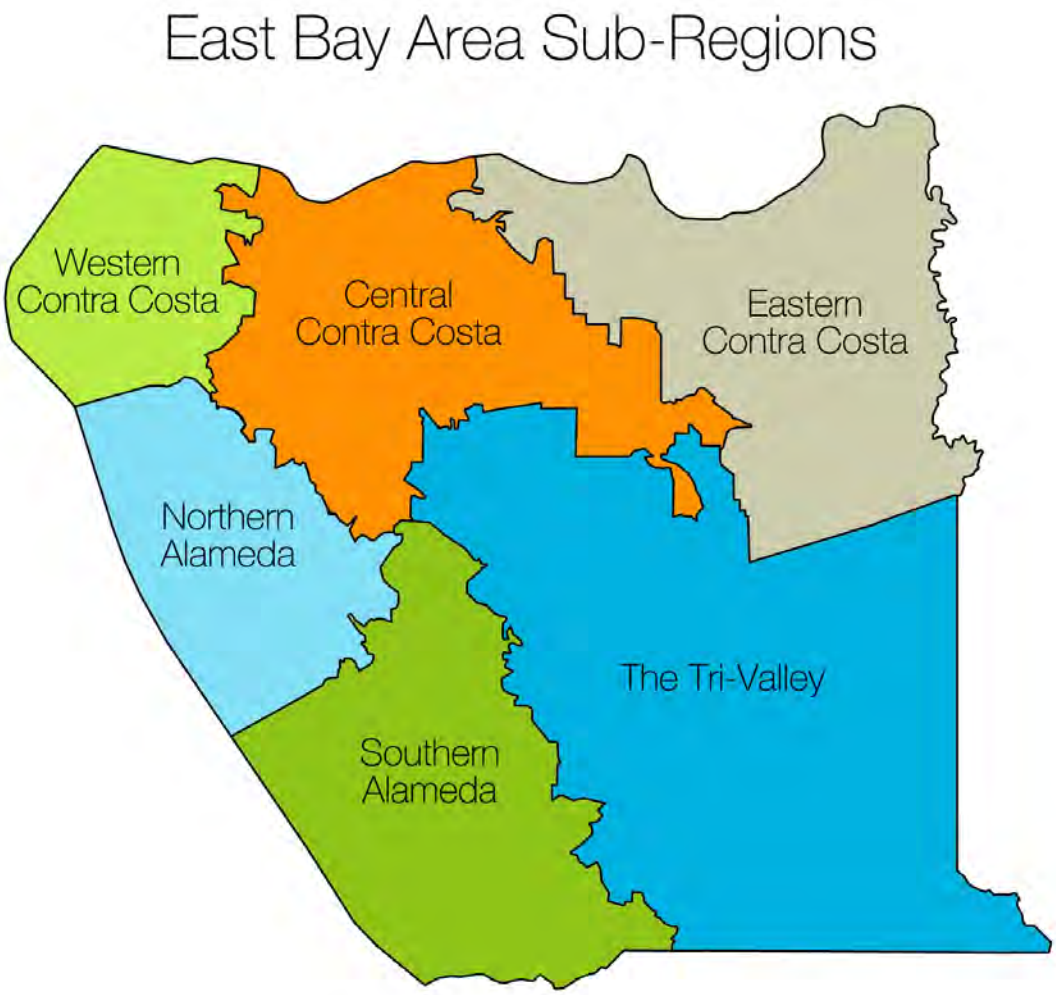
What are stackable certificates and what role could they play in the region: *Stackable certificates play a dual role of certifying that an individual has specific skills needed in the workplace while providing credit for coursework that can either be used to work towards a college degree or a more advanced level of certification and incrementally advancing skills development. The East Bay's Design it-Ship it-Build it grant project[56] provides a valuable opportunity to assess how stackable certificates could be developed in the East Bay and the impact they will have upon participants once they are implemented.*

The findings of the research provide some valuable lessons for the East Bay and the use of certificates to prepare the workforce. First, not all certificates are created equal – focusing on those fields with higher wage differentials and those that support industry cluster priorities within the region should be a priority. Second, certificates provide more benefit for those students with less formal academic preparation and should be targeted toward those students that are less likely to continue education after high school or are more likely to leave college without completing a degree or a program. Lastly, it is important to ensure that certificates are reflected in career pathway planning at the two and four-year colleges such that course credits earned can be built upon as students work towards higher degrees.

[56] See page 67 for more information on East Bay's Design it – Build it – Ship it project.

The East Bay is comprised of six sub-regions with distinct populations and micro-economies, all of which offer differing areas of specialization. The following section highlights these sub-regions (defined by aggregated zip regions) and presents workforce trends related to occupational categories, population growth, resident wealth and education levels and industry cluster employment.[57]

Figure 29: East Bay Area Sub-Regions



[57] Traditional industry and industry cluster employment and occupational data are sourced from EMSI Complete Employment 2013.1. Population growth trends, resident wealth and poverty and resident education are derived from the ACS 2011 5-year estimates.

NORTHERN ALAMEDA COUNTY

Northern Alameda County, which is home to the University of California, Berkeley and the Lawrence Berkeley National Laboratory, represents the largest sub-region by population in the East Bay. The sub-region comprises the cities of San Leandro, Oakland, Alameda, Emeryville, Berkeley, Albany and Piedmont, and is connected to the rest of the Bay Area by the I-80, I-580, I-880 and I-980 interstate highways. Other logistics infrastructure includes the Oakland International Airport, the Bay Bridge and the Port of Oakland.

Thirty-five percent of the East Bay's jobs are located in Northern Alameda County, of which nearly 8,700 were at the sub-region's largest employer, the University of California, Berkeley in 2012. From 2007 to 2012, the highest growing occupations were Personal Care Aides, Home Health Aides and Personal Financial Advisors while the occupations experiencing the most declines were Retail Salespersons and Laborers and Freight, Stock and Material Movers.

Population Growth Trends

- Overall population in Northern Alameda County grew by nearly two and a half percent between 2001 and 2012, the second lowest growth rate among the East Bay's six sub-regions.
- From 2001 to 2012, the Asian, Non-Hispanic population was the fastest growing ethnic cohort (28% growth) followed by Hispanics (19% growth).
- Black, Non-Hispanic and White, Non-Hispanic sub-groups each declined by over fifteen percent in the last 12 years.
- The 40 and over population has grown by nearly 47,000 since 2001, second only to Southern Alameda County while the 39 and under cohort has experienced a decline of over 27,000 people.

Resident Wealth and Poverty

- 2011 per capita income in Northern Alameda County ($34,846) ranked behind the Tri-Valley ($50,110) and Central Contra County ($44,419) sub-regions.
- Nearly 16 percent of the overall sub-regional population and 21 percent of the population under the age of 18 were living below the poverty level in 2011, both the highest ratios in the East Bay.

Resident Education

- According to 2011 ACS 5-year estimates, 43 percent of the population 16 and over in Northern Alameda County possessed a Bachelor's degree or higher.
- In 2011, just under one-third of the population 16 years and older had a high school diploma or less.

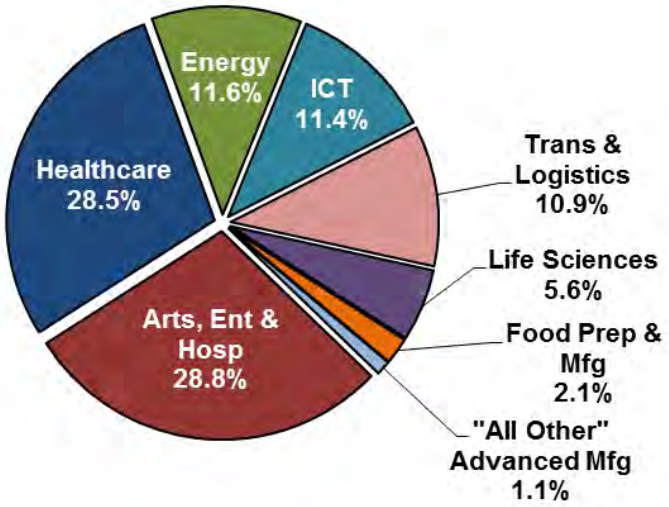
Cluster Employment

- The region boasts over 20 percent of overall East Bay employment within each of the eight industry clusters defined earlier in the report and presented in the table below.
- Nearly 50 percent (17,959) of East Bay Transportation and Logistics employees work in Northern Alameda County.
- The Arts, Entertainment and Hospitality cluster and the Healthcare cluster each employ over 45,000 workers in Northern Alameda County.

Table 38: Northern Alameda County Industry Cluster Employment, 2012

Industry Cluster	2012 Jobs	% of 2012 East Bay Employment
Arts, Entertainment & Hospitality	47,374	38.6%
Healthcare	46,973	38.3%
Energy	19,193	25.4%
Information & Communications Technologies (ICT)	18,756	23.5%
Transportation & Logistics	17,959	49.0%
Life Sciences	9,253	23.7%
Food Preparation and Manufacturing	3,408	39.4%
"All Other" Advanced Manufacturing	1,860	20.3%
Total Sub-Regional Jobs	**474,072**	**35.0%**

Figure 30: Northern Alameda County Industry Cluster Employment, 2012



SOUTHERN ALAMEDA COUNTY

Southern Alameda County is well connected to the rest of the East Bay and wider Bay Area via the I-880, I-680 and I-580 interstate highways, two bridges (Dunbarton and San Mateo-Hayward), BART and three railroads. The Southern Alameda County sub-region includes the following cities; Fremont, Newark, Union City and Hayward. The sub-region is the second largest in the East Bay with nearly 600,000 residents in 2012.

One fifth of all East Bay Jobs (271,717) were in Southern Alameda County in 2012, the majority of which were in Manufacturing and Professional, Scientific and Technical Services. Team Assemblers and Assemblers and Fabricators experienced the largest occupational decline from 2007 to 2012 along with Carpenters. The Healthcare occupations, Home Health Aides and Personal Care Aides, grew the most in Southern Alameda County over the last 5 years.

Population Growth Trends

- Overall population in Southern Alameda County grew by seven percent in the last twelve years adding nearly 42,000 people.
- Similar to the other sub-regions in the East Bay, Southern Alameda County experienced growth in Asian, Non-Hispanic (24%) and Hispanic (16%) cohort populations from 2001 to 2012.
- The White, Non-Hispanic sub-group declined by over 20 percent while the Black, Non-Hispanic sub-group decreased by over 18 percent since 2001.
- Keeping pace with Northern Alameda County, Southern Alameda County's population of 40 and over grew by over 47,000 people in the last 12 years.
- The 19 and under population grew by nearly 2,700 (2%) from 2001 to 2012.

Resident Wealth and Poverty

- 2011 per capita income in the sub-region was $31,993, below Northern Alameda County ($34,846), Central Contra Costa County ($44,419) and the Tri-Valley ($50,110)
- Eighteen percent of the population aged 18 and under and eight percent of the population aged 65 and older lived below the poverty line in 2011.

Resident Education

- Thirty-seven percent of Southern Alameda County residents 16 and over had a Bachelor's degree or higher in 2011 while 39 percent possessed a high school diploma or less.

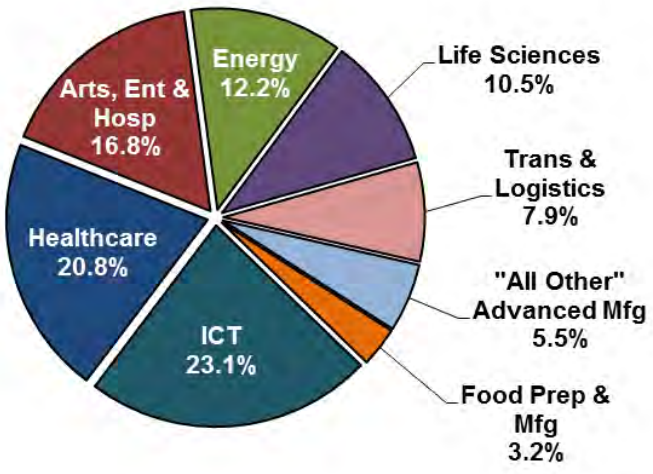
Cluster Employment

- Two-thirds of East Bay employment in the "All Other" Advanced Manufacturing[58] industry cluster was located in Southern Alameda County in 2012.
- Forty percent of all Food Preparation and Manufacturing employees in the East Bay work in Southern Alameda County.
- Nearly one-third of ICT jobs are located in the sub-region.
- Almost 23,000 Healthcare jobs were situated in Southern Alameda County in 2012, nearly one-fifth of all East Bay jobs in the industry.

Table 39: Southern Alameda County Industry Cluster Employment, 2012

Industry Cluster	2012 Jobs	% of 2012 East Bay Employment
Information & Communications Technologies (ICT)	25,384	31.9%
Healthcare	22,874	18.6%
Arts, Entertainment & Hospitality	18,535	15.1%
Energy	13,482	17.9%
Life Sciences	11,511	29.4%
Transportation & Logistics	8,747	23.9%
"All Other" Advanced Manufacturing	6,057	66.0%
Food Preparation and Manufacturing	3,504	40.5%
Total Sub-Regional Jobs	**271,717**	**20.1%**

Figure 31: Southern Alameda County Industry Cluster Employment, 2012



[58] This includes industries such as Asphalt Paving Mixture and Block Manufacturing, Machine Shops, Textile Machinery Manufacturing, Gasoline Engine and Engine Parts Manufacturing, and Boat Building.

THE TRI-VALLEY

The Tri-Valley comprises parts of Contra Costa and Alameda Counties in the south-eastern portion of the East Bay region. The sub-region is home to both the Lawrence Livermore National Laboratory and the Sandia National Laboratories, California. These laboratories support the development of advanced transportation, clean technology and alternative energy. The Tri-Valley is comprised of the following cities/towns; Pleasanton, Dublin, Livermore, San Ramon and Danville.

Seventeen percent of all jobs in the East Bay are located in the Tri-Valley sub-region. Professional, Scientific and Technical Services and Retail Trade industries account for a nearly a quarter of all jobs within the sub-region. The occupations that experienced the most decline over the last five years included Real Estate Sales Agents, Carpenters and Retail Salespersons while Personal Financial Advisors and Registered Nurses saw the greatest increase in jobs.

Population Growth Trends

- The Tri-Valley's overall population grew by over 37,000 (13% growth) people from 2001 to 2012.
- Keeping with the trend of the overall East Bay, the Asian, Non-Hispanic ethnic sub-group experienced almost 60 percent growth over the last 12 years while the Hispanic population increased by nearly 44 percent in the Tri-Valley, mirroring similar growth patterns in Northern and Southern Alameda County (Asian, Non-Hispanic growth rates higher than Hispanic growth rates).
- The Tri-Valley sub-region experienced the greatest increase in Black, Non-Hispanics (8% growth) compared to other East Bay sub-regions since 2001, meanwhile White, Non-Hispanics decreased by just over eight percent.
- The population of those aged 65 and over grew at the second greatest rate (32% growth) in the Tri-Valley, behind only Eastern Contra Costa County (49% growth).

Resident Wealth and Poverty

- In 2011, the Tri-Valley sub-region had the highest per capita income, $50,110, nearly $6,000 higher than the next highest, Central Contra Costa County ($44,419).
- The Tri-Valley had the lowest percentage of overall population living beneath the poverty level according to ACS 5-year estimates in 2011 when compared to the other East Bay sub-regions.

Resident Education

- The Tri-Valley is the highest educated sub-region in the East Bay, with 52 percent of the population possessing a Bachelor's degree or more.
- Only 19 percent of the population in the Tri-Valley had a high school diploma or less in 2011.

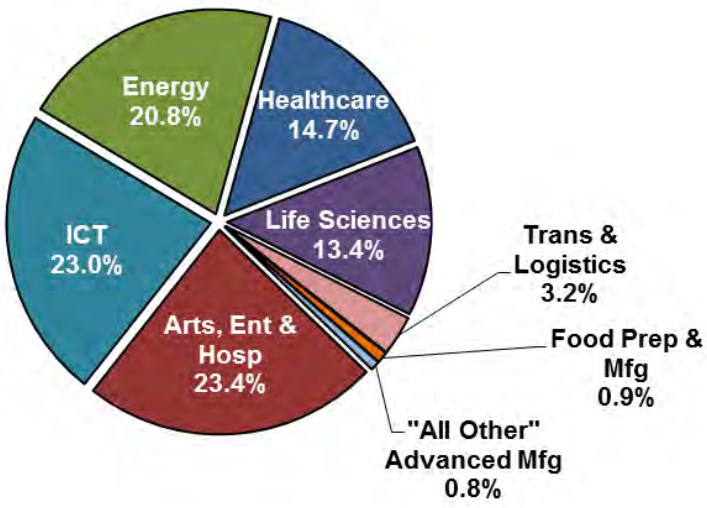
Cluster Employment

- The Life Sciences industry cluster represents nearly 12,000 jobs and just over 30 percent of overall East Bay employment in the cluster in the Tri-Valley.
- Roughly a quarter of East Bay ICT and Energy jobs are located in the Tri-Valley.
- The Tri-Valley is underrepresented in employment for the East Bay (when referencing share of overall employment) for Transportation and Logistics, Food Preparation and Manufacturing and "All Other" Advanced Manufacturing industry clusters.

Table 40: Tri-Valley Industry Cluster Employment, 2012

Industry Cluster	2012 Jobs	% of 2012 East Bay Employment
Arts, Entertainment & Hospitality	20,752	16.9%
Information & Communications Technologies (ICT)	20,380	25.6%
Energy	18,436	24.4%
Healthcare	13,039	10.6%
Life Sciences	11,877	30.4%
Transportation & Logistics	2,800	7.6%
Food Preparation & Manufacturing	782	9.0%
"All Other" Advanced Manufacturing	670	7.3%
Total Sub-Regional Jobs	**225,168**	**16.6%**

Figure 32: Tri-Valley Industry Cluster Employment, 2012



WESTERN CONTRA COSTA COUNTY

The Western Contra Costa County sub-region is located at the north-western corner of the East Bay region and includes the cities of El Cerrito, Richmond, Hercules, Pinole and San Pablo. Western Contra Costa County's shoreline touches the San Francisco Bay to the west, San Pablo Bay to the north and the Carquinez Strait to the East. The I-80 and I-580 highways and two bridges (Richmond-San Rafael and Carquinez) connect Western Contra Costa County to the rest of the East Bay and the wider Bay Area.

Nearly 81,000 total jobs were located in Western Contra Costa County (6% of all East Bay jobs) in 2012. Almost 37 percent of sub-regional jobs are concentrated in Healthcare and Social Assistance, Government, and Retail Trade industries. The top three occupations with the highest growth over the last five years were Healthcare professions; Registered Nurses, Medical Assistants and Medical Secretaries. Meanwhile, Retail Salespersons, Carpenters and Construction Laborers represented occupational categories that experienced the most decline in jobs.

Population Growth Trends

- The sub-region experienced overall population growth of just under 13 percent from 2001 to 2012.
- The Hispanic population in Western Contra Costa County increased by over 20,000 in the last 12 years while the Asian, Non-Hispanic population grew by just over 12,000 people.
- Western Contra Costa County experienced a 17 percent decrease in White, Non-Hispanics, second only to Southern Alameda County while Black, Non-Hispanics grew by just over one percent.
- The population aged 65 and over increased by nearly 8,000 people from 2001 to 2012 in Western Contra Costa County while the segment of the population that is 19 or under only increased by about 2,500.

Resident Wealth and Poverty

- The sub-region had a per capita income of $28,780 in 2011, the second lowest when compared to the other sub-regions in the East Bay.
- Western Contra Costa had the second highest overall poverty rate (14%) when compared the rest of the East Bay in 2011 while the poverty rate for the population aged 18 and under (22%) was the highest in the East Bay.

Resident Education

- Almost 40 percent of the sub-region's population in 2011 possessed a high school diploma or less.
- Just under one-third of the population possesses a Bachelor's degree or more.

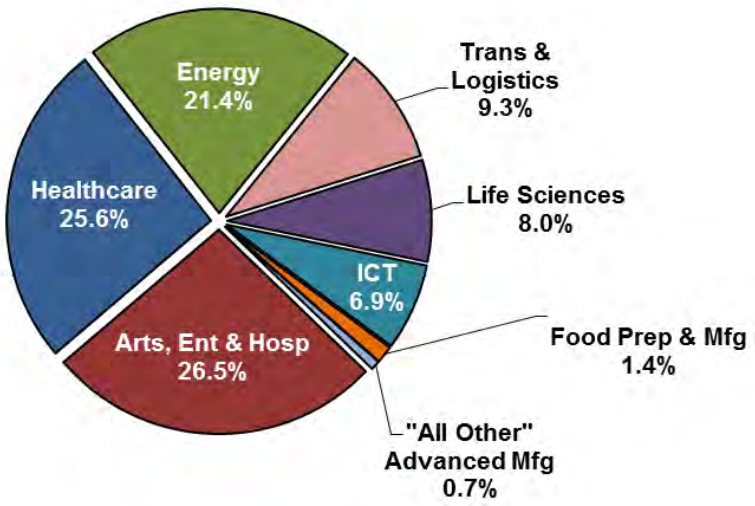
Cluster Employment

- Western Contra Costa County houses nearly 10 percent of employment within the Energy industry cluster despite only representing six percent of overall employment in the East Bay.
- Both Healthcare and Arts, Entertainment and Hospitality industry clusters comprised over 8,500 jobs in the sub-region

Table 41: Western Contra Costa County Industry Cluster Employment, 2012

Industry Cluster	2012 Jobs	% of 2012 East Bay Employment
Arts, Entertainment & Hospitality	8,920	7.3%
Healthcare	8,624	7.0%
Energy	7,206	9.6%
Transportation & Logistics	3,140	8.6%
Life Sciences	2,702	6.9%
Information & Communications Technologies (ICT)	2,319	2.9%
Food Preparation and Manufacturing	462	5.3%
"All Other" Advanced Manufacturing	250	2.7%
Total Sub-Regional Jobs	**80,945**	**6.0%**

Figure 33: Western Contra Costa County Industry Cluster Employment, 2012



CENTRAL CONTRA COSTA COUNTY

Central Contra Costa County is situated in the central-northern half of the East Bay region and comprises the cities of Moraga, Orinda, Lafayette, Walnut Creek, Pleasant Hill, Martinez, Concord and Clayton. Well-designed business parks dot the sub-region with major employers including the Contra Costa County Regional Medical Center and John Muir Health Foundation. The I-680 interstate highway, BART and the George Miller Jr. Memorial Bridge connect Central Contra Costa County to the East Bay region and wider Bay Area.

Almost a quarter of a million jobs could be found in Central Contra Costa County in 2012, representing over 18 percent of all jobs in the East Bay. Over one-third of all jobs were in Government, Healthcare and Social Assistance and Professional, Scientific and Technical Services. Personal Financial Advisors, Home Health Aides and Personal Care Aides were occupational categories that added the most jobs from 2007-2012 in Central Contra Costa County. The two occupational categories that lost the most jobs over the same time period were Real Estate Sales Agents and Retail Salespersons.

Population Growth Trends

- Central Contra Costa County was the only East Bay sub-region to experience overall population decline since 2001 (-1.3% growth).
- Both the Hispanic and Asian, Non-Hispanic population sub-groups grew at fairly similar rates from 2001 to 2012 (36% and 33% respectively).
- The sub-region saw the White, Non-Hispanic population decrease by over 45,000 individuals, second only to Northern Alameda County's decline of over 50,000.
- The Black, Non-Hispanic sub-group grew by just under three percent.
- Central Contra Costa County's 19 and under population decreased by over nine percent since 2001 while its 65 and over cohort increased by over 17 percent.

Resident Wealth and Poverty

- Central Contra Costa County's per capita income in 2011 was second among the six East Bay sub-regions, at $44,419.
- Seven percent of the sub-region's overall population and nine percent of the population 18 and under were living under the poverty level in 2011.

Resident Education

- Over 47 percent of Central Contra Costa County's overall population had a Bachelor's degree or more in 2011, second only to the Tri-Valley.
- Just under 24 percent of the population had a high school diploma or less in 2011.

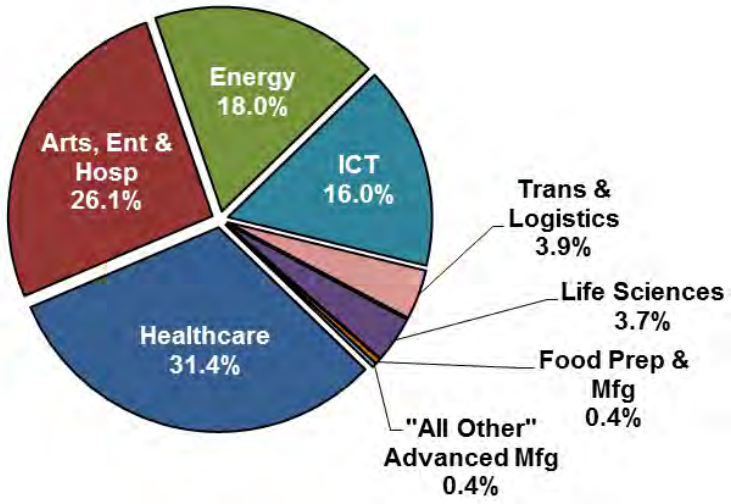
Cluster Employment

- Nearly 24,000 Healthcare jobs are located in the Central Contra Costa County sub-region, representing nearly 20 percent of all Healthcare jobs in the East Bay.
- The sub-region employed nearly 20,000 people in the Arts, Entertainment and Hospitality industry cluster in 2012.
- Central Contra Costa County had a relatively small amount of its workforce in Food Preparation and Manufacturing and "All Other" Advanced Manufacturing.

Table 42: Central Contra Costa County Industry Cluster Employment, 2012

Industry Cluster	2012 Jobs	% of 2012 East Bay Employment
Healthcare	23,980	19.5%
Arts, Entertainment & Hospitality	19,949	16.2%
Energy	13,781	18.3%
Information & Communications Technologies (ICT)	12,262	15.4%
Transportation & Logistics	3,015	8.2%
Life Sciences	2,817	7.2%
Food Preparation and Manufacturing	329	3.8%
"All Other" Advanced Manufacturing	270	2.9%
Total Jobs	**249,742**	**18.4%**

Figure 34: Central Contra Costa County Industry Cluster Employment, 2012



EASTERN CONTRA COSTA COUNTY

Eastern Contra Costa County comprises the north-eastern portion of the East Bay with a shoreline to the north that hugs the San Joaquin River Delta. The sub-region is made up of the following cities; Pittsburg, Antioch, Oakley and Brentwood. Much of Eastern Contra Costa County is encompassed by large tracts of undeveloped land. BART and Highway 4 offer connections to the rest of the East Bay and Bay Area with the Antioch Bridge providing access to Sacramento County.

Only five percent (65,255) of total East Bay jobs are concentrated in Eastern Contra Costa County. Thirty-one percent of jobs in the sub-region are clustered in the Retail Trade and Healthcare and Social Assistance industries. The highest growing occupation in the five years between 2007 and 2012 was Combined Food Preparation and Serving Workers, followed by Medical Assistants. Carpenters, Retail Salespersons and Construction Laborers experienced the greatest decline in jobs for the Eastern Contra Costa County sub-region.

Population Growth Trends

- Eastern Contra Costa County saw its population grow by nearly 26 percent since 2001, the highest growth among East Bay sub-regions.
- The Hispanic population experienced the greatest growth (58% growth) in Eastern Contra Costa County than in any other East Bay sub-region over the last 12 years.
- Asian, Non-Hispanics grew in population by over 9,300 from 2001 to 2012.
- Eastern Contra Costa County experienced the greatest growth (11% growth) in its Black, Non-Hispanic population when compared to other East Bay sub-regions while the White, Non-Hispanic sub-group fell by almost three percent over the last 12 years.
- The sub-region saw its population grow across all age cohorts, with the population of those aged 65 and older growing by almost 50 percent (9,800 people) from 2001 to 2012.

Resident Wealth and Poverty

- Eastern Contra Costa County had the lowest per capita income ($27,452) of the six East Bay sub-regions in 2011, almost $23,000 lower than the Tri-Valley's.
- Nearly seventeen percent of the 18 and under population in Eastern Contra Costa County lived below the poverty level in 2011.

Resident Education

- One-fifth of Eastern Contra Costa County's population had a Bachelor's degree or more in 2011, the lowest proportion amongst the six sub-regions in the East Bay.
- Forty-two percent of residents in the sub-region possessed a high school diploma or less according to ACS 2011 5-year estimates.

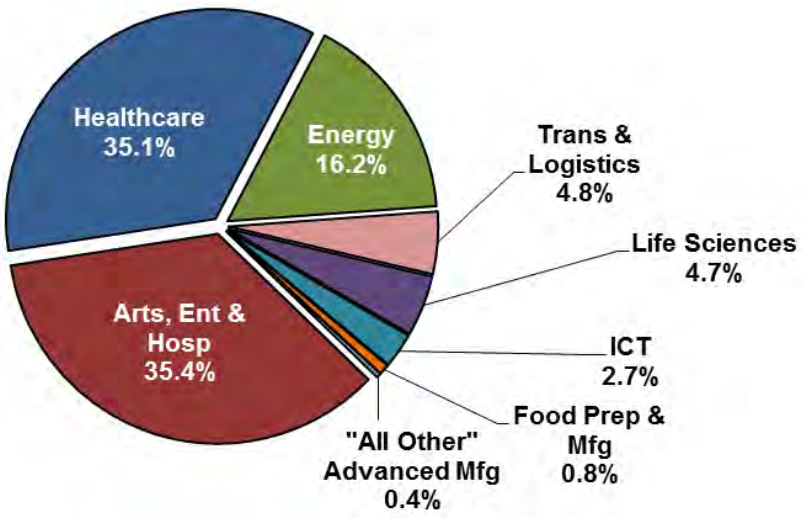
Cluster Employment

- Although representing only five percent of all East Bay jobs in 2012, Eastern Contra Costa County contained nearly six percent of East Bay employment for both Healthcare and Arts, Entertainment and Hospitality.
- Eastern Contra Costa County was underrepresented (when referencing share of overall employment) for each of the other six industry clusters.[59]

Table 43: Eastern Contra Costa County Industry Cluster Employment, 2012

Industry Cluster	2012 Jobs	% of 2012 East Bay Employment
Arts, Entertainment & Hospitality	7,268	5.9%
Healthcare	7,215	5.9%
Energy	3,323	4.4%
Transportation & Logistics	987	2.7%
Life Sciences	963	2.5%
Information & Communications Technologies (ICT)	558	0.7%
Food Preparation & Manufacturing	167	1.9%
"All Other" Advanced Manufacturing	73	0.8%
Total Sub-Regional Jobs	**65,255**	**4.8%**

Figure 35: Eastern Contra Costa County Industry Cluster Employment, 2012



[59] Energy, Transportation & Logistics, Life Sciences, ICT, Food Preparation & Manufacturing and "All Other" Advanced Manufacturing.

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