Labor Market Analysis of San Francisco Construction Industry

A Citywide Examination and Focus on District 10

FEBRUARY 2017

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Introduction and Overview

In early summer of 2016, the San Francisco Public Utilities Commission (SFPUC) and the Office of Economic and Workforce Development (OEWD) joined forces to produce an updated Labor Market Analysis of the San Francisco Construction Industry. Like the two previous analyses generated in 2010 and 2013, this report examines the industry from the perspectives of workforce demand and supply.

This report presents data and findings pertinent to

1. Assessing the continued demand for construction skilled trades workers
2. The characteristics of the city's current construction workforce
3. The state of the city's construction industry workforce pipeline.

As such, the study should be useful to City policy makers and stakeholders reviewing the progress of the Local Hiring Policy for Construction. However, this 2016 analysis goes beyond the borders of the two previous studies to respond to specific workforce concerns presented by the San Francisco Public Utilities Commission's Sewer System Improvement Program (SSIP).

SSIP is a 20-year, multibillion dollar investment to upgrade the City's 100-year-old sewage system. Completion of the program will "ensure the reliability and performance of the City's sewer system now and into the future."[1] Phase 1 of SSIP features 70 projects with an estimated construction value of $2.9 billion dollars. To date, six of these Phase 1 projects have been completed, 10 more are underway and a host of other projects are scheduled. SSIP will be one of the largest infrastructure projects ever undertaken by the City. Just like its sister program, the $4.8 billion dollar Water System Improvement Program (WSIP) generated millions of work hours over the course of its construction, SSIP will do the same. Moreover, most of SSIP's projects will be completed within the boundaries of the City and County of San Francisco and be subject to the City's Local Hiring Policy for Construction and First Source Hiring Policy. The potential skilled trades work opportunities for San Franciscans are perhaps unparalleled. In a recent news article, the City reported that already 37% of all SSIP construction work hours have been performed by San Francisco residents and 77% of all of the apprentice hours have been performed by San Francisco resident apprentices.[2] The recently executed Project Labor Agreement for SSIP will also ensure that these skilled trades jobs are directed to a unionized workforce reflecting pay rates generated by collective bargaining agreements.

The SSIP projects include another layer of opportunity for a subsector of San Francisco; the residents of District 10 that roughly encompasses the Bayview Hunters Point and Sunnydale neighborhoods. This area

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[1] SFPUC Website -- https://sfwater.org/Index.aspx?pag October 12, 2016.

[2] SFPUC News Archive. Thousands of Jobs to be Created as San Francisco Signs Historic Labor Agreement for Sewer System Infrastructure Program: New agreement contains job training programs that target communities most in need of economic opportunity. Posted: 8/4/2016 12:00 pm https:sfwater.org/Index.aspx?pag.

currently houses the City's largest sewage treatment facility and will be the site of the largest projects completed in Phase 1. In 2011, the SFPUC adopted a Community Benefits Policy to ensure its intent to be a good neighbor to residents living in neighborhoods impacted by SFPUC operations. The policy's operational criteria and guidelines have become standard features in SFPUC contracting documents. SFPUC contractors are required to make firm, quantifiable and measureable commitments to provide financial contributions, volunteer hours, and in-kind donations to local schools and nonprofits in the communities in which they perform work for the SFPUC.

Both the SFPUC and its SSIP Phase 1 consultants have committed to investing resources in the District 10 community, a community that has disproportionately borne the burden of the City's sewage treatment for decades. To guide these investments, SFPUC has requested that this analysis provide the following:

- Information about the quantity and nature of the construction skilled trades and professional services jobs that SSIP Phase 1 projects are likely to generate;
- Updated demographic information for District 10 and its construction workforce;
- A skills gap analysis between the skills required for the SSIP Phase 1 jobs and the skill level of District 10 residents; and
- Status update of existing construction-related training and educational providers available to District 10 residents.

This report is divided into two parts with several subsections.

- Part I presents the city-wide construction demand and supply data. It concludes with a discussion regarding worker availability and the existing construction workforce pipeline.
- Part II focuses entirely on SSIP Phase 1 and San Francisco's District 10. This segment presents the potential job opportunities that will be generated by SSIP Phase 1 and reviews updated demographic information for District 10. Also included is a skills gap analysis between upcoming SSIP Phase 1 jobs and existing workers' skills, and updated information about existing construction related training and educational providers. Part II concludes with a set of recommendations for SFPUC and City consideration regarding potential workforce investments that will most benefit District 10 residents.

The SSIP Labor Market Analysis for San Francisco Construction Industry is data-driven and rich. We have included numerous charts and graphs within the body of the document but to enhance the report's readability we have placed additional supportive data in the appendices.

The L. Luster & Associates research team thanks the SFPUC and OEWD for the opportunity to prepare this report. Also, we would like to acknowledge the tremendous assistance rendered by the staff of both agencies.

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We hope that this Labor Market Analysis will contribute to the public dialogue surrounding construction workforce development and will significantly benefit San Francisco's most economically vulnerable citizens.

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Executive Summary

This Labor Market Analysis (LMA) of the San Francisco Construction Industry updates and expands upon two previous Labor Market analyses of the San Francisco construction industry undertaken in 2010 and 2013. It presents data and findings pertinent to:

- The continued demand for construction skilled trades workers
- The characteristics of the city's current construction workforce
- The state of the city's construction industry workforce pipeline.

Like the previous two analyses, this LMA addresses questions regarding the progress of the construction Local Hire Policy adopted by the City/County of San Francisco. Beyond the previous two analyses, this LMA responds to specific workforce challenges and opportunities presented by the San Francisco Public Utilities Commission's Sewer System Improvement Program (SSIP), currently estimated at $2.9 billion.

Below is a summary of major findings.

I. Demand Side: Projected growth for construction employment and related professional services employment, with an unprecedented level of major public sector and private sector projects planned.

- Since the 2013 report (including construction employment data through November 2012), construction employment in both California and San Francisco has continued to increase. For California, construction employment reached a peak in employment in February 2006 at 945,100 construction jobs, before falling dramatically to 545,500 construction jobs in July 2010. Since July 2010 construction employment has steadily increased to a level of 761,200 jobs in July 2016.

- San Francisco construction has followed a similar trajectory, though its growth since July 2010 has outpaced the state construction growth. San Francisco is grouped with San Mateo County for the San Francisco Metropolitan District. The construction employment in this District rose from 25,000 jobs in 2011 to the July 2016 number of 45,700 jobs.

- The most recent City and County of San Francisco Capital Plan states that "San Francisco is riding a historic wave of infrastructure investments." Between 2016 and 2025, the City has identified $32 billion in infrastructure investments that include $23 billion in direct city investments and another $9 billion in external agency investments. At this time, the Office of Economic and Workforce Development (OEWD), which tracks both privately and City sponsored construction work, reports that there are major projects currently underway with combined project values of $11.5 billion, the majority of which will not be completed until the end of 2018. There is another group of projects valued at $27 billion that are scheduled to start in 2017, 2018 or beyond, some with estimated durations of 10, 15 and 20 years.

- Professional service positions, outside of the skilled trades jobs, are an important and often overlooked area of analysis when examining jobs generated by infrastructure and other construction projects. Chief among these are positions in the following categories: (i) Design, Architecture, and Engineering, (ii) Environmental Testing and Remediation, (iii) Compliance and Safety, (iv) Project and Construction Management and (v) Community Planning and Outreach. These jobs are more modest in number than the construction jobs generated by public and private projects. However, both projections by the state Employment Development Department (EDD) and by the LMA team are for professional service employment in nearly all categories.

II. Supply Side: Characteristics of the San Francisco Construction Workforce

The LMA reviews main characteristics of two categories of the San Francisco construction workforce:

- Workers whose primary worksite is in San Francisco, regardless of where they live.
- Workers who live in San Francisco, regardless of their primary worksite.

For each category, the LMA draws on data from the U.S. Census, American Community Survey and the Employment Development Department payroll data. Each category of the construction workforce is analyzed along the following characteristics: (1) Distribution by Trade, (2) Distribution by Earnings, (3) Distribution by Weeks Worked and Hours Worked, (4) Distribution by County of Residence, (5) Distribution by Educational Attainment, (6) Distribution by Race/Ethnicity and (7) Distribution by Age.

Understanding both categories is important for evaluation of Local Hire going forward, as well as crafting a workforce policy related to the SSIP. A number of findings might be highlighted, though, concerning the resident construction workforce:

- The construction workforce resident in San Francisco jumped from an estimated 7855 workers in 2010 and 9941 workers in 2012 to an estimated 14,161 workers in 2015. The distribution by trades remained similar to the 2012 distribution. Almost half of the San Francisco resident construction workers were employed in three trades: Construction Laborers (23.7%), Carpenters (12.3%) and Construction Managers (11.9%). Painters, Electricians, and Plumbers were the other main trades.

- The median annual earnings of the construction workforce resident in San Francisco were $40,000 in 2015, well below the City's median earnings. The mean was $50,966, similarly well below the City's mean income. About 5,428 workers whose primary occupation was in construction earned less than $25,000 per year. And only 816 workers earned more than $125,000. Looking more closely, a primary cause of the lower annual earnings of a good segment of the workforce was related to lack of regular work. Around 28% of the resident workforce reported working less than 40 hours in a typical work week and 14.5% reported worker fewer than 30 hours.

- Regarding educational attainment, around 27% of the resident construction workforce have a four year degree or higher, and another 20% had some college. The percentage with some post-secondary education was slightly higher than the broader pool of Bay Area construction workers employed in San Francisco. At the other end, 20% of the construction workers have attained less than a high school education.

- The racial distribution of resident construction workers was only slightly changed since 2013. The White percentage rose from 31% to 38.2% (though below the 49.4% White percentage of the entire San Francisco workforce). The Asian, Pacific Islander percentage also rose from 32% to 34%, as did the African American percentage from 3% to 4.8%. The Hispanic percentage declined from 31% to 21.5%.

III. San Francisco Resident Participation in Recent Years on City Sponsored Projects

- The Elation Systems data track the hours worked on City-sponsored projects. The 2016 Elation Systems data reveal that for all City sponsored projects the number of hours worked by City residents has increased significantly since the 2010 and 2013 reports, as has the percentage of hours worked by City residents compared to non-residents. On all City-sponsored projects, San Francisco residents have increased hours from 701,377 in the period 2011-2012 to 1,836,407 hours in the period 2014-2015. On Local Hire Projects, the increase in hours worked by City residents is more dramatic. In the period March 2011-March 2012, total hours worked by SF residents totaled slightly more than 45,000 hours. By the following year period, the number had grown to around 332,000. In the most recent year, March 2015-March 2016, the number of hours worked by SF residents on Local Hire had reached over 595,500.

- The 30% Local Hire requirement has been met in this recent year, even with increased worker need. But several construction dynamics mean that meeting this requirement will be a challenge in upcoming years given the projected construction activity noted throughout this report, as well as the aging of the San Francisco resident construction workforce.

IV. Existing Pipeline for Future Construction Employment in San Francisco

- In San Francisco, City sponsored projects operate in a union environment, so that the pipeline for entry into construction jobs on City sponsored projects (and on most large privately developed projects) is through the union apprenticeship system. The number of San Francisco resident apprentices stood at 1718 in July 2016. They reflected the multi-ethnic nature of the City—32% Hispanic, 24% White, 22% Asian Pacific Islanders, 21% African American, and also the continued low percentage of women (only 11% female apprentices). The number of apprentices entering each year has increased in the past few years, but only gradually, from 595 in 2012 to 646 in 2015, indicating that the pipeline has not widened greatly, even with the increased construction work.

- City Build Academy plays an important role in the apprentice pipeline, as the City's main pre-apprenticeship program. It also has seen an increase in its enrollment numbers, but gradually, from 81 enrollees in 2011-2012 to 99 in 2014-2015. With the assistance of the state Employment Development Department, the project team was able to track earnings data of City Build participants since 2005 and found both above-average retention rates of City Build graduates in the construction trades as well as earnings increases, especially in the first years after graduation. CityBuild graduates, though, have been limited in entering certain trades in highest demand on City projects, particularly as Electricians and Plumbers.

V. District 10 Demographics and Skills to Fill Construction and Professional Service Positions

- The boundaries of District 10 correspond with the Bayview/Visitacion Valley/Excelsior Public Use Microdata Area (PUMA) utilized by the Census Bureau, so that Census Bureau data can yield insight into the District's demographic characteristics and employment. In 2014, the Asian population constituted by far the largest ethnic group at 52.3%, followed by the Latino population (23.3%), African American (11.5%) and White (10.8%). There were several characteristics of the adult population that make District residents a fit for SSIP construction opportunities. The formal education level of the adult population in District 10 in 2014 was significantly lower than the rest of the City: 53% of the District population had a high school diploma or less. For some among this population, construction employment, especially construction employment on public works jobs, represents a realistic option for middle income employment. Additionally, the median income of employed adults in the District in 2014 was $32,000, well below the City median of $55,000. Over 32,000 adults in the District in 2014 were earning less than $25,000 and another 17,000 were earning between $25,000-$50,000, so that for many of these employed District 10 workers, construction employment would represent higher wages than their current situations.

- Examining the experience of District 10 residents on the SSIP Phase 1 projects so far finds that District 10 residents have been active on these projects, performing 11% of all work hours and 28% of all hours worked by San Francisco residents. The District 10 residents have been concentrated in the Laborer positions, though, and participation in upcoming projects will require greater entry into three other trades projected to be in demand on upcoming SSIP projects: Plumbers, Electricians, and Operating Engineers.

- As noted in Section 2 of this report, the SSIP projects, as other major infrastructure projects will be generating jobs in professional services as well as construction. There are scant data so far on the participation of District 10 residents in professional services jobs connected to SSIP Phase 1 or other infrastructure projects. The data on District 10 resident educational levels, though, indicate that movement into these jobs by District 10 residents will be a challenge in most cases, and will require additional targeted training, even at entry level.

VI. Recommendations for Facilitating Opportunity for District 10 Residents

The final section of this LMA consists of a series of workforce related recommendations, identifying specific avenues for workforce investment that the SFPUC, the City and their workforce partners may consider for SSIP Phase 1 projects. The strategies are ones that (i) take advantage of SFPUC's existing structures and lessons learned from its Water System Improvement Program (WSIP), (ii) build on widening existing educational and training efforts, and (iii) reinforce partnerships to strengthen the local workforce pipeline for the building industry to attract and retain new entrants.

PART I
CITYWIDE WORKFORCE ANALYSIS

Section 1: Demand for Construction Employment

PART I – CITYWIDE WORKFORCE ANALYSIS

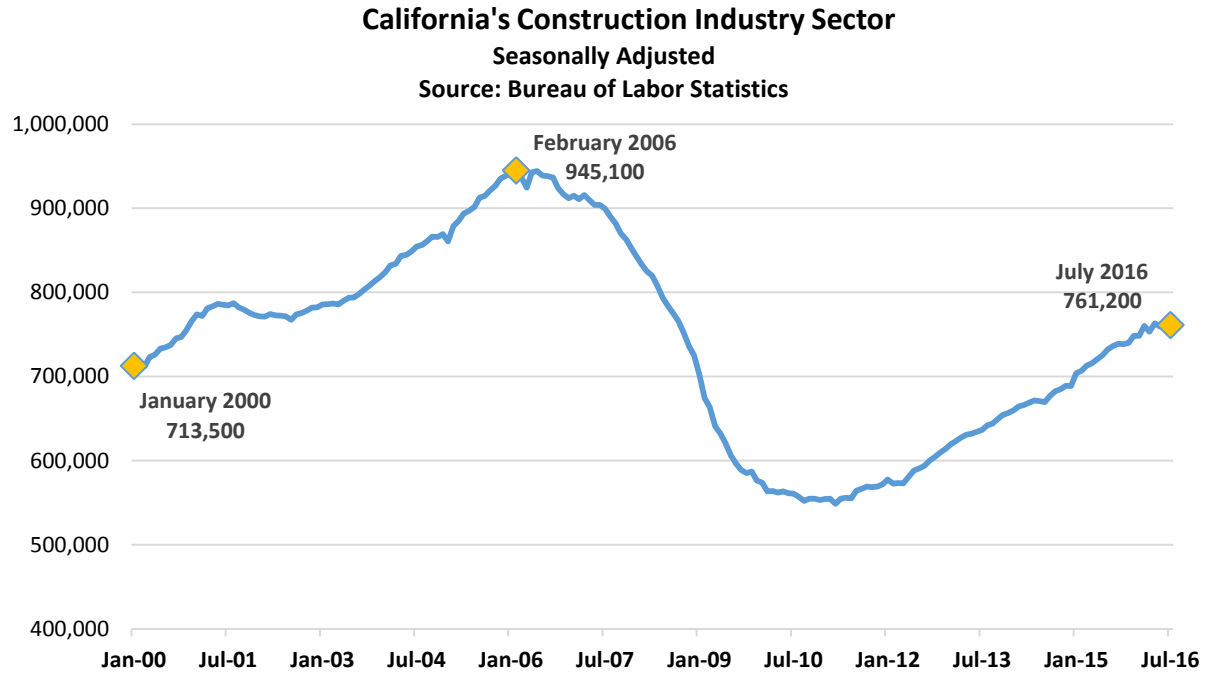
Section 1: Demand for Construction Employment

A. Statewide Construction Employment Demand

Construction employment in California has seen a steady growth over the past six years, as shown in chart 1 below. As of July 2016, construction employment stood at 761,200. This was well below the 945,100 construction jobs in February 2006, but also well above the drop to 545,000 construction jobs by July 2010.

Throughout the early 2000s, construction employment grew sharply, and by late 2006 there was expectation that there would be well over one million construction jobs by 2010. Instead, during the Great Recession, construction employment in California went into free fall, and lost over 400,000 jobs by July 2010**.**

Chart 1: Trends in California's Construction Industry Sector

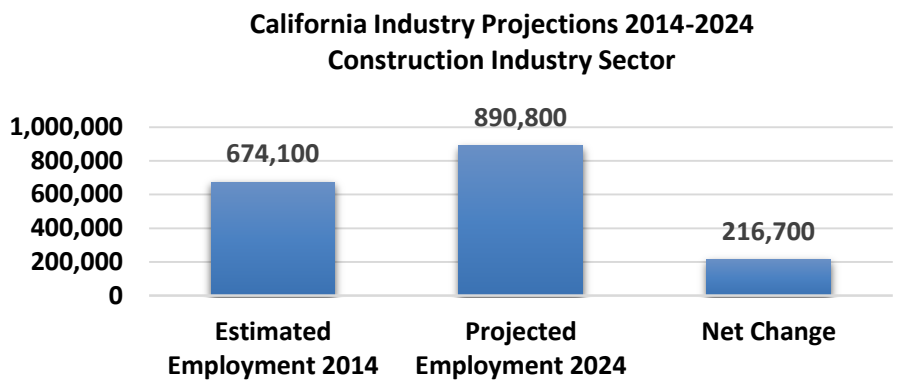


Source: CA Employment Development Department, Labor Market Information Division, September 2016

The growth since July 2010 has brought construction employment to a level of over 761,000 jobs, slightly above where it stood in January 2000.

The state Employment Development Department (EDD) undertakes 10-year projections of job growth for different sectors statewide. The latest estimate for construction was undertaken for the period 2014-2024, as shown on chart 2. It shows construction employment continuing to grow during this decade, but even by 2024 reaching only 890,800 jobs—below the number reached before the Great Recession.

Chart 2: Employment Projections for California Construction Industry Sector



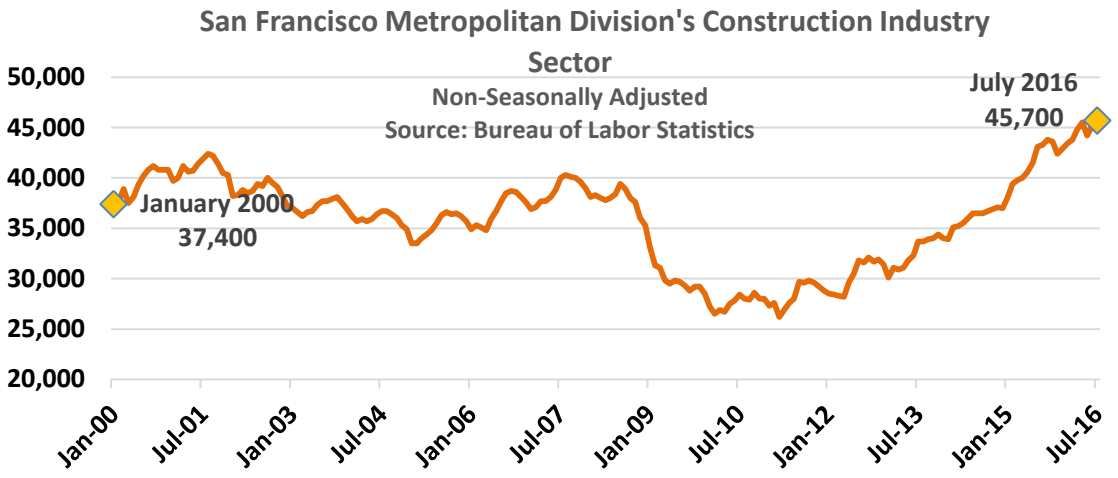
Source: CA Employment Development Department, Labor Market Information Division, September 2016

B. Construction Employment in the San Francisco Metropolitan District

Construction employment in the San Francisco Metropolitan Division has largely followed the ups and downs of state construction employment since January 2000. However, the growth since July 2010 has outpaced the state growth.

San Francisco is grouped with San Mateo County for the San Francisco Metropolitan Division (SFMD)—previously Marin County was also included in this group, though it is now grouped with Sonoma County. The construction employment in the SFMD has risen from slightly above 25,000 jobs in 2011 to the July 2016 number of 45,700.

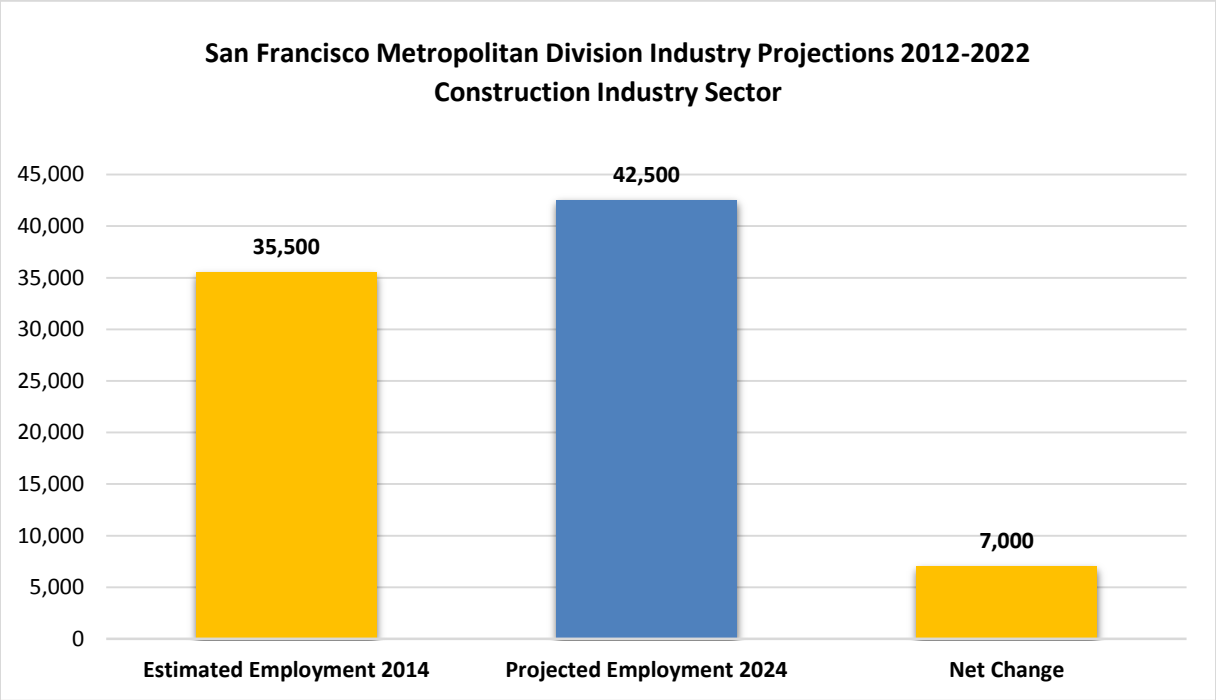
Chart 3: Employment Trends for SF Metropolitan Division Construction Industry Sector



Source: CA Employment Development Department, Labor Market Information Division, September 2016

EDD's last construction employment projections for the SFMD date from 2012, and cover the period 2012-2022. They show employment reaching 42,500 construction jobs by 2022. This is below the construction jobs number reached in 2016. EDD officials acknowledge that they failed to anticipate the enormous construction activity in San Francisco during the past few years, and expect to update these numbers soon. At the same time, they warn that even a net change of 33% over this period would result in around 60,000 jobs—not dramatically different given the 1,089,000 jobs currently in the SFMD.

Chart 4: Employment Projections for SF Metropolitan Division of Construction Industry Sector



Source: CA Employment Development Department, Labor Market Information Division, September 2016

C. Activity Driving Construction Employment

As EDD noted, currently San Francisco is experiencing "enormous" construction activity. This is being generated by both City-sponsored projects as well as by major privately sponsored projects. In its most recent City and County of San Francisco Capital Plan, the City stated, "San Francisco is riding a historic wave of infrastructure investments."[3] Between 2016 and 2025, the City has identified $32 billion dollars in infrastructure investments that include $23 billion dollars in direct city investments and another $9 billion dollars in external agency investments. For the current fiscal year, 2015-16, the City has adopted a capital

[3] City and County of San Francisco, **CAPITAL PLAN 2016-2025** | *Executive Summary,* p. 3 April 21, 2015

budget of $115 million dollars, a level of investment that is presented as "the highest capital budget in recent history and several times larger than some of the capital budgets during the recent recession." [4]

The City's Capital Plan lists a number of the City's most critical projects that are currently in either the planning or construction phases. These are all large multi-billion or multi-million dollars projects. They include:

- Improvements to the San Francisco General Hospital campus
- Veteran's War Memorial Building Retrofit
- Water System Improvement Program
- Sewer System Improvement Programs
- HOPESF Housing Projects
- Pier 70
- Moscone Center Upgrade
- Seawall Lot 337 Development projects
- Neighborhood Park Renovations
- Major Transportation Projects such as Muni Forward, Vision Zero Pedestrian Safety Program, Van Ness and Geary Bus Rapid Transit (BRT) projects, improvements at SFO, Central Subway, Transbay Terminal, and Presidio Parkway Project

In addition to these City-sponsored projects, the Office of Economic and Workforce Development (OEWD), which tracks construction work undertaken privately or by other public entities as part of its responsibilities as the City's First Source Hire Policy Administrator, estimates that projects totaling $16.3 billion dollars will be initiated and under construction in San Francisco prior to 2025. These are listed on Chart 5.

Chart 5: Non-City Sponsored Projects: Pipeline of Major Construction in San Francisco – 2016-2020

PROJECT	TYPE OF PROJECT	ESTIMATED VALUE
Warriors Arena	Sports Arena	$1 billion
5 M Development	Office and Residential	$450 million
Park Merced	Residential	$1.3 billion
SF Honda Dealership	Commercial	$300 million
Treasure Island	Residential & Commercial	$1.5 billion
Schlage Local	Mixed Use	$637 million
Potrero Power Plant	Redevelopment site	$2 billion
SF Goodwill Site		$500 million
Executive Park	Commercial	$500 million
I-280 Removal and Caltrain	Transportation	$2.6 billion

[4] Ibid.

PROJECT	TYPE OF PROJECT	ESTIMATED VALUE
Railyard Removal		
Salesforce	Commercial	$1 billion
Hunters Point Shipyard Phase 2	Residential & Commercial	$2.4 billion
California Pacific Medical Center	Hospital & Medical Office Building	$1 billion
UC San Francisco	Hospital, Research & Office Buildings	$1.2 billion

Source: SF Office of Economic and Workforce Development, Report to Mayor's Construction Workforce Advisory Committee, June 2016

The combination of these City and privately sponsored building projects will produce pronounced numbers of construction skilled trades positions over the next nine years through 2025. OEWD estimates that infrastructure projects alone will produce six million construction work hours each year.

D. Conclusions Regarding Demand for Construction Employment

San Francisco has emerged from the Great Recession much like it did from the Great 1906 Earthquake, with a passion for construction and infrastructure expansion. The city's public and private sectors have set in motion some of the largest building projects in the city's history. In addition to major projects, the 2013 Labor Market Analysis of SF Construction noted that much of San Francisco's construction employment is generated by repairs to existing commercial buildings and residential construction and repairs. Therefore, it is safe to predict that construction employment will remain high throughout the current decade and into the early years of the next. So far, the thriving local economy is supporting this forecast.

E. Summary of Findings

Since 2010, construction employment overall in California and in San Francisco has continued to rise as the economy has rebounded. Construction employment statewide grew from 545,500 construction jobs in July 2010 to 761,200 jobs in July 2016. In the San Francisco-San Mateo Metropolitan District, construction employment rose from 25,000 jobs in July 2011 to 45,700 jobs in July 2016.

Further, the projection for San Francisco construction employment , in particular, is strong in the next years with $32 billion in infrastructure investments planned from 2016-2025 and an additional $16.8 billion in private construction projects during this period.

Section 2: Demand for Professional Services Occupations

Section 2: Demand for Professional Services Occupations

A. Professional Services Occupations Overview

Professional occupations associated with construction are an important and often overlooked area of analysis when calculating jobs generated by a project or assessing labor demand. This report includes a review of the demand for professional services occupations as these fields, like the construction skilled trades are anticipated to remain in demand or expand in step with San Francisco's robust construction sector.

Professional services are jobs that are critical in the construction of a large project, but fall outside of the skilled trades jobs generated by construction. Professional services include these broad areas:

- Design, Architecture, and Engineering
- Environmental Testing and Remediation
- Compliance and Safety
- Project and Construction Management
- Community Planning and Outreach

Chart 6 below shows a number of the occupations that are common to each of these broad professional services areas. The list is not exhaustive but rather indicative of the types of jobs that are included under the rubric of professional services.

Chart 6: Sample Professional Services Occupations

PROFESSIONAL SERVICES AREA	OCCUPATIONS
Design and Engineering	Architect Architectural Drafter CAD Operator Architectural/Engineering Manager Civil, Mechanical, Electrical, Structural Engineer Surveyor Survey and Mapping Technician
Environmental Testing and Remediation	Environmental Engineer Environmental Remediation Specialist Environmental Engineering Technician Environmental Technician

PROFESSIONAL SERVICES AREA	OCCUPATIONS
Safety and Compliance	Construction and Building Inspector Materials Tester
Program, Project and Construction Management	Program Manager Project Manager Construction Manager
Community Planning and Outreach	Urban/Community Planner Communications/Public Relations Specialist Community Outreach Specialist

Source: CA Employment Development Department, California Occupational Guides, 2016

B. Demand for Professional Services – San Francisco

The outlook data for professional services positions are tracked and reported by EDD similarly to overall construction employment data. The data for San Francisco County is combined with data from San Mateo County and reported as the San Francisco-Redwood City-South San Francisco Metropolitan Division (San Francisco and San Mateo Counties).

The chart below shows projected growth or demand for construction-associated professional occupations for the San Francisco Metropolitan Division (SFMD) 2014-2024. There is modest demand projected across most of the professional occupations areas, with the strongest growth overall projected for Architectural and Engineering Manager and Urban Planning areas.

Chart 7: Outlook for Professional Services Occupational Growth

PROFESSIONAL SERVICES OCCUPATION AREAS	OCCUPATIONS	OCCUPATIONAL GROWTH/DEMAND SFMD 2014-2024
Design & Engineering	Architectural Drafter	-19.1%
	Architectural/Engineering Manager	9.6%
	Civil Engineer	-4.6%

PROFESSIONAL SERVICES OCCUPATION AREAS	OCCUPATIONS	OCCUPATIONAL GROWTH/DEMAND SFMD 2014-2024
	Engineering Technician	-2.4%
	Surveyor	-15.4%
	Surveying and Mapping Technician	-7.1%
Environmental Engineering	Environmental Engineer	6.8%
Safety and Compliance	Construction and Building Inspector	-1.1%
Construction & Project Management	Construction Manager	7.1%
	Urban/Community Planner, Project Manager	10%
Community Planning and Outreach	Communications/Public Relations Specialist	7.9%
Secretarial and Administrative Assistant except Legal, Medical and Executive	Secretaries, Office Assistants	1.7%

Source: CA Employment Development Department, Labor Market Information Division, January 2017.

Demand is understood in two ways - in terms of growth of the occupational sector and in terms of the numbers of jobs that become available in a given interval as an outcome of this growth combined with replacement of existing positions. Depending on its base, an occupational sector may project strong growth, but because the size of the sector is small, this may translate into fewer jobs than another more robust sector for which weaker growth is projected. The chart below shows actual numbers of jobs projected, including replacement of existing jobs.

In terms of real numbers of San Francisco jobs, the largest demand is anticipated for Construction Managers (240) followed by Secretarial and Administrative Support (177), Architectural/Engineering Managers (92), Civil Engineers (90) and Public Relations Specialists (70).

Chart 8: Annual Job Openings for Professional Services Occupations

OCCUPATIONS	ANNUAL JOB OPENINGS INCLUDING NET REPLACEMENTS SFMD B 2014-2024
Architectural & Civil Drafter	16
Architectural/Engineering Manager	92
Civil Engineer	90
Engineering Technician	10
Surveyor	4
Surveying and Mapping Technician	2
Environmental Engineer	15
Construction and Building Inspector	26
Construction Manager	240
Urban/Community Planner	20
Communications/Public Relation Systems Specialist	70
Secretaries, Office Assistants	177

Source: CA Employment Development Department, Labor Market Information Division, January 2017.

In addition to the occupations listed in the tables above, there are a host of professional supportive positions and entry-level positions that unfortunately cannot be teased out easily from the EDD data. Such jobs as document control clerks, field engineering technicians, office assistants and other administrative support positions, quality assurance/quality control specialists, construction field secretaries, contract administrators, human resources support specialists, compliance specialists, project control technicians and office managers cannot be identified solely for the construction sector. Nonetheless, each major construction project will include hires in all or most of these occupations. As local construction activity remains high, the demand for these types of construction related positions, although modest, will also persist.

C. Conclusions Regarding Demand for Professional Services Employment

Overall there is strong demand for each of the five areas of construction associated professional services occupations. This is true statewide, regionally and within the San Francisco Bay Area. Demand projections indicate the strongest growth in the Environmental and Remediation areas. In terms of real numbers of jobs, three professional / managerial occupations lead the way: Civil Engineer, Architectural/Engineering Manager, and Construction Manager. These professional services jobs like those in the skilled trades will be generated by every major private and publically sponsored building project in San Francisco in the coming years. The occupations that fall within the professional services domain, including the supportive and entry level jobs, will continue to be in high demand. These jobs, though smaller in number than those generated in the skilled trades, can serve as potential targets for San Francisco residents, and should be included in the construction workforce equation. As for all construction related employment, the consistent vibrancy of the city's economy will be a pre-requisite for persistent growth and high demand.

D. Summary of Findings

The projected construction boom will bring not only the construction jobs, but also jobs in related professional services. These professional services jobs range among five major areas of "Design and Engineering", "Environmental Engineering", "Safety and Compliance", "Project and Construction Management", and "Community Planning and Outreach". The professional services jobs like those in the skilled trades will be generated by each of the major private and public infrastructure projects.

Overall there is modest but persistent demand for each of the five areas of construction associated professional services occupations in San Francisco. Demand projections indicate the strongest growth in for Construction Management, Architectural/Engineering Management, Civil Engineering, Public Relations Specialists and their secretarial and administrative supportive and entry level counterparts.

Section 3: San Francisco Construction Workforce

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The earlier sections of the report focused on the demand for construction employment including both skilled trades and professional services occupations. This segment of the report concentrates on the existing San Francisco construction workforce with an emphasis on skilled trades workers. The data are drawn from the U.S. Census Bureau and the California Employment Development Department (EDD).

Just as with employment in other industrial sectors in San Francisco's economy, substantial numbers of construction workers commute in to job sites in San Francisco from their residences in other Bay Area communities. Also, to a lesser extent, some construction workers who reside in San Francisco commute out to jobs in other parts of the Bay Area. Therefore, when discussing the San Francisco construction workforce, it is important to distinguish between these segments. In this section, we have divided the San Francisco construction workforce into two sub-categories:

1. **Those workers whose primary worksite is in San Francisco County**, regardless of where they happen to live; and
2. **Those workers who live in San Francisco County**, regardless of where their primary worksite is located.

Following is a discussion of the general employment and demographic characteristics of workers in each of these sub-categories.

A. Characteristics of Construction Workers Whose Primary Workplace is in San Francisco

Payroll data from the EDD indicates there were 17,942 workers who were employed on construction worksites in San Francisco County in 2015. Unfortunately, this data does not contain any additional information about the characteristics of these workers beyond their mere numbers. A separate survey, however, conducted by the U.S. Census Bureau, the American Community Survey, does collect such information for a smaller sample of 744 workers who were employed on construction worksites in San Francisco County between 2012 and 2014. For the purposes of this study then, we overlaid the percentages from this Census survey to the EDD employment counts to provide an overall profile of employment and demographic characteristics of workers in this subcategory. For example, the Census survey revealed that 19% of their sample of 744 workers were Construction Laborers. We therefore applied this 19% to the 17,942 workers counted in the EDD survey to arrive at our estimate that 3,338 of the entire workforce were Construction Laborers.

Since 2015, there has been an upward trend in employment in San Francisco County both overall and in the construction industry. As of January 2017, EDD had not released county-level data from 2016. However, they had released employment data for the San Francisco Metropolitan Division that includes both San Francisco and San Mateo counties. These metropolitan figures indicate that total employment on construction worksites in the two counties continued to grow during 2016, increasing from 41,500 in June 2015 to 46,100 in December 2016. It would be reasonable to suppose a similar percentage increase occurred

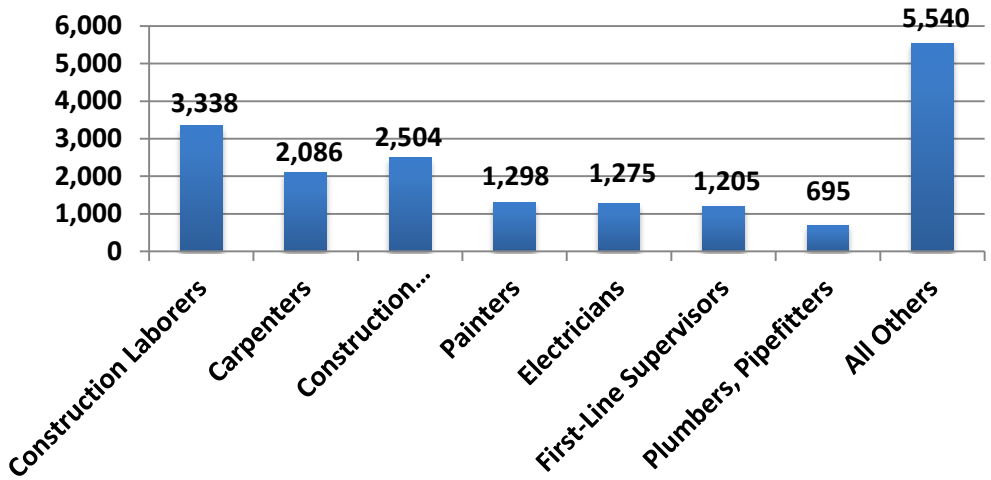
in San Francisco County alone during the same period. If so, San Francisco construction employment might have been nearer to 19,500 by December 2016.

As noted above, in the analysis that follows, we present estimates of how San Francisco's construction workforce is broken down by demographic and socio-economic characteristics. Since these estimates were based on percentage overlays derived from the most recent Census data available at the time of our analysis (2012-2014 averages) there is some possibility these percentages could have changed slightly since that period. In general however, changes in the proportion of any population by such factors as age, race/ethnicity, gender, educational attainment, etc. occur relatively slowly over time and we shouldn't expect that these would change markedly since 2012-2014.

- Distribution by Trade

The trades that dominate construction employment in San Francisco in 2015 are Construction Laborers (3,338), Carpenters (2,086) and Construction Managers (2,504), constituting about 42% of all construction jobs in the city. As can be seen in Chart 9, these were followed by Painters (1,298), Electricians (1,275), First-Line Supervisors (1,205) and Plumbers and Pipefitters (695).

Chart 9: Construction Workers Employed in San Francisco by Trade, 2015



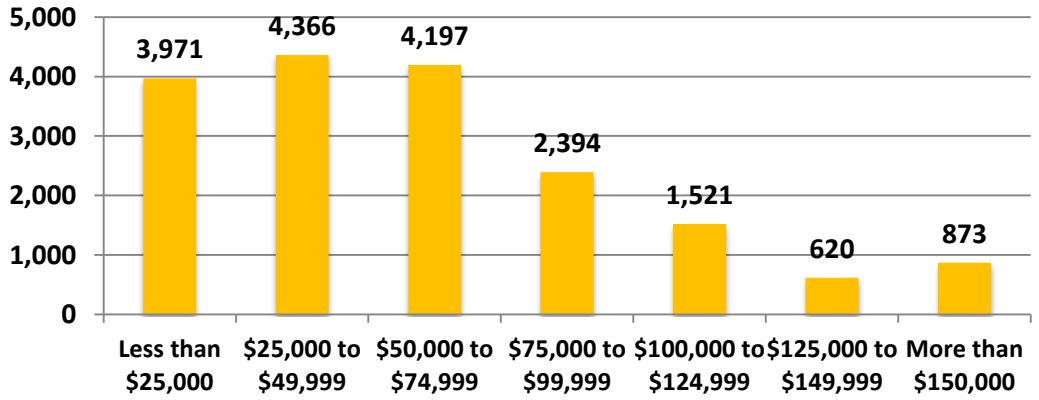
Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

- Distribution by Earnings

The earnings distribution of construction workers employed in San Francisco is shown in Chart 10. Average annual earnings were $62,950, and median annual earnings were $50,000. Nearly 4,000 or approximately one fifth of construction workers working in San Francisco earn less than $25,000 per year, and another 4,400 or approximately one quarter of workers earn between $25,000 to $50,000 annually. In broad strokes, the majority (69%) of workers are earning below $75,000 per year; however, there is a great deal of variation in the earnings of workers. The universe of construction industry workers considered in these surveys

includes both workers in the construction occupations and those employed in the construction industry. It includes both union and non-union members, and all of those involved in specialty trades as well as residential trades.

Chart 10: Construction Workers Employed in San Francisco by Annual Earnings, 2015



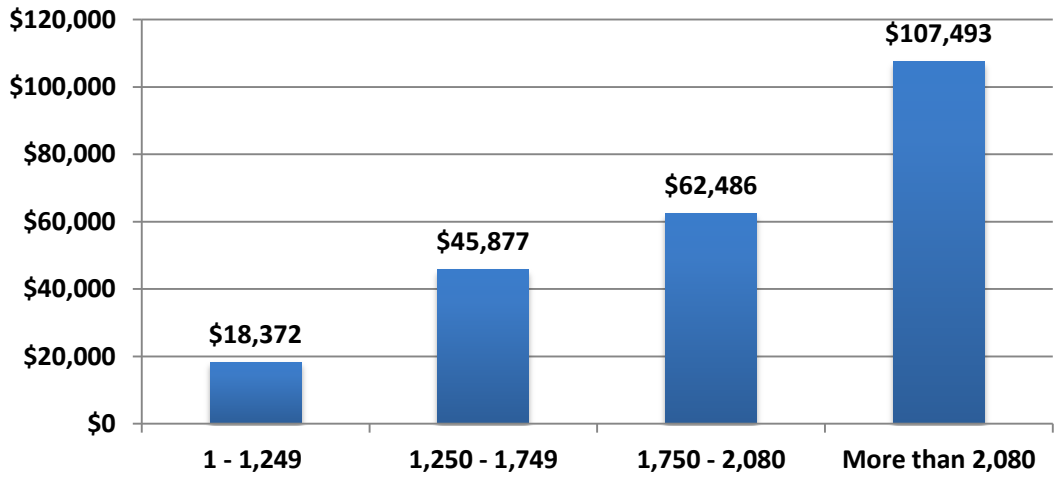
Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

- Distribution by Weeks Worked and Hours Worked

Although the mean annual earnings of construction workers working in San Francisco was estimated to be $62,950, nearly one-third were estimated to earn less than $30,000. In a previous report, we found that a primary cause of relatively lower annual earnings for some construction workers was that they did not work regularly throughout the year. Since construction is a seasonal activity, and because contract work is more sporadic than other types of employment, we found that some workers go through sizable stretches during the year when they are not fully employed.

Finally, we analyzed the relationship between annual earnings and hours worked during the year for construction workers working on job sites in San Francisco. Chart 11 shows the very strong relationship between earnings and hours for these workers. For the 3,509 who worked more than 2,080 hours, mean annual earnings were more than $100,000. The 9,082 workers who worked between 1,750 and 2,080 hours earned an average of $62,480 during the year, very close to the mean for the entire group of construction workers working in San Francisco reported earlier. Those working fewer than 1,750 hours during the year earned progressively less: $45,877 for those working between 1,250 and 1,749 hours, and just $18,372 for those working less than 1,250 hours.

Chart 11: Construction Workers Employed in San Francisco Mean Annual Earnings by Total Hours Worked During the Year, 2015

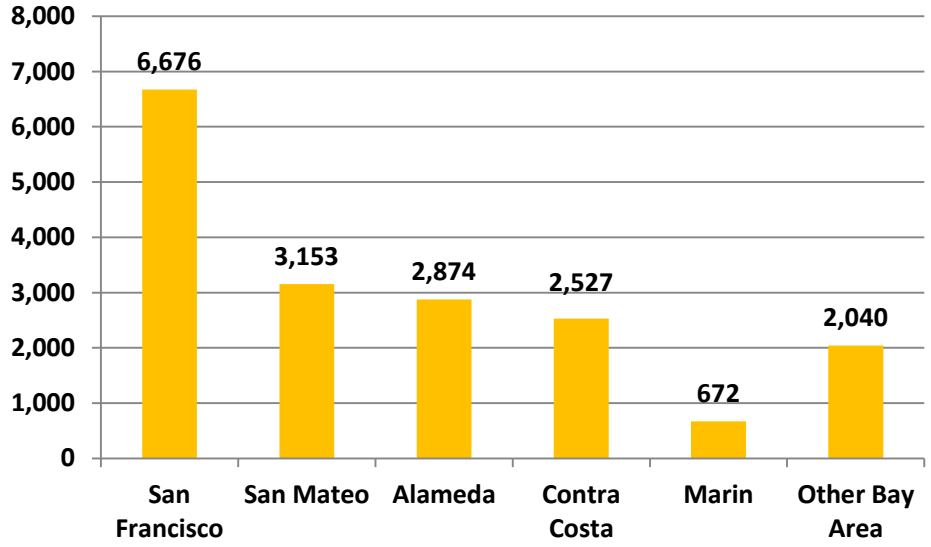


Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

- Distribution by County of Residence

Construction workers employed in San Francisco reside throughout the Bay Area, but as Chart 12 indicates, the largest number by far, 6,676 or 37.2% live in San Francisco County itself. The next most represented counties of residence are those closest to San Francisco: San Mateo (17.6%), and Alameda (16%). Of counties further away, Contra Costa (14.1%), and Marin (3.7%) are the most represented.

Chart 12: Construction Workers Employed in San Francisco by County of Residence, 2015



Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

- Distribution by Educational Attainment

In terms of the educational attainment of construction workers employed in San Francisco, the largest segment - almost 60% - has completed high school or some college, considered the threshold education to participate in construction. More than 50% of workers haven't studied beyond high school. A substantial 16% (2,874) left school before even entering high school. Almost a quarter or approximately 24% of construction workers employed in San Francisco have a four-year college degree or post graduate degree.

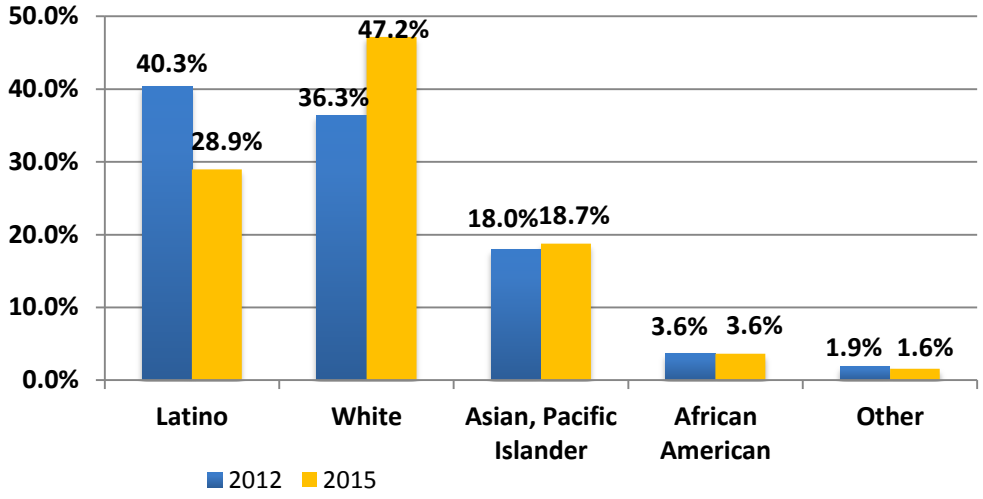
- Distribution by Gender

A dramatic gender imbalance among construction workers persists. In our 2013 report, we noted that female construction worker employment had declined to just 2% from 3% in 2010. In our latest estimates, this figure has remained at 2.1%, with 382 female workers out of 17,942 workers employed in San Francisco.

- Distribution by Race & Ethnicity

Chart 13 shows that in terms of race and ethnicity, nearly 8,500 of the San Francisco construction workforce is Non-Hispanic White, and that over 5,000 of it is Latino. There are just about 4,250 workers who are Asian, African American, or Other. The racial and ethnic composition of the construction workforce has changed since our 2012 findings as can be seen in Chart 13; White construction workers are now the majority with 47% of construction workers employed in San Francisco classified as Non-Hispanic Whites. This is followed by Hispanics who make up approximately 29% of construction workers employed in San Francisco. Non-Hispanic Asians maintains a major presence with 3,361 workers, 19% of workers. Non-Hispanic African Americans and Other races make up less than 6% of this distribution, which is consistent with the numbers in our 2012 report.

Chart 13: Construction Workers Employed in San Francisco by Race/Ethnicity Comparing 2015 to 2012

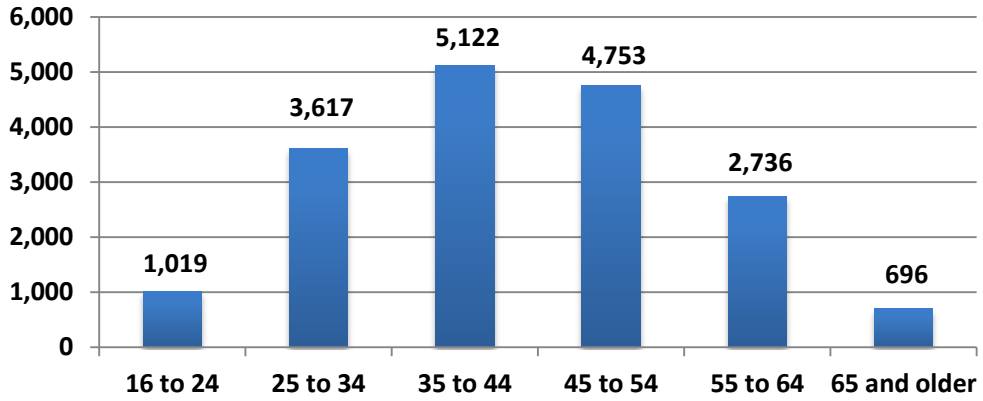


Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

- Distribution by Age

The age distribution of construction workers employed in San Francisco is skewed towards older workers as indicated in Chart 14. While the largest number (5,122) are in the 35 to 44 age cohort, about 45% are aged 45 or older, while only about 26% are aged 34 or younger.

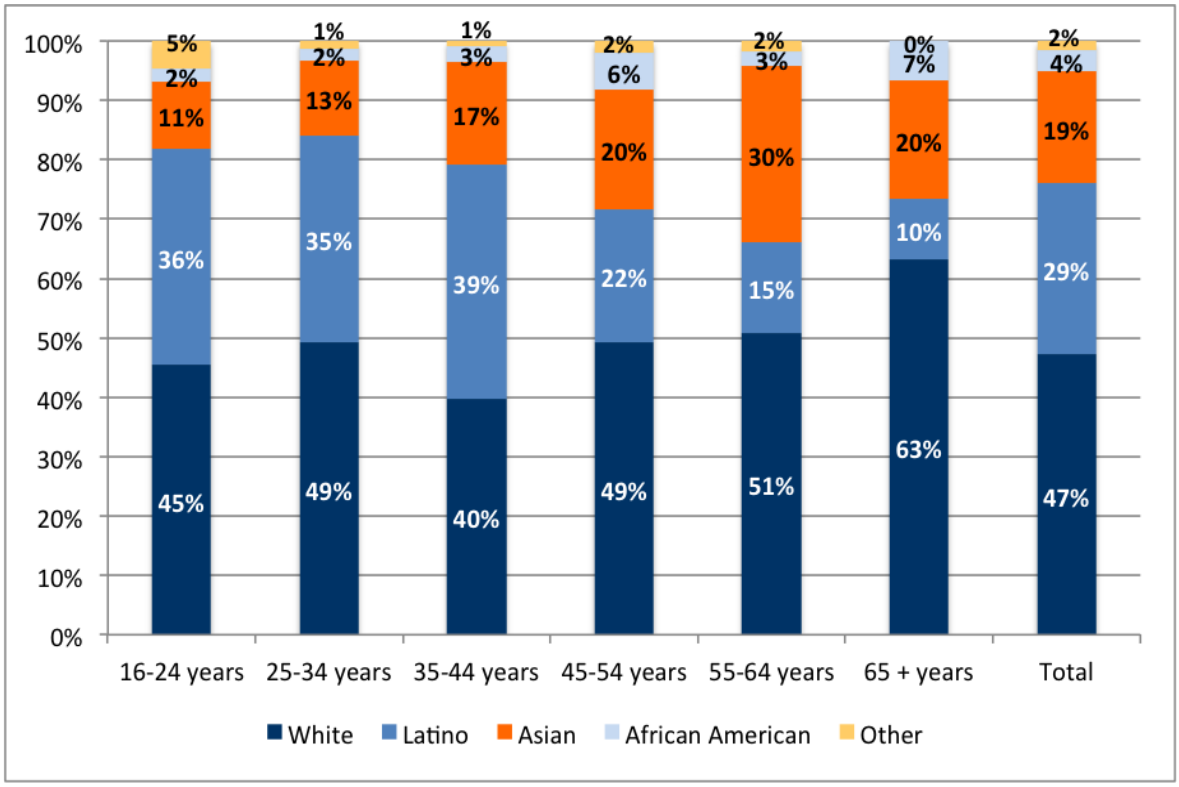
Chart 14: Construction Workers Employed in San Francisco by Age, 2015



Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

Chart 15 shows this age distribution further broken down by race and ethnicity. Two trends stand out. First, Asian construction workers are highly skewed towards older workers. Only around 11% of workers in the 16 - 24 age range are Asian. On the other hand, 30% of those in the 55 - 64 age range and about 20% in both the 35 - 44 range and over 65 range are Asian. The second trend is that Latino construction workers are heavily skewed in the opposite direction towards younger workers. Between 35% and 40% of workers younger than 45 are Latino, whereas fewer than 20% of workers 45 or older are. The White age distribution is tilted towards older workers while the African American distribution, while small, has a more stable age distribution than the other groups.

Chart 15: Construction Workers Employed in San Francisco by Age and Race & Ethnicity, 2015



Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

B. San Francisco Resident Construction Workers

We now turn to the second sub-category of the San Francisco construction workforce to profile those workers who live in San Francisco County, regardless of where their primary worksite is located. To estimate the demographic and employment characteristics of this group of workers, we used data from the U.S. Census, American Community Survey and the EDD payroll data. Since the EDD payroll data only counts workers by the place where they are employed as opposed to where they live, we used the Census data to estimate the percentage of workers in the five counties of the San Francisco-Oakland-Hayward Metropolitan Statistical Area who lived in San Francisco County. We then applied this percentage to EDD's aggregate count of all construction workers in the Bay Area to obtain an estimated 14,161 construction workers residing in San Francisco County in 2015.

As noted in our previous discussion of the characteristics of construction workers employed in San Francisco, EDD county-level payroll data for 2016 had not been released by January 2017. We therefore based our estimate of the number of construction workers residing in San Francisco County on the EDD data from 2015 that was available at the time of our analysis. However, EDD has released metropolitan-level data for construction employment in 2016 for all of San Francisco and San Mateo counties. These figures indicate that the construction employment in these two counties grew by around 8.9% between June of 2015 and

June of 2016. If there were a similar percentage increase in the number of construction workers residing in San Francisco, this might mean there were as many as 15,400 construction workers residing in San Francisco County by December 2016.

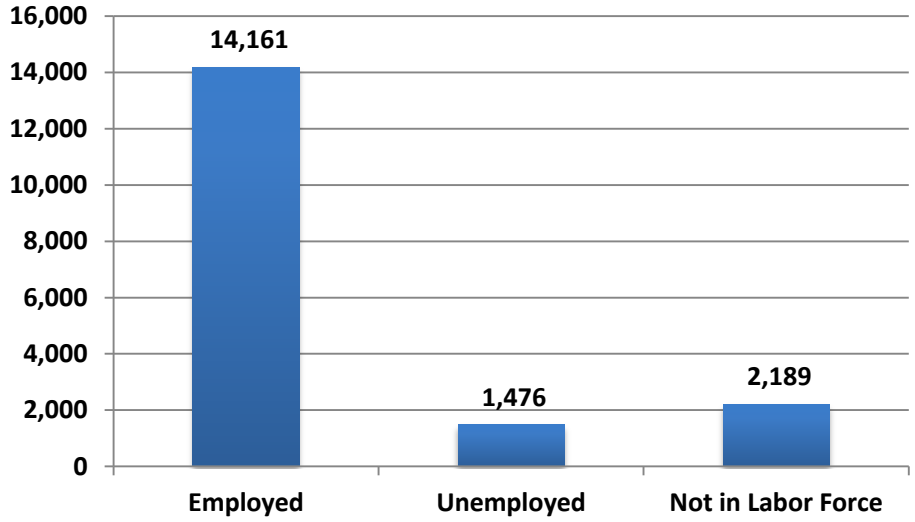
Following is a discussion of the general employment and demographic characteristics of the 14,161 workers residing in San Francisco in 2015, using information drawn from American Community Survey data.

- Employment and Unemployment

The Census survey asks respondents whether they were employed during the preceding week, and if not, were they actively seeking work. To be considered officially unemployed, a person who is not working must be actively looking for work. If they are not actively seeking work, they are considered to be "not in the labor force", even if they would like to work. In a bad economy, many workers who have lost their jobs and cannot find new ones become discouraged and stop looking, and then exit the labor market. So, a broader measure of employment status would not only consider employed and unemployed workers, but also those who are no longer in the labor force.

In another part of the Census survey, respondents are asked their primary occupation and industry in the previous calendar year, regardless of whether they were working or not in the preceding week. Using these two pieces of information from the survey, we were able to determine whether workers who lived in San Francisco and had been employed in construction during the previous year were presently employed, unemployed, or not in the labor force. Chart 16 shows our estimate of the employment status of San Francisco resident construction workers in 2015. It shows that in addition to the 14,161 persons employed, there were an estimated 1,476 persons unemployed, and another 2,189 who were no longer in the labor force.

Chart 16: SF Resident Construction Workers by Employment Status, 2015



Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

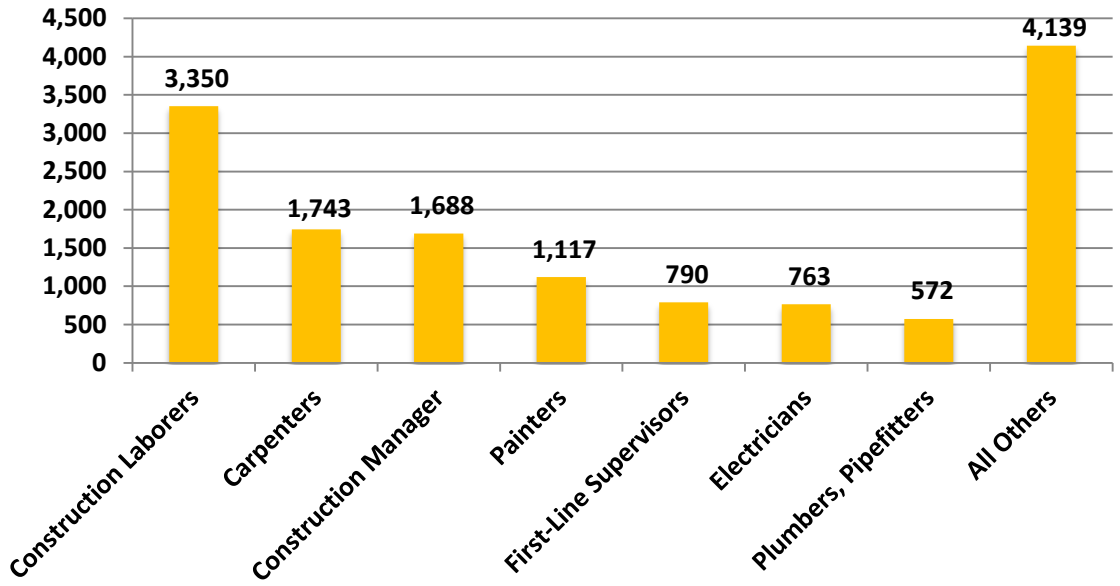
The Bureau of Labor Statistics defines the unemployment rate as the number of persons unemployed divided by the sum of the number of persons employed and unemployed. By this definition, the unemployment rate for construction workers living in San Francisco was estimated to be 9.4% in 2015.

According to EDD labor force data, overall unemployment in San Francisco County has fallen considerably since 2012, from an average of 6.8% in 2012 to 3.0% by December 2016. Unfortunately, EDD does not make unemployment estimates for specific industries like construction, and only estimates it for the county as a whole. We made our own estimate a 9.4% unemployment rate for construction workers in living in San Francisco in 2015 using the best information available to us at the time of our analysis. As with the rest of our analysis, this information came from two sources: the total number of construction jobs in San Francisco and nearby counties in 2015 using county-level EDD payroll data, and the percentage of construction workers living in San Francisco employed and unemployed from the 2012-2014 Census overlays. Both of these pieces of information are likely to have changed by January 2017, and unemployment in the construction industry is likely to be considerably lower today than 9.4%. However, we do not have access to more timely data that would allow us to make a numerical estimate of this unemployment rate at this time.

- Distribution by Trade

The distribution of trades for San Francisco resident construction workers follows a similar pattern as that of workers employed in San Francisco: the same seven trades that dominate construction employment in San Francisco mirror those for construction workers residing in San Francisco. Chart 17 shows that almost half of San Francisco resident construction workers are employed in three trades: Construction Laborers (23.7%), Carpenters (12.3%), and Construction Managers (11.9%).

Chart 17: SF Resident Construction Workers by Trade, 2015

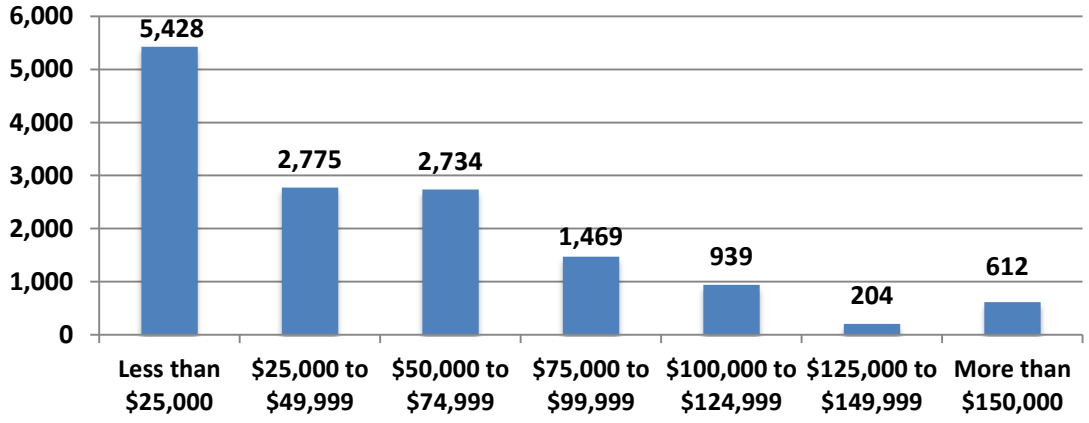


Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

- Distribution by Earnings

Chart 18 shows the distribution of annual earnings for San Francisco resident construction workers in 2015. Median annual earnings for San Francisco resident construction workers are $40,000, and the mean is $50,966. As can be seen, the largest number by far (5,428) earns less than $25,000 a year. EDD wage data indicated that earnings by construction workers employed at San Francisco worksites grew by 6.3% between 2015 and 2014. Unfortunately, county-level wage data by industry for 2016 had not been released by January 2017, so it was not possible for us to see if this level of wage growth continued over the next year.

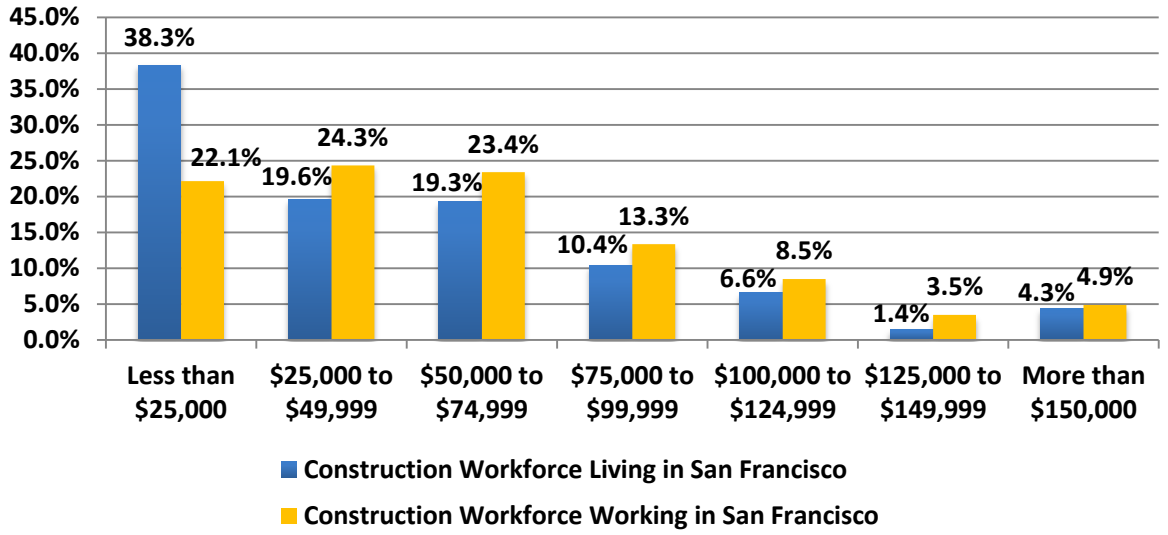
Chart 18: SF Resident Construction Workers by Annual Earnings, 2015



Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

Chart 19 shows that construction workers who live in San Francisco are earning considerably less than the broader Bay Area construction worker pool represented in the Employed in San Francisco data set discussed above. The biggest disparity shown is between those earning less than $25,000 annually. As can be seen, a far higher proportion (38%) of those living in San Francisco earn as little as this than those working in San Francisco (22%). For every other earnings category, there is a higher percentage of workers in the workforce working in San Francisco than the workforce living in it.

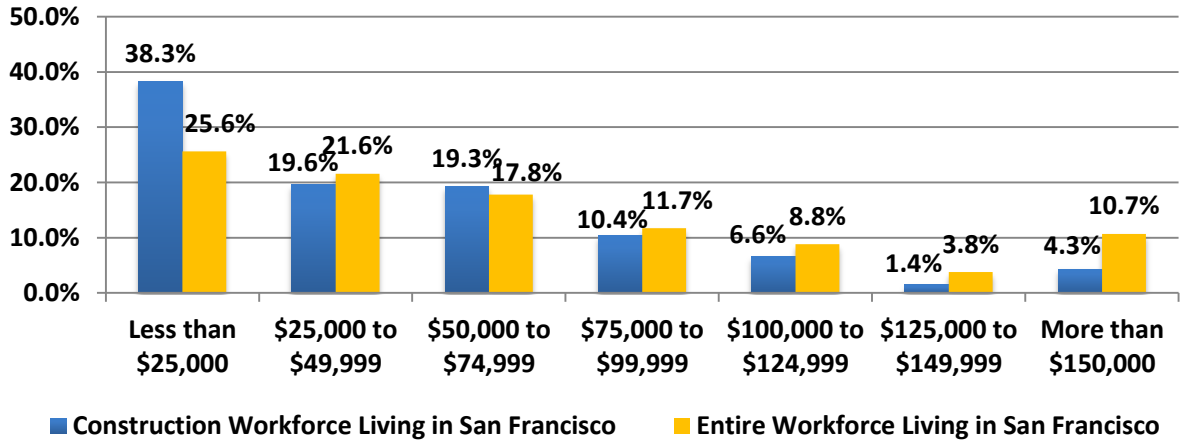
Chart 19: Annual Earnings of SF Resident Construction Workers Compared to Construction Workers Working in San Francisco, 2015



Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

Chart 20 compares annual earnings of construction workers living in San Francisco to earnings of all workers living in San Francisco regardless of occupation or industry. It shows that compared to the broad aggregate of all workers living in San Francisco, construction workers earn less and are disproportionately bunched in the lower earning ranges, particularly the under $25,000 category.

Chart 20: Annual Earnings of SF Resident Construction Workers Compared to All Workers Living in SF, 2015



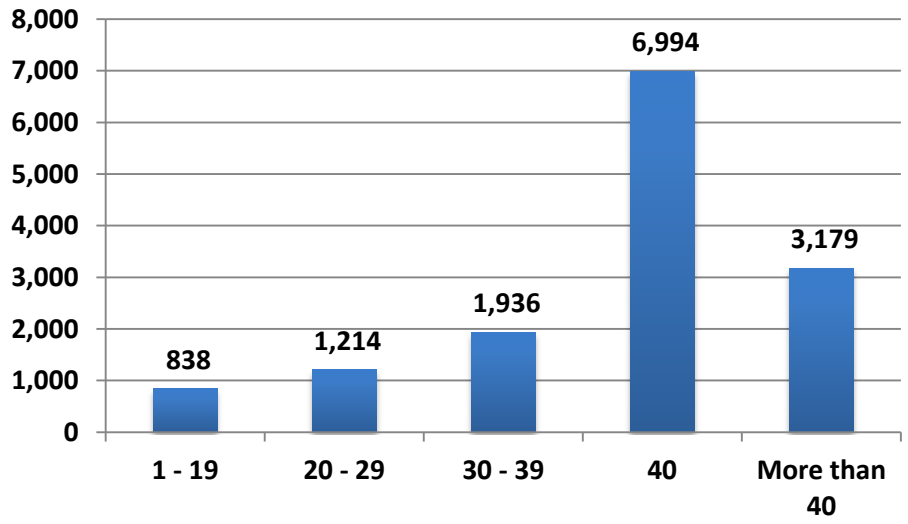
Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

- Distribution by Weeks Worked and Hours Worked

We saw earlier that for Construction Workers who were employed in San Francisco, a primary cause of relatively lower annual earnings was that some did not work regularly throughout the year. This is because construction is a somewhat seasonal activity, and because contract work is more sporadic than other types of employment. We wanted to see to what extent the relatively lower earnings of workers living in San Francisco could be attributed to the same cause. Therefore for these workers, we examined the number of hours worked during the typical week, the weeks worked during the year, and the estimated total number of hours worked during the year.

Chart 21 shows how the number of hours worked during a typical week varied among these workers in a similar pattern as it did for workers employed in San Francisco. Again, while nearly three-fourths of these workers reported working 40 or more hours during a typical week, around 28% reported working less than 40 hours, and around 14.5% reported working fewer than 30 hours during a typical week. All in all, a lower proportion of these workers worked 40 hours or more than the broader group of construction workers who worked in San Francisco.

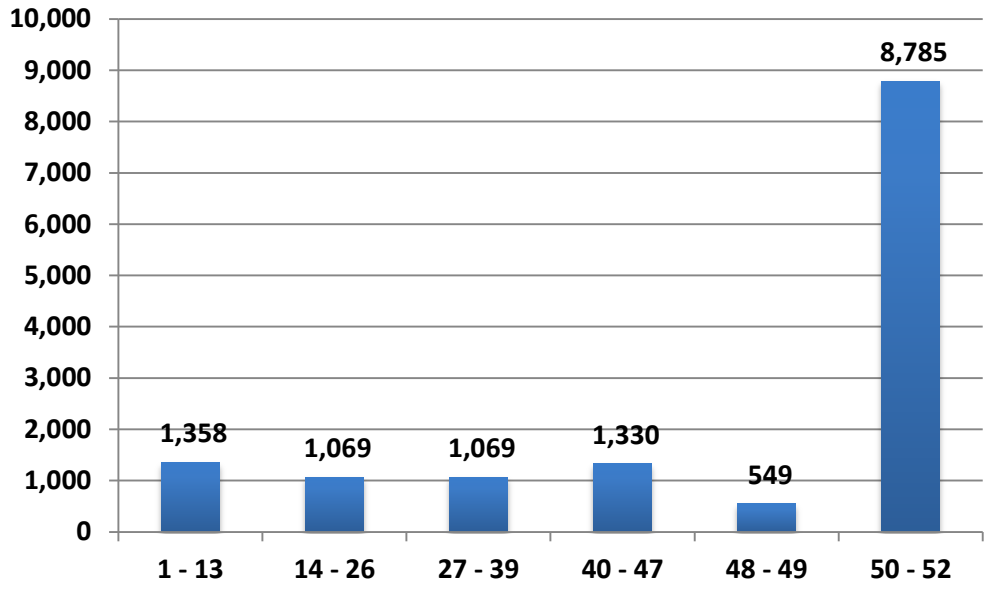
Chart 21: SF Resident Construction Workers by Hours Worked During a Typical Week, 2015



Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

Chart 22 shows how the weeks worked during the year varied for these workers. As can be seen, most workers did work close to a full year. An estimated 9,335 (66%) worked 48 weeks or more. However, 3,496 (24.7%) work fewer than 40 weeks. All in all, a smaller percentage of these workers worked more than 48 weeks than the broader group of construction workers working in San Francisco.

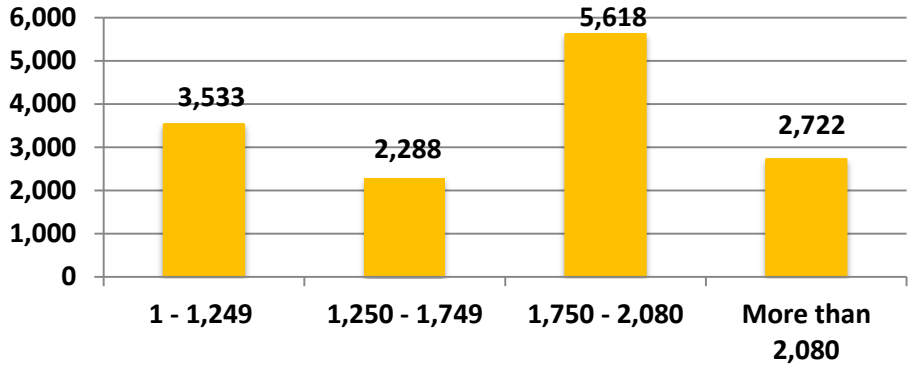
Chart 22: SF Resident Construction Workers by Weeks Worked During the Year, 2015



Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

Chart 23 shows the distribution of total annual hours worked during the year for these workers. We used the same method to estimate annual hours for each worker as we did before by multiplying the number of hours they reported working during a typical week by the number of weeks they reported to have worked. The mean annual hours worked for our sample of construction workers living in San Francisco was 1,690, about 100 hours less than the U.S. average. We found that a much higher proportion of these workers work fewer than 1,250 hours annually than the broader group of construction workers working on job sites in San Francisco.

Chart 23: SF Resident Construction Workers by Total Hours Worked During the Year, 2015

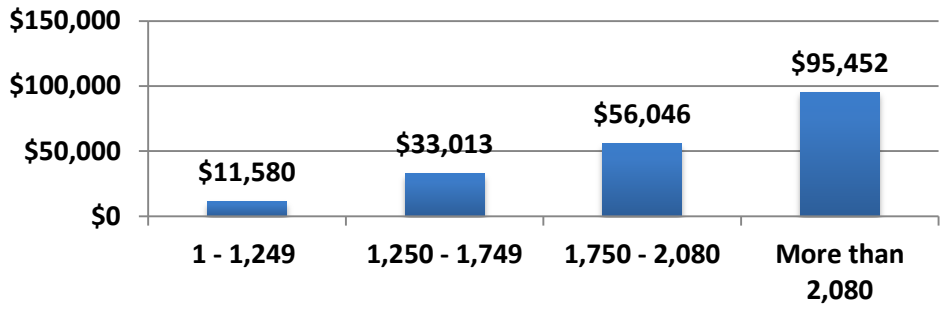


Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

Finally, we analyzed the relationship between annual earnings and hours worked during the year for construction workers living in San Francisco. Chart 24 shows the very strong relationship between earnings

and hours for these workers. For the 2,722 who worked more than 2,080 hours, mean annual earnings were around $95,000. The 5,618 workers who worked between 1,750 and 2,080 hours earned an average of $56,046 during the year, about $6,000 higher than the mean annual earnings level for the entire group of construction workers living in San Francisco. Those working fewer than 1,750 hours during the year earned progressively less: $33,013 for those working between 1,250 and 1,749 hours, and just $11,580 for those working less than 1,250 hours.

Chart 24: SF Resident Construction Workers Mean Annual Earnings by Total Hours Worked During the Year 2015

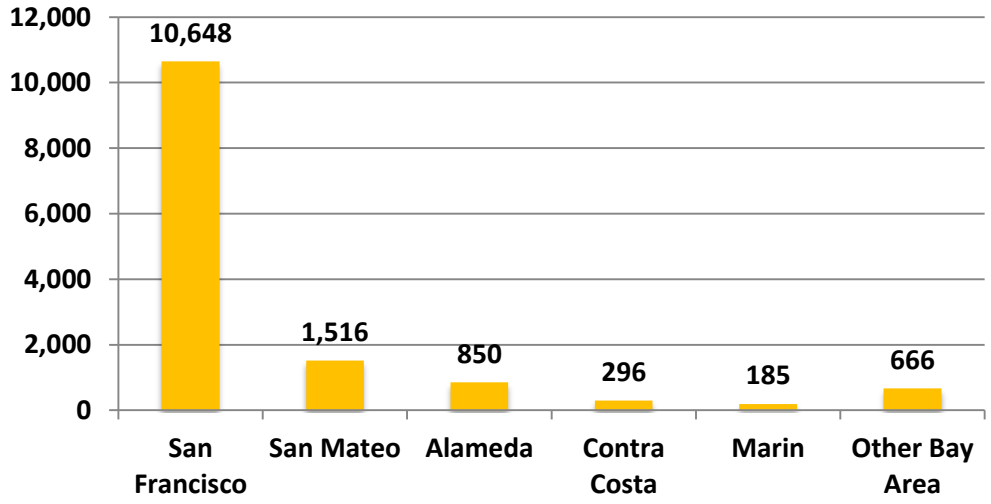


Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

- Distribution by County of Employment

Chart 25 shows the county where construction workers who live in San Francisco work. The large majority – 75% - work in San Francisco County itself. The remainder work largely in nearby San Mateo, and Alameda Counties.

Chart 25: SF Resident Construction Workers by County Where Working, 2015

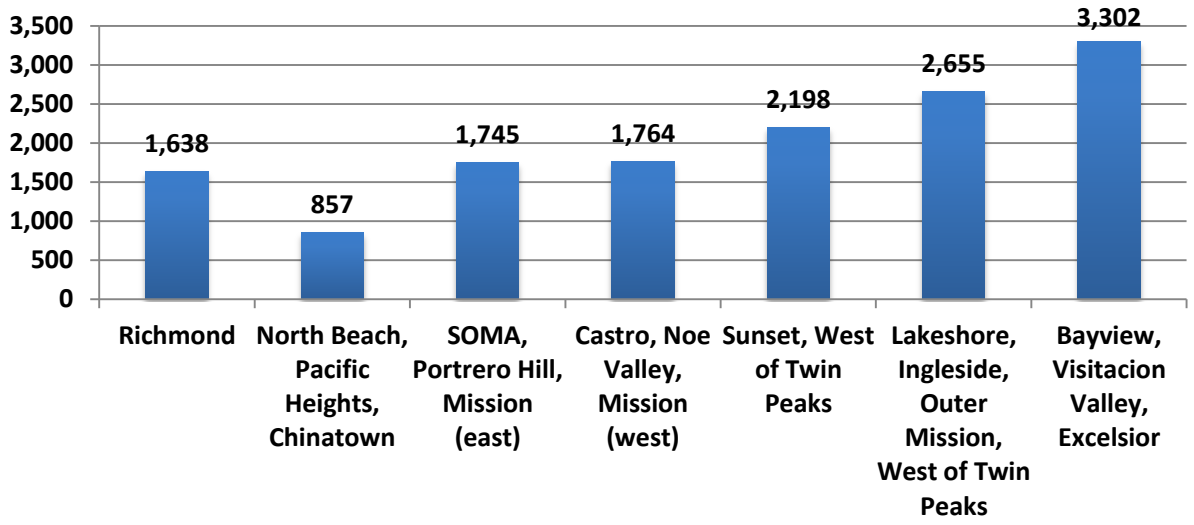


Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

- Distribution by San Francisco Neighborhood

Chart 26 shows the district in San Francisco where these construction workers live. The method the Census uses to define the seven separate Public Use Microdata Areas (PUMAs) in San Francisco shown in the chart is described in more detail later in this report (see Section 6). Nearly one quarter of these construction workers residing in San Francisco live in the Bayview, Visitacion Valley, and Excelsior PUMA corresponding most closely to Supervisorial District 10. Another 18.8% reside in the Lakeshore, Ingleside, Outer Mission, West of Twin Peaks PUMA and 15.5% reside in the Sunset and West of Twin Peaks PUMA.

Chart 26: SF Resident Construction Workers by Neighborhood of Residence, 2015

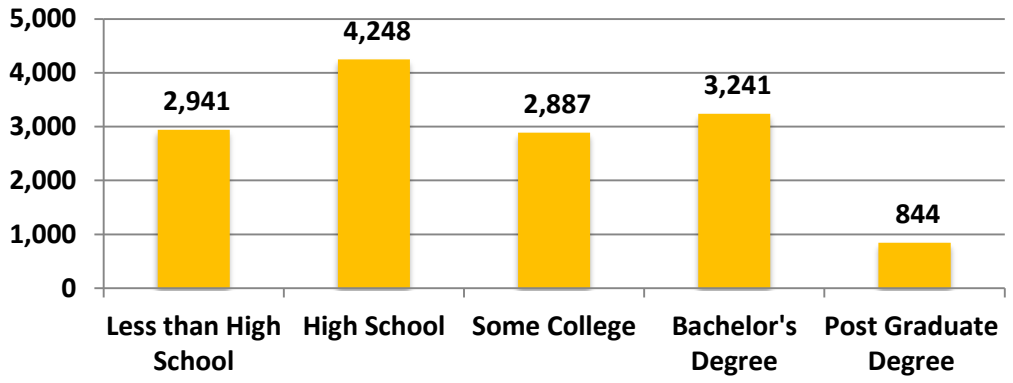


Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

- Distribution by Educational Attainment

Chart 27 illustrates the distribution of educational attainment among construction workers that live in San Francisco. There is significant representation in each segment of educational attainment, including 4 year college and post graduate; yet it is important to note that 50% of these workers have only obtained a high school education or less. On the other hand, about 27% have a four-year bachelor's degree or higher, and another 20% have had some college. Construction workers living in San Francisco have slightly more post-secondary education in comparison to the broader pool of Bay Area construction workers represented in the Employed in San Francisco data set. However, a higher proportion of construction workers who live in San Francisco (20%) have attained less than high school education.

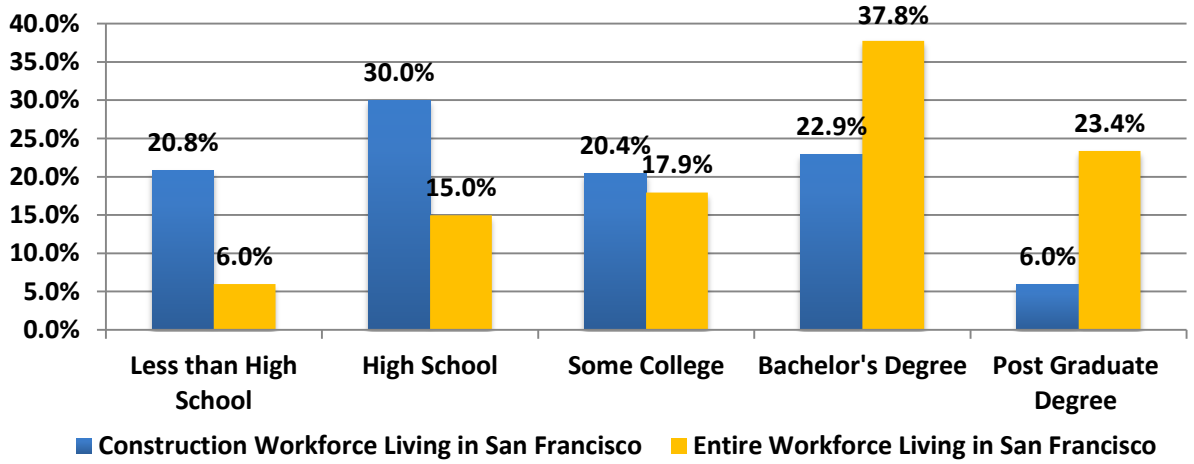
Chart 27: SF Resident Construction Workers by Educational Attainment, 2015



Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

Compared to other workers living in San Francisco, construction workers have less education on average. Chart 28 compares the percentages of workers in each educational attainment category for these two groups of workers. As can be seen, there are much higher percentages of workers with four-year Bachelor's Degrees and Post Graduate Degrees in the entire workforce than among construction workers.

Chart 28: Educational Attainment of SF Resident Construction Workers Compared to All Workers Living in San Francisco, 2015



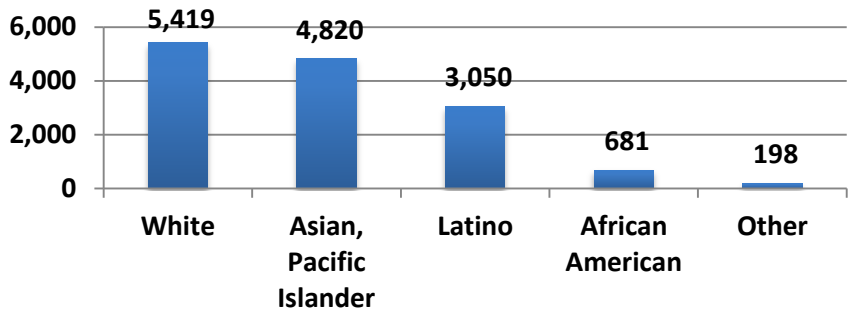
Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

- Distribution by Gender and Race & Ethnicity

As was true for construction workers employed in San Francisco, there are relatively few women construction workers living in San Francisco in 2015, just 2% (382). There is, once again, a major presence of Non-Hispanic Whites among resident San Francisco workers with 5,419 (38.3%) workers. Compared to the workers employed in San Francisco, there is a noticeably higher percentage of Asian and Pacific Islanders in the workforce with 4,820 (34%) workers. Similar to the broader group of workers employed in San Francisco,

Non-Hispanic African Americans and Multiracial make up a small percentage (about 6%) of all the resident San Francisco workers as illustrated by the chart below.

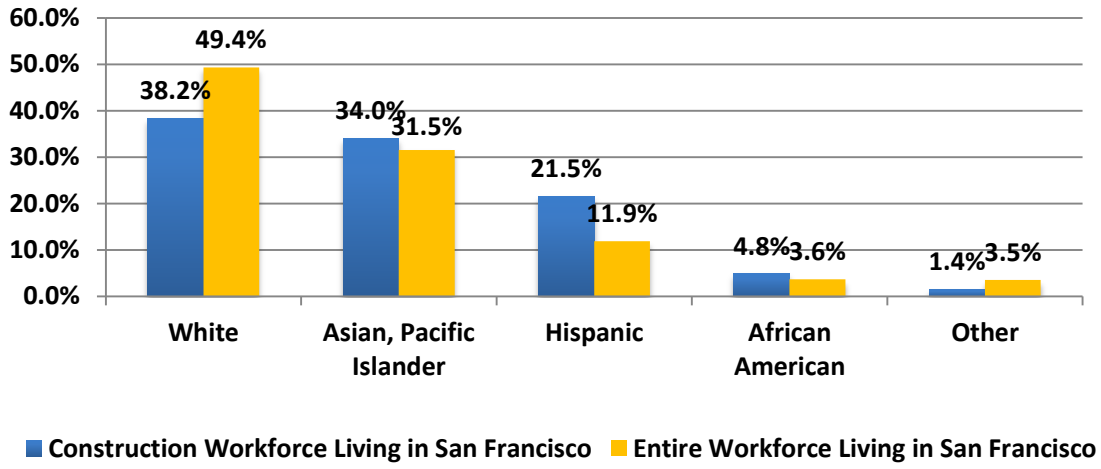
Chart 29: SF Resident Construction Workers by Race & Ethnicity, 2015



Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

Compared to other workers living in San Francisco, construction workers are racially and ethnically more diverse. Chart 30 compares the percentages of workers in each ethnic and racial category for these two groups of workers. As can be seen, there is a higher percentage of White workers in the entire workforce than among construction workers. On the other hand, there are higher percentages of resident construction workers than of other workers in each of the other racial and ethnic categories.

Chart 30: Race and Ethnicity of SF Resident Construction Workers Compared to All Workers Living in San Francisco, 2015



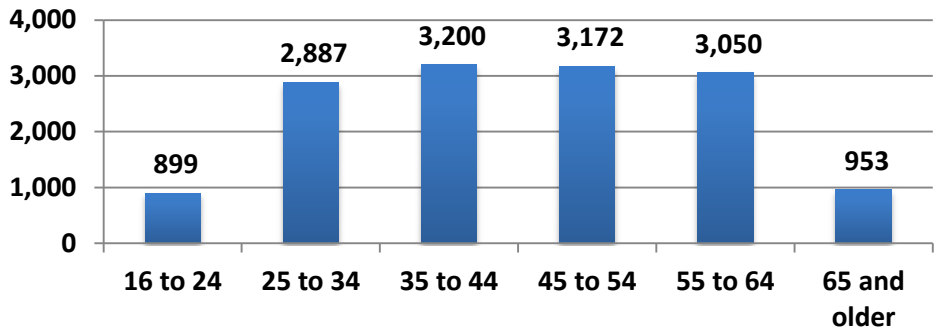
Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

- Distribution by Age

The age distribution of construction workers employed in San Francisco is even more highly skewed towards older workers than was the age distribution for the broader pool of Bay Area construction workers who are

employed in San Francisco. Chart 31 shows that over 7,000 of construction workers living in San Francisco are beyond the age of 45, and that less than 4,000 are below the age of 35.

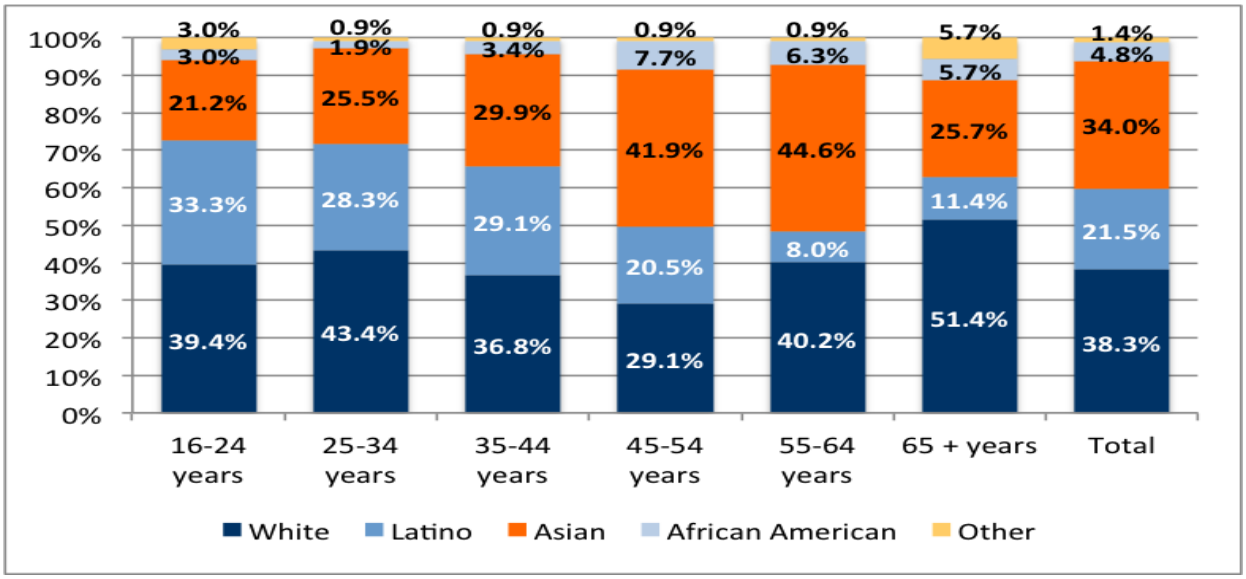
Chart 31: SF Resident Construction Workers by Age, 2015



Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

Chart 32 shows this age distribution further broken down by race and ethnicity. Several of the trends noted in our earlier analysis of the broader pool of Bay Area construction workers employed in San Francisco seem also to hold here for this group of construction workers residing in San Francisco, but are somewhat less pronounced. Again, in moving up the age range towards older age cohorts, there tend to be proportionately more Asian construction workers in the older age categories and proportionately fewer Latino construction workers. This was the same trend we saw for the broader group of all construction workers employed in San Francisco.

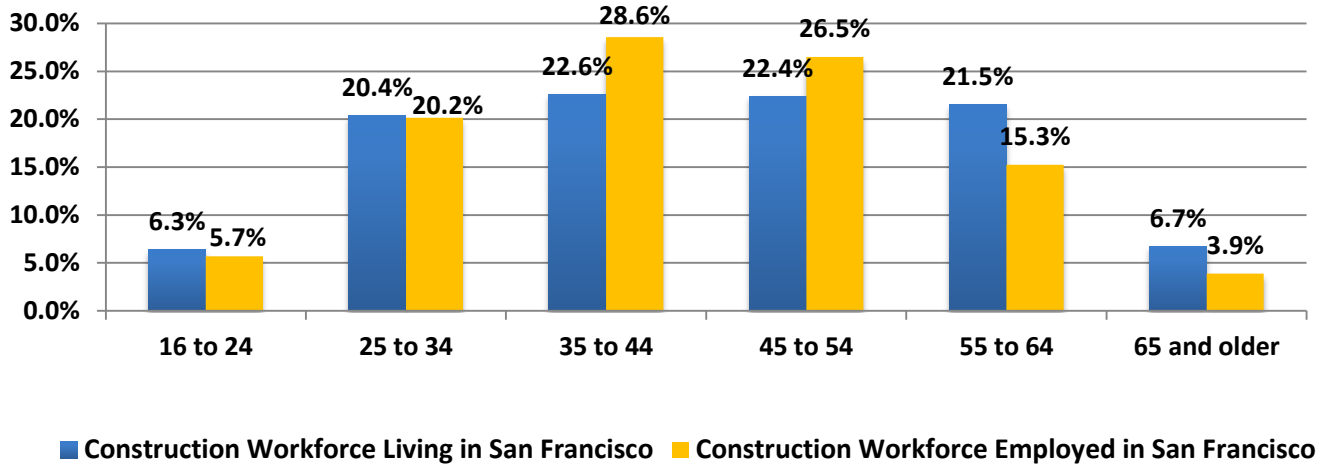
Chart 32: San Francisco Resident Construction Workers by Age and Race & Ethnicity, 2015



Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

Compared to the broader pool of Bay Area construction workers who are employed in San Francisco, those living in San Francisco are older. Chart 33 shows that in the comparison between these two groups of construction workers, there are similar percentages in the younger age ranges up through age 35, but for workers between the ages 35 to 55, there are proportionately fewer amongst those living in San Francisco than those working there. On the other hand, for workers beyond the age of 55, there are proportionately much higher numbers living in San Francisco compared to those working there.

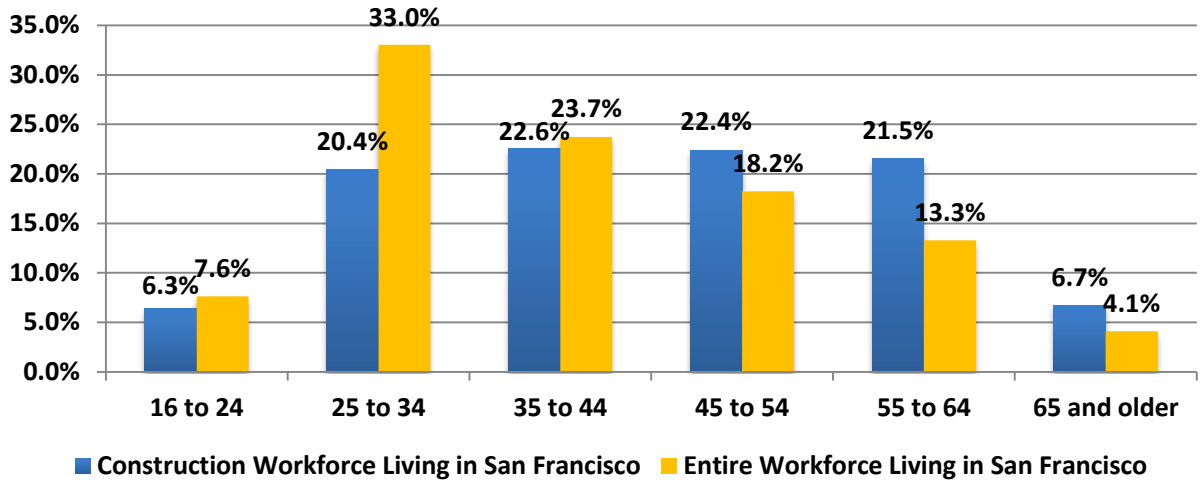
Chart 33: Age Distribution of SF Resident Construction Workers Compared to Construction Workers Employed in San Francisco, 2015



Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

Construction workers living in San Francisco are also older on average when compared to all workers who live in San Francisco. Chart 34 compares the percentages of workers in each age range for these two groups of workers. As can be seen, there are many fewer younger workers in the 25 – 34 year age range amongst construction workers than for all workers living in San Francisco. Additionally, for construction workers, there are much higher percentages in the age ranges beyond 45 than for all workers living in San Francisco in general.

Chart 34: Age Distribution of SF Resident Construction Workers Compared to All Workers Living in San Francisco, 2015



Source: CA Employment Development Department, and U.S. Census Bureau, American Community Survey

C. San Francisco Resident Construction Workers on City Projects

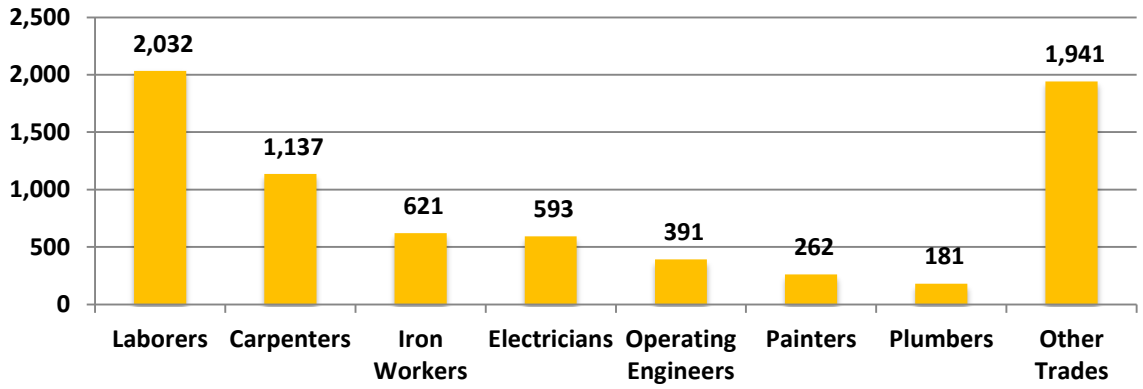
In this section of the report, we make use of the City's employment data available through the Elation Systems database to describe demographic and employment characteristics of San Francisco resident construction workers employed by construction contractors on City contracts. Because these workers are privately employed in construction and living in San Francisco, there will be some overlap with the workers described in the previous section for all construction workers living in San Francisco.

There are important limitations to working with the Elation Systems data. It was collected for the entire period between March 2011 and March 2016, and is based on cumulative hours for all contracts. It includes information on a worker's zip code, trade, gender, race and ethnicity, total hours per contract, and total compensation per contract. There is no information about a worker's age, education, or the year in which they accumulated hours or compensation.

- Distribution by Trade

Of the various construction trades employed on City contracts, Laborers make up the largest single group with over 2,000. Carpenters, with over 1,100, Iron Workers and Electricians, both with around 600, and Operating Engineers, with nearly 400, are other trades with significant employment on City contracts.

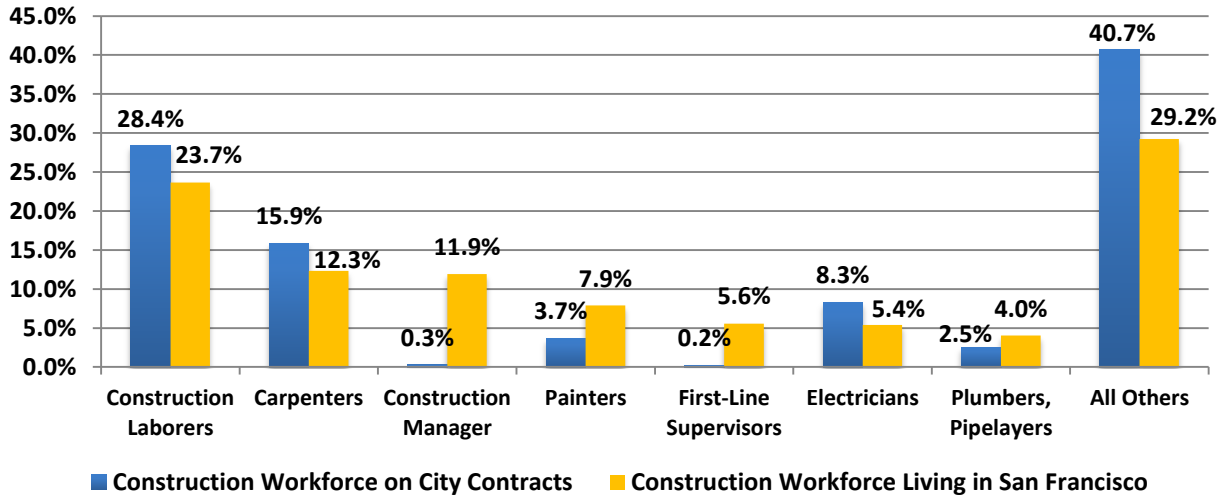
Chart 35: SF Resident Construction Workers on City Contracts by Trade, 2011-2016



Source: Elation Systems

The composition of trades amongst those construction workers on City contracts is broadly similar to that for all construction workers living in San Francisco, as can be seen in Chart 36. It shows that there are slightly higher proportions of Laborers, Carpenters, and Electricians on City contracts than there are amongst all construction workers living in San Francisco. It also shows relatively much fewer Managers and Supervisors, but this is probably due to the way the Census data is classified where these occupations are included in the construction trade category. With the Elation Systems data, many manager and supervisor positions are probably not included. Finally, while Iron Workers and Operating Engineers make up a relatively high percentage of the trades amongst workers on city contracts, there are relatively smaller proportions of these amongst all San Francisco resident construction workers.

Chart 36: Trades of SF Resident Construction Workers on City Contracts Compared to All Construction Workers Living in San Francisco, 2015



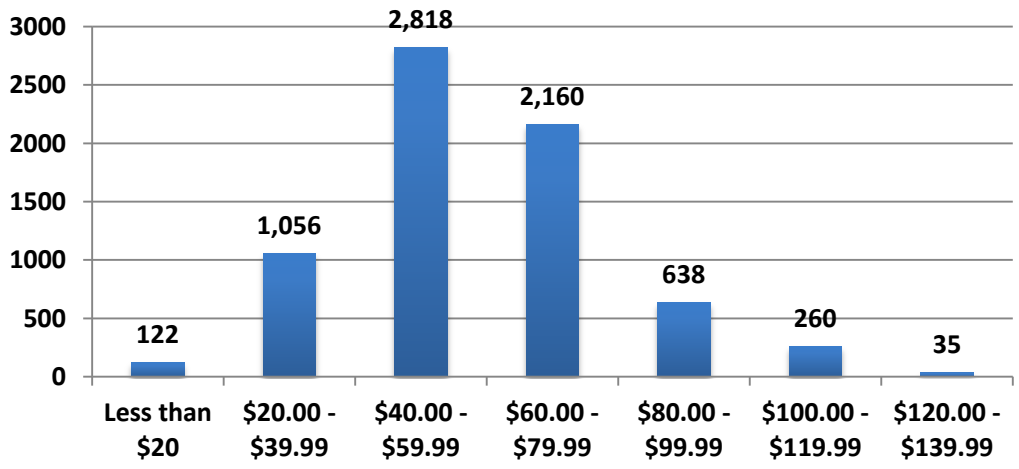
Sources: Elation Systems, CA Employment Development Department, and U.S. Census Bureau, American Community Survey

- Distribution By Compensation

The Elation Systems data we used to analyze characteristics of San Francisco resident construction workers on city contracts only provided each worker's total compensation and total hours for each contract project. Employment on a project could be for as short as a few weeks to as long as several years, and we did not have access to information on the duration of the project. Compensation included benefits as well as gross pay. From total compensation and total hours, we were able to calculate an hourly compensation rate. To adjust for outliers in the data, we dropped 70 workers who had calculated hourly compensation rates higher than $125 per hour. This left us with 7,089 workers to analyze in terms of compensation and hours.

Chart 37 shows that most SF resident construction workers on City contracts earned between $20 and $80 in hourly compensation. The highest number of workers, about 2,800, earned hourly compensation in the $40-$60 range. The next largest group, 2,160 workers, fell into the $60-$80 range, and another 1,050 fell into the $20-$40 range. Since we were unable to obtain a breakdown between gross pay and benefits in the Elation Systems compensation figures, it was not possible to make a direct comparison between the hourly pay of these workers on city contracts, and San Francisco resident construction workers as a whole. For those later workers, the census data only reports gross pay figures and not the value of benefits. Nonetheless, the hourly compensation rates reported here are roughly twice the hourly wage estimates from EDD and Census data reported earlier for all construction workers working in San Francisco. This is perhaps unsurprising since the EDD and Census data includes many nonunionized workers whereas the Elation Systems data includes primarily unionized workers whom comprise a significant number of workers on City contracts.

Chart 37: SF Resident Construction Workers on City Contracts by Hourly Compensation, 2011-2016

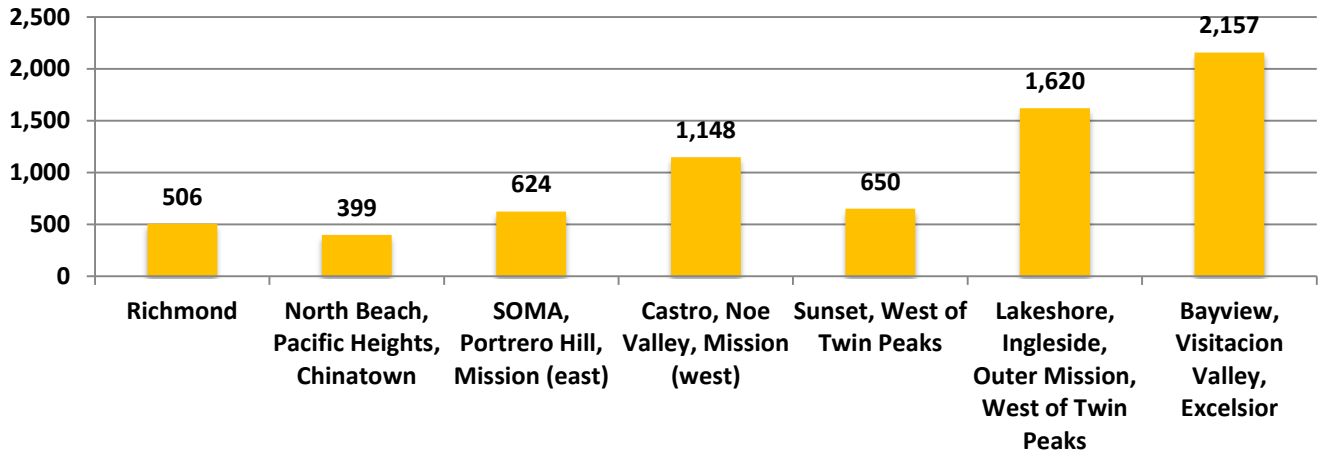


Source: Elation Systems

- Distribution by San Francisco Neighborhood

As explained above, the Elation Systems data provided information on each worker's Zip Code, and from this we were able to locate their PUMA (Public Use Micro Area) of residence consistent with the area of residence figures provided elsewhere in this report. Chart 45 shows that most construction workers on city contracts lived in either the Bayview, Visitacion Valley, Excelsior PUMA or the Lakeshore, Ingleside, Outer Mission, West of Twin Peaks PUMA.

Chart 38: SF Resident Construction Workers on City Contracts by Neighborhood of Residence, 2011-2016

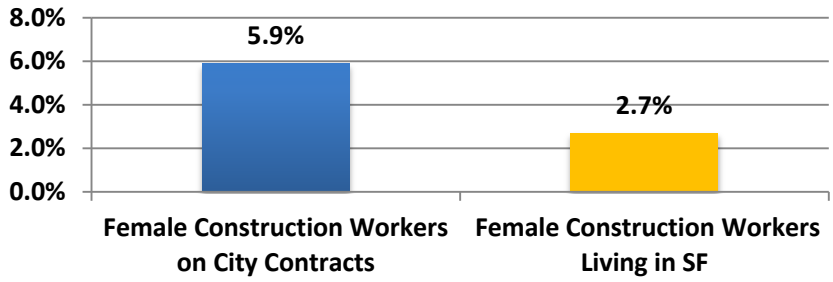


Source: Elation Systems

- Distribution by Gender

There were 419 women SF resident construction workers employed on City contracts from 2011-2016, constituting nearly 6% of all workers. While a low overall percentage, this still compares favorably to the percentage of females amongst all San Francisco resident construction workers, as can be seen in Chart 39.

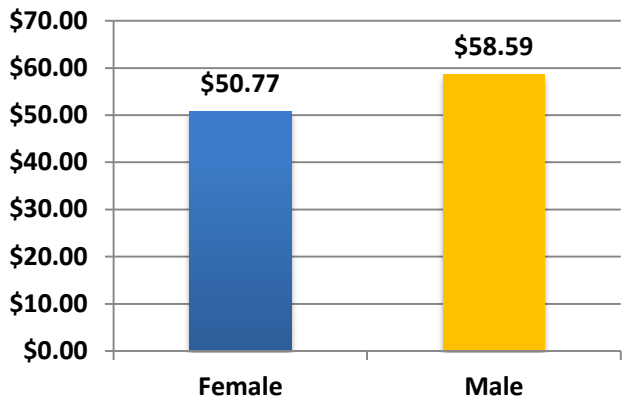
Chart 39: SF Resident Female Construction Workers on City Contracts Compared to Female Construction Workers Living in San Francisco, 2015



Sources: Elation Systems, CA Employment Development Department, and U.S. Census Bureau, American Community Survey

Chart 40 compares mean hourly compensation between women and men. As can be seen, SF resident men on City contracts received about $8.00 more in hourly compensation than women. Note that this does not control for trade or other factors. Moreover, we also found that men totaled on average over 100 more hours than women in terms of total hours under contract.

Chart 40: SF Resident Construction Workers on City Contracts by Mean Hourly Compensation and Gender, 2011-2016

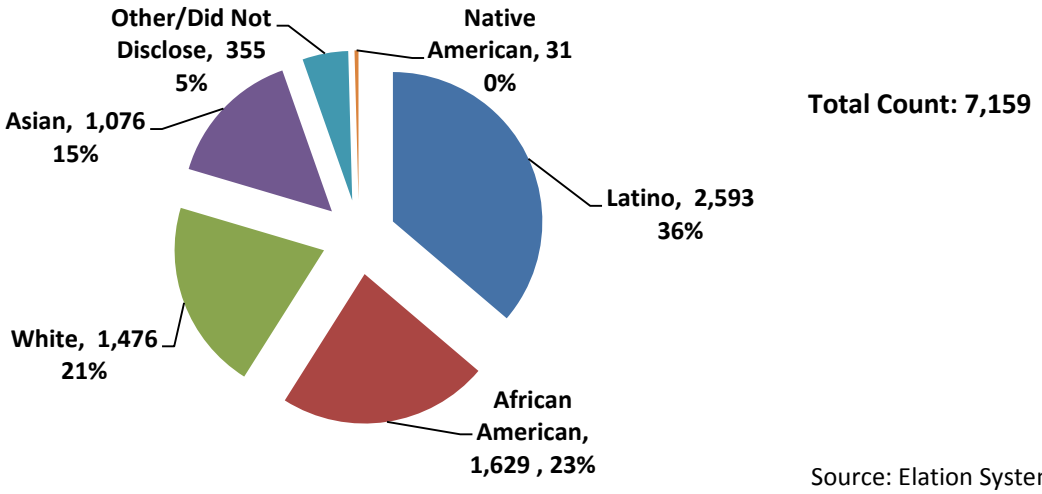


Source: Elation Systems

- Distribution By Race and Ethnicity

Chart 41 shows that, in terms of race and ethnicity, Latinos, with nearly 2,600 workers, make up the largest racial or ethnic group of workers on city contracts. African Americans and Whites, with 1,600 and 1,500 respectively, are the next largest categories, whereas Asians make up just over 1,000.

Chart 41: SF Resident Construction Workers on City Contracts by Race and Ethnicity, 2011-2016

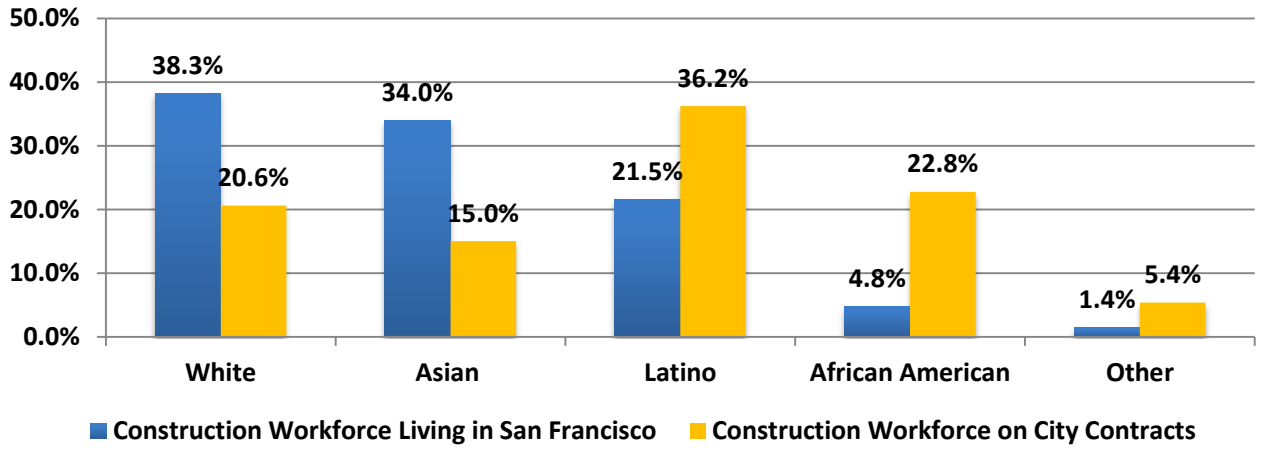


Source: Elation Systems

Interestingly, the racial and ethnic composition of the workforce on City contracts differs substantially from the composition of all construction workers living in San Francisco, as can be seen in percentage terms in

Chart 42. For construction workers on City contracts, Whites and Asians make up a much smaller percentage compared to construction workers overall living in San Francisco. Latinos and African Americans, on the other hand, make up a much larger portion.

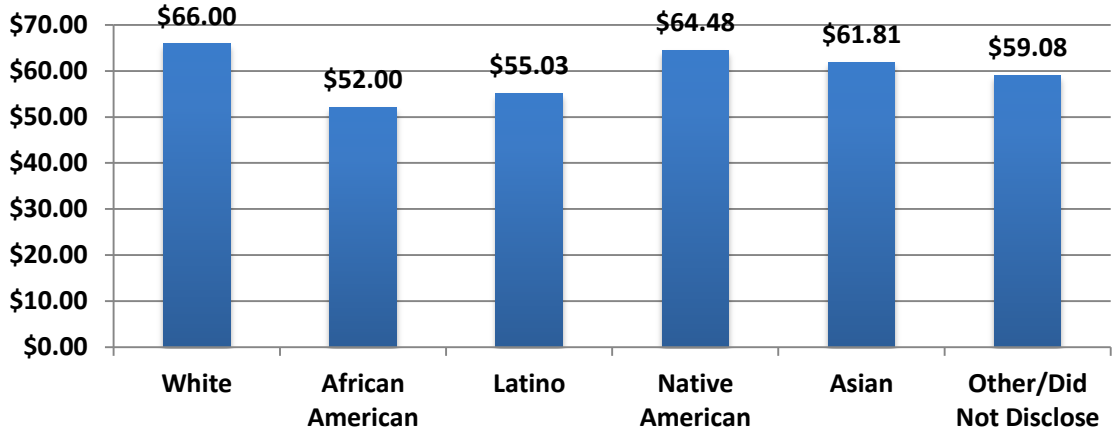
Chart 42: Race and Ethnicity of SF Resident Construction Workers on City Contracts Compared to All Construction Workers Living in San Francisco, 2015



Sources: Elation Systems, CA Employment Development Department, and U.S. Census Bureau, American Community Survey

Chart 43 compares mean hourly compensation by race and ethnicity. It shows that Whites had a higher rate of hourly compensation than workers of other races or ethnicities. Native Americans were almost as highly compensated, but there were only 31 such individuals in the sample. Asians received nearly $62 in hourly compensation on average, which was higher than for both Latinos ($55) and African Americans ($52). Note that these comparisons do not control for trade or other factors.

Chart 43: SF Resident Construction Workers on City Contracts by Race and Ethnicity and Mean Hourly Compensation, 2011-2016



Source: Elation Systems

D. Summary of Findings

This section reviewed a number of data sources on (a) those workers whose primary worksite is in San Francisco County, regardless of where they live, and (b) those workers who live in San Francisco County, regardless of where their primary worksite is located. Though understanding both categories is important for evaluation of Local Hire going forward, particular attention should be given the findings regarding the resident construction workforce, and the data comparisons with the 2012 Labor Market Analysis.

The construction workforce resident in San Francisco jumped from an estimated 7855 workers in 2010 and 9941 workers in 2012 to an estimated 14,161 workers in 2015. The distribution by trades remained similar to the 2012 distribution. Almost half of the San Francisco resident construction workers were employed in three trades: construction laborers (23.7%), carpenters (12.3%) and construction managers (11.9%). Painters, Electricians, and Plumbers were the other main trades.

The median annual earnings of the construction workforce resident in San Francisco was $40,000 in 2015, well below the City's median earnings. The mean was $50,966, similarly well below the City's mean income. About 5,428 workers whose primary occupation was in construction earned less than $25,000 per year. And only 816 workers earned more than $125,000. Regarding educational attainment, around 27% of the resident construction workforce have a four-year degree or higher, and another 20% had some college. The percentage with some post-secondary education was slightly higher than the broader pool of Bay Area construction workers employed in San Francisco. At the other end, 20% of the construction workers have attained less than a high school education.

The racial distribution of resident construction workers was only slightly changed since 2013. The White percentage rose from 31% to 38.2% (though below the 49.4% White percentage of the entire San Francisco workforce). The Asian, Pacific Islander percentage also rose from 32% to 34%, as did the African American percentage from 3% to 4.8%. The Hispanic percentage declined from 31% to 21.5%.

Section 4: Availability of San Francisco Resident Construction Workforce

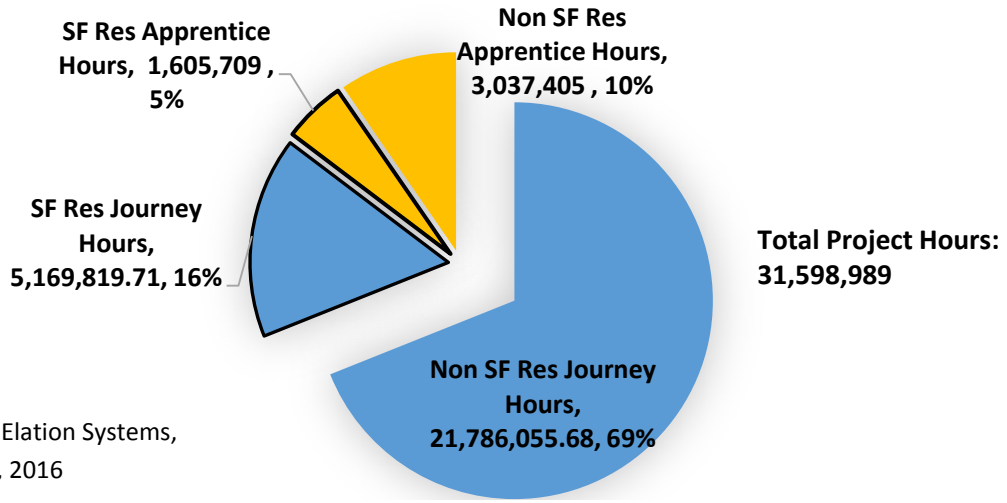
Section 4: Availability of San Francisco Resident Construction Workforce

In Section 3, we examined the characteristics of the San Francisco construction workforce, comparing San Francisco resident workers generally with SF resident workers performing work on City sponsored contracts specifically. In this segment we use Elation Systems data to provide an updated picture of how the participation of San Francisco resident workers compares with the participation of non-San Francisco Residents workers on City sponsored projects. One of the aims of the 2013 Labor Market Analysis of San Francisco Construction Industry (LMA Report 2013) was to inform the review of San Francisco's Local Hiring Policy for Construction by the City and policy stakeholders. Again, we hope to provide data that will contribute to the assessment of the impact of escalating mandatory participation levels for San Francisco residents on City sponsored projects and the availability of a sufficient supply of qualified resident construction workers to meet the resulting demand.

A. San Francisco Resident Participation on City Sponsored Projects

The 2016 Elation Systems data reveal that for all City sponsored projects[5]; including those that are covered by the Local Hire ordinance and those that are not, the cumulative participation of SF residents is 21%. This is only one percentage point higher than the cumulative ratio of SF resident workers to Non-SF resident workers reported in 2010[6] and is the same 21% cumulative ratio reported in 2013[7].

Chart 44: Ratio of Construction Hours Performed by SF Residents and Non-SF Residents on All City Sponsored Construction Projects March 21, 2011 -March 1, 2016

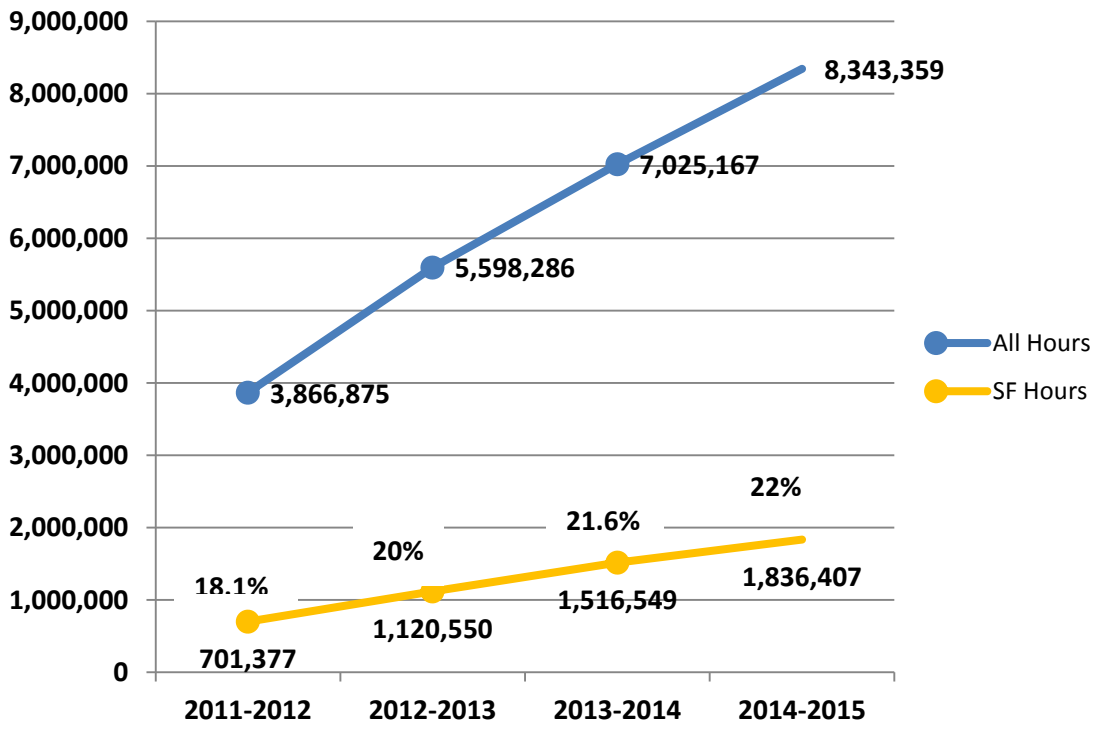


Source: Elation Systems, June 30, 2016

[5] All City sponsored projects noted here includes all City sponsored projects and several non-City sponsored projects that have local hire agreements with the City such as the Hunters Point Shipyard and California Pacific Medical Center Projects.
[6] L. Luster & Associates, Bernick, Michael, Esq., Cordoba Corporation and Davillier-Sloan. Labor Market Analysis San Francisco Construction Industry Final Report October 18, 2010. p 30
[7] L. Luster & Associates, Bernick, Michael, Esq., Potepan, Michael, Ph.D., Cordoba Corporation and Techscribe Communications, Labor Market Analysis of San Francisco Construction Industry Final Report, October 15, 2013, p. 44.

While it appears that the participation of San Francisco residents is being held at 20 to 21%, the number of hours included in these ratios and how the ratios have varied over time reveal a different trend. In 2010, we reported on a total of 4,310,148 construction hours and a total of 17,932,770 hours in 2013. Cumulative hours through March 2016 now total 31,585,989 construction hours. When reviewed year over year, there has been a steady increase in the percentage of hours worked by SF residents since the Local Hiring Policy for Construction was adopted in 2011. Moreover, not only are SF resident construction workers capturing a greater percentage of all City project work, they are also working significantly more hours.

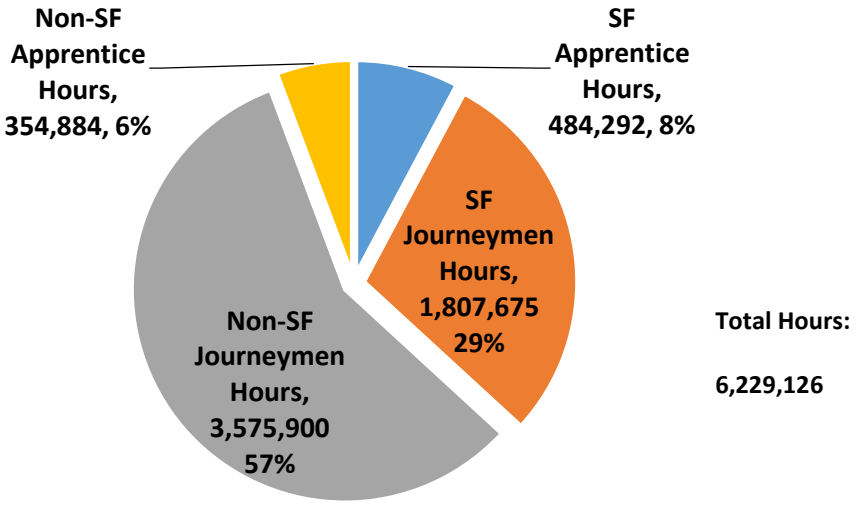
Chart 45: Growth in Construction Hours Performed by San Francisco Residents for All City Sponsored Projects



Source: Elation Systems data, June 30, 2016

The comparison of the participation of SF residents on all City sponsored projects to their participation on only those projects subject to the Local Hiring Policy for Construction reveals more impacts of the legislation and program. On projects subject to the local hiring policy, San Francisco resident participation climbs to 37%.

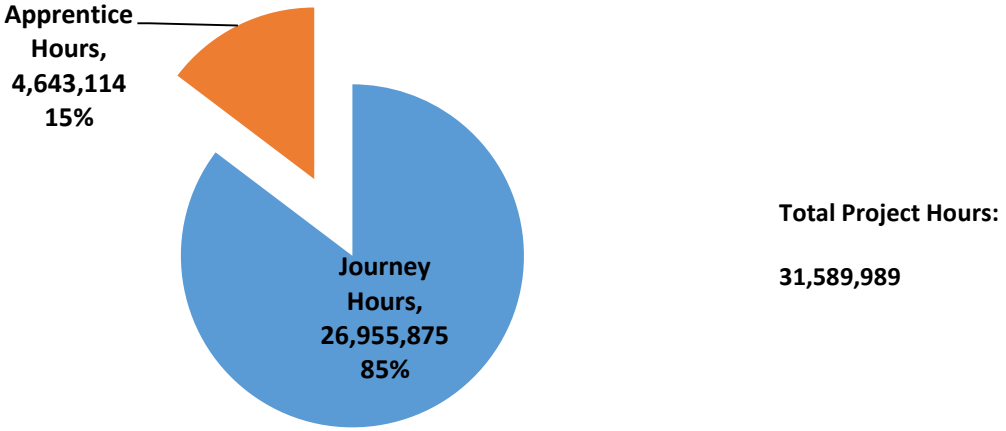
Chart 46: Local Hire Projects: Ratio of SF Resident Worker Hours to Non-SF Resident Worker Hours March 25, 2011 - March 1, 2016



Source: Elation Systems data, as of June 30, 2016

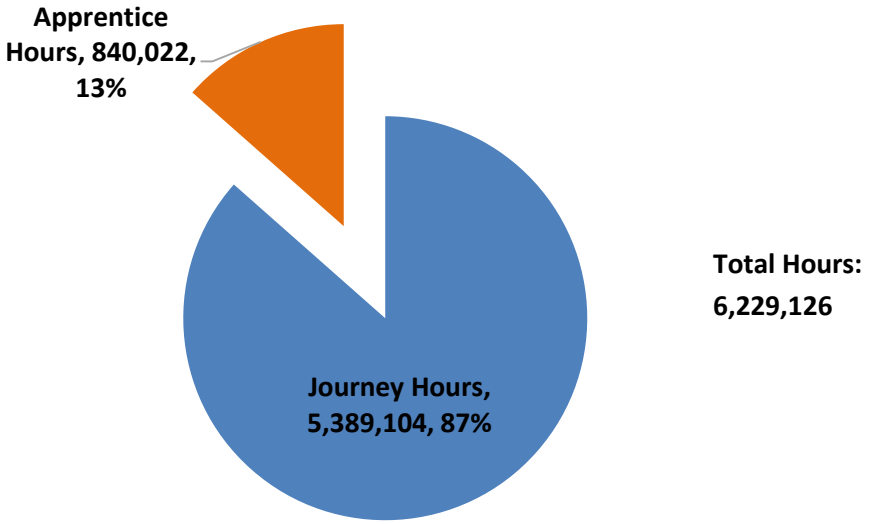
Interestingly, the cumulative ratio between journey and apprentice workers does not differ significantly. For all City sponsored projects, apprentices have performed 15% of the job hours and on local hire projects they have performed only 13% of the hours.

Chart 47: All City Sponsored Projects: Ratio of Journey to Apprentice Hours March 25,2011 - March 1, 2016



Source: Elation Systems data, as of June 30, 2016

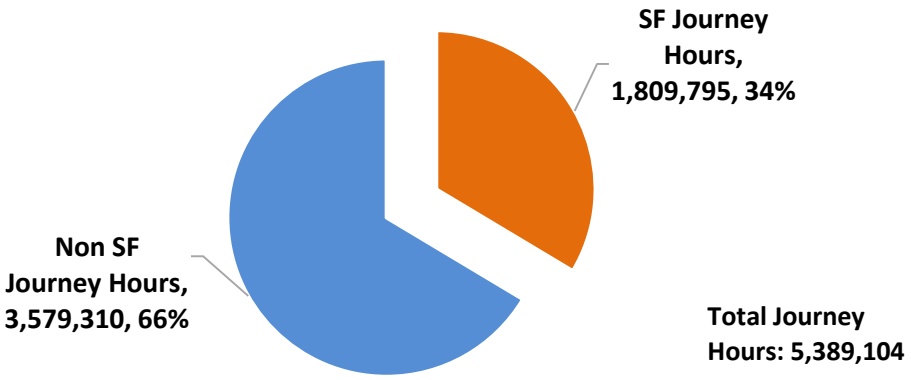
Chart 48: All Local Hire Projects: Ratio of Journey to Apprentice Hours March 25, 2011-March 1, 2016



Source: Elation Systems, June 30, 2016

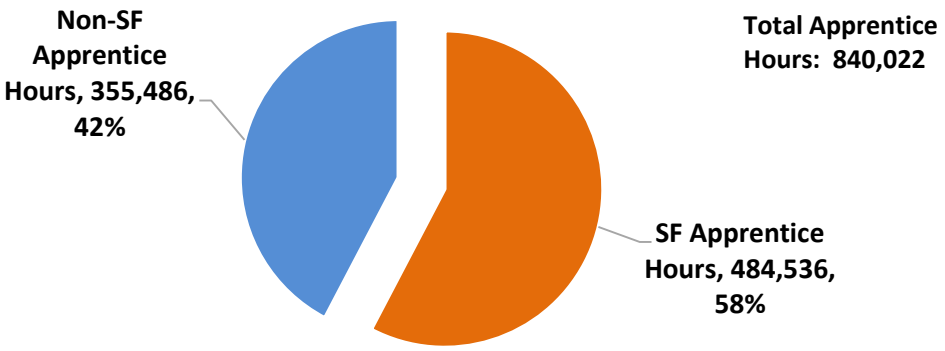
While the cumulative ratios of journey to apprentice hours are not significantly different from that of all City sponsored projects, the impact on San Francisco workers is noteworthy for local hire projects only. Of all the journey hours, SF residents have performed 34% of these hours and 58% of all apprentice hours.

Chart 49: All Local Hire Projects: Ratio of SF Resident Journey Hours to Non-SF Resident Journey Hours March 25, 2011-March 1, 2016



Source: Elation Systems, June 30, 2016

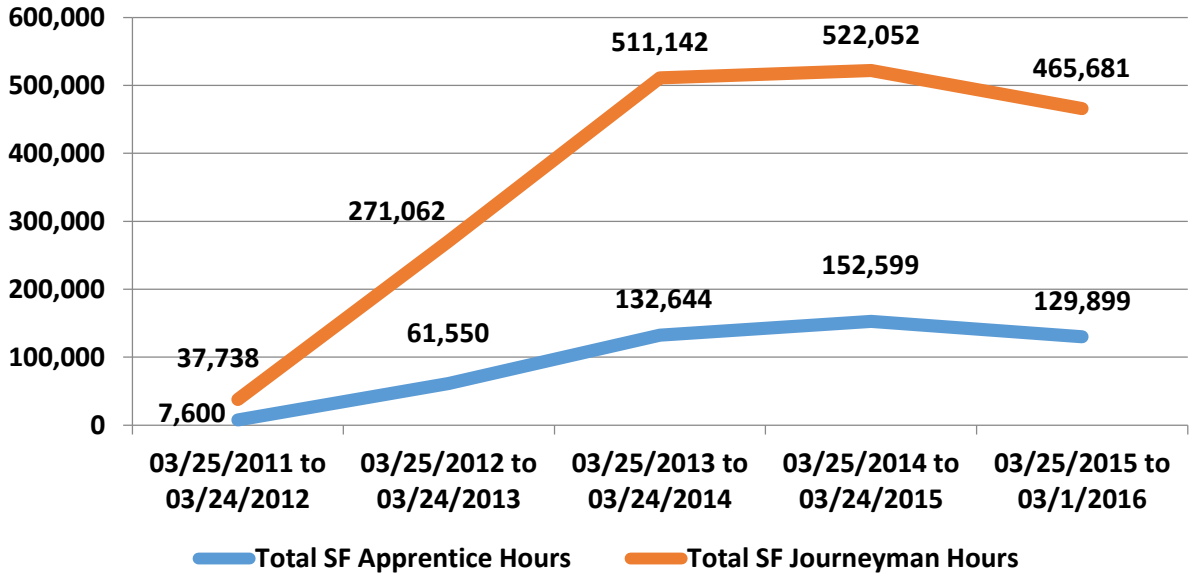
Chart 50: All Local Hire Projects: Ratio of SF Resident Apprentice Hours to Non SF Resident Apprentice Hours March 25, 2011-March 1, 2016



Source: Elation Systems data, as of June 30, 2016

As noted previously, focusing on cumulative data does not show trends over time. When we look at changes in SF resident participation over time, the impact of local hire is more fully revealed. When reviewed year over year, there have been dramatic increases in the number of hours worked by SF residents since the Local Hiring Policy for Construction was adopted in 2011.

Chart 51: Growth of SF Resident Journey & Apprentice Hours on Local Hire Projects by Policy Year



Source: Elation Systems data, as of June 30, 2016

B. Conclusions Regarding Availability

The data presented in this report show that San Francisco resident construction workers participating in all City projects and in City sponsored projects subject to the local hiring ordinance account for a greater and greater number of the construction hours performed on these projects. Moreover, City contractors appear to be meeting the targeted participation rates for San Francisco residents. OEWD highlighted the following in its 2015/2016 Annual Report to the San Francisco Board of Supervisors regarding the SF Local Hiring Policy for Construction:[8]

A total of 6,229,126 hours have been worked on projects subject to the Local Hiring Policy

- *79 Projects have been subject to the 20% hiring requirement and have reported an overall local hiring performance of 33%*
- *84 projects have been subject to the 25% hiring requirement and have reported an overall local hiring performance of 34%*
- *201 projects have been subject to the 30% requirement and have reported an overall local hiring performance of 45%*
- *Overall, apprentice participation continues to exceed the 50% requirement with an average performance of 58%.*

Therefore, it would appear that there are more than a sufficient number of San Francisco resident construction workers available to meet the current demand. Nonetheless, the following questions remain:

- Will future construction demand on City sponsored projects exceed the current demand?
- Will there be a sufficient number of available SF resident construction workers to meet the demand of the increased number of City projects that carry mandatory participation requirements of 30% or greater?
- What factors should be considered in determining availability of SF construction workers and escalating the mandatory requirement on City sponsored projects?

In the *Findings and Implications for Local Hire Policy* section of the 2013 LMA Report, we concluded that there were five main drivers contributing to the demand for and availability of San Francisco resident construction workers. In 2016, these factors have not changed.

1. Ongoing City investment in infrastructure and building projects
2. Large private sector investments in major building projects
3. Initiation of an increased number of City projects subject to the 30% local hire requirement
4. Pressures created by an aging local construction workforce
5. State of the construction workforce pipeline for SF residents

[8] OEWD, 2015/16 Annual Report to the Board of Supervisors, Local Hiring Policy for Construction, March 2016, P.7

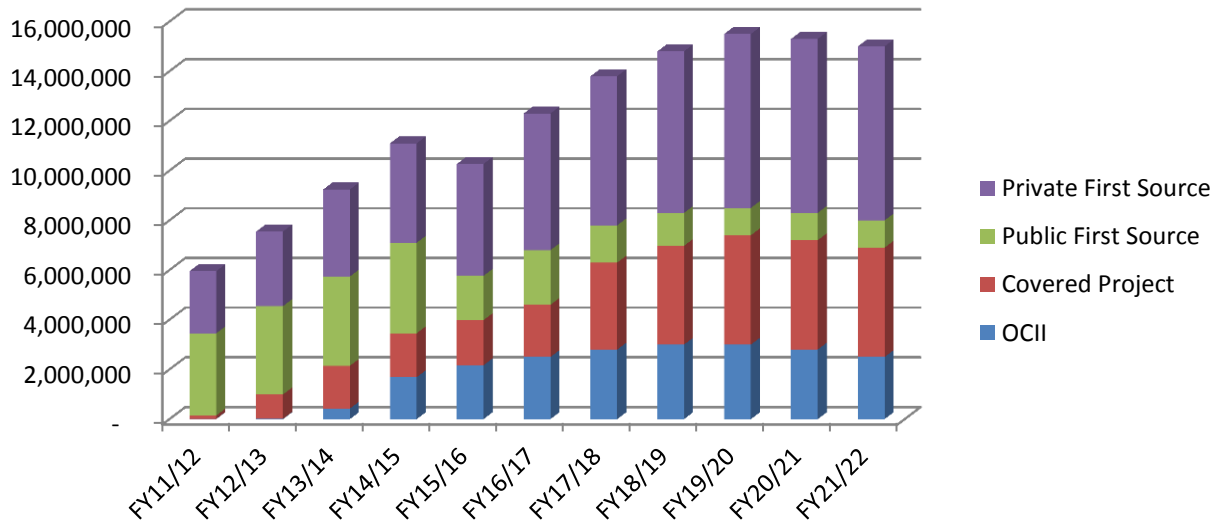
- City and Non-City Sponsored Projects

Indeed, as noted in the Section 1 of this report, both publically and privately sponsored projects continue to come on line at a very robust pace in San Francisco. The City's 2012-2021 Capital Plan identified $24.8 billion dollars in recommended investments. The City Plan is now recommending $32 billion dollars in infrastructure investments between 2016 and 2025.

At this time, OEWD reports that there are a number of major construction projects in the city that are currently underway with combined project values of $11.5 billion dollars, the majority of which will not be completed until the end of 2018.[9] These include the Central Subway, SFO Terminal 1, Transbay Terminal, Salesforce Tower and California Pacific Medical Center. Additionally, there is another $14 billion dollars in construction work that is scheduled to start in 2017, some of which have estimated durations of 10, 15 and 20 years. The projects with 2017 start dates will be followed by an additional $13 billion dollars in work that will begin in 2018 and beyond. These projects include but are not limited to the Hunters Point Shipyard Phase 2, Mission Rock, 30 Van Ness, and SFPUC's SSIP Phase 2.

Therefore, we can confidently suggest that the increase in City sponsored and non-City sponsored projects will produce a significantly increased demand on the San Francisco construction workforce. Following is OEWD's estimate of the construction work hours associated with the current and upcoming work. The hours for FY 2011-2012 to FY2015-2016 are actual; the hours going forward through FY2021-2011 are estimated.

Chart 52: Forecast of Construction Work Hours FY2011-12 to FY2021-22



Source: Office of Economic and Workforce Development, November 2016

[9] OEWD, Mayor's Construction Workforce Advisory Commission, Presentation, November 29, 2016.

- Number of City Projects Subject to 30% Hiring Requirement

The SF Local Hiring Policy for Construction 2015/2016 Report to the San Francisco Board of Supervisors states that as of March 2016 there were 364 projects subject to the ordinance. As predicted in 2013, there are more than twice as many projects subject to the 30% mandatory participation level than were subject to the 25% level, and almost three times as many than were subject to the initial 20% participation level.

Chart 53: Growth in Number of SF Projects Covered by Local Hire Ordinance, 2011-2016

Hiring Requirement Percentage	Number of Projects Covered By Local Hire Ordinance
20%	79
25%	84
30%	201
Total	365

Source: OEWD, 2015/16 Annual Report to the Board of Supervisors

As City sponsored projects continue to be initiated with the 30% requirement, these total project numbers will climb. Further, the OEWD's annual local hire presents cumulative data that do not fully depict the entire local hire picture. When the local hire data are viewed on a project-by-project basis and are complemented with compliance data, a richer and more nuanced process is revealed.

On a project-by-project basis, many City contractors have struggled to achieve the local hire requirements across all trades. According to OEWD compliance staff, what appears to be happening is some City contractors are achieving great success while a significant number of others are struggling. These disparities are not shown in the cumulative data.

The implementation of the Local Hire program is achieved through a balanced structure of compliance and employment referral support provided to contractors and local workers. Over the life of a project, OEWD compliance staff work diligently negotiating, monitoring and supporting contractors to ensure they meet participation goals. Of the 441 total projects subject to the Local Hiring Policy for Construction, 243 have closed out with 100 or 41% of them requiring corrective action; utilizing the program's "off ramps" that include applying credits for SF resident utilization on non-covered projects or sponsoring a local resident in an apprenticeship program to avoid penalties. The City has assessed penalties for non-compliance on 11 projects to date and one additional penalty is pending. Currently, there are 198 active projects subject to the ordinance, and 90 or 45% have hiring deficiencies.

The City's local hiring legislation is being implemented through the application of an ever increasingly sophisticated compliance and employment referral structure. While it has been largely successful at directing work opportunities to SF residents, as the number of projects with a 30% hiring requirement climbs, contractors will continue to encounter serious challenges in meeting the trade-by-trade utilization target.

- Aging Local Construction Workforce

Census data in Section 3 highlight the continued "graying" of the SF resident construction workforce. Of the approximately 14,161 construction workers living in San Francisco in 2015, about 7,000 or roughly half of them are 45 years and older. This reflects a 10% increase from 2013. The percentage of these workers 55 years and older has climbed from 13% in 2013 to 28.3% in 2016. Likewise, the segment of workers 35 years and under has dropped from 30% in 2013 to 26.7% in 2016. These are the same trends we noted in 2013, and there is no evidence that they are going to turn around any time soon. Therefore, the simultaneous aging of the local construction workforce and decline in the number of younger workers will continue to negatively impact the availability of SF resident construction workers.

- Construction Workforce Pipeline

The final factor we will examine is the state of the construction workforce pipeline for SF residents. The pipeline issue is so critical that we will discuss it in a separate section that follows. However, it is important to note that, again, the pipeline has not significantly changed over the last three years. It remains constricted, and we believe that the growth in the vibrancy of the city's economy has hampered recruitment of local residents into construction. Unemployment is at historical lows and jobs are abundant.

Therefore, despite the reported cumulative 2015-16 local hire statistics, the research team remains skeptical that the City can effectively escalate local hire requirements much further beyond 30%. This is due to the anticipated heightened demand for workers generated by both public and private construction activity and the simultaneous challenge to availability of an aging local workforce and small number of new industry entrants. We believe the City is approaching its saturation levels for unionized, non-resident construction employment; the workforce that performs work on City sponsored projects.

C. Summary of Findings

The Elation Systems data tracks the hours worked on City-sponsored projects. The 2016 Elation Systems data reveal that for all City sponsored projects the number of hours worked by City residents has increased significantly since the 2010 and 2013 reports, as has the percentage of hours worked by City residents compared to non-residents. On all City-sponsored projects, San Francisco residents have increased hours from 701,377 in the period 2011-2012 to 1,836,407 hours in the period 2014-2015. On Local Hire Projects, the increase in hours worked by City residents is more dramatic. In the period March 2011-March 2012, total hours worked by SF residents totaled slightly more than 45,000 hours. By the following year period, the number had grown to around 332,000. In the most recent year, March 2015-March 2016, the number of hours worked by SF residents on Local Hire had reached over 595,500.

The 30% Local Hire requirement has been met in this recent year, even with increased worker need. But several construction dynamics mean that meeting this requirement will be a challenge in upcoming years given the projected construction activity noted throughout this report, as well as the aging of the San Francisco-resident construction workforce.

Section 5: Construction Workforce Pipeline

Section 5: Construction Workforce Pipeline

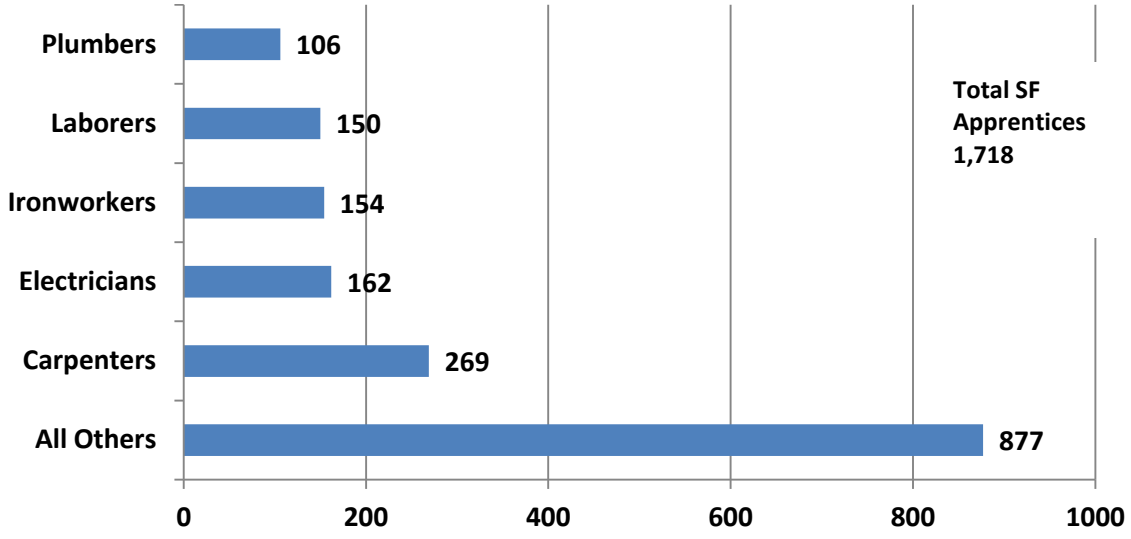
A critical factor in assessing whether there will be a sufficient number of SF resident construction workers in coming years is the pipeline that conveys new local workers into the industry. In San Francisco, City sponsored projects and large privately developed projects operate almost exclusively in a unionized labor environment. This means that the pipeline of new workers onto City projects consists of new apprentices enrolled in State of California approved apprenticeship training programs. San Francisco residents comprise a segment of this pipeline and following is a review of recent trends for this population of new construction workers.

A. Number and Characteristics of San Francisco Resident Apprentices

- Trade Distribution

As of July 2016, there were 1,718 active apprentices residing in San Francisco. These apprentices are spread throughout the skilled trades but concentrated in five main fields: Carpenters, Electricians, Ironworkers, Laborers and Plumbers. Chart 4 depicts this distribution. By a significant amount, the largest trade for apprentices is Carpenters with 269 active SF-resident apprentices in July 2016. The next largest categories are Electricians at 162, Ironworkers at 154, Laborers at 150, and Plumbers at 106. These trade concentrations differ somewhat from the overall SF resident construction workforce as well as the SF resident workforce on City contracts. For both these populations, Laborers are the most highly concentrated trade followed by Carpenters, with local residents also clustered in the Electrical, Plumbing, Ironwork, Painting and Operating Engineering trades.

Chart 54: Active SF Resident Apprentices by Trade, 2016

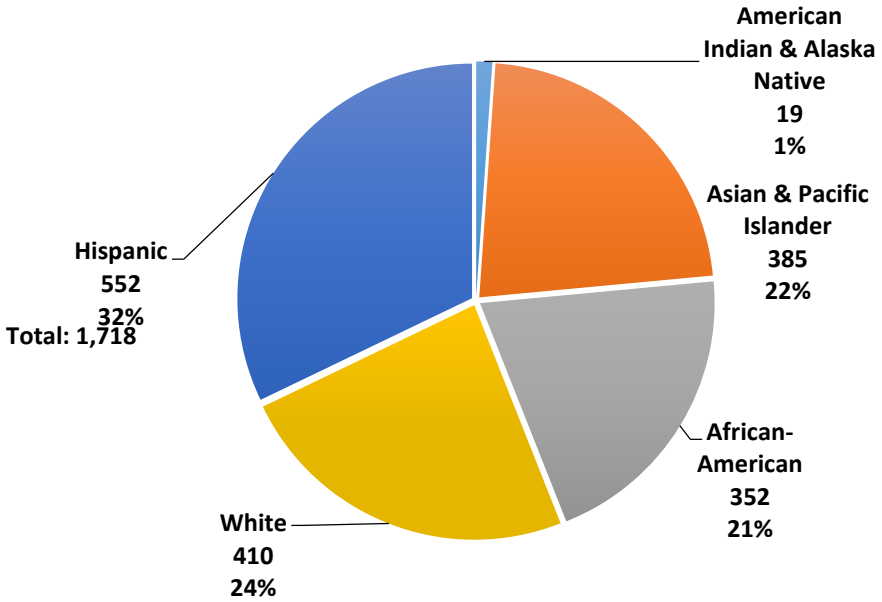


Source: Department of Industrial Relations/Division of Apprenticeship Standards, July 2016

- Distribution by Race & Ethnicity

Active San Francisco apprentices reflect the multi-ethnic nature of the City. The majority are Hispanic (32%) followed by Whites (24%), Asian Pacific/Islanders (22%), African Americans (21%) and Native Americans (1%). The ethnic distribution of these active SF apprentices differs somewhat from that of all SF resident construction workers in that African American apprentices comprise a considerably larger percentage 21% as compared with 5% of construction workers living in SF. Likewise, while not as wide a difference, the percentage of Hispanic apprentices is larger at 32% than for all SF resident construction workers at 22%. White and Asian Pacific/Islander apprentices comprise a smaller percentage of the group as compared with all SF resident construction workers, dropping from 38% to 24% and 34% to 22% respectively. Similar to SF active apprentices, for SF residents working on City contracts, Hispanics comprise the larger portion of workers. However, African Americans working on City contracts account for a larger percentage of the workers than do Whites which differs from the active apprentices. In contrast, Asian Pacific Island residents working on City contracts account for a smaller percentage of workers than they do for apprentices, 15% and 22% respectively.

Chart 55: Active SF Resident Apprentices by Race & Ethnicity,[10] 2016



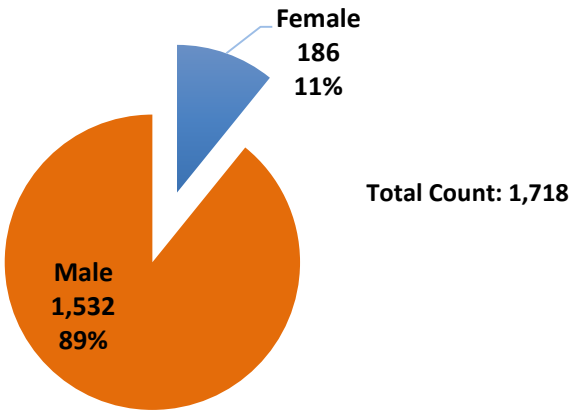
Source: Department of Industrial Relations, Division of Apprenticeship Standards, July 2016

[10] Asian apprentices include individuals from the following ethnic backgrounds: Asian or Pacific Islander, Asian Indian, Cambodian, Chinese, Fijian, Filipino, Guamanian, Hawaiian, Japanese, Korean, Laotian, Pakistani, Samoan, Sri Lankan, Taiwanese, Thai, Tongan and Vietnamese.

- Gender Distribution

The distribution of gender among active SF apprentices also differs substantially from the broader SF construction workforce. Among apprentices, women account for 11% of all active SF apprentices while they are only 2% of the total SF resident construction workforce and 5.9% of women working on City contracts.

Chart 56: Active SF Resident Apprentices by Gender, 2016

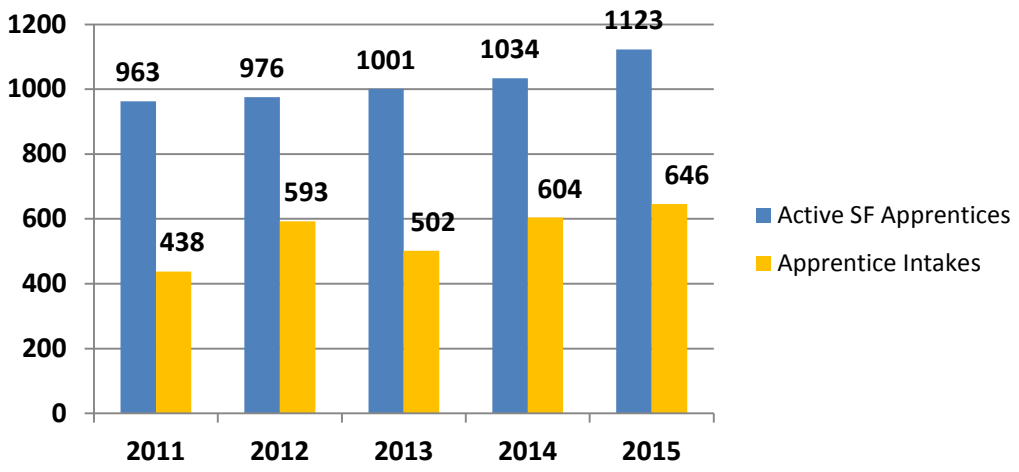


Source: Department of Industrial Relations, Division of Apprenticeship Standards, July 2016

- Intake Trends

San Francisco residents have been conveyed into the construction industry in a relatively constant manner since 2011. Aside from the decrease in intakes in 2013, intakes of apprentices have steadily climbed since 2011, climbing from 438 new apprentices and to 646 apprentices in 2015. However, since the Great Recession San Francisco has not returned to its peak of 2,458 active SF apprentices at the end of 2000. San Francisco dipped to 1,976 in 2001, 1,761 at the end of 2004 but rebounded to 1,837 by the close of 2005. However, after 2005, SF active resident apprentices declined in number each year between 2005 and 2010. Finally in 2011, their numbers began to slowly ascend but they have not yet reached the highs seen before the Great Recession.

Chart 57: SF Active Apprentices and Resident Apprentice Intake by Year, 2010-2015[11]



Source: Department of Industrial Relations/Division of Apprenticeship Standards, November 2016

B. The CityBuild Academy Pipeline

Of particular interest to the City of San Francisco is the relative impact of CityBuild Academy (CBA), its construction workforce program that has been contributing to the pipeline of active San Francisco apprentices since 2005. CityBuild Academy is administered by the Office of Economic and Workforce Development (OEWD) in partnership with City College of San Francisco. CityBuild Academy offers an 18-week pre-apprenticeship training program at the City College of San Francisco, Evans Campus.

Following is a discussion of CBA program, beginning an overview of CBA participants, followed by an analysis of how participating in CBA impacts participants' earnings. Finally we examine CBA graduates' subsequent career pathways in the construction sector.

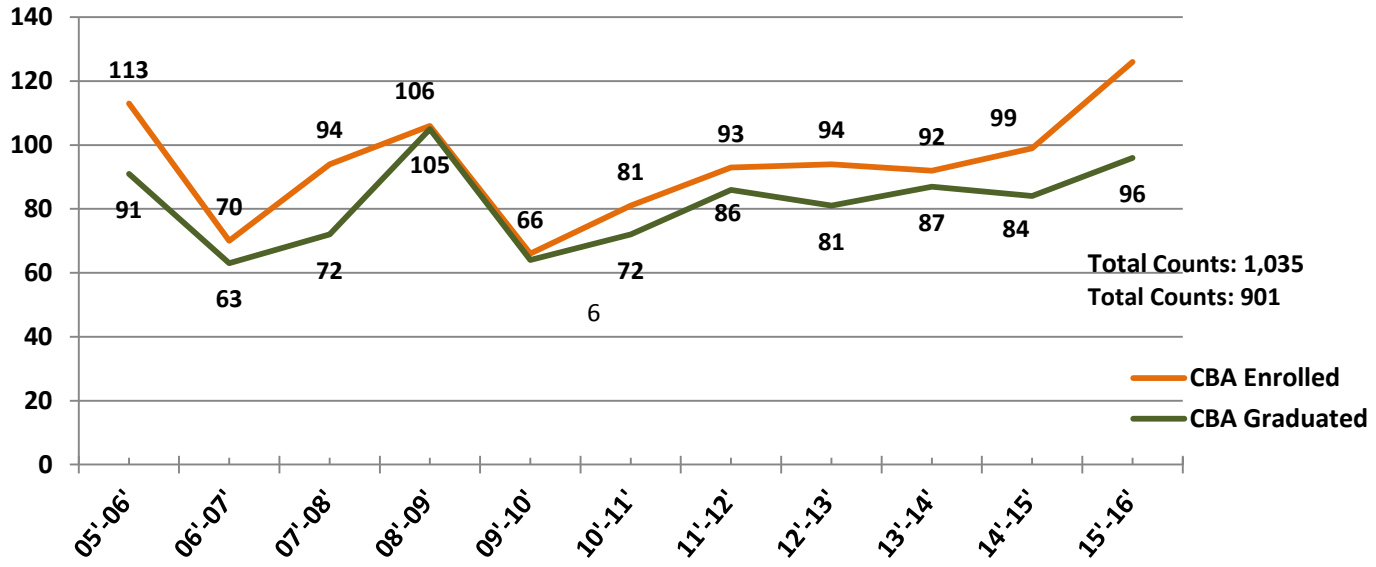
This discussion draws from two slightly different sets of data. The overview of CBA draws from data furnished by the OEWD and encompasses total participants including CBA graduates. Analysis of program impact on earnings and construction career pathway was drawn from EDD data for CBA graduates only. There are small unaccountable variances between these two datasets, primarily in the universe of CBA graduates and participants, but the overall story the data tell is the same.

- CityBuild Academy Overview

Since its beginning, 1,035 San Francisco residents have participated in CBA; 901 of these have graduated, for a graduation rate of 87%.

[11] There have been 325 SF resident apprentices enrolled as of July 2016.

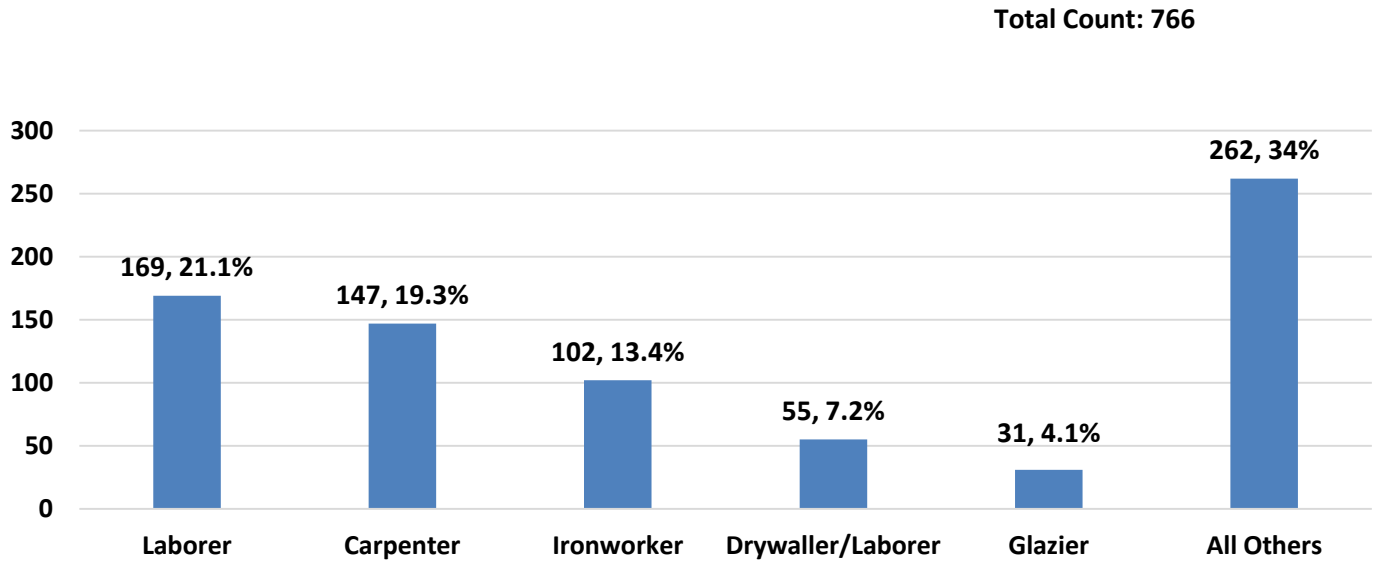
Chart 58: CityBuild Academy: Enrollments Compared with Graduates, FY2005-06 to FY2015-16



Source: OEWD, June 16, 2016

Of these graduates, 766 or 85% have secured employment in various construction trades or positions. Most of these graduates have entered union apprenticeship programs with the highest numbers entering the following trades: 21% have become Laborers, followed by Carpenters (19.3%), Ironworkers (13.4%), Drywall/Latherers (7.3%), and Glaziers (4.1%). The remainder are dispersed throughout the other trades.

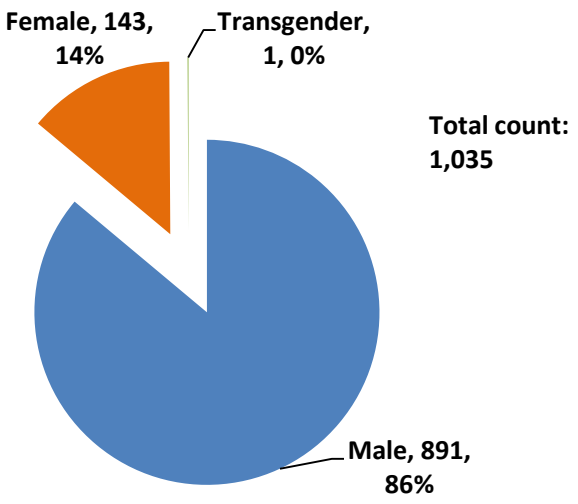
Chart 59: CityBuild Academy Graduates Employed in Skilled Trades, FY2005 - 2016



Source: OEWD, June 16, 2016

Like the active SF Apprentices, CBA participants have a higher percentage of women than does the overall SF resident construction workforce or for those SF residents working on City contracts. While 86% of participants are male, 14% of CBA participants are women. There was also one transgender CBA participant.

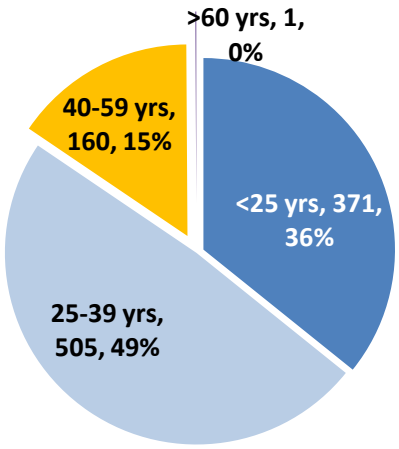
Chart 60: CityBuild Academy Participants by Gender, FY2005-06 to FY2015-16



Source: OEWD, June 16, 2016

In terms of age, the largest number of participants, 49%, are between the ages of 25 and 39. However, there is a significant percentage, 36%, under 25 years. Chart 61 shows the age distribution of CBA participants at the time of their enrollment in the program.

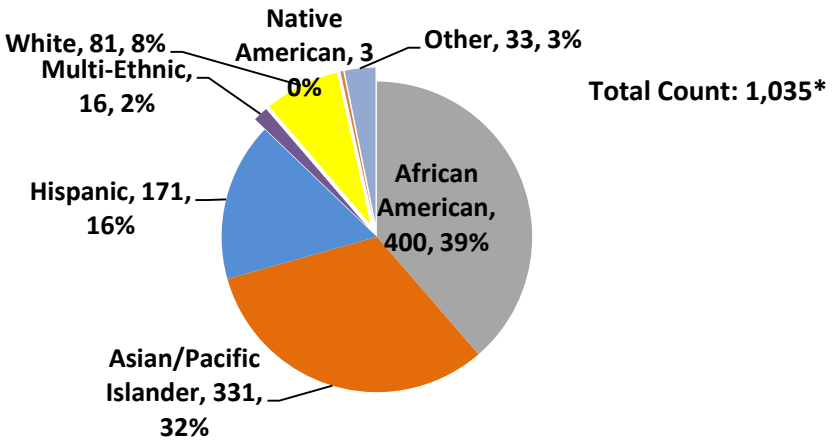
Chart 61: CityBuild Academy Participants by Age, FY 2005-06 to FY 2015-16



Source: OEWD, June 16, 2016

Chart 62 shows the racial and ethnic composition of CBA participants. In comparison with the SF resident construction workforce, African Americans are more highly represented in the Academy with Whites less likely to participate. There is closer alignment between the percentages of Asian/Pacific Islander and Hispanic Academy participants and the composition of the wider SF resident construction workforce.

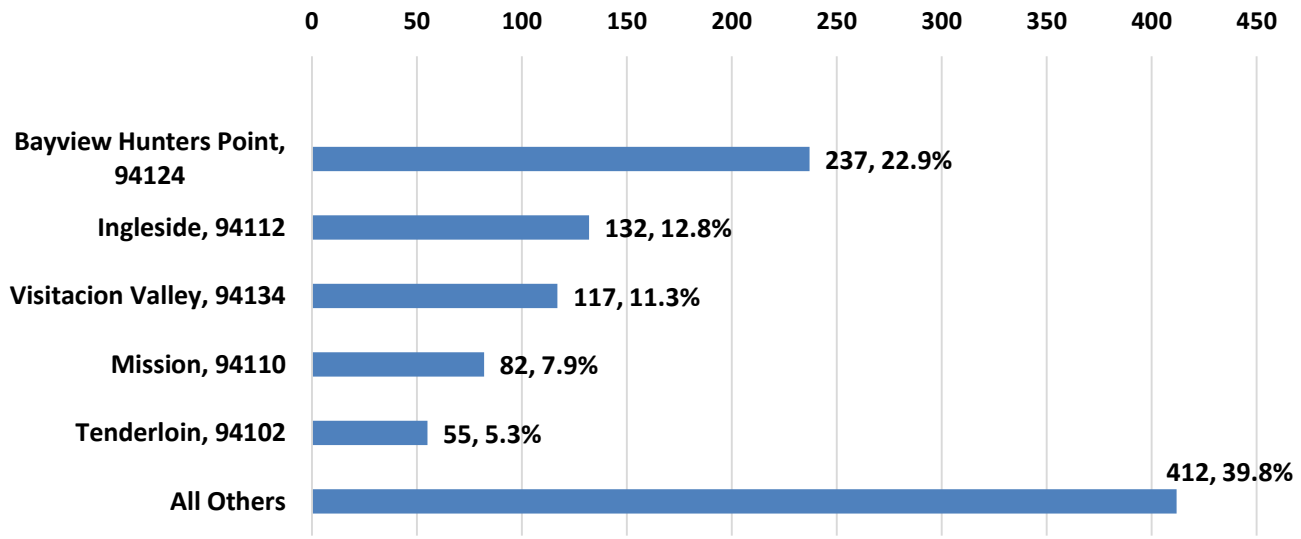
Chart 62: CityBuild Academy Participants by Race & Ethnicity, FY2005-06 to FY2015-16



* Chart numbers vary from Total Count of 1,035 by 2 or (.2%)
Source: OEWD, June 16, 2016

CBA participants live all over San Francisco, but 60% reside in one of five zipcodes corresponding to the Bayview Hunters Point, Ingleside, Visitacion Valley, Mission and Tenderloin neighborhoods. Significantly, about 23%, or approximately 1 in 5 CBA particpants, reside in Bayview Hunters Point, making this the most common zipcode of residence for CBA participants. This neighborhood distribution is in keeping with Census data for the overall SF resident construction workforce and the resident workforce working on City contracts. San Francisco's Bayview Hunters Point community contains the highest concentration of construction workers in the city.

Chart 63: CityBuild Academy Participants by Neighborhood of Residence, FY2005-06 to FY 2015-16



Source: OEWD, June 16, 2016
* Chart numbers vary from Total Count of 1,035 by 2 or (.2%)

- Impact of CityBuild Academy on San Francisco's Apprenticeship Pipeline

Since its inception in 2005, CityBuild Academy has had a significant impact on the intake of SF resident apprentices in the building trades. According to the DIR/Department of Apprenticeship Standards, there were a total of 2,783 new San Francisco resident apprentice intakes in the building trades between 2011 and 2015 (See Chart 57). During this same period, CityBuild Academy graduated and placed 522 San Francisco residents into apprenticeship programs. This indicates that approximately 19% of all San Francisco resident apprentice intakes for that period resulted from CityBuild Academy participation. Moreover, as CBA recruitment, training and placement funding is tied to the federal Workforce Investment Act that targets economically disadvantaged citizens and those with multiple barriers to employment, CBA is providing training and industry entry to some of San Francisco's most vulnerable residents.

- Impact of Participating in CBA on Graduate Earnings

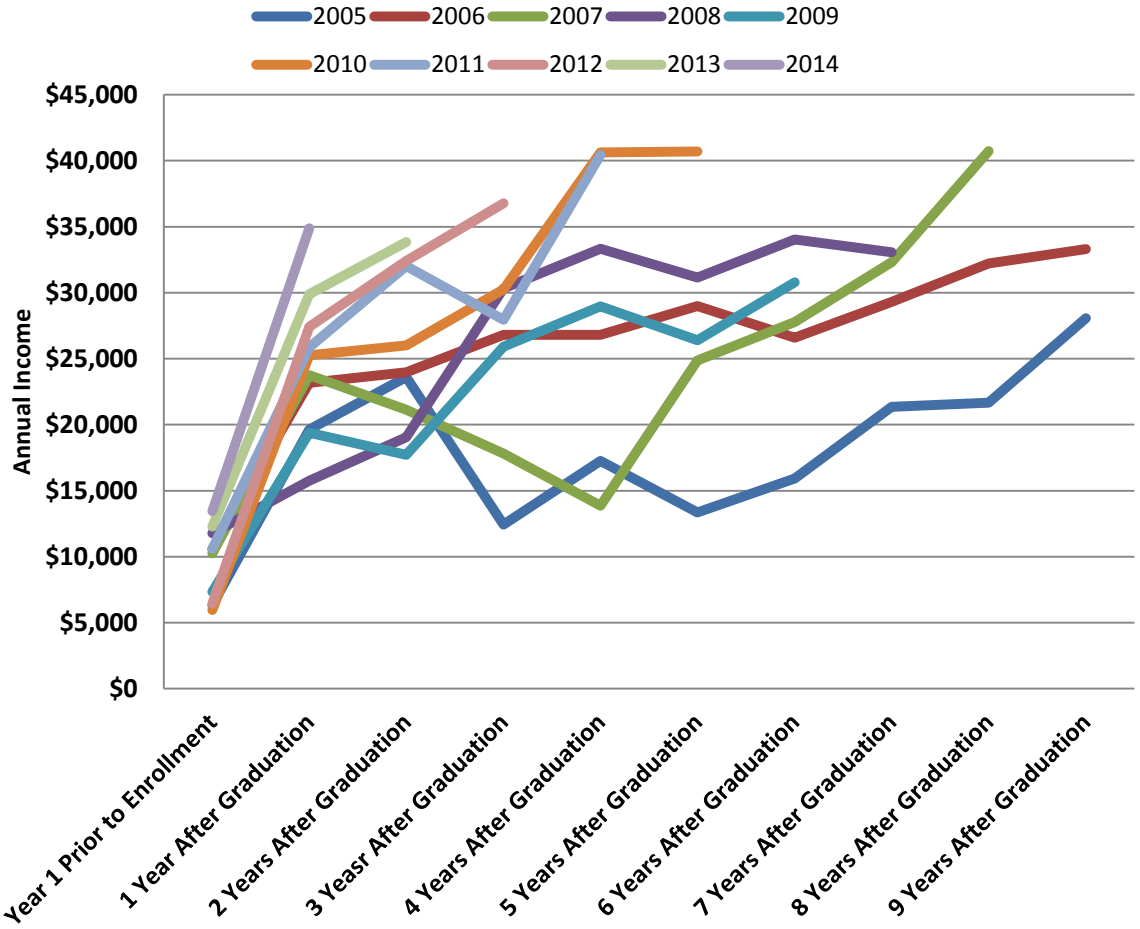
The fact that CBA serves a dual purpose in preparing local residents for the construction industry and providing economic opportunity to disadvantaged residents makes it important to determine the extent to which participation in CityBuild Academy impacts earnings. Equally as important is to try to determine whether its graduates are joining and remaining in the construction workforce. With the assistance of the State Employment Development Department (EDD), we sought to address these issues by researching earnings of CityBuild Academy graduates one year prior to enrollment and then for some years after program graduation. This is the first time that such data have been available to the City or the research team.

EDD provided earnings for graduates of the first CityBuild class in 2005, and for each of the subsequent classes through 2014. For the CityBuild graduates of the class of 2005, EDD was able to track earnings for nine years following graduation. For each of the subsequent CityBuild classes, the tracking was a year less, so that for the 2014 CBA graduates there is only one year of data after participation in CBA. Years 1 and 2 are the only cohorts that have been tracked a full nine years, which weights analysis of years further out from graduation from CBA towards the experience of those early cohorts. For this reason, with the exception of Chart 64, we compare and present data over a period of three years for several cohorts for which the data are available. Additionally, EDD is only able to track earnings for individuals employed in the State of California. Therefore, for any graduates that may have moved out of state, there won't be any earnings data available. This is one of the limitations of the data.

In Chart 64, each of the 10 years is graphed by median income of graduates. The individual graphs differ widely, but all show a sharp increase in annual income in the first year after program graduation. With some variability, wages then continue to increase, so that income in the sixth to eighth year after graduation is significantly higher than pre-program income, but below $50,000 (and usually below $40,000 per year). The income of these CBA graduates includes both construction industry and non-construction sector earnings.

Baseline median incomes prior to participation in the program are between $5 and $15K annually, averaging $10,426 across all cohorts. 2005 and 2010 cohorts have exceptionally low baseline median incomes, prior to participating in CBA, at approximately $6K each. The experience of each cohort is highly variable, but does not seem particularly tied to pre-participation income, and overall shows an upward arc in income after CBA Academy graduation. We found that graduation from CityBuild Academy positively impacts the earnings of its graduates although most do not move into high income categories.

Chart 64: CityBuild Academy Graduates' Median Income Trajectories - Cohorts 2005 -2014



Source: CA Employment Development Department, Labor Market Information Division, October 2016

- Impact of participating in CBA on Graduates' Pathways in Construction Sector

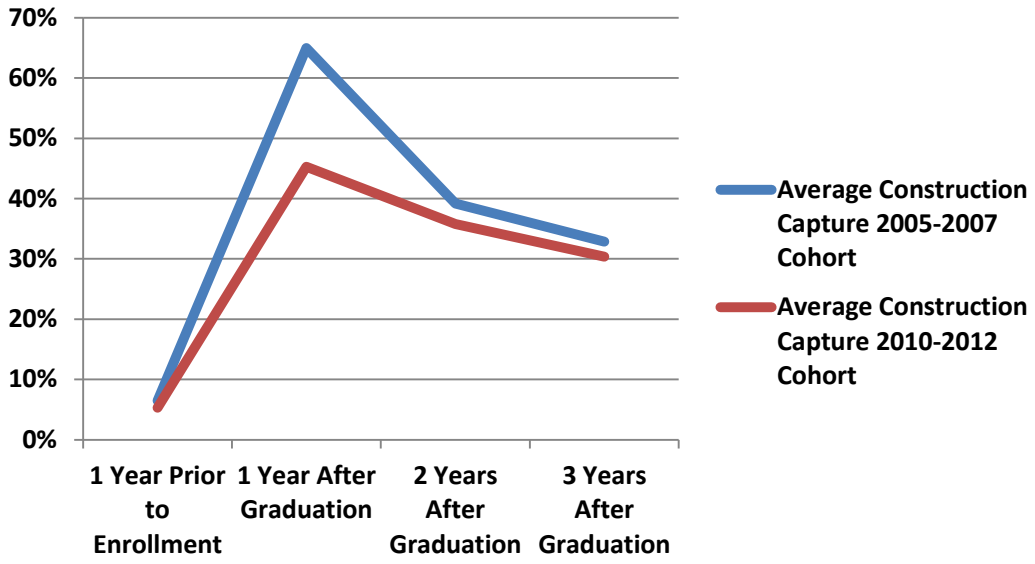
For this analysis we examine two discrete cohorts of CBA graduates to get a sense of what outcomes result for these specifically in the *construction* sector. The first cohort is comprised of the CBA graduates from 3 years - 2005, 2006, and 2007. These correspond to the beginnings of the CityBuild Academy, and also a period of economic recession, nationally and regionally within the construction sector. The second cohort is comprised of again 3 years – 2010, 2011, and 2012. These years correspond to a period when the CityBuild program is not only more mature, but also is operating within the context of improving economic conditions in the region's construction sector.

For this discussion we compare the average percent of construction sector capture and average median earnings from construction across the first 3 years after graduation for both cohorts.

The two cohorts begin with an average of 5-6% of participants who are in the construction sector prior to enrolling in the CBA. Within 1 year after graduation, the 2005-2007cohort shows a jump to an average of 65% of graduates working in the construction sector. By the second year after graduation, this number falls to 45%; and by the third year after graduation, it falls to 33% or one third of CBA graduates working in the construction sector.

The 2010-2012 cohort shows a similar pattern starting from an average of 5% of CBA participants working in the construction sector prior to participating in CityBuild. Within 1 year after graduation from CBA, we see a jump to 45% of graduates working in the construction sector. This falls to 36% of working in the construction sector 2 years after graduation from CBA, and 30% in year 3. Chart 65 shows the average percent of CBA graduates in construction for both cohorts from 1 year prior to enrolling to 3 years after graduating from CBA.

Chart 65: Average Construction Capture Before and After Participating in CityBuild Academy

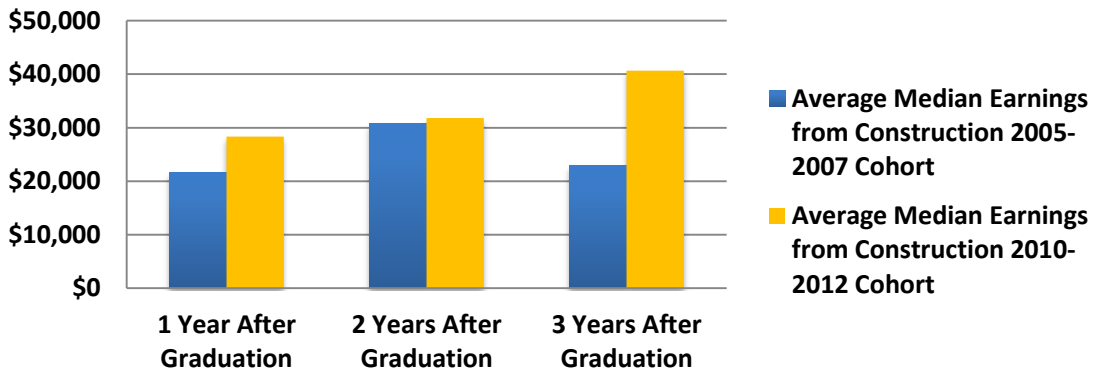


Source: CA Employment Development Department, Labor Market Information Division, October 2016

While 5-6% of both cohorts were working in construction prior to enrolling in CBA, earnings from construction were negligible at that time. However, one year after graduation, the early cohort (2005-2007) saw average median earnings from construction of $21,628; two years after of $30,828, and three years after of $22,960. This is considerably higher than the average median income of $10,426 prior to participating in CBA for all years.

This pattern is replicated for the 2010-2012 cohort but with higher returns: $28,723 average median construction earnings one year from graduation, $31,858 two years after and $40,698 three years out. Chart 66 below shows average annual construction earnings for both cohorts three years from graduating from CityBuild Academy.

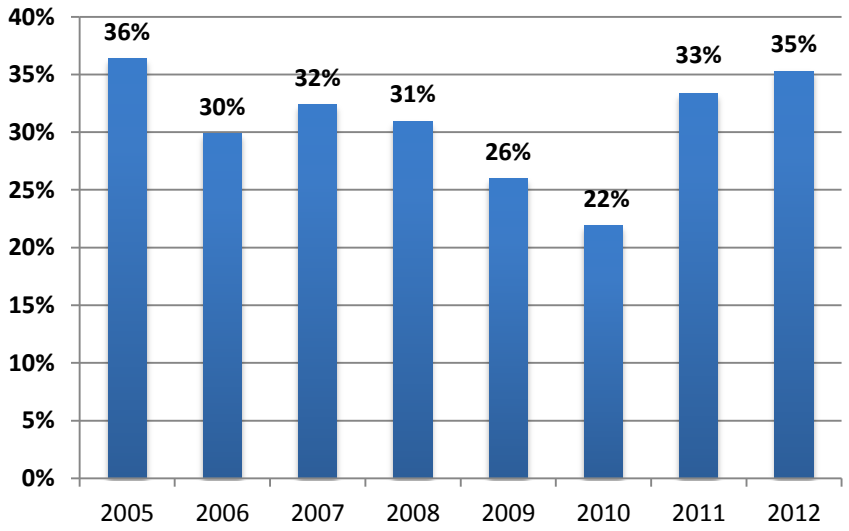
Chart 66: CityBuild Academy Graduates' Median Earnings from Construction Cohorts 2005-2007 v. Cohorts 2007-2012



Source: CA Employment Development Department, Labor Market Information Division, October 2016

While encouraging as these data appear, it is important to note that as the earnings data move further beyond the graduation year, it appears that fewer and fewer graduate have earnings derived from construction work. Chart 67 illustrates this fall off within the three years after graduation. Of a total of 542 CBA graduates, 169 or 31% remained in construction three years after graduation. There was variability over years as depicted below.

Chart 67: CityBuild Academy Graduates - Percent Working in Construction 3 Years after Graduation, 2005-2012



Source: CA Employment Development Department, Labor Market Information Division, October 2016

C. Conclusions Regarding the Pipeline

- Participating in CityBuild results in a steep increase in income. On average, participation in CityBuild results in a 135% increase in median income in the first year upon completion of the program. Incomes continue to rise and hover between $30K and $40K in subsequent years after completion of the CityBuild program.

- Incomes are in step with those of construction laborer income projections from the EDD, and CityBuild graduate incomes reflect the often part-time, seasonal nature of construction work throughout the scope of this analysis.

- CityBuild Academy, the City's primary pre-apprenticeship training program that also ushers new entrants onto City contracts, is currently showing a long-term 30% retention rate. This retention rate bests many of the apprenticship program drop-out rates that tend to hover around 50% within the first year for many of the building trades.

- Citybuild apprentices are not all entering trades in highest demand on City contracts. The higher list trades, that include electricians and plumbers, are not enrolling new entrants from the City system in any signficiant numbers.

As we concluded in 2013, the pipeline has limited access points. The Joint Apprenticeship Training Committees (JATCS) apprentices indenturned into local unions serve union affiliates throughout Northern California and San Franicsco apprentices make up only a portion of their enrollment. The JATCs are set up to respond to regional market conditions rather than San Francisco demands. Moreover, the JATCs are always a step behind the workforce demand in that they ramp up in response to shortages but only after the shortages have been detected. Even with a sizeable uptick in San Francisco apprentice enrollment, it would be years before these apprentices attain journey status and contribute to the pool of experienced journey level skilled trades workers. Again, even if workers migrate from other industry sectors, they must still enter the unionized skilled trades through the apprentice sytstem.

There continue to be challenges in making inroads into SF resident participation in Electricians, Plumbers, Operating Engineers. San Francisco residents are not entering the unionized construction workforce in large numbers. There is a steady increase but it is not enormous. As depicted in Section 4, we can anticipate that the current inflow of new entrants into the construction skilled trades will not be sufficient to keep up with the demand presented by the combination of City and privately sponsored construction that is scheduled over the next decade.

D. Summary of Findings

In San Francisco, City sponsored projects operate in a union environment, so that the pipeline for entry into construction jobs on City sponsored projects (and on most large privately developed projects) is through the

union apprenticeship system. The number of San Francisco resident apprentices stood at 1718 in July 2016. They reflected the multi-ethnic nature of the City—32% Hispanics, 24% White, 22% Asian Pacific Islanders, 21% African American, and also the continued low percentage of women (only 11% female apprentices). The number of apprentices entering each year has increased in the past few years, but only gradually, from 595 in 2012 to 646 in 2015, indicating that the pipeline has not widened greatly, even with the increased construction work.

City Build Academy plays an important role in the apprentice system, as the City's main pre-apprenticeship program. It also has seen an increase in its enrollment numbers, but gradually, from 81 enrollees in 2011-2012 to 99 in 2014-2015. With the assistance of the state Employment Development Department, the project team was able to track earnings data of City Build participants since 2005 and found both above-average retention rates of City Build graduates in the construction trades as well as earnings increases, especially in the first years after graduation. CityBuild graduates, though, have been limited in entering certain trades in highest demand on City projects, particularly as electricians and plumbers.

PART II
SSIP PHASE 1 AND DISTRICT 10 ANALYSIS

Section 6: District 10 Demographics

PART II – SSIP PHASE 1 AND DISTRICT 10 ANALYSIS

The San Franciso Public Utilities Commission has embarked on the Sewer System Improvement Program (SSIP), a $2.9 billion dollar program to upgrade the City's aging sewer infrastructure. When complete, SSIP will make the City's sewer and waste water treatment system more reliable and seismically safe for generations to come. In addition to the infrastructure benefits that SSIP will deliver to the city, the program also contains provisions for delivering tangible community and economic benefits to the local residents. Specifically, SSIP construction includes a Community Benefits Program, the City's Local Hiring Policy for Construction, a Project Labor Agreement and the City's Local Business Enterprise Program.

As noted in the Executive Summary, the residents of San Francisco's Supervisorial District 10, roughly containing the Bayview Hunter Point, Visitacion Valley and southern portion of Potrero neighborhoods, will receive special focus during SSIP's construction. This area will be the site of the largest projects completed during SSIP Phase I.

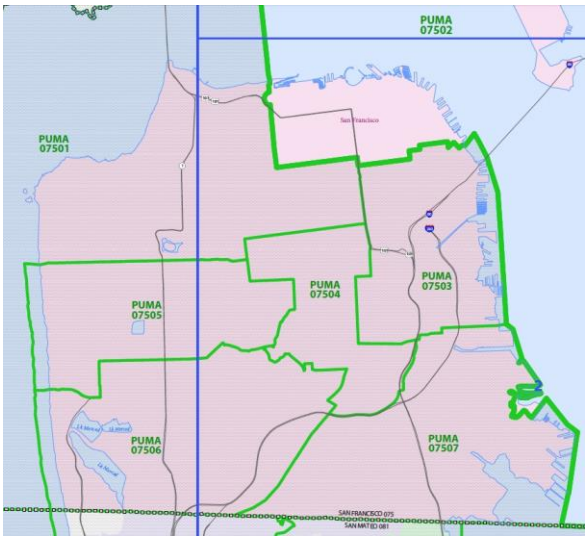
This segment of the report, Section 6, begins with an update of the demographics of District 10. This is a dynamic neightborhood that has undergone great change during the last decade. It is also the site of one of San Francisco's largest redevelopment projects, the Hunters Point Shipyard Project, that is contributing to the continuing rapid change to the neighborhood. The updated District 10 information is followed by Section 7 that includes a review of the job opportunities that are likely to be generated by SSIP Phase 1 projects and a snap shot of how District 10 residents are currently participating on these projects. This section closes with an analysis of what gaps in skill levels may exist between SSIP Phase 1 jobs and District 10's existing workforce.

The report concludes with Section 8 consisting of a brief review of the existing employment training organizations accessible to District 10 residents, and a set of recommendations for potential workforce investments to benefit Disrict 10 residents.

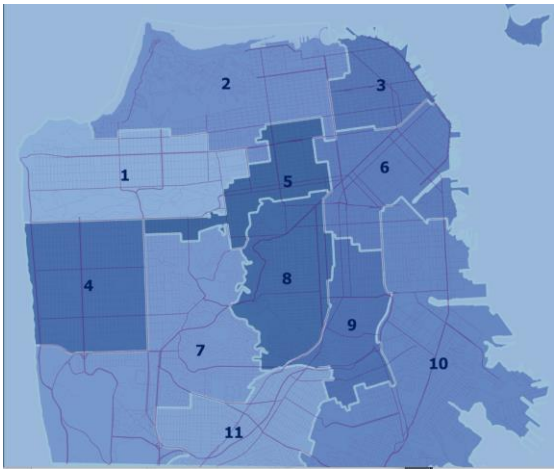
Section 6: District 10 Demographics

A. Demographic Characteristics of District 10

The census data available through the American Community Survey divides San Francisco into seven districts called PUMA's (Public Use Microdata Areas). For privacy reasons, these are the smallest geographical units available when using American Community Survey data. San Francisco's PUMA's are shown within the green boundaries on the pink map below. PUMA boundaries are chosen by the Census to include roughly 120,000 residents each, and indeed, six of the seven PUMA's shown below were estimated to have between 105,000 and 125,000 persons in 2014, while the remaining one (PUMA 07501) had slightly more with approximately 145,000.



For comparison purposes, San Francisco's Supervisorial districts are shown on the blue map below. While some of the city's political districts do not correspond very closely with the Census PUMA's, Supervisorial District 10 does (with some exceptions) line up reasonably well with PUMA 07507. Part of District 10's Potrero Hill section to the north is not included in PUMA 07507, while some of District 11's Excelsior and Crocker Amazon's sections to the west are included in PUMA 07507. Nonetheless, neighborhoods such as the Bayview, Hunter's Point, Visitacion Valley, and Portola, all in District 10 are also in PUMA 07507.



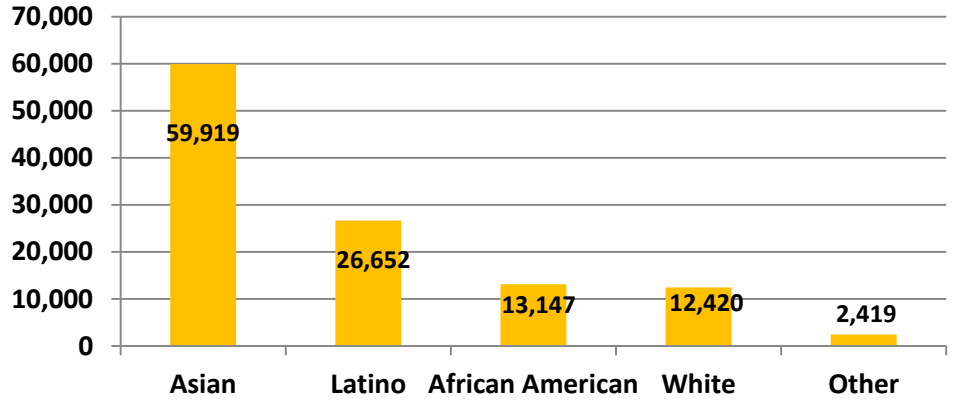
In this section of the report, we make use of this census data from the American Community Survey to describe the demographic and socioeconomic characteristics of the residential population of PUMA 07507, with a special emphasis on employment and housing conditions. We also compare these characteristics to other Census areas in San Francisco as well as San Francisco in total. The following table provides the label we apply to each of San Francisco's seven PUMAs, along with a more detailed list of some of the more prominent neighborhoods included in each.

PUMA	Census Area Label	Neighborhood, Detailed
7501	Richmond	Presidio, Richmond, Laurel Heights, Western Addition, Alamo Square, North Panhandle
7502	North Beach, Pacific Heights, Chinatown	Marina, Pacific Heights, Cow Hollow, Russian Hill, Nob Hill, Telegraph Hill, North Waterfront, North Beach, Chinatown
7503	SOMA, Potrero Hill, Mission (east)	Union Square, Tenderloin, SOMA, Yerba Buena, Mission District (east of Valencia), Potrero Hill, Dogpatch
7504	Castro, Noe Valley, Mission (west)	Castro, Haight-Ashbury, Cole Valley, Mission District (west of Valencia), Bernal Heights, Noe Valley
7505	Sunset, Twin Peaks	Sunset, Outer Parkside, Golden Gate Heights, Twin Peaks
7506	Lakeshore, Ingleside, Outer Mission, West of Twin Peaks	Lakeshore, Inner Parkside, Ingleside, West of Twin Peaks, Outer Mission, Glen Park
7507	Bayview, Visitacion Valley, Excelsior	Bayview, Hunters Point, Portola, Visitacion Valley, Excelsior, Crocker Amazon

- Race & Ethnicity

In terms of race and ethnicity, Asians predominate in the Bayview, Visitacion Valley, Excelsior PUMA than any other racial or ethnic group, as can be seen in Chart 68 below. Of the nearly 60,000 Asians in the area, about 41,000 are of Chinese ancestry, and another 18,000 are of some other Asian ancestry. The next largest group is Latino, and of the nearly 27,000 Latinos in the area, about 17,000 are of Mexican ancestry while the other 10,000 are of some other Latino ancestry.

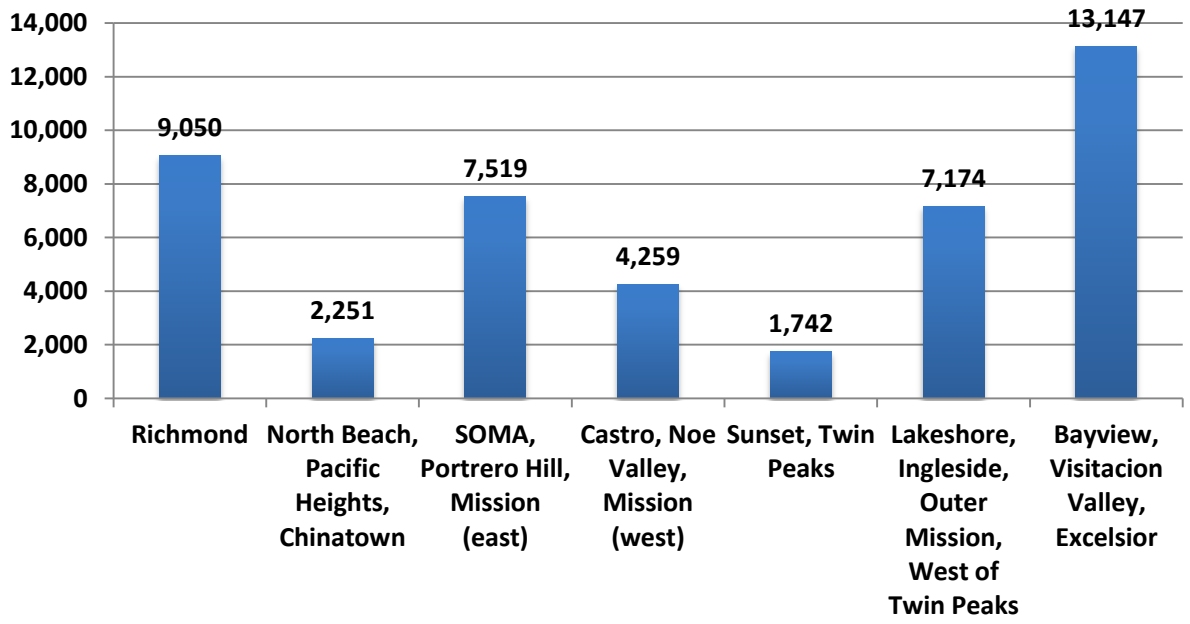
Chart 68: Race & Ethnicity of Residents of Bayview, Visitacion Valley, Excelsior Neighborhoods, 2014



Source: American Community Survey, 2014

This PUMA contains the Bayview and Hunters Point neighborhoods which since the 1940's have been predominantly African American. Today, about 13,000 residents of this PUMA are African American. While much smaller than the number of Asians and Latinos, this still represents the largest concentration of African Americans in all of San Francisco's PUMAs as can be seen in Chart 69 below.

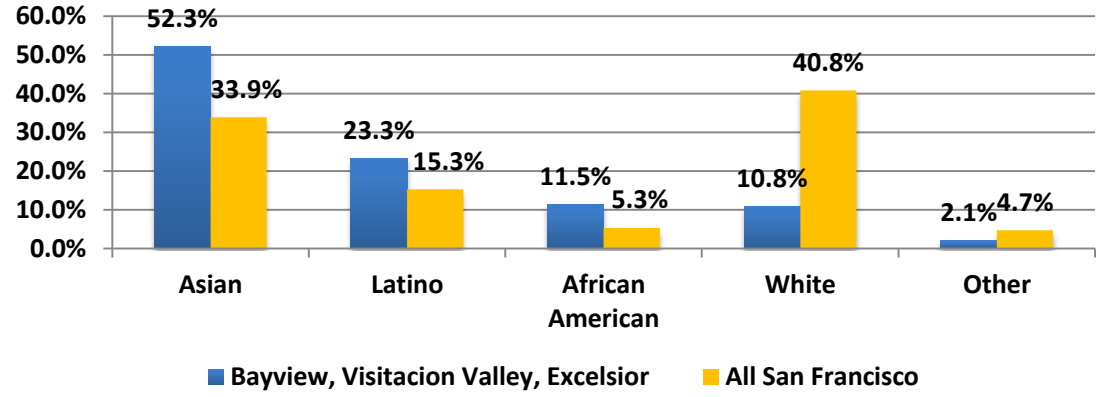
Chart 69: African American Residents by San Francisco PUMA, 2014



Source: American Community Survey, 2014

Compared to San Francisco's other PUMA areas, the Bayview, Visitacion Valley, Excelsior PUMA is its most racially and ethnically diverse, as shown in Chart 70. As can be seen, there are higher percentages of Asians, Latinos, African Americans, and Others and a much lower percentage of Whites than in San Francisco as a whole.

Chart 70: Race & Ethnicity in Bayview, Visitacion Valley, Excelsior v. San Francisco, 2014

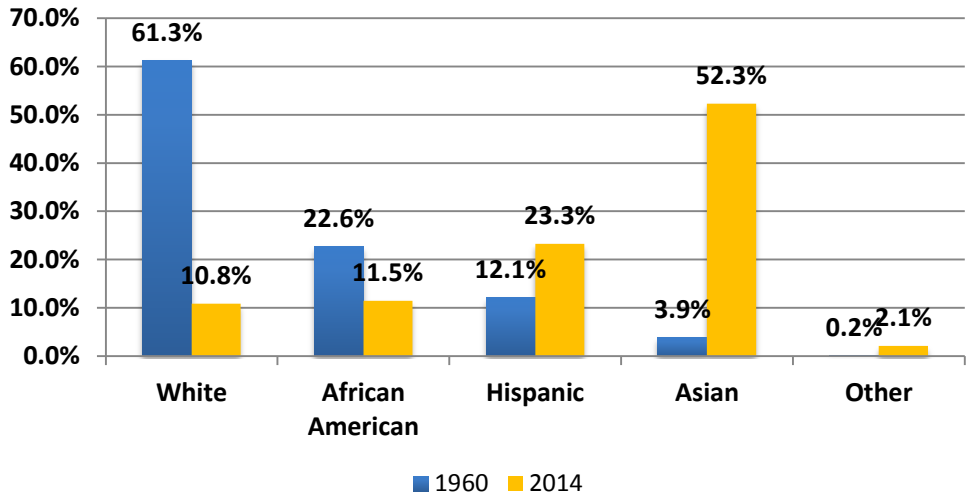


Source: American Community Survey, 2014

These estimates of the racial and ethnic composition of the Bayview, Visitacion Valley, Excelsior PUMA and San Francisco as a whole were derived from the 2014 Census data. Changes in the racial and ethnic composition of the population in a geographic area like a PUMA or county occur relatively slowly over time, and substantial changes tend to show up in a decade-to-decade comparison as opposed to year-to-year comparison. Therefore, we would not expect to see major changes in these overall percentages between 2014 and January 2017.

The decline in Bayview and Hunters Point's historic black population is evident in Chart 71 which compares the Bayview, Visitacion Valley, Excelsior PUMA's racial and ethnic composition in 1960 (as recorded in the 1960 Decennial Census) with its composition today. As can be seen, both the African American and White populations declined substantially, whereas the Latino and Asian ones have increased. As a percent of the entire PUMA population, the African American share fell from 22.6% in 1960 to 11.5% in 2014. The White share fell from 61.3% to 10.8%.

Chart 71: Race & Ethnicity in Bayview, Visitacion Valley, Excelsior, 1960 v. 2014

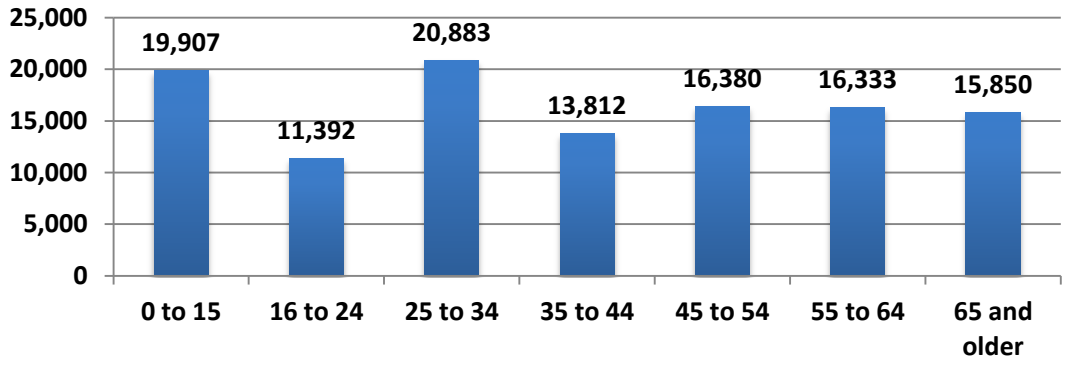


Source: U.S. Census, 1960 & American Community Survey, 2014

- Age

Bayview, Visitacion Valley, Excelsior has more young children and young adults than any of the other age groups. Chart 72 shows there are about 20,000 persons each in the 0-15 and about 21,000 in the 25-34 age range. Interesting, the 16-24 age range has the fewest number of all with about 11,000. The older adult age ranges are more similar in size, ranging from about 14,000 to 16,000.

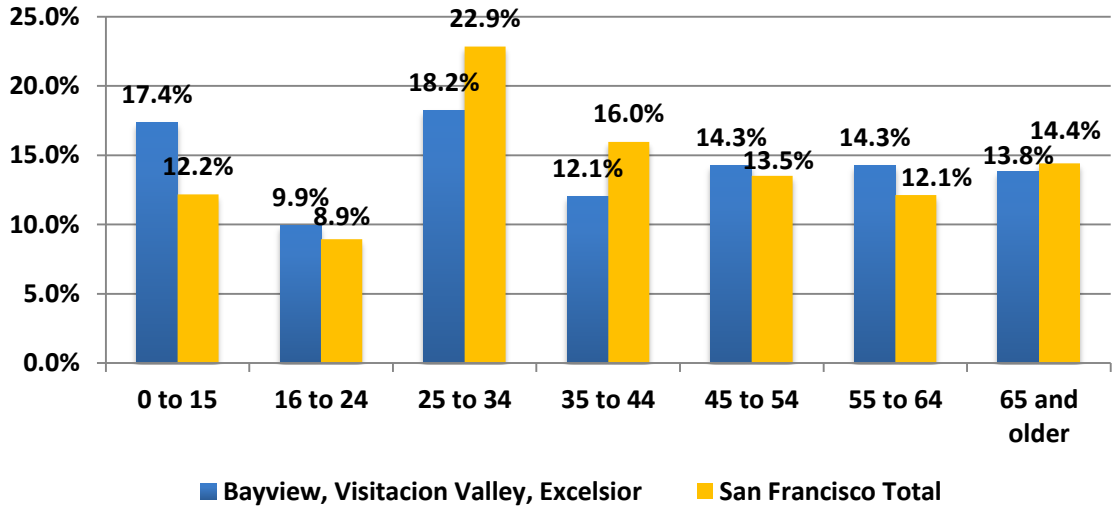
Chart 72: Age Distribution of Bayview, Visitacion Valley, Excelsior Residents, 2014



Source: American Community Survey, 2014

Compared to San Francisco as a whole, Bayview, Visitacion Valley, Excelsior has relatively more children and a relatively fewer working age adults up to the age of 45 than the city as a whole. This can be seen in Chart 73 which compares the age distribution of these PUMAs to that of San Francisco as a whole.

Chart 73: Age Distribution in Bayview, Visitacion Valley, Excelsior Compared to All of San Francisco, 2014

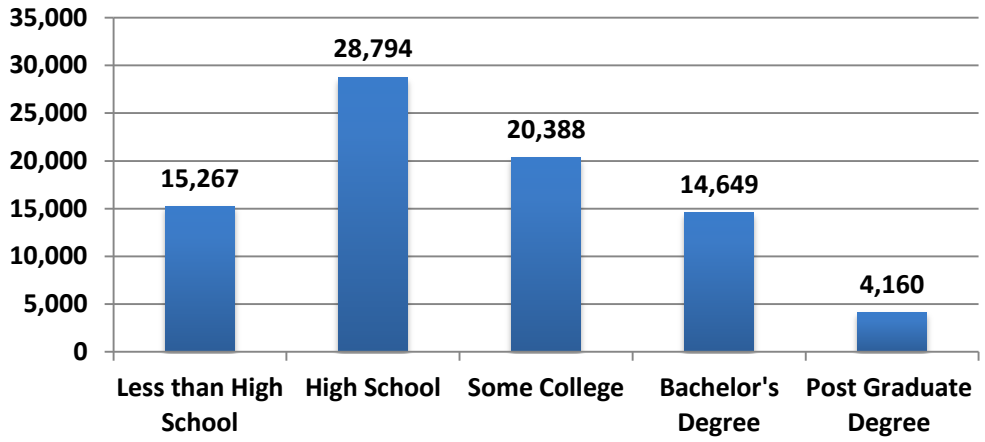


Source: American Community Survey, 2014

- Educational Attainment

The median education level of adults in the Bayview, Visitacion Valley, Excelsior PUMA is a high school diploma, and 53% of the population have a high school diploma or less. As can be seen in Chart 74 below, while about 44,000 adults in the PUMA have high school or less, only 14,600 have a four-year bachelor's degree, and a mere 4,100 have a post graduate degree.

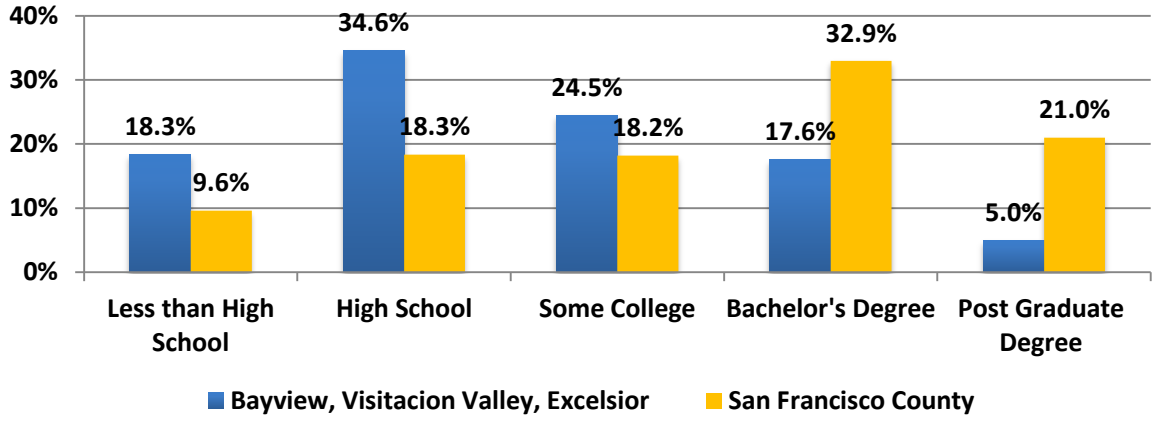
Chart 74: Educational Attainment of Adults in Bayview, Visitacion Valley, Excelsior, 2014



Source: American Community Survey, 2014

This level of educational attainment is not nearly as high as in the rest of San Francisco, as can be seen in Chart 75. It shows that the Bayview, Visitacion Valley, Excelsior population has a disproportionately high percentage of those with high school or less, and a disproportionately low percentage of those with four-year college degrees or post graduate degrees.

Chart 75: Educational Attainment in Bayview, Visitacion Valley, Excelsior Compared to All of San Francisco, 2014

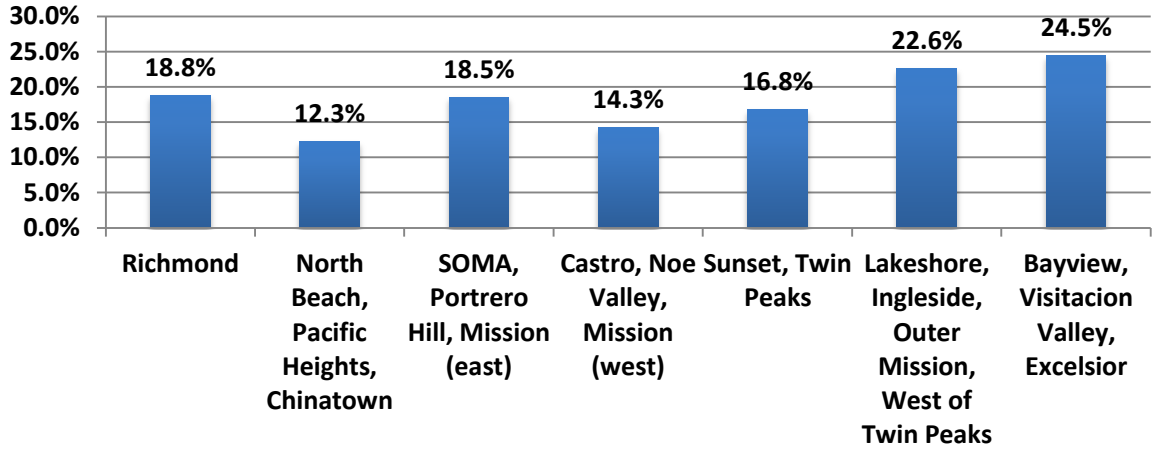


Source: American Community Survey, 2014

While proportionately fewer adults in the Bayview, Visitacion Valley, Excelsior PUMA have bachelor's or post graduate degrees, this PUMA has the highest percentage of persons with some college, as can be seen in Chart 76 below. The some college category includes anyone who has completed at least a semester of college but has not attained a four-year bachelor's degree. Those in this category range from those with some minimal coursework at a community college to those who dropped out of a four-year university a few classes short of graduation. The relatively high percentage of these persons in the Bayview, Visitacion Valley,

Excelsior PUMA might be due to financial or other reasons, but we have no way to verify the exact cause. Nonetheless, these 20,000 or so persons who at one time attended college but did not complete might represent a potential source to be attracted into construction industry employment.

Chart 76: Adults with Some College as a Percentage of the Adult Population by San Francisco PUMA, 2014



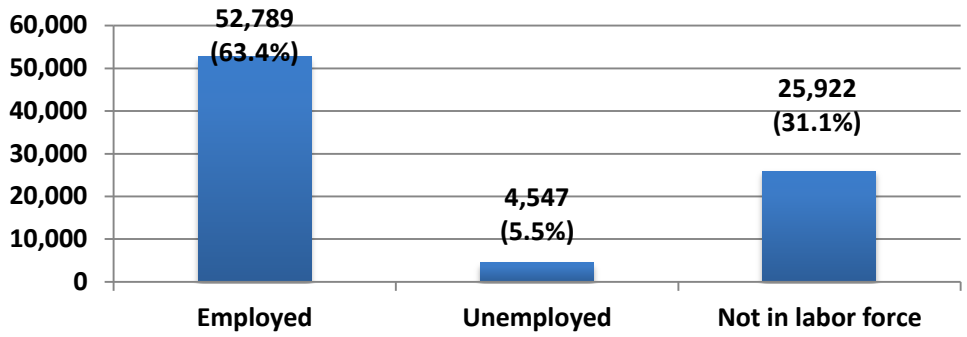
Source: American Community Survey, 2014

- Employment Status

The Census Bureau and the Bureau of Labor Statistics break down the employment status of adults 16 years or older into three categories. To be considered employed, a worker must simply have worked at all for a wage or salary during the previous reporting period, regardless of whether the work was full time. To be considered unemployed, a person must not have a job, but also be actively seeking one by taking actions such as applying for jobs, inquiring about them, checking hiring notices, etc. If a worker is neither employed nor actively looking for employment, they are considered to be not in the labor force, regardless of whether they would desire to be working or not. Examples of those not in the labor force are retired persons, stay-at-home spouses, adults in school, and persons who would like to be working but have become discouraged and are no longer actively looking for a job.

Chart 77 shows that over 50,000 adults in the Bayview, Visitacion Valley, Excelsior PUMA were employed in 2014. Another 26,000 were out of the labor force, and about 4,500 were unemployed.

Chart 77: Employment Status of Adults in Bayview, Visitacion Valley, Excelsior, 2014

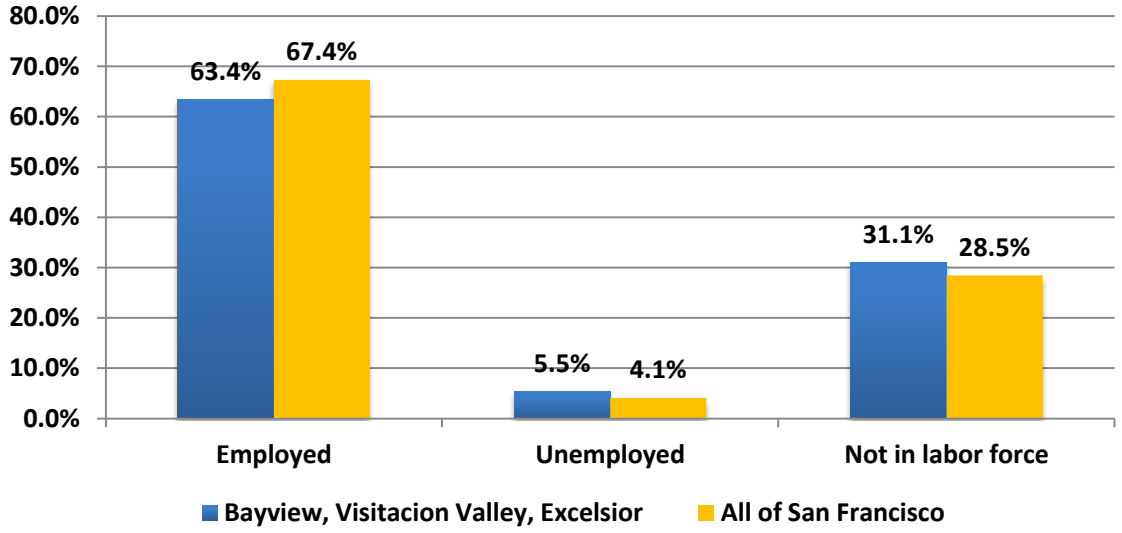


Source: American Community Survey, 2014

The employment rate in Bayview, Visitacion Valley, Excelsior (the percent of the adult population who are employed), was 63% in 2014, as shown in Chart 78. As can be seen, this employment rate was four percentage points lower in Bayview, Visitacion Valley, Excelsior than in San Francisco as a whole. Additionally, the unemployment rate was two percentage points higher than for San Francisco as a whole. The percentage of adults not in the labor force was also higher in the Bayview, Visitacion Valley, Excelsior PUMA than in San Francisco as a whole. These comparisons suggest that the jobs recovery that was beginning to pick up steam in the rest of the city in 2014 was slow in coming to Bayview, Visitacion Valley, Excelsior.

As noted before, according to EDD labor force data, overall unemployment in San Francisco County has fallen considerably in recent years. In 2014, overall unemployment in San Francisco County stood at 4.4% according the EDD, but this has since fallen to an estimated 3.0% by December 2016. Unfortunately, EDD does not make unemployment estimates for smaller units within counties such as PUMAs, and only estimates it for the county as a whole. Since unemployment in the county as a whole as fallen since 2014, it is likely to have also fallen in the Bayview, Visitacion Valley, Excelsior PUMA to something lower than the 5.5% estimated here for 2014. However, we do not have access to more timely data that would allow us to make a numerical estimate of this unemployment rate at this time.

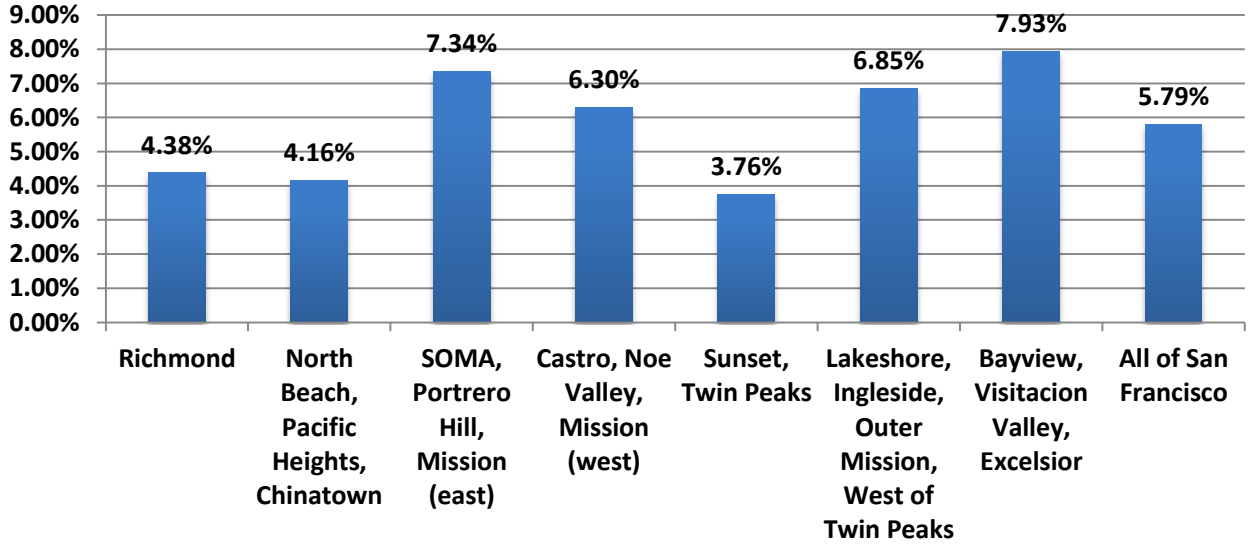
Chart 78: Employment Status in Bayview, Visitacion Valley, Excelsior Compared to All of San Francisco, 2014



Source: American Community Survey, 2014

Chart 79 compares the unemployment rate in Bayview, Visitacion Valley, Excelsior to the city's other PUMA areas. As can be seen, unemployment was the highest overall in Bayview, Visitacion Valley, Excelsior. PUMAs with Unemployment below 4.5% were Richmond, North Beach, Pacific Heights, Chinatown, and Sunset Twin Peaks. Only the SOMA, Potrero Hill, Mission (east) PUMA and the Bayview, Visitacion Valley, Excelsior PUMA had unemployment above 7%.

Chart 79: Unemployment Rates by San Francisco PUMA, 2014



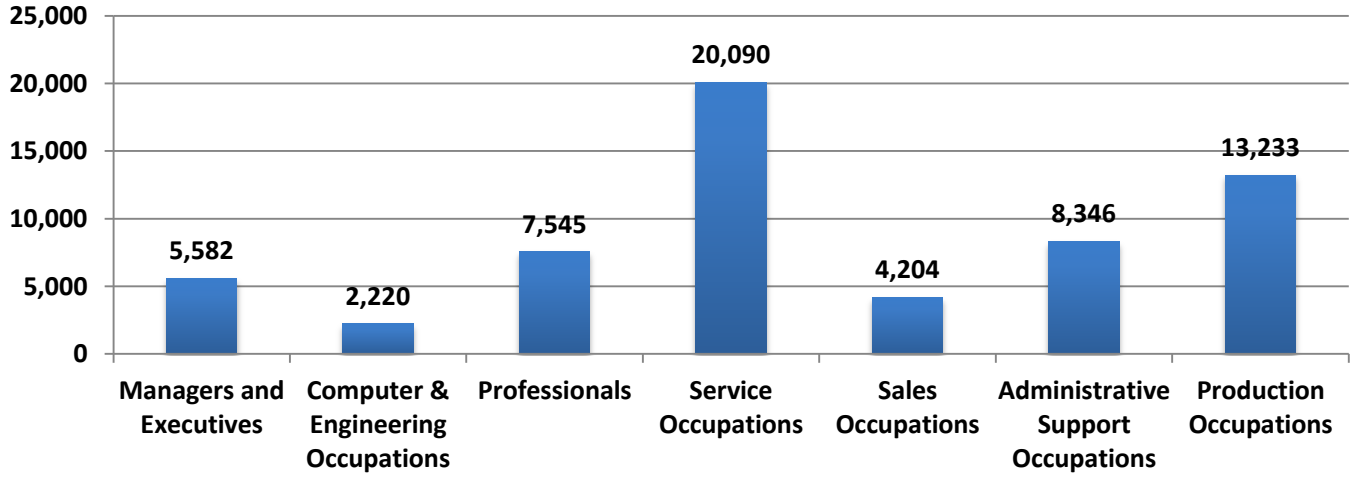
Source: American Community Survey, 2014

- Occupations

The Census Bureau and the Bureau of Labor Statistics use an elaborate occupational categorization called the Standard Occupational Classification Policy Committee (SOCPC) to distinguish between different types of occupations. For this report, we have simplified these into a smaller number of categories. As a methodological note, the American Community Survey uses a different universe of survey respondents when they inquire about employment status than when they inquire about occupation. For employment status, they query all adults 16 years and older period. For occupation, they query all adults 16 years or older *who have worked during the previous five years*. We saw in the last section that there were an estimated total 83,258 persons in Bayview, Visitacion Valley, Excelsior who were either employed, unemployed, or not in the labor force. For the occupational figures reported here, there are an estimated total of 79,470 adults who had worked during the previous five years. This total is lower than the employment status total because some persons considered not in the labor force have not worked during the previous five years, and so were not included in the occupational figures. Further, some who were included in the occupational figures because they worked during the previous five years are currently either unemployed or not in the labor force. Therefore, the number of persons listed in the occupational totals is different from the number listed as employed in the employment status totals.

Chart 80 shows the occupational categories of adult residents in Bayview, Visitacion Valley, Excelsior. By far the highest number of workers are employed in service occupations, nearly 21,000 or about 25%. In many cases, service occupations are relatively low-skilled, low-earning occupations. Examples include: cooks and food servers, building cleaning workers, building supervisors, gardeners and grounds maintenance workers, housekeepers, personal care workers, etc. The second highest number of workers are employed in production occupations, about 13,000 or 17%. Some of these jobs are relatively higher skilled and examples include: constructions workers, mechanics, machinists, metal workers, equipment installers, etc.

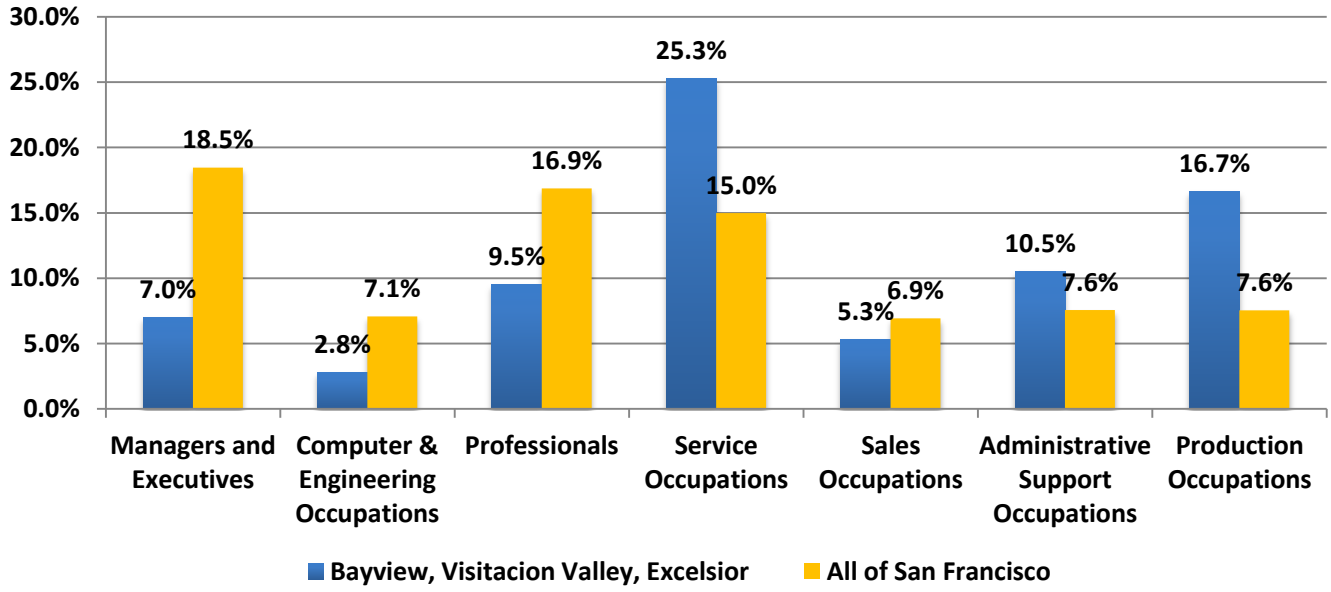
Chart 80: Employment by Occupation in Bayview, Visitacion Valley, Excelsior, 2014



Source: American Community Survey, 2014

Chart 81 compares the distribution of occupations in Bayview, Visitacion Valley, Excelsior to that of San Francisco as a whole. As can be seen, there is a disproportionately high concentration of jobs in service and production occupations in this PUMA compared to San Francisco overall. On the other hand, there are disproportionately small percentages of jobs in such relatively high skilled and high earning occupations as managers, executives, professionals, and engineering compared to San Francisco as a whole.

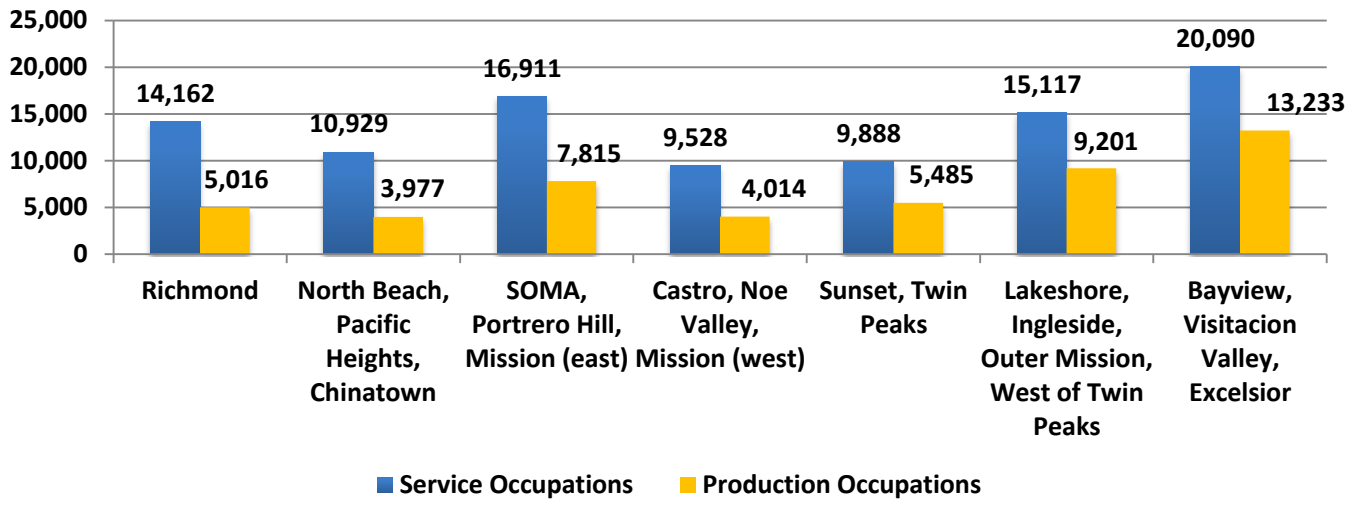
Chart 81: Employment by Occupation in Bayview, Visitacion Valley, Excelsior Compared to All of San Francisco, 2014



Source: American Community Survey, 2014

Chart 82 focuses on the service and production occupations that are so concentrated in Bayview, Visitacion Valley, Excelsior. It shows the numbers of these jobs in all seven of San Francisco's PUMAs. Bayview, Visitacion Valley, Excelsior has considerably more people employed in both these occupations than any other PUMA in San Francisco

Chart 82: Employment in Service and Production Occupations by San Francisco PUMA, 2014

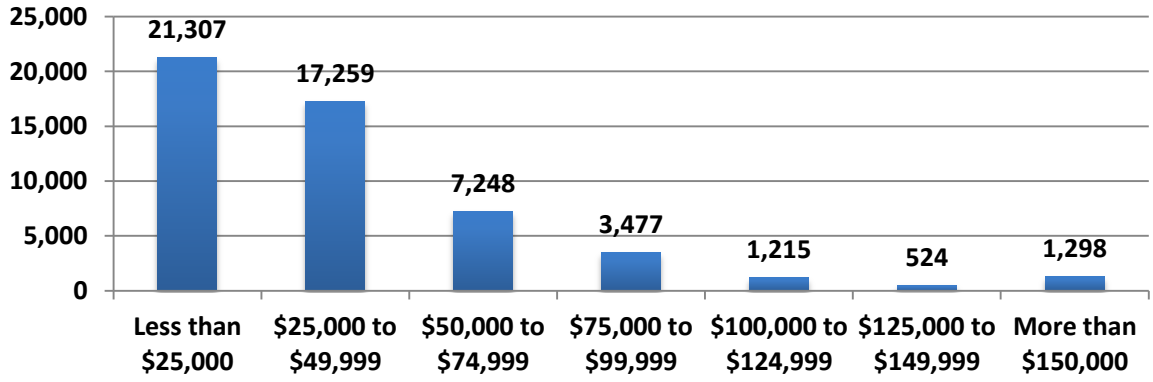


Source: American Community Survey, 2014

- Earnings

Employed residents of Bayview, Visitacion Valley, Excelsior earn far less annually on average than residents in any of the city's other PUMAs. The median earnings of employed adults in this PUMA was just $32,000 in 2014, compared to $55,000 for the city as a whole. To further contrast, the second lowest earning PUMA was SOMA, Potrero Hill, Mission (east) where the median earning level was $50,000 in 2014. Chart 1.16 shows the number of employed adults in Bayview, Visitacion Valley, Excelsior that fell within the specified earnings ranges. As can be seen, the highest number, 21,000, falls within the lowest annual earning range, less than $25,000. The second highest number, 17,000, falls within the $25,000 to $49,999 range. On the other hand, fewer than 2,000 earn more than $100,000 annually.

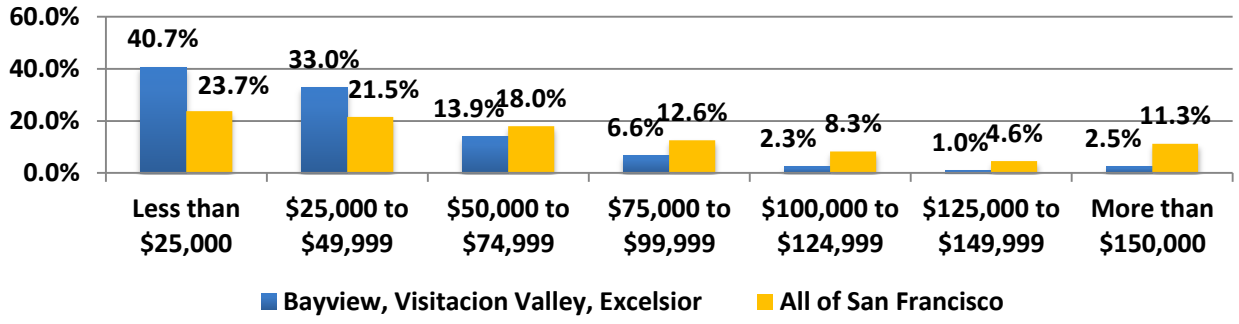
Chart 83: Annual Earnings of Employed Individuals in Bayview, Visitacion Valley, Excelsior, 2014



Source: American Community Survey, 2014

Chart 84 compares earnings in the Bayview, Visitacion Valley, Excelsior PUMA to those of employed individuals in San Francisco as a whole. As can be seen, there is a disproportionately high percentage of employed residents in this PUMA earning less than $50,000 (the city median) compared to the city as a whole. On the other hand, for every earning range above $50,000, Bayview, Visitacion Valley, Excelsior has a smaller percentage of employed residents than the city as a whole.

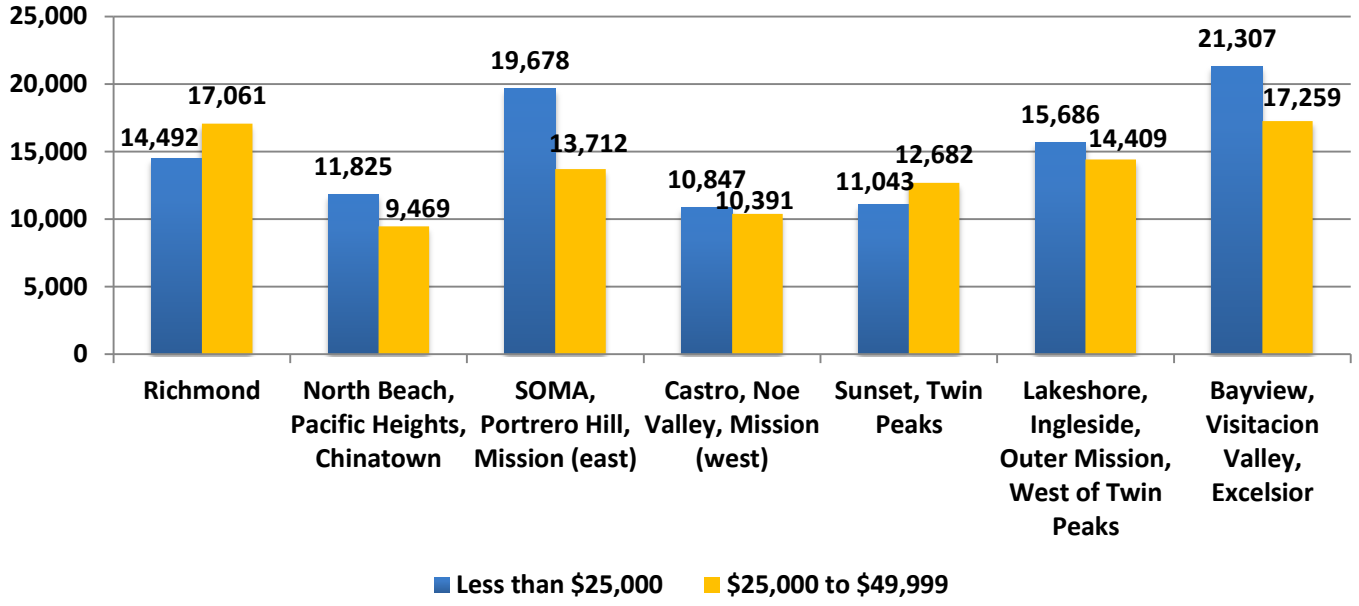
Chart 84: Annual Earnings by Employed Individuals in Bayview, Visitacion Valley, Excelsior Compared to All of San Francisco, 2014



Source: American Community Survey, 2014

Chart 85 shows the number of employed individuals in the two lowest annual earning ranges below $50,000 in each of the city's seven PUMAs. As can be seen, Bayview, Visitacion Valley, Excelsior has more individuals earning less than $25,000 than any other of the city's PUMAs. It also has the highest number of individuals earning between $25,000 and $49,999, although the Richmond PUMA is a very close second.

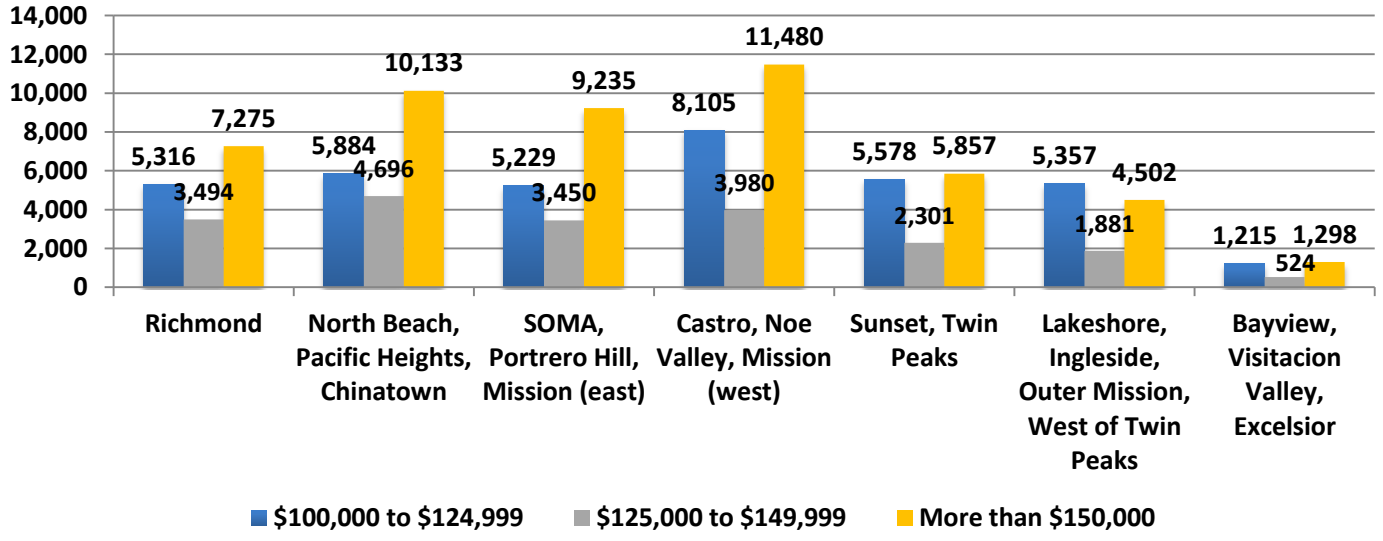
Chart 85: Annual Earnings Less Than $50,000 by San Francisco PUMA, 2014



Source: American Community Survey, 2014

Finally, Chart 86 shows the number of employed individuals in the three highest earnings categories above $100,000 in each of San Francisco's seven PUMAs. In this case, Bayview, Visitacion Valley, Excelsior has by far the lowest number of employed individuals with earnings this high compared to the other PUMAs.

Chart 86: Annual Earnings More Than $100,000 by San Francisco PUMA, 2014

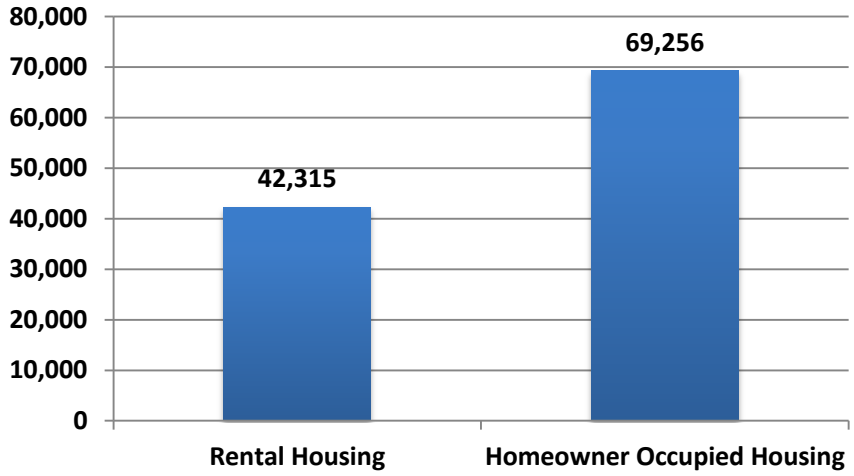


Source: American Community Survey, 2014

- Housing

Despite it being one of the poorest PUMAs in San Francisco, residents of Bayview, Visitacion Valley, Excelsior predominately live in homeowner occupied housing as opposed to rental housing. Chart 87 shows the number of individual residents in this PUMA that live in homeowner occupied housing and the number living in rental housing in 2014. Nearly 70,000 of the PUMAs residents lived in homes they own, whereas only about 42,000 rented their homes from a landlord.

Chart 87: Persons in Rental and Homeowner Occupied Housing in Bayview, Visitacion Valley, Excelsior,2014

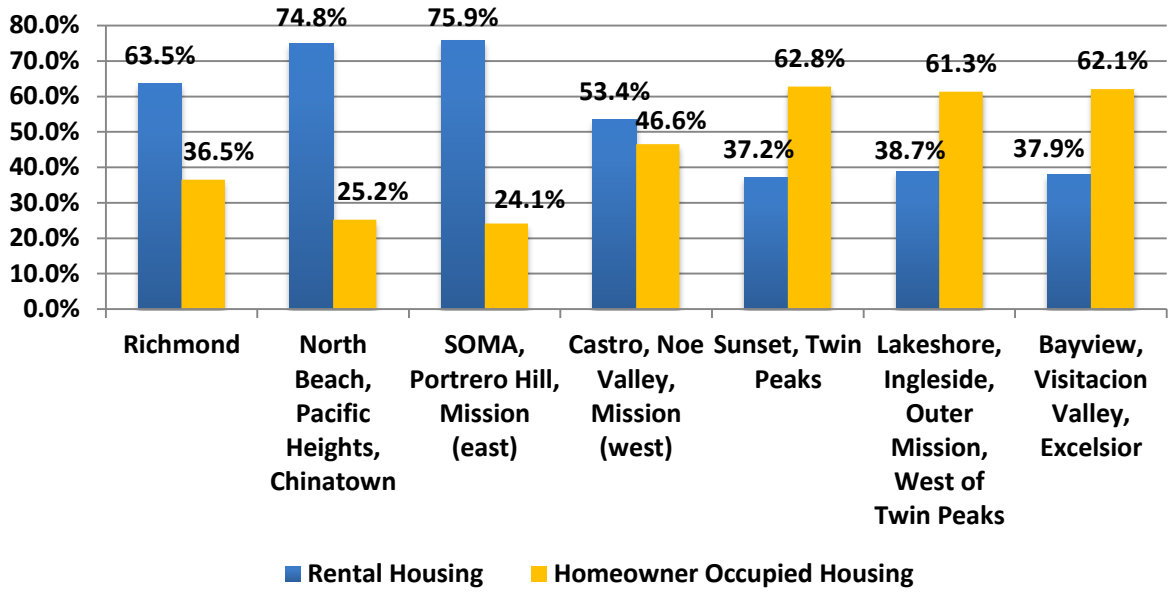


Source: American Community Survey, 2014

Bayview, Visitacion Valley, Excelsior actually has one of the city's highest homeownership rates at 62.1%, just slightly below that of the much wealthier Sunset Twin Peaks PUMA at 62.8%. Chart 88 shows that that the three PUMAs with the highest homeownership rates in 2014 were located on the southern and western edges of the city where single-family houses predominate.

Analysis of homeownership rates in a geographic area like a PUMA or county occur relatively slowly over time, and substantial changes tend to show up in a decade-to-decade comparison as opposed to year-to-year comparison. Therefore, we would not expect to see major changes in these overall percentages between 2014 and January 2017.

Chart 88: Renter and Homeownership Rates by PUMA, 2014

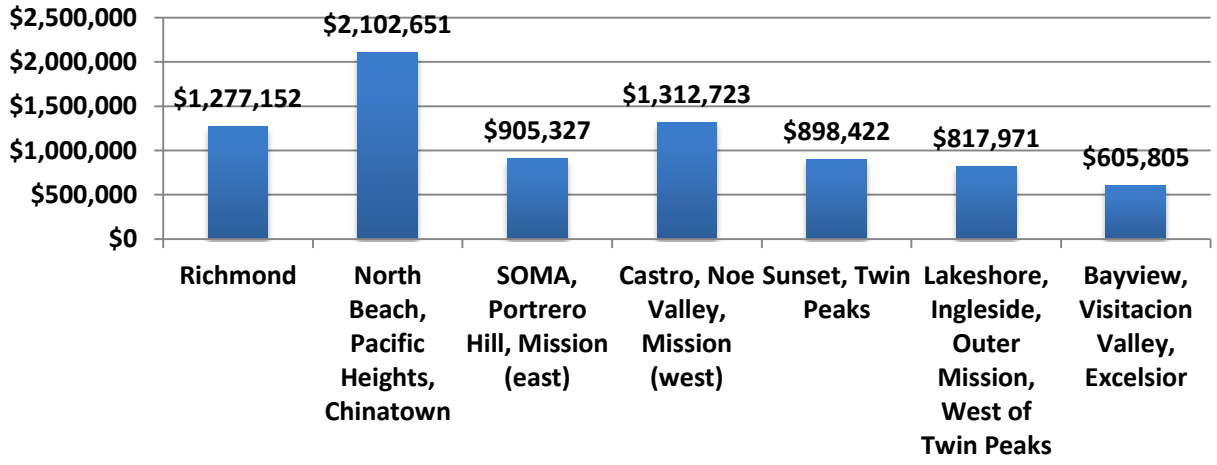


Source: American Community Survey, 2014

Despite having one of the city's highest homeownership rates, homeowner occupied housing in Bayview, Visitacion Valley, Excelsior of considerably lower value than in any other PUMA in the city. This is consistent with the fact that this is the poorest PUMA in San Francisco, as historically, housing value at the neighborhood level is highly correlated with income. Chart 89 shows the mean value of homeowner occupied housing in each of the city's seven PUMAs in 2014. As can be seen, the self-reported mean value of $605,805 was over $200,000 less than in the next lowest priced PUMA, Lakeshore, Ingleside, Outer Mission, West of Twin Peaks where it was $817,971.

Housing prices in San Francisco have continued to rise since 2014, though there has been some leveling off during the past year. According to the real estate website Zillow, the median listing price of single family housing in San Francisco as a whole has increased from $925,000 in June 2014 to $1,180,000 in December 2016. Its one-year forecast is for less than a 1% increase by December 2017. While some parts of San Francisco have undoubtedly seen a sharper rise in prices than others, Zillow does not provide data on prices by neighborhood within the city. Therefore it is unknown to what extent housing prices in the Bayview, Visitacion Valley, Excelsior PUMA have risen.

Chart 89: Mean Value of Homeowner Occupied Housing by PUMA, 2014

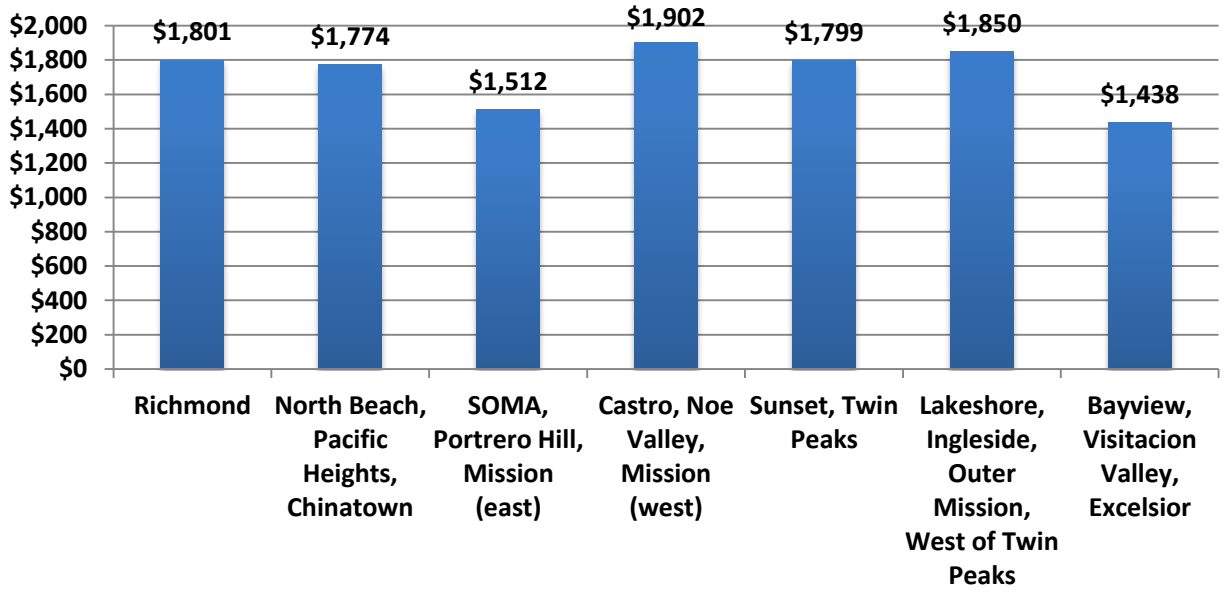


Source: American Community Survey, 2014

For the 38% of residents in Bayview, Visitacion Valley, Excelsior who rent, rent levels are considerably lower than those in most other PUMAs in the city. Chart 90 shows that the mean monthly rent of rental occupied housing in Bayview, Visitacion Valley, Excelsior was lower than in any other San Francisco PUMA in 2014. Only SOMA, Potrero Hill, Mission (east) had a mean rent nearly as low as Bayview, Visitacion Valley, Excelsior. Monthly rent in every other PUMA was at least $300 higher on average.

There is some evidence from real estate listing websites like Zumper that rents have softened in San Francisco since 2014. Zumper estimates that the median rent of one-bedroom units in San Francisco actually fell by 4.9% between 2015 and 2016. According to their data, the median rent for one-bedroom units listed in fall 2016 for the city as a whole was $3,440. The median listing rent in the Bayview neighborhood was $2,525. Note that these figures refer to vacant units currently on the market. In our analysis, we used the self-reported rents existing tenants actually paid, which is considerably lower than the market rate for newly listed vacant units.

Chart 90: Mean Monthly Rent for Rental Housing by PUMA, 2014



Source: American Community Survey, 2014

B. Characteristics of Construction Workers Living in District 10 Who Work on City Contracts

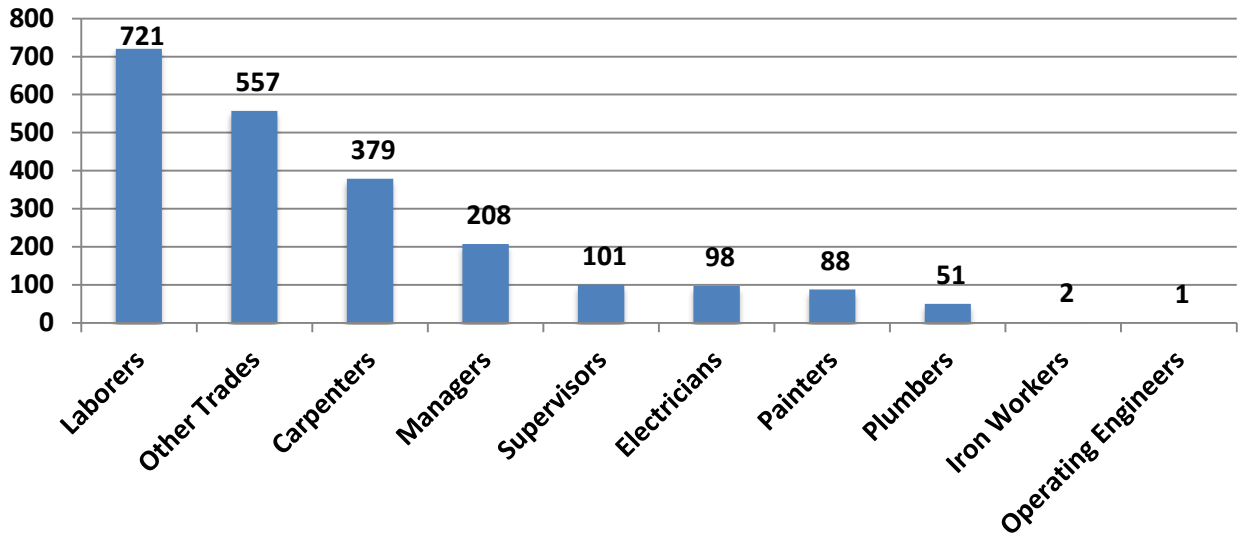
In this section of the report, we make further use of the City's employment data available through the Elation Systems database as described in Section 3. C. There, we used this data source to describe demographic and employment characteristics of San Francisco resident construction workers employed by construction contractors on city contracts. Here, we provide the same type of analysis for just those privately employed construction workers on city contracts who reported that they resided in either zip code 94124 or 94134, corresponding to Supervisorial District 10.

As discussed in some detail in Section 3. C., there are some important limitations to working with the Elation Systems data. Despite this, the Elation Systems data we used to report these findings does provide a meaningful summary of the characteristics of District 10 resident construction workers employed on city contracts. While the actual numbers of workers on these contracts who actually live in the district is likely to be lower than 2,049 reported here, the data nonetheless provides a useful overall composite picture of this workforce.

- Distribution by Trade

Of the various construction trades employed on city contracts, Laborers again make up the largest single group with 721, as shown in Chart 91. The catchall category of Other Trades is the next largest group with 557. Carpenters, with 379, and Managers with 208 are the next largest groups. All others have 100 or fewer workers.

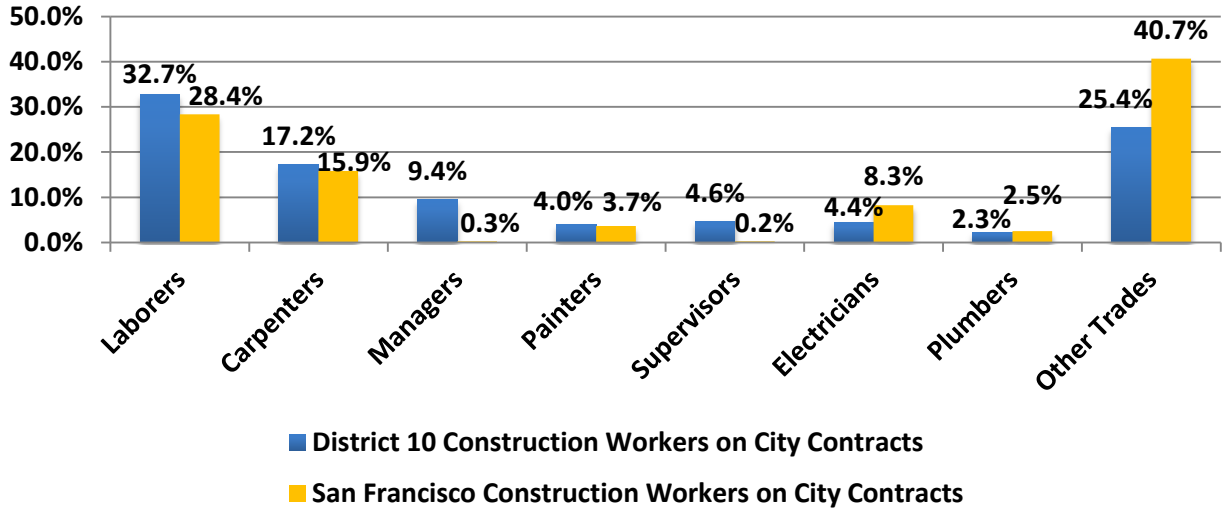
Chart 91: District 10 Resident Construction Workers on City Contracts by Trade, 2011-2016



Source: Elation Systems

The composition of trades amongst the District 10 construction workforce on city contracts is broadly similar to that for the entire San Francisco construction workforce on city contracts, as can be seen in Chart 92. It shows that there are slightly higher proportions of Laborers, and Carpenters, but a lower proportion of Electricians and Other Trades. It also shows a relatively higher percentage of Managers and Supervisors residing in District 10 than in San Francisco as a whole.

Chart 92: Trades of District 10 Resident Construction Workers on City Contracts Compared to All San Francisco Construction Workers on City Contracts, 2011-2016



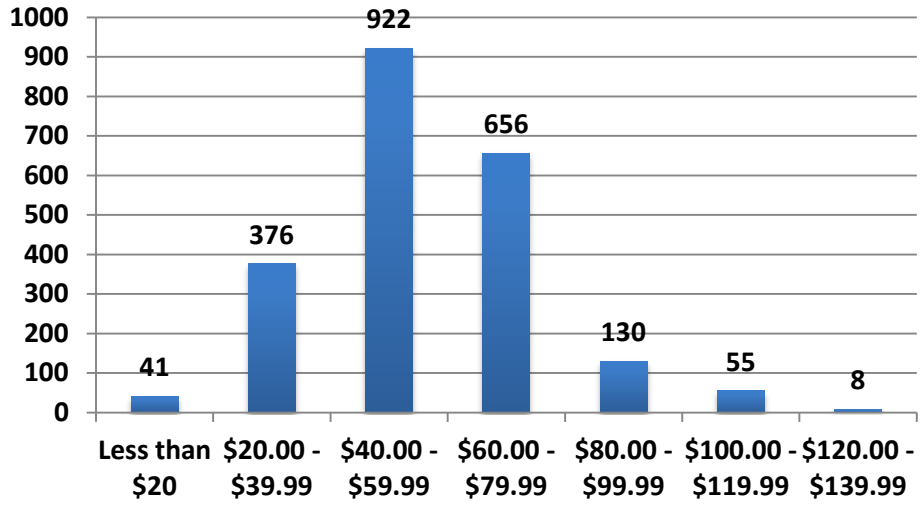
Sources: Elation Systems

- Distribution by Compensation

As explained in Section 3. C., the Elation Systems data only provided each worker's total compensation and total hours for each contract project over an indefinite period. Employment on a project could be for as short as several weeks to as long as several years, and we did not have access to information on the duration of the project. Compensation included benefits as well as gross pay. From total compensation and total hours, we were able to calculate an hourly compensation rate. To adjust for outliers in the data, we dropped workers who had calculated hourly compensation rates higher than $125 per hour.

Chart 93 shows that most workers earned between $20 and $80 in hourly compensation. The highest number of workers, about 922, earned hourly compensation in the $40-$60 range. The next largest group, 656 workers, fell into the $60-$80 range, and another 376 fell into the $20-$40 range.

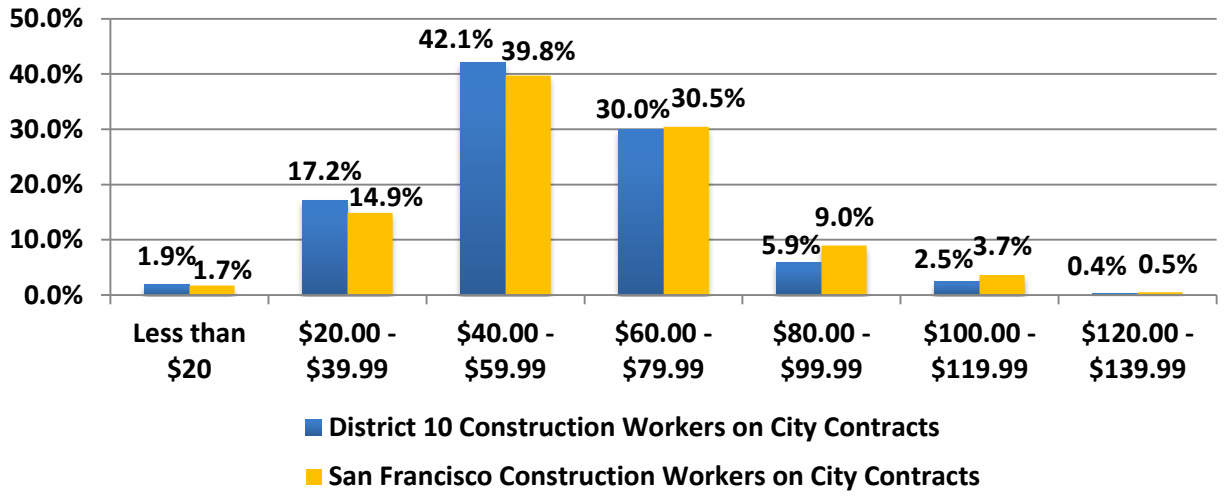
Chart 93: District 10 Resident Construction Workers on City Contracts by Hourly Compensation, 2011-2016



Source: Elation Systems

Compared to all San Francisco construction workers on city contracts, those residing in District 10 earned slightly lower levels of hourly compensation as can be seen in Chart 94. There are slightly higher percentages of workers from District 10 in the lower compensations ranges than from San Francisco overall and slightly lower percentages in the higher compensation ranges.

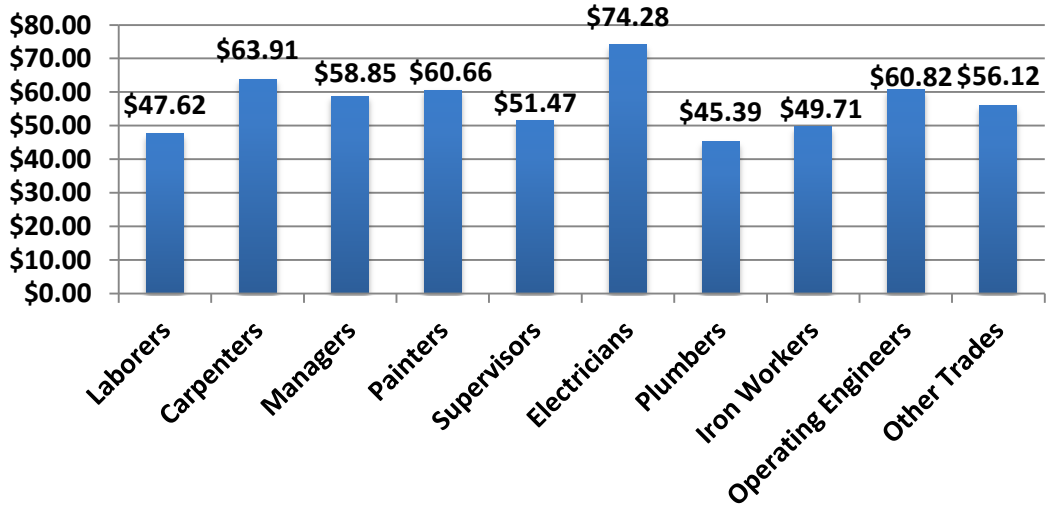
Chart 94: Hourly Compensation of District 10 Resident Construction Workers on City Contracts Compared to All San Francisco Construction Workers on City Contracts, 2011-2016



Sources: Elation Systems

Chart 95 shows mean hourly compensation by Trade for District 10 construction workers on city contracts. Electricians again earned the highest hourly compensation at about $74. Carpenters, Painters, Plumbers and Operating Engineers all earned between $60 and $65, on average. Laborers and Iron Workers earned less than $50. Compared to the figures for all San Francisco construction workers on city contracts, hourly earnings for District 10 workers were generally comparable, with no meaningful differences.

Chart 95: District 10 Resident Construction Workers on City Contracts by Mean Hourly Compensation and by Trade, 2011-2016

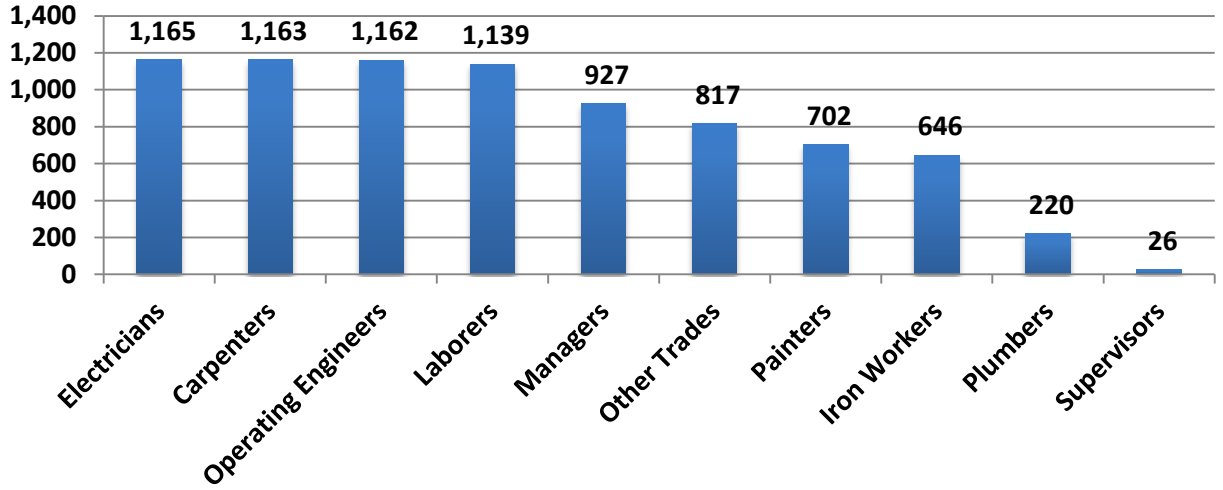


Source: Elation Systems

- Distribution By Total Hours Worked

As noted above, the Elation Systems data also provided data on total hours under contract for each worker. Total hours could vary both because of variation on the number of hours on a particular project, or because of variation in the number of projects a worker worked on. Chart 96 below shows the mean levels of total hours by trade. As can be seen, there was considerable variation in the number of hours worked according to trade. Operating Engineers had a considerably higher mean number of hours than other trades, whereas Painters and Iron Workers had a lower mean number of hours.

Chart 96: District 10 Construction Workers on City Contracts by Mean Total Hours and by Trade, 2011-16

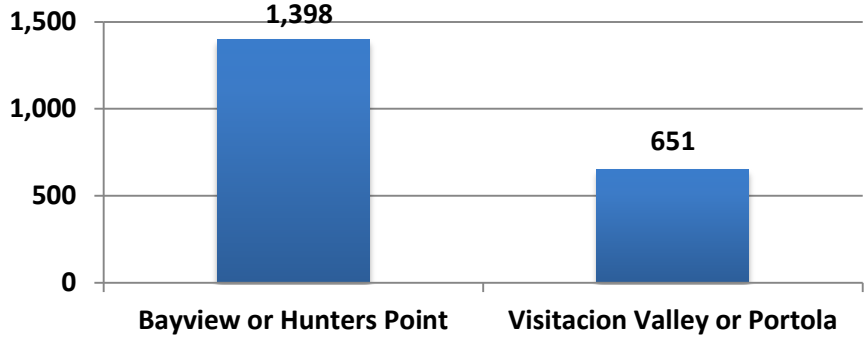


Source: Elation Systems

- Distribution by Neighborhood of Residence

Chart 97 shows that approximately two-thirds of the District 10 construction workers on city contracts live in the 94124 zip code that includes the Bayview and Hunters Point neighborhoods. The remaining one-third lives in the 94134 zip code that includes the Visitacion Valley and Portola neighborhoods.

Chart 97: District 10 Resident Construction Workers on City Contracts by Neighborhood of Residence, 2011-2016

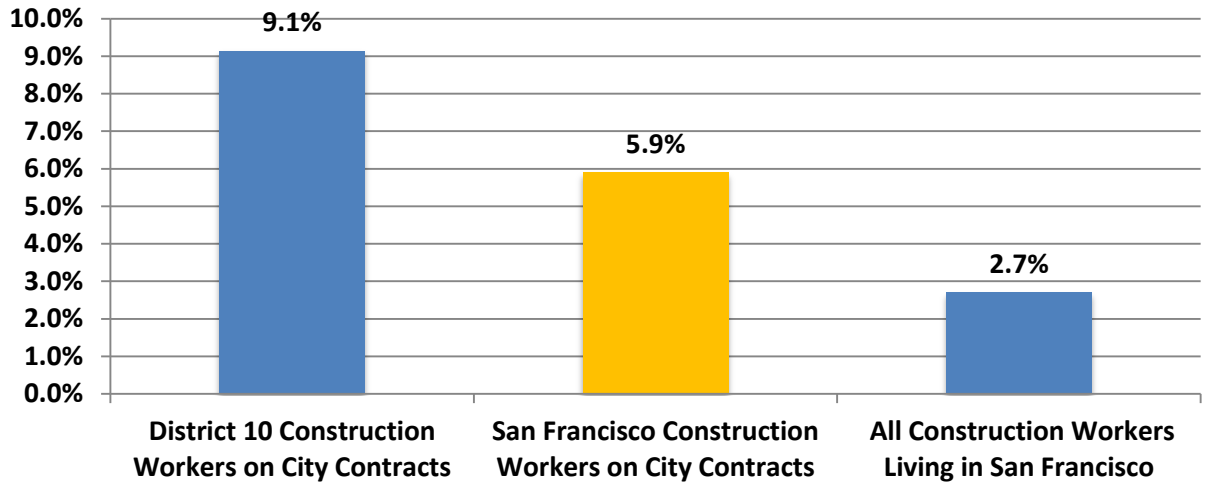


Source: Elation Systems

- Distribution By Gender

There were 200 women District 10 construction workers employed on city contracts in the 2011-1016 period, constituting 9.1% of all such workers. This is a higher percentage of women construction workers than for either all San Francisco construction workers on city contracts (5.9%), or all construction workers living in San Francisco (2.7%), as can be seen in Chart 98.

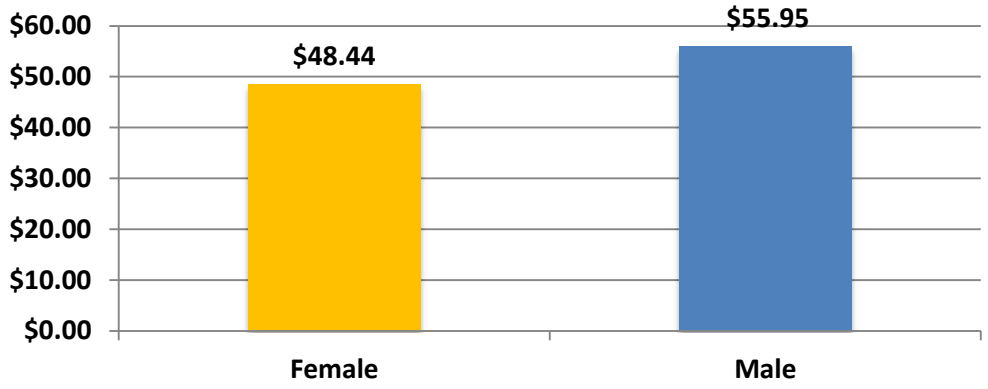
Chart 98: Female Construction Workers - District 10 Workers Compared with Workers Citywide, 2011-2016



Sources: Elation Systems, CA Employment Development Department, U.S. Census Bureau, American Community Survey

Despite being more highly represented amongst construction workers living in District 10, women still lagged behind men living in the District both in hourly compensation and the total number of hours worked. Chart 99 compares mean hourly compensation between women and men. Men on City contracts received nearly $8.00 more in hourly compensation than women. Note that this does not control for trade or other factors.

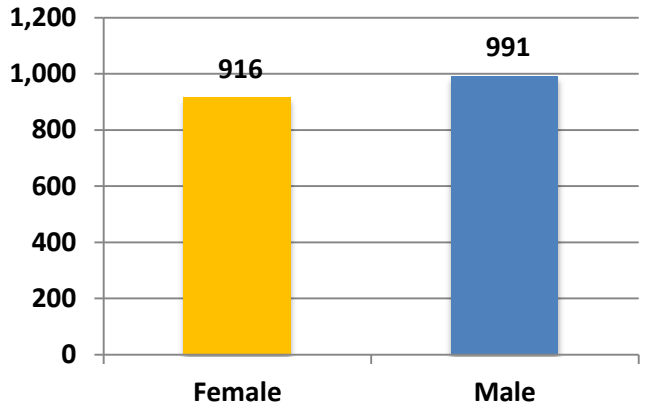
Chart 99: Mean Hourly Compensation of District 10 Resident Construction Workers by Gender, 2011-16



Source: Elation Systems

Chart 100 shows that men totaled on average about 75 more total hours per contract than women amongst District 10 construction workers on city contracts.

Chart 100: Mean Total Hours Per Contract of District 10 Construction Workers by Gender, 2011-16

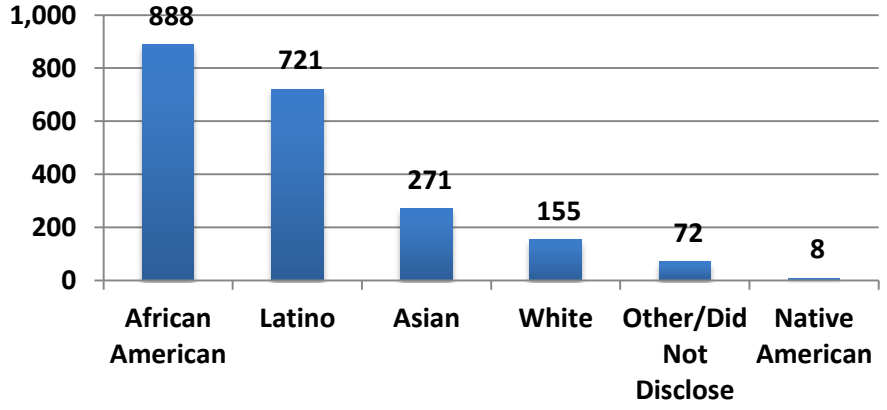


Source: Elation Systems

- Distribution by Race and Ethnicity

Chart 101 shows that, in terms of race and ethnicity, African Americans, with 888 workers, make up the largest racial or ethnic group of District 10 construction workers on City contracts. Latinos and Asians, with 721 and 271 respectively, are the next largest categories.

Chart 101: District 10 Resident Construction Workers on City Contracts by Race and Ethnicity, 2011-2016

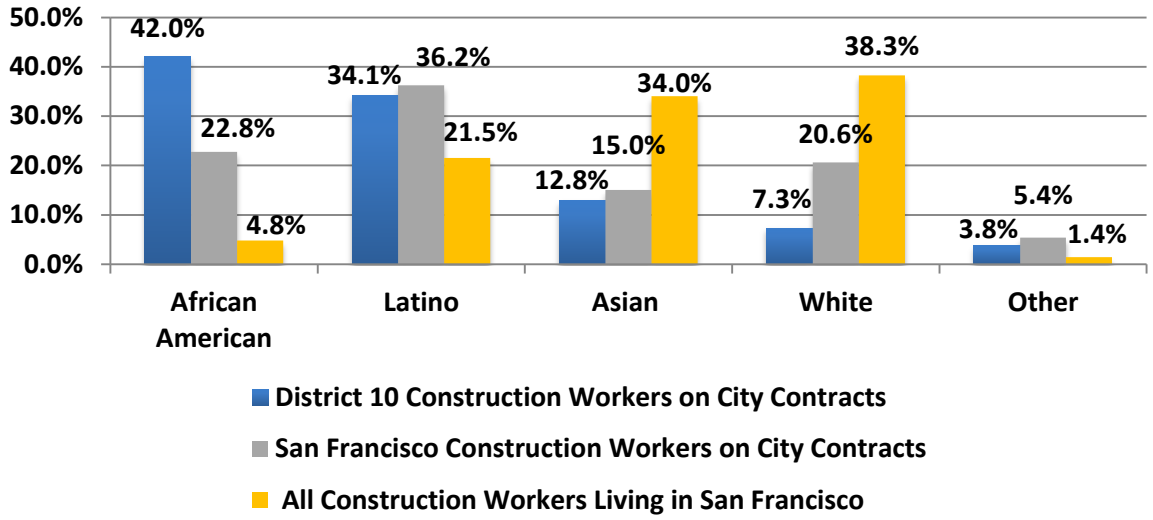


Source: Elation Systems

The racial and ethnic composition of District 10 construction workers on city contracts differs substantially from the composition of both all San Francisco construction workers on city contracts, and the larger group of all construction workers living in San Francisco. This can be seen in Chart 102. African Americans make up 42% of the District 10 workforce on city contracts, 22.8% of the entire San Francisco workforce on City

contracts, and just 4.8% of the entire construction workforce living in San Francisco. Whites, on the other hand, are almost the mirror opposite, making up just 7.3% of the District 10 workforce, 20.6% of the entire San Francisco workforce on city contracts, and 38.3% of the entire construction workforce living in San Francisco.

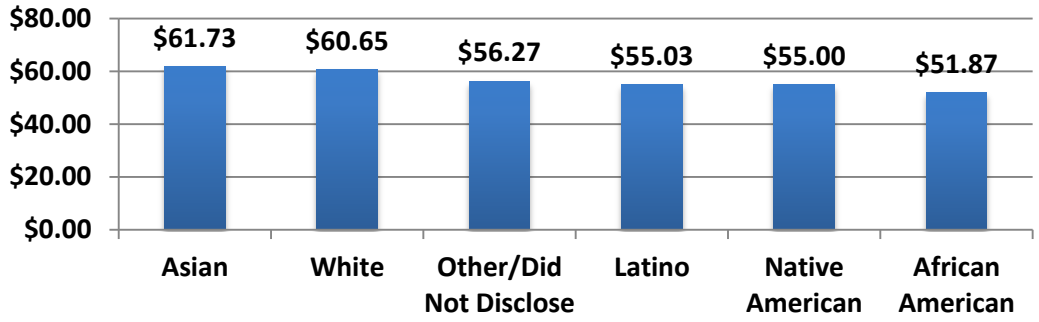
Chart 102: Race & Ethnicity of District 10 Resident Construction Workers on City Contracts Compared to All San Francisco Construction Workers on City Contracts and All Construction Workers Living in San Francisco, 2011-2016



Sources: Elation Systems, CA Employment Development Department, and U.S. Census Bureau, American Community Survey

Chart 103 compares mean hourly compensation by race and ethnicity for District 10 construction workers on city contracts. It shows that despite the fact that African Americans are the most prominent racial or ethnic group, they earned the least in terms of hourly compensation, nearly $10 less on average than Whites or Asians, in the low $50 range as opposed to the low $60 range. Latinos and Native Americans (only 8 workers) earned in the mid-$50 range.

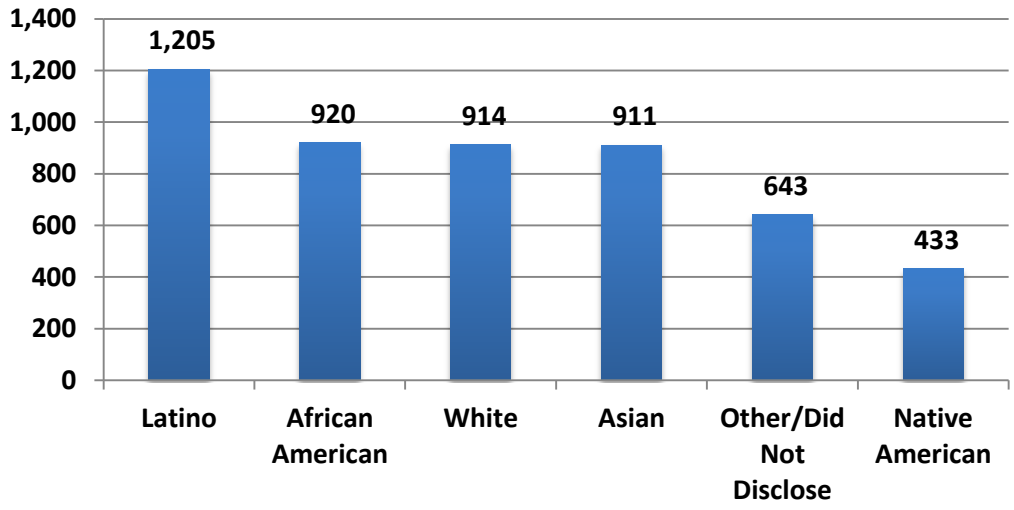
Chart 103: Mean Hourly Compensation of District 10 Resident Construction Workers by Race & Ethnicity, 2011-2016



Source: Elation Systems

Chart 104 shows the variation in mean total hours of District 10 construction workers on City contracts by race and ethnicity. Latinos again had the highest number of total hours with nearly 1,200. African American, White and Asian workers followed with a little more than 900 total hours.

Chart 104: Mean Total Hours per Contract of District 10 Construction Workers by Race & Ethnicity, 2011-2016



Source: Elation Systems

C. Summary of Findings

The boundaries of District 10 correspond with the Bayview/Visitacion Valley/Excelsior Public Use Microdata Area (PUMA) utilized by the Census Bureau, so that Census Bureau data can yield insight into the District's demographic characteristics and employment. In 2014, the Asian population constituted by far the largest ethnic group at 52.3%, followed by the Latino population (23.3%), African American (11.5%) and White (10.8%). There were several characteristics of the adult population that make District residents a fit for SSIP construction opportunities. The formal education level of the adult population in District 10 in 2014 was significantly lower than the rest of the City: 53% of the District population had a high school diploma or less. For some among this population, construction employment, especially construction employment on public works jobs, represents a realistic option for middle income employment. Additionally, the median income of employed adults in the District in 2014 was $32,000, well below the City median of $55,000. Over 32,000 adults in the District in 2014 were earning less than $25,000 and another 17,000 were earning between $25,000-$50,000, so that for many of these employed District 10 workers, construction employment would represent higher wages than their current situations.

Section 7: District 10 Pipeline to SSIP Opportunities

Section 7: District 10 Pipeline to SSIP Opportunities

Section 7 presents a discussion of potential areas of disconnect between the types of jobs that will be generated by SSIP Phase 1 projects and the educational attainment and skill levels of District 10 residents. As for the entire city, the issue of District 10 worker availability adds another layer to a skills gap analysis. Our data are drawn from several sources:

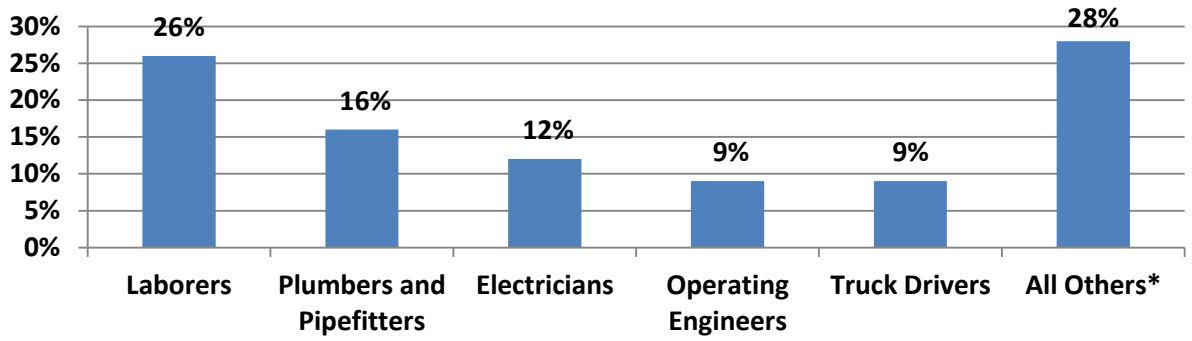
- Engineer estimates of types of jobs that will be generated by SFPUC SSIP Phase 1 projects;
- Demographic characteristics of District 10 from US Census data ;
- Elation Systems workforce data from City sponsored projects and SSIP Phase 1 projects;
- Qualitative interviews with CityBuild Academy instructors, graduates and case managers employed by the community organizations that recruit, refer and support CityBuild Academy graduates from District 10;
- Data from San Francisco Unified School District; and The San Francisco Foundation's District 10 Report.

Phase 1 of SSIP features 70 projects with an estimated construction value of $2.9 billion dollars. At this time, six of these Phase 1 projects have been completed with another 10 in construction. The jobs that these projects will generate can be divided into two main categories: 1) unionized skilled trades jobs that will be worked by members of the 26 different trades and basic crafts; and 2) professional services jobs that include positions associated with the planning, design and management of the construction projects.

A. SSIP Phase 1 Skilled Trades Job Opportunities

SFPUC engineers estimates that the majority, or 63%, of the construction hours generated by these projects will be performed by Laborers followed by Plumbers and Pipefitters, Electricians, and Operating Engineers. Truck drivers will account for another 9% of these hours. Workers from the other skilled trades will perform the remaining 28% of the construction hours. SSIP Phase 1 construction will result in sizeable numbers of job opportunities in these highest demand trades over the next decade. While exact projections are not available, City and County of San Francisco construction work, which includes SFPUC construction, produces roughly 3,147,320 construction hours per billion dollars of total project value. For SSIP Phase 1, this translates into approximately 9,127,228 construction hours. With approximately 160,000 project hours completed through March 2016, annual construction hours flat lined from 2017 through 2025 would total 996,358 hours.

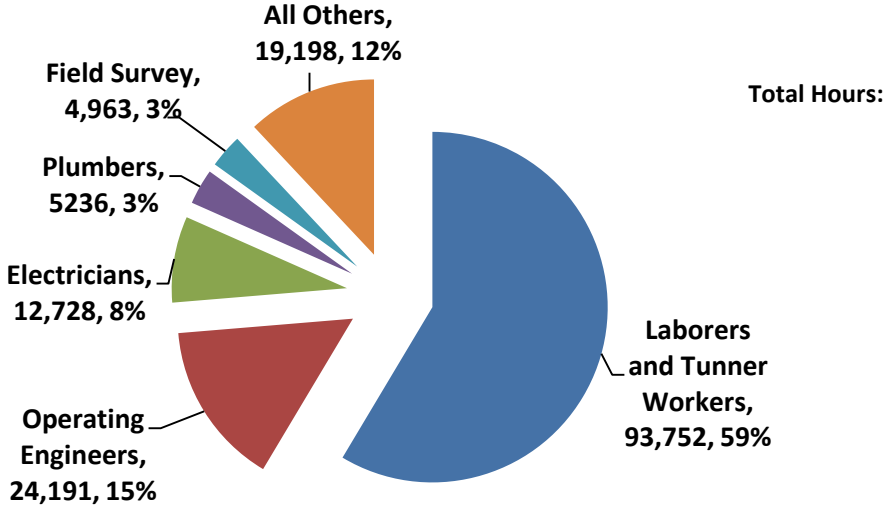
Chart 105: SSIP Phase 1 - Estimated Percentage of Hours to be Performed by Trades In Highest Demand



*All others: Carpenters, Cement Masons, Iron Workers & Welders, Painters, Pile Drivers, and Sheet Metal Worker
SFPUC, Elation Systems, June 15, 2016

A pattern of highest demand for four skilled trades is evident in SSIP Phase 1 projects already underway; Laborers and Tunnel Workers, Operating Engineers, Electricians and Plumbers account for 85% of the 160,000 total construction hours through March 2016.

Chart 106: SSIP Phase 1 Projects Workforce by Trade as of March 2016

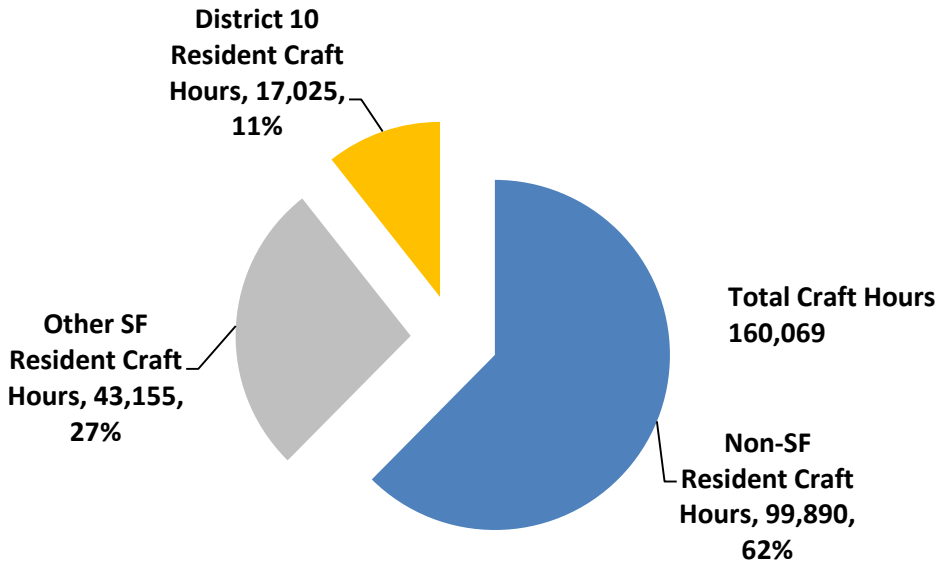


SFPUC Elation Systems Data, June 16, 2016

SSIP Phase 1 projects are subject to the City's Local Hiring Policy for Construction; SFPUC contractors must meet a local hire goal of 30% across all trades as well as achieve a 50% apprentice utilization target. As of March 2016, San Francisco residents had performed 38% of all construction hours. District 10 workers have been active on these early SSIP Phase projects; Chart 104 shows they are performing 11% of all work hours and 28% of all San Francisco resident work hours. Likewise, approximately 57 District 10 workers performed

the work comprising 11% of the total workforce of 498 workers and 29% of the 193 San Francisco resident workforce for these projects.

Chart 107: SSIP Phase 1 Projects Craft Hours by Residence



SFPUC Elation Systems Data, June 16, 2016

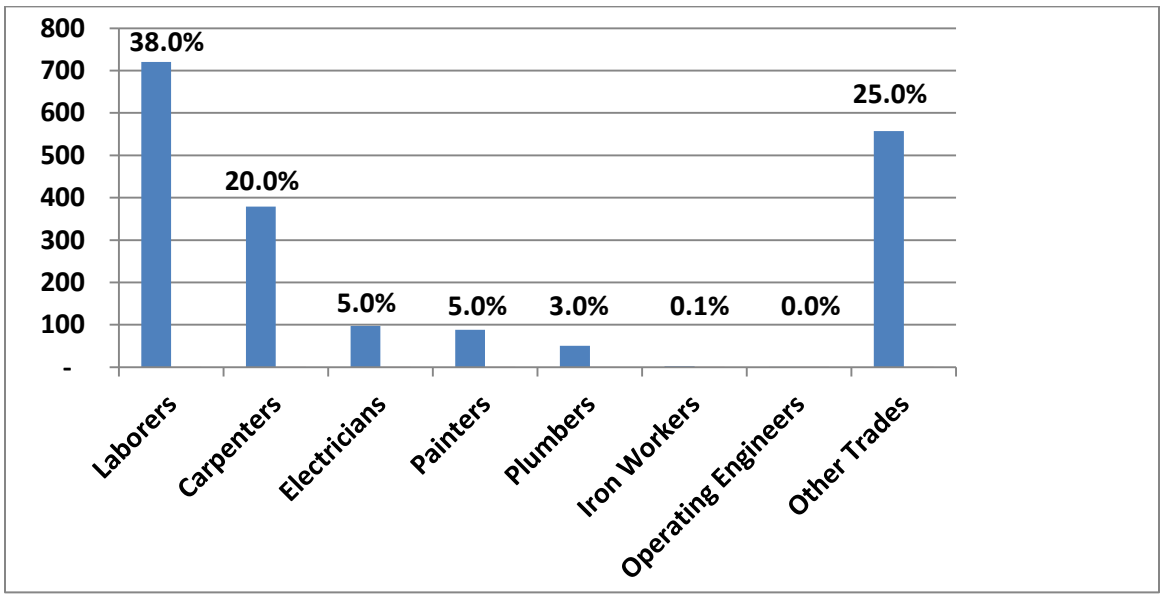
B. Match of SSIP Phase 1 Skilled Trades Jobs and District 10 Resident Skills

- Current District 10 Skilled Trades Workforce

The census data presented in Section 3 indicated that about 25% of the SF resident construction workforce lives in the Bayview, Visitacion Valley, and Excelsior neighborhoods currently. Indeed, these neighborhoods contribute more workers to the local construction workforce than any other areas in San Francisco. More specifically, Elation Systems data revealed that 30% of all SF residents working on City sponsored projects are residents of District 10. Therefore, it is safe to conclude that there are a significant number of construction workers living in District 10. Moreover, as many of them are already working on City sponsored projects, it is probable that they are part of the city's unionized workforce, and therefore, more likely to be eligible to work on SSIP Phase 1 projects.

Elation Systems data also indicate that these District 10 workers that are already working on City sponsored projects are concentrated in several main trades**.** Laborers and Carpenters make up 58% of the District 10 skilled trades workforce, followed by electricians and painters at 5% each, plumbers at 3% and the remainder are scattered throughout the other skilled trades. In terms of actual numbers, Elation Systems data approximate these workers at a little less than 2,000.

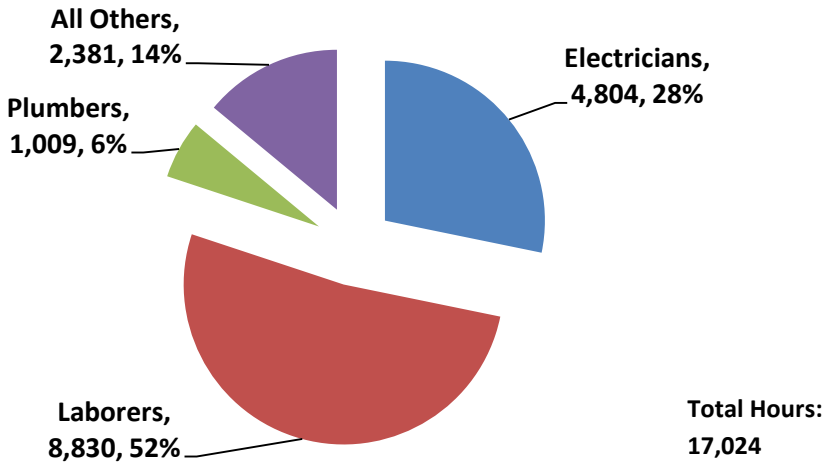
Chart 108: District 10 Resident Construction Workers on City Contracts by Trade, 2011-2016



Source: Elation Systems

Again, these trade distribution concentrations are already apparent on District 10 participation on SSIP Phase 1 projects. Of these 17,024 hours performed by District 10 residents through March 2016, Laborers accounted for more than 50% of these hours, followed by electricians at 28% and plumbers at 6%. Workers in all the other trades, including Operating Engineers, performed 14% of all the construction hours; 54% of the hours were performed by journey workers and 46% by apprentices.

Chart 109: SSIP Phase 1 Projects through March 2016: Distribution of Trade Hours Performed by District 10 Residents



SFPUC Elation Systems Data, June 16, 2016

When we look at these numbers in relation to the SSIP Phase 1 trades that will be in highest demand, District 10 residents are well represented in only one category, the Laborers. For the other highest demand SSIP Phase 1 trades, Plumbers, Electricians and Operating Engineers, District 10 residents have limited or almost no presence. While District 10 residents are already active on SSIP Phase 1 projects, they can stand to participate in a more substantial way, specifically as Electricians, Plumbers, and Operating Engineers.

As Chart 110 below shows these three high demand trades, Electricians, Plumbers and Operating Engineers, pay substantial starting wages and experienced workers can expect to earn high salaries. However, these trades have higher educational thresholds for entrance and are more competitive. Moreover, their entrance is highly regulated by the union locals in that the enrollment in apprenticeship opportunities is opened only periodically to respond to perceived local market demand. This differs from other unions such as the Carpenters and Laborers that tend to remain open to apprentices and are not as closely controlled.

Chart 110: Trades in High Demand on SSIP Phase 1 Projects

TRADES	WAGES	PREPARATION
ELECTRICIANS	▪ Starting wage as an apprentice is $23.53 per hour ▪ Average wage for Electricians in the San Francisco Bay Area is $98,641 annually	5–Year Apprenticeship Program. Entrance Requirements: Must be 18 or older to be indentured; Photo Identification, HS diploma or GED, Proof of Algebra or calculus class completion with grade of C- or higher, Passing score on NJATC Tech Math course, US Citizen or meet INS requirements. Complete application form; physically and mentally able to safely perform essential job functions; able to get to and from job sites anywhere within apprenticeship program geographical area; able to attend all classroom trainings; able to hear, understand instructions and warnings. Pass Apprenticeship Entry exam and interview. Location of Training Center: 4056 Mission St. San Francisco, CA 94112
OPERATING ENGINEERS	▪ Starting pay for apprentices is $21.05 per hour ▪ The median wage for Operating Engineers in the San Francisco Bay Area is $78,760 annually	39-Month Apprenticeship Program Entrance Requirements: Must be 18 years; Physically able to perform all phases of work; valid California Driver's License; Read, write and speak English well enough to comprehend instructions on job and in training classes and for job safety; Complete application form; provide evidence of legal employable status in the United States of America. Pass oral exam;

TRADES	WAGES	PREPARATION
		Location of Training Center: Joint Apprenticeship Training Committee for Operating Engineers for Northern California 14738 Cantova Way Sloughhouse, CA 95683
PLUMBERS	▪ Starting wage for apprentices is $26.40 ▪ The median wage for Plumbers, Pipefitters, and Steamfitters in the San Francisco Bay Area is $57,812 annually	5-Year Apprenticeship Program, Entrance Requirements: H.S. Diploma or GED; High school preparation courses in algebra, computer aided drafting, computer technology, English, physics, and shop are helpful. Must be 18 years or older; Valid CA Driver's License; completed application; pass a written exam offered every 2 years (Next test is summer 2018). Interview. Successful applicants are placed on a numbered list. The number of openings in the Apprenticeship Program is determined twice annually by the JATC. Trainees are indentured as apprentices after they begin job-site training. Location of Training Center: United Association Local 38 Joint Apprenticeship & Training Committee Of The Plumbing & Pipe Fitting Industry 2660 Newhall Street San Francisco, CA 94124 And 3473 Santa Rosa Avenue Santa Rosa, CA 95407

C. Potential Challenges for District 10 Residents in Capturing SSIP Skilled Trades Jobs

A review of demographic characteristics of District 10 residents from the U.S. Census, educational attainment data from San Francisco Unified School District, and interview data from stakeholders in CityBuild Academy, the City's construction pre-apprenticeship program, help to identify potential challenges for District 10 residents in entering these highest demand trades. These challenges are located within both individual preparation and institutional accessibility.

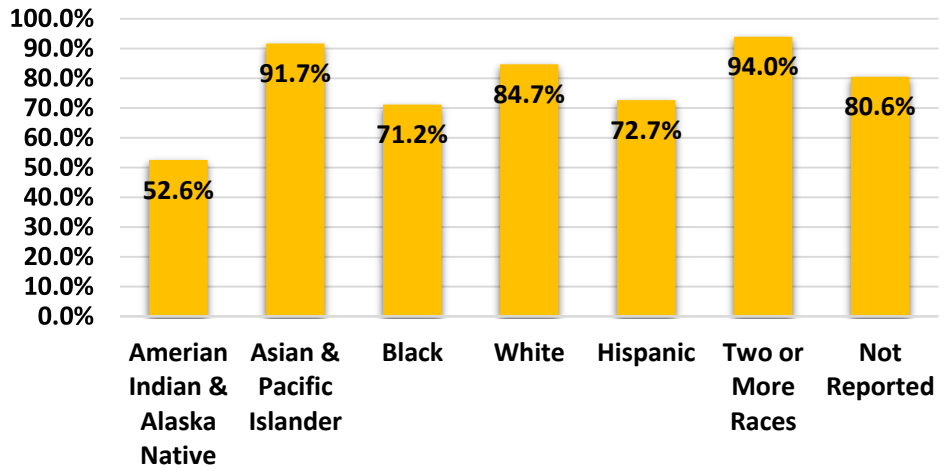
- Individual Preparation
    - Limited Educational Attainment/ Limited English Proficiency

Census data show that a greater proportion of District 10 residents, have less than a high school diploma as compared with the city as a whole - 18.3% as compared with 9.6%. Therefore, there are fewer adults in this sector of the city able to meet one of the first requirements for entrance into the union apprenticeship programs associated with the high demand trades called out above.

This issue is exacerbated by the city's racial disparities for high school completion and drop-out rates. As discussed previously, about 30% of the City's construction workforce currently resides in District 10. Of those employed on City contracts, almost 60% of them are either African American or Latino. Unless construction employment trends change dramatically over the next decade, the educational attainment of African Americans and Latinos is a critical factor.

As of 2014, District 10's racial and ethnic distribution was as follows: Asians comprised the largest ethnic group, 52.3%, followed by Latinos, 23.3% and African Americans at 11.5%, Whites at 10.8% and Other at 2.1%. According to SFUSD data, graduation rates vary by race and ethnicity. In 2014-2015, those who were categorized as being two or more races had a cohort graduation rate of 94.0%. This was closely followed by Asian and Pacific Islander SFUSD students with a cohort graduation rate of 91.7%. Next were White students with a cohort graduation rate of 84.7%. However, Hispanic students had a cohort graduation rate of 72.7%, Black students followed with a cohort graduation rate of 71.2% and American Indian & Native Alaskan students with an even significantly lower cohort graduation rate of 52.6%.

Chart 111: SFUSD Cohort Graduation Rates, 2014-2015 Academic Year



Source: California Department of Education, Educational Demographics Unit, Dataquest, Accessed August 2016

Correspondingly, across SFUSD, in 2014-2015, there was an average cohort drop-out rate of 7.0%. Like graduation rates, drop- out rates also varied across racial and ethnic groups. Black (African American)

students had the highest cohort drop- out rate at 16.4%. American Indian & Alaska Native students had the second highest cohort drop-out rate at 15.8%. Hispanic (Latino) SFUSD students had a cohort drop-out rate of 12.5%. White students had a cohort drop-out rate of 7.8%. Those students who identified as being two or more races had the second lowest cohort drop-out rate at 4.0%. Asian and Pacific Islander SFUSD students had the lowest cohort drop-out rate at 3.3%.

Consequently, it is likely that District 10 construction workers will continue to have a disproportionate number of individuals without a high school diploma. This will present a significant barrier to entrance into these three union apprenticeship programs.

Data from interviews conducted with CityBuild Academy instructors, graduates and representatives from community organizations that recruit and refer individuals to the Academy added to these findings. Since the inception of CityBuild, San Francisco's construction workforce pre-apprenticeship program, District 10 residents have comprised about 33% of all CityBuild Academy graduates. Like the entire SF resident construction workforce, more CityBuild participants live in District 10 than in any other area of the city.

CityBuild instructors report although CityBuild participants must have a high school diploma in order to enter the program, most enter needing to improve basic reading and math skills. Additionally, very few have any prior construction experience or experience working with their hands. Likewise, participants come into the program with little or no knowledge of hand tools or small machinery or safety procedures; and most have never done physical labor or worked out of doors. They are not familiar with spacial and mechanical terms or related vocabulary. Without college entry level reading and math skills, these participants are less prepared to take and pass the more rigorous entrance exams required by the Electrical, Plumbing and Operating Engineer apprenticeship programs. While the Academy does offer some test preparation, not all CBA participants are academically ready to achieve competitive scores.

- Limited English Language Proficiency

Quite a number of the CBA students are immigrants for whom English is their second language. Again, while they must achieve a targeted score on an English Language proficiency test, many are limited English speakers when they begin the program. Language challenges, again, make them less competitive in a very competitive testing and work environment.

- Physical Conditioning

CBA graduates and instructors noted another preparation issue that challenges all participants – physical conditioning. As urbanites, just as most participants have not worked with their hands or out of doors, many do not possess the physical conditioning initially to meet the demands of construction skilled trades work. Over the years both CBA and the community organizations that recruit and orient CBA participants have incorporated some aspect of physical conditioning into their curriculums. Nonetheless, lack of adequate physically conditioning can inhibit entry and success in the skilled trades

- Driver's Licenses and Paperwork

Finally, all of the CBA graduates asserted that assembling the paperwork required for CBA entrance was demanding and time consuming. This task included obtaining official birth certificates, social security cards, high school diplomas, and service discharge papers. Perhaps the most difficult was obtaining a California driver's license. While most participants may have had a driver's license (although not all did), for some the license had been suspended due to citations. All of these issues had to be resolved prior to entering the Academy. Similarly, a number of the participants had to resolve outstanding child support cases or clear up issues associated with contact with the criminal justice system. As far as can be ascertained, a criminal record is not a barrier for entrance into the high end trades. These apprenticeship programs, like others in California do not bar most convicted felons from entrance. However, once the individual enters the job market, such convictions can be a barrier to work.

All of these preparation factors can constitute significant barriers to District 10 resident entrance into the Electrical, Plumbing and Operating Engineering apprenticeship programs. While participating in CityBuild Academy or other pre-apprenticeship training can assist in overcoming a number of these barriers, acquiring adequate English language proficiency and significantly improving basic skills can be very challenging.

- Institutional or Structural Accessibility

A skills gap analysis approach to identifying holes or barriers related to achievement is inherently focused on the individual and what he or she must do in order to mitigate the barriers or fill the spaces to achieve the desired outcomes. In reviewing the data for this study, we found that there was another set of institutional or contextual factors that would contribute to the challenges District 10 residents would face in entering these higher end trades.

- Income Challenges

Drawing on the data emanating from the CBA focus groups, all of the stakeholders noted that CBA participants experienced great difficult sustaining themselves financially over the 18 weeks of pre-apprenticeship training. CBA does not provide a stipend or any type of financial support while participants are training. These difficulties are not surprising in that District 10 PUMA residents have the lowest incomes of any area in the City. In 2014, 74% of these residents earned less than $50,000 as compared with 46% of the city. There were more residents earning less than $25,000 than in any other part of the city. Moreover, the majority of these residents are concentrated in occupations that are disproportionately concentrated in service and production occupations (that include construction) and conversely represented in occupations as managers, executive, professionals or engineering. To participate in educational and training, individuals must be able to sustain themselves. Whether this comes from individual earnings or family support, District 10 residents are at a disadvantage when compared with the rest of the city.

Union initiation fees can also present a barrier for participants from lower income circumstances. CityBuild can obtain sponsorship from construction partners. However, this is one of the things that can determine which trade a person enters. Participants take the first job that is offered that frequently comes with sponsorship by a contractor.

- Housing and the Cost of Living

As most San Francisco residents are aware, the Bay Area is experiencing a housing crisis, with rents skyrocketing over the past several years. San Francisco has the highest rent in the nation at an average of $4,780.[12] Again, all CBA stakeholders interviewed noted the difficulties many CBA participants encounter maintaining a secure housing situation while training. Some participants have attempted to complete the program while being homeless. This is almost an insurmountable obstacle. Stakeholders noted that some type of housing assistance whether in the form of dormitory housing or housing subsidy would be extremely beneficial for CBA participants.

- Location of Many Union Training Centers

Another potential barrier for San Franciscans, including District 10 residents, to completing skilled trades training is that many of the apprenticeship training facilities are located outside of the city. While some are in Alameda County, a number are located in Contra Costa County and as far north as Sacramento County. Access to reliable transportation is required to complete apprenticeship training for many of the skilled trades.

- Limited Offerings and Knowledge of Construction

Almost all of the CityBuild graduates said that they didn't know anything about careers in construction prior to enrolling in the Academy. While many had attended high school in San Francisco, they were unaware of construction related careers. Some years ago SFSUD removed all its shop classes and has only maintained a very small construction program at John O'Connell High School. John O'Connell's program is described as a college preparatory curriculum with emphasis in engineering, biotechnology, advanced media arts and architecture. In great part, SFUSD students do not receive career information about skilled trades or any occupations related to the building industry that do not initially require a college degree while they are in high school.

- Lack of Childcare Support for Women/Challenges of Working in a Male Dominated Field

There are more women in San Francisco entering construction but women continue to comprise a very small percentage of the workforce. Elation Systems data revealed that about 9.1% of the District 10 construction workers working on City contracts are women. This compares favorably with the 5.9% of women working on City contracts as a whole and 2.7% in the city's overall construction workforce. Likewise, 11% of San Francisco's active apprentices are women and women have made up 14% of CityBuild participants over the years. Yet, working in a male dominated field continues to be challenging to women. CBA instructors noted that women in the academy were very motivated but they still had to deal with the gamut of male-to-female

[12] CNN Money By Kathryn Vasel @KathrynVasel April 1, 2016: 1:24 PM ET http://money.cnn.com/gallery/real_estate/2016/04/01/cities-with-highest-rents/ accessed November 20, 2016

issues that can arise on job sites. This was difficult for some women and kept them away from the field. In addition, the lack of childcare for women inhibited training completion and work retention.

- Robust San Francisco Economy

The representatives from community organizations that regularly recruit for CBA reported that recruiting for the Academy has become more difficult over the past couple of years. They have found that the individuals they attempt to interest in the Academy and construction have wider entry-level job options because of San Francisco's robust job market. There are simply more jobs and more options than in previous years. As a result, individuals in communities that might have previously opted to try construction are pursuing other career paths. This situation is exacerbated by the jobseekers' lack of knowledge of construction work and the perception that it is physically difficult, dirty and usually not full-time.

- Historical Ties to San Francisco High Skilled / High Wage Crafts

Until recently, the San Francisco union locals representing high skilled/high wage trades have possessed a reputation for being less likely to work with the City or other owners and their contractors to refer local residents to City sponsored projects. Likewise, they have been less likely to work with CityBuild or other pre-apprenticeship training organizations to train and usher in apprentices from ethnic backgrounds under-represented in these trades. These trades are considered the elite crafts that carry the potential for workers to earn the highest wages. As a result, there are fewer long-term, established working relationships between these crafts and the pre-apprenticeship training organizations serving District 10 residents that are conduits for area workers into the local construction industry. While the situations with these union locals are changing, the relationships are newer. District 10 workers do not have role models or as many ties to these crafts as they have to the basic craft unions. This is important in terms of the informal relationships in any work sector that help individuals learn how that system works; who they should connect with to maximize opportunities to obtain work; which contractors are best to work with, etc.

D. SSIP Phase 1 Professional Services Opportunities

The San Francisco Public Utilities Commission has 10 active professional services contracts associated with SSIP Phase 1 totaling $281,000,050. These are largely concentrated in engineering services but also include program management, planning, environmental, and geo-technical services. These contracts represent approximately 10% of the SSIP Phase 1 $2.9 billion budget and have durations that range from 2011 through 2026.[13]

The City of San Francisco's First Source Hiring Program Ordinance is applicable to all SFPUC professional services contracts over $50,000. All ten of these SFPUC SSIP professional services contracts are subject to the

[13] Wastewater Enterprise Capital Improvement Program, Quarterly Report (July 2015 to September 2015)

Ordinance and have targeted First Source hiring outcomes. These contracts are scheduled to produce a total of 107 entry -level positions that the firms will attempt to fill working in cooperation with the City's First Source Hiring system. As of June 2016, 19 of these positions had been filled by firms with the three largest contracts, representing 93% of all professional services contracted. The remainder, consisting of smaller, newer contracts have been less utilized.

The SFPUC has identified these entry level jobs that will be produced by First Source Hiring requirements as priority positions for potential direction to District 10 residents. They represent an opportunity for interested residents to participate in SSIP Phase 1 and gain entry into growth occupations. As noted in Section 2, professional services occupations are on a growth trajectory not only in San Francisco but also throughout California. The growth areas include: design and engineering, environmental testing and remediation, project and construction management and community and urban planning.

- Requirements and Quality of the jobs

For purposes here we will focus on the entry level professional services positions. In the Bay Area all of these entry level jobs require:

- A high school diploma of GED at minimum. Many require college level coursework
- Competency in spoken and written English
- Basic computer skills, and at minimum knowledge of Microsoft Word and Excel

Many require technical courses beyond high school either through a community college and/or certificate program. Some are positions best filled by college students studying engineering, architecture, construction management or some other related aspect of the building industry.

Compensation for these jobs varies but is likely to pay at minimum $18 to $20 dollars per hour. Unlike the skilled trades, most hiring is for full-time positions that pay benefits. For the SSIP Phase 1 jobs, the firms that will be hiring for these positions are larger corporations with human resources infrastructure and benefit packages. Success in these positions could lead to longer terms employment and career advancement with these SSIP Phase 1 consultants.

Chart 112: Potential Professional Services Positions for SSIP Phase 1 Projects

Entry Level Positions	Basic Requirements for Entry Level Positions
Architecture • CADD Technician • Drafting Technician • Architecture Trainee (Students)	• High School Diploma or GED • Coursework in English, mathematics, chemistry, physics, computer science, and mechanical drawing or computer aided design courses • Technical classes – drafting, CADD at community college

Entry Level Positions	Basic Requirements for Entry Level Positions
	• Junior or Senior level in college for Architecture Trainee • Knowledge of Microsoft Word, Excel. • To advance requires a Bachelor's degree in Architecture or related Design degree.
Engineering • Engineering Assistant • Field Engineer • Engineering Trainee	• H.S. Diploma or GED • Coursework in English, mathematics, chemistry, physics, computer science, and civil, mechanical, structural or electrical engineering. • 2-4 year college degrees required for entry-level positions • Junior or Senior level in college for Engineering Trainee • Knowledge of Microsoft Word. Strong Excel skills • To advance requires a Bachelor's degree in Engineering
Environmental Engineering , Environmental Remediation Specialist • Environmental Technician • Entry Level Positions • Technical Assistant	• H.S. Diploma or GED required for entry-level positions and some college highly desirable. • Coursework in English, mathematics, physical and life sciences. • To advance requires at least a Bachelor's degree in Engineering, Environmental Science or other related science degree.
Inspection • Construction Materials Tester	• High School diploma or GED • Community College coursework in English, mathematics, and physical and life sciences. • Apprenticeship programs are available for Materials Testers. Most programs require three to five years of on-the-job training plus related classroom instruction. Apprenticeship program applicants must be at least 18 years of age and physically able to perform the work. • Valid California driver license. • Required license or certification is ACI Field Testing Certification.
Project and Construction Management • Construction Admin Support • Document Control Specialist • Project Control Technician • Construction Secretary • Human Resources Assistant • Financial Assistant • Technical Assistant	• High School Diploma or GED • Coursework in drafting, business, mathematics, computer science, English • Strong Microsoft Word Skills • For Project Control, Financial and Technical Assistant - Strong Excel skills • Knowledge of basic office procedures

Entry Level Positions	Basic Requirements for Entry Level Positions
Urban and Regional Planning • Planning Associate/Junior Planner • Communications Associate • Outreach Assistant • Event Organizer	• H.S. Diploma or GED • High School or Community College coursework in English, mathematics, computer technology, marketing, general business, communications, public speaking are helpful. • Knowledge of basic office procedures

Source: CA Employment Development Department, California Occupational Guides, 2016

E. Potential Challenges for District 10 Residents in Capturing SSIP Professional Services Positions

There is much less detail available about these professional series jobs and the level of existing participation by District 10 residents than was available for skilled trades positions. Neither the City nor the State requires the same type of documentation or tracking of these positions. Nonetheless, the types of skills that all of these positions will encompass include the following:

When reviewing the potential gaps between the skills required by these professional services positions and the skill level of District 10 residents, the most critical factors are:

- Educational attainment, rates of high school and college graduation.
  As evidenced previously from 2014 census data, a higher proportion of District 10 residents have a high school diploma or less; and fewer have graduated from college or attained post graduate degrees.

- English Language Proficiency.
  While we do not have census data regarding English Language proficiency of District 10 residents, we do know that the majority of residents, 75% are from Asian and Latino ethnic backgrounds. We could expect that a segment of these populations are more recent immigrants, comparable with the city as a whole and for whom English is their second Language.

- According to research presented by the San Francisco Foundation[14], as of 2010 foreign-born residents constitute 35% of District 10's residents. In Visitation Valley, 51% of residents are foreign-born. In Bayview/Hunters Point 33% of residents are foreign-born. In Potrero Hill, only 17% of residents are foreign-born. Asian language households make up 30% of District 10, and of this 30%, 33% are linguistically isolated households.[15] Spanish language households represent 18% of District

[14] San Francisco Foundation. "District 10: Demographic Profile." PowerPoint Presentation. Accessed July 2016, http://www.sff.org
NOTE: San Francisco Foundation Report defines District 10 as follows: three neighborhoods that most closely overlap with District 10 (94124, 94134, 94107)
[15] Linguistically isolated means no one over age 14 years speaks English well in the household.

10, and of this 18%, 24% are linguistically isolated households. As such we can conclude that for adults English Language Proficiency may present a barrier to employment in the professional services fields.

- Existing Occupations for Employed District 10 Workers.
  Again 2014 census data informed us that employed District 10 residents were concentrated in lower skilled, lower paying service and production occupations. This aligns with the educational levels for most area residents. Even if currently employed residents want to move into professional services entry-level positions, it is likely that many would have to undertake additional training to become competitive for these jobs.

- Barriers Detailed for Skilled Trades Positions
  Several of the same barriers detailed for skilled trades positions apply equally to District 10 residents for professional services positions. While there may be subtle nuanced differences, the major factors are the same. Individuals that will need to undergo training or additional educational coursework will face the same challenges to sustaining themselves through this process prior to beginning work. Likewise the high cost of living in SF will impact them equally as they attempt to work, live and remain in the city despite increasing costs. Finally District 10 women face the same issues as do all women in the city in attempting to secure affordable childcare that meets the needs of their work lives. None of these challenges are simple to resolve. Each must be confronted and overcome in order for local residents to participate in SSIP Phase 1 employment in meaningful and tangible ways.

F. Summary of Findings

The Census Bureau data on District 10 residents provided in the previous Section highlighted a number of the main demographic /employment characteristics of District residents in relation to construction employment. Examining the experience of District 10 residents on the SSIP Phase 1 projects so far finds that District 10 residents have been active on these projects, performing 11% of all work hours and 28% of all hours worked by San Francisco residents. The District 10 residents have been concentrated in the Laborer positions, though, and participation in upcoming projects will require greater entry into three other trades projected to be in demand on upcoming SSIP projects: Plumbers, Electricians, and Operating Engineers.

As noted in Section 2 of this report, SSIP Phase 1 projects will be generating jobs in professional services occupations as well as construction skilled trades. There are scant data so far on the participation of District 10 residents in professional services jobs connected to SSIP Phase 1 or other infrastructure projects. The data on District 10 resident educational levels, though, indicate that movement into these jobs by District 10 residents may be a challenge and will require additional targeted training even for entry level positions.

Section 8: Recommendations for Facilitating Opportunity for District 10 Residents

Section 8: Recommendations for Facilitating Opportunity for District 10 Residents

This final section of the report consists of a series of workforce-related recommendations. These recommendations identify specific avenues for workforce investment that the SFPUC, the City and their workforce partners may consider that will benefit District 10 residents and facilitate their preparation and hire in jobs generated by SSIP Phase 1 projects. We focus on a workforce strategy for SSIP Phase 1 skilled trades and professional services positions that:

1) Takes advantage of SFPUC's existing structures and lessons learned from its Water System Improvement Program (WSIP);

2) Build's on widening existing educational and training efforts; and

3) Reinforces partnerships to strengthen the local workforce pipeline for the building industry to attract and retain new entrants.

The research findings have informed our analysis and workforce recommendations. In some instances, the team's suggestions address ways to close educational and skills gaps so that an individual may be competitive for SSIP Phase 1 generated skilled trades or professional services jobs. In other instances, we have signaled ways in which the SFPUC and its partners can address structural or contextual issues that will require institutional responses. Finally, our recommendations also draw upon the many strengths District 10 residents bring to SSIP Phase 1 projects such as existing local knowledge of the building trades as evidenced by the high concentration of construction workers in the area, the significant number of residents with some college level coursework, and the stability of the area's population because of higher rates of home ownership than in other San Francisco neighborhoods.

The recommendations set out below are divided into three sections:

I. Recommendations for SSIP Construction Skills Trades Employment

II. Recommendations for SSIP Professional Services Employment

III. Recommendations to Address Construction Workforce Pipeline Issues

I. RECOMMENDATIONS FOR SSIP CONSTRUCTION SKILLED TRADES EMPLOYMENT

As the research findings revealed, SSIP Phase 1 projects will produce the greatest number of job opportunities for Laborers, Plumbers, Electricians, and Operating Engineers. Currently, District 10 residents are heavily concentrated within the Laborers and Carpenters trades. The Electricians, Plumbers and Operating Engineers require more educational preparation than many of the other trades. Entrance into these three trades is more strictly controlled and enrollment is highly competitive.

The LLA team recommends that SFPUC and its partners implement a series of strategies to facilitate the entry of District 10 residents into the three trades of Electricians, Plumbers and Operating Engineers.

1. Negotiate and Sponsor Specialized Training and Direct Entry Agreements Leading to Increased Enrollment of District 10 Residents in Electrical, Plumbing and Operating Engineer Apprenticeship Programs. This effort will take advantage of SSIP Phase 1 job opportunities and expand the entry of District 10 and San Francisco residents into these competitive apprenticeship programs.

***SPECIALIZED TRAINING*.** There are several programs that can serve as models and starting points for specialized training discussions.

SFPUC's WSIPLA/Job Training and Opportunities Program (JTOP). The SFPUC's WSIP program operated with a Project Labor Agreement (WSIPLA) that included the Job Training and Opportunities Program (JTOP), a program that promoted pre-apprenticeship training and employment of SFPUC territory residents on WSIP projects. Over the course of the SFPUC's WSIP program, the SFPUC Workforce & Economic Program Services Bureau (Infrastructure Division) supported several JTOP community partners who recruited service territory residents and provided the pre-apprenticeship and life skills training. In addition, the SFPUC entered into partnerships with the Laborers, Carpenters, and Operating Engineers to sponsor specialized training associated with WSIP projects. These highly successful efforts included: the Miner Tender Program (Laborers), BioRegional Habitat Restoration Program (Laborers), and the Operating Engineers GPS Training Program (Operating Engineers). The Labor partners provided specialized training to selected JTOP participants in areas in demand on WSIP projects. Working with both its JTOP and labor associates, the SFPUC facilitated the hire of program graduates by WSIP contractors. These programs gave San Francisco and other SFPUC territory residents specialized and competitive job skills; ushering many of them into apprenticeship opportunities on WSIP projects.

In August 2016, the SFPUC and San Francisco Building and Construction Trades Council signed the SSIP Project Labor Agreement (SSIPLA). The SIPLA builds on this codified and successful partnership of the SFPUC, labor, contractors, and community training programs. However, SSIP projects will offer far greater workforce opportunities for San Francisco residents given the location of the projects in San Francisco and the application of the City's Local Hiring Policy for Construction and First Source Hire policies. As such, the specialized training partnerships developed during WSIP should be reconfirmed and expanded. Particular effort should be made to develop such training with the Electricians, Plumbers and, again, with the Operating Engineers.

CityBuild Academy/Cement Masons Partnership. San Francisco's CityBuild Academy (CBA) has partnered with the Cement Masons to deliver specialized training in this trade. Cement Mason Apprenticeship Coordinators deliver 9 weeks of focused training to Academy participants at the beginning of their 10th week in the Academy.

- Initially, CBA participants are introduced to the trade and the specialized training.
- The Apprenticeship Coordinators interview interested CBA students; selecting 8 – 12 students for the training.

- The Apprenticeship Coordinators spend eight to nine hours per week with the selected CBA participants; focusing on specific aspects of the trade and providing opportunities to complete hands-on projects.
- At the completion of this special modular training, the CBA participants have gained enough knowledge and skills of the trade to make them competitive and competent apprentices.

Opportunity to generate and sponsor this type of specialized training partnership between the union affiliates, particularly the Electricians, Plumbers and Operating Engineers and CityBuild Academy should be undertaken by the SFPUC. The SFPUC should consider sponsoring a specialized pre-apprenticeship training for District 10 residents generated cooperatively with one of the priority union affiliates and CityBuild Academy. Such Training could:

- Augment existing pre-apprenticeship training and focus on that specific trade area.
- Provide needed educational support to augment participant mathematical and technical skills
- Be extended to a wide audience of potential District 10 recruits to include:
  - Current City College students, particularly those with math or technical backgrounds
  - CityBuild Academy, Job Corps or other pre-apprenticeship program graduates with stronger than average math skills
  - Experienced skilled trades people interested in moving into electrical work, again with technical or mathematical backgrounds or experience
  - Veterans with technical training
  - Workers from other sectors that have an interest and aptitude for electrical work
  - Be offered in the evening to accommodate working individuals.
  - Take advantage of the sizeable number of District 10 residents with existing construction experience as well as those that have taken college-level coursework.

Additionally, the SFPUC could again work cooperatively with labor, training partner and SSIP contractors to usher program graduates into apprenticeship programs and employment on SSIP Phase 1 projects.

<u>Training for Incumbent Workers.</u> Another prospect for enhancing SSIP job opportunities for District 10 residents would be for the SFPUC to consider sponsoring specialized training for incumbent workers. The SFPUC could seek a partnership with the Operating Engineers to deliver training to extend or upgrade their trade skills. This might include working with large machinery in confined spaces or training that led to other certifications useful for SSIP Phase 1 project work. In this way, experienced District 10 workers could become more competitive; specifically augmenting their job skills in areas in demand on SSIP projects. Other such incumbent worker specialized training could be extended to other trades as well to gain certifications required for SSIP Phase 1 construction work. Completing these would increase the competitiveness of District 10 workers and enhance the likelihood of their hire and retention.

***DIRECT ENTRY AGREEMENTS*.** With regard to direct entry agreements with union apprenticeship programs, there are some existing models that may be useful starting points.

CityBuild Academy/IBEW Local 6 Program**.** CityBuild Academy has developed a new partnership with San Francisco's electrical union, IBEW Local 6. The partnership allows CityBuild to submit applications of CityBuild Academy graduates that meet certain criteria, such as an 85% attendance rate, to the IBEW apprenticeship program within one year of Academy graduation. The CityBuild referrals are not required to take the apprenticeship exam and are guaranteed interviews. These arrangements recognize the training and skills CBA graduates obtain during their pre-apprenticeship training and enhance their likelihood for entrance into the IBEW apprenticeship program. The SFPUC could explore establishing similar arrangements with the Plumbers and Operating Engineers.

However, more specific direct entry programming would be the most beneficial. Building on the potential partnerships that could be established through jointly delivered specialized training, the SFPUC could negotiate with the Electricians, Plumbers and Operating Engineers to designate a set number of direct entry slots for SF/District 10 residents that successfully complete pre-apprenticeship and these specialized programs. Again, the SFPUC could work with SSIP contractors to sponsor District 10 residents into the Electricians, Plumbers or Operating Engineers apprenticeship programs and for work on a SSIP Phase 1 projects. This level of cooperative agreement and action would be historic for the City.

2. Sponsor Program Enhancements for Existing Pre-Apprenticeship Programs. SFPUC should build on the existing network of pre-apprenticeship programs that serving District 10 and other San Francisco residents. These include CityBuild Academy, the SFUSD partnership with Jewish Vocational Services, the San Francisco Conservation Corps, and community-based training at Asian Neighborhood Design and Young Community Developers (See Appendix for fuller descriptions of these programs)

The review of the existing local pre-apprenticeship programs and the results of focus groups held with CityBuild Academy instructors, graduates and CBO case managers provided key insights for ways to improve the existing pre-apprenticeship programs. The following recommendations include many of the suggestions that emanated from these sources.

ADDITIONAL CLASS OFFERINGS. Three priority needs emerged from the research that pertain to the educational and training curriculum offered by the existing programs:

- Additional English Language Instruction for Limited English Speakers
- Spanish Language Instruction for Non-Spanish Speakers
- Additional Hands-on Training Opportunities

English Language Instruction. The SFPUC should consider working with City College, CityBuild Academy, Catholic Cultural Charities, Asian Neighborhood Design, etc. to sponsor additional English Language classes for District 10 and San Francisco residents particularly focusing on gaining construction and jobs site related English language proficiency. While participants in these programs can study English at the same time they are enrolled in a pre-apprenticeship program, all stakeholders indicated that additional and more construction focused language study was needed. The lack of English language proficiency is inhibiting

performance in apprenticeship programs, job placement and jobsite success. Such instruction might take the form of small group specialized training and/or individualized instruction. Additionally, SFPUC and its training partners might consider exploring the use of computer-based instructional models that could reinforce classroom language learning.
San Francisco is replete with technology firms that could assist with generating specialized language curriculum for District 10 and San Francisco residents.

Spanish Language Instruction. Additionally, Spanish has become as important on the construction jobsite as English. Non-Spanish speaking CityBuild Academy graduates asserted that gaining a basic working knowledge of Spanish would enhance their ability to perform well on the job. SFPUC and its training partners should consider offering introductory Spanish classes with a focus on construction jobsite vocabulary to both new apprentices and incumbent workers. Again, this training may be enhanced by using web-based or other technical educational aides available for language acquisition.

ADDITIONAL HANDS ON WORK EXPERIENCE. Currently, all the pre-apprenticeship training programs offer hands-on construction experience. The amount and intensity of this instruction varies among the programs. Nonetheless, because few urban residents come into these programs with experience working with their hands or with knowledge of basic tool use, obtaining actual building experience is critical. Likewise, few program participants have outdoor work experience that also requires sustained physical exertion. The SFPUC and its pre-apprenticeship training partners should seek ways to incorporate additional opportunities for program participants to gain actual building and outdoor work experience. For example, at one time CityBuild Academy students worked on Habitat for Humanity projects. This proved to be a valuable relationship for both parties but Habitat for Humanity is no longer completing projects in San Francisco.

The SFPUC should consider establishing such educational work opportunities for District 10 and San Francisco residents participating in pre-apprenticeship programs on its SSIP Phase 1 projects. SFPUC and the City could explore regularly utilizing these pre-apprentices to complete small projects on City owned properties. This would require partnering with the respective union locals to create educational work opportunities for these pre-apprentices that would not interfere with existing agreements. Such an effort could greatly benefit these resident students as well as make important contributions to the SFPUC and City.

Assist Community Organizations with Targeted Outreach and Selection. As part of our research effort, we have reviewed other targeted construction employment efforts throughout the United States. This review indicates that the key elements of an effective targeted outreach and selection process include the following elements:

1. Wide net outreach through both traditional workforce outreach mechanisms and newer social media mechanisms;
2. Screening to determine commitment as well as aptitude; and
3. On-going case management, at least through training and initial employment stages.

The local community based organizations involved in recruiting for pre-apprenticeship programs use some aspects of this type of targeted outreach but the CBO focus group members noted that it would be useful to know how to more effectively use social media. Likewise, it appears that program selection has focused more on persuasion than aptitude historically. Again, it would be useful for program recruiters to have more sophisticated tools at their disposal for assessing aptitude for the skilled trades. The SFPUC should consider participating with the City and other partners to provide relevant training to program recruiters to enhance their ability to connect and refer interested, viable candidates to pre-apprenticeship training.

FINANCIAL SUPPORT DURING TRAINING. The stakeholder focus groups each reported that pre-apprenticeship trainees encounter serious problems sustaining themselves financially through CityBuild's 18-week training program. They noted that one of the main reasons that participants are unable to complete pre-apprenticeship training is due to economic hardship. Some participants work in the evenings and on weekends and earn enough to sustain themselves and their families. However, others are not able to do this. San Francisco's high cost of living exacerbates this situation. Providing financial support during training has its advocates and critics. The City and its partners have operated training programs under both models.

The SFPUC could consider covering the cost for training stipends, childcare, and food or transportation vouchers to provide pre-apprenticeship program participants with some financial support.

3. Promote Partnerships between SSIP Phase 1 Contractors and CityBuild Academy or other Pre-Apprenticeship Training Programs

CityBuild and other pre-apprenticeship training programs could benefit greatly from more intense and consistent partnerships with City contractors. These partnerships can also serve local contractors interested in identifying well trained local workers.

The SFPUC should consider promoting formal partnerships between SSIP Phase 1 contractors and CityBuild Academy or other local pre-apprenticeship training programs. The contractor partners could:

- Provide much needed construction machinery and tools
- Connect the programs with tool manufacturers and suppliers
- Contribute instructional services to demonstrate new construction methods and tools
- Participate in program discussions about careers in construction

Likewise, the programs could introduce contractors to graduating apprentices, provide interview opportunities and assist contractors in recruiting new apprentices for local projects.

4. Sponsor a Ramp Program to Pre-Apprenticeship Training to Assist District 10 and other SF Residents to Prepare for Entry to Pre-Apprenticeship Programs.

In order to enter an apprenticeship program or even a pre-apprenticeship program such as CityBuild Academy, a District 10 or San Francisco resident must meet basic entry requirements such as:

- Having a high diploma or GED
- Possessing a California driver's license
- Attaining a minimum level of English Language Proficiency
- Having at minimum 8th grade math and reading skills

For some individuals interested in entering the construction trades, meeting these basic entry requirements is challenging yet not impossible.

The SFPUC should consider sponsoring a Pre-Apprenticeship Ramp Program to help these interested residents prepare for entry into local pre-apprenticeship and apprenticeship programs. In addition to providing basic skills upgrades, a Pre-Apprenticeship Ramp Program could be directly linked to the building trades: include an introduction to the construction trades, physical conditioning, basic tool identification and use, safety instruction, and some hands-on work experience. This industry focus could be complemented with life skills education and case management support to ensure that participants achieve desired outcomes. Again, such a program should explore how new technology and social media could be used to enhance communication and learning.

5. Promote the Retention of District 10 and other SF Residents in the Skilled Trades

The research findings indicate that a sizeable number of District 10 and San Francisco residents that complete pre-apprenticeship training and enter apprenticeship programs do not remain in the skilled trades for more than several years. Although this is in keeping with attrition rates for many of the trades, the SFPUC and its partners should consider sponsoring efforts to retain resident workers in the field. Even a modest boost in retaining resident workers will positively impact the number of available SF residents for work on SSIP Phase 1 and other City sponsored projects.

The CityBuild program has begun reaching out to CBA alumni and holding get-togethers. This provides opportunity for CityBuild staff to reconnect with workers, get updated on their work status, and remain available to assist alumni to resolve any work-related issues. Similarly, there are local contractors that have asked more senior workers to "watch out for" new apprentices. This is not an unusual practice. However, it is not ubiquitous.

Mentoring Program. SFPUC could consider partnering with union locals and SSIP Phase 1 contractors to establish formal mentoring programs to provide support to District 10 and other SF resident workers upon entry into apprentice positions. Such mentoring could take the form of a big brother/big sister system, job coaching by an experienced worker and union member, or a very structured guided mentoring program. Many of the local residents that are more recent entrants into the construction industry do not come from families that have historically worked in construction. Many are unfamiliar with unions or the benefits that can be derived from union membership. There are a variety of work related and personal issues that these new apprentices encounter that can derail their efforts to remain working and participating in their

apprenticeship programs. The City's investment in their training warrants taking additional steps to help them remain on the job, complete apprenticeship training and attain journey status.

Apprentice Post Employment Workshops. SFPUC should consider partnering with CityBuild, union locals, contractors and community organizations to sponsor workshops for SSIP Phase 1 District 10 and other SF resident apprentices to support and assist them. CBA graduates noted the following needs. However, a survey of apprentices could easily be completed to augment these topic areas.

- Financial literacy and budgeting
- Credit Repair
- Homeownership Preparation
- Expungement of Criminal Records
- Pros and Cons of Moving from One Trade into Another

Promote Retention of Women. SFPUC should consider partnering with CityBuild, union locals, contractors and community organizations to specifically promote the retention of women in the skilled trades. While San Francisco has a significantly higher percentage of women apprentices (11%) and about 9.1% of all District 10 construction workers on City projects are women, the number of female skilled trades workers remains relatively small.

CityBuild Academy has launched a program to specifically address the needs of female construction workers and to promote their retention in the industry. The program has assigned an employment liaison to work with female Academy graduates and other female construction workers served by CityBuild. This staff member hosts quarterly events for female workers to promote mutual support and networking, provides one-on-one support, and refers workers for assistance as needed. Also, CityBuild has formed a Leadership Advisory Committee to help promote women's retention and advance career and leadership development. The program sponsors female worker participation in state and national conferences directed towards tradeswomen. Another organization that focuses on women construction workers, Tradeswomen, Inc. has previously received support from the SFPUC.

SFPUC should support the work of CityBuild and Tradeswomen Inc. towards retaining women in construction skilled trades. More specifically, SFPUC should consider sponsoring a program directed at retaining women on SSIP Phase 1 projects.

6. Contribute to the Creation of a City Training Site

One of the most constraining factors confronting CityBuild Academy and other pre-apprenticeship training programs is inadequate training space. Currently the Academy is housed at City College of San Francisco's Evans Campus. The available training space consists primarily of indoor classrooms that must be shared with other programs and an extremely limited outdoor space. The space

constraints inhibit potential offerings, the scheduling and timing of trainings as well as the number of participants that can be served.

Establish a San Francisco Construction Skills Center. SFPUC should consider working with City, labor and industry partners to establish a San Francisco Construction Skills Center at which District 10 and San Francisco residents could receive training to include: pre-apprenticeship training, various construction skills certification training, specialized training, skills upgrade training, and potentially other related vocational training. Such a permanent, dedicated training site would maximize the City's training offerings. The Center could include shop facilities with the capacity to house large pieces of machinery and construction equipment. There could be ample classroom space and outdoor areas for practicing building techniques, building and demolishing structures, and ample storage. It is conceivable that both union and industry partners might contribute to creating such a facility within the city.

Provide Training Space. SFPUC should also consider providing training space to CityBuild or other pre-apprenticeship training partners at SFPUC facilities. These could serve as spaces for specialized training or other training that is not currently feasible due to space constraints or lack of outdoor access. Even if reaching such a facility might necessitate providing a van to transport participants to and from the training, it would serve an important role in filling in gaps in current training offerings.

II. RECOMMENDATIONS FOR SSIP PROFESSIONAL SERVICES EMPLOYMENT

The City's First Source Hiring requirements are creating entry-level professional services employment positions for San Francisco residents on SSIP Phase 1 projects. Due to the number and duration of the SSIP Phase 1 opportunities, the SFPUC should consider partnering with City College of San Francisco (CCSF) and the OEWD's Construction Administration & Professional Service Academy (CAPSA) to create a pool of professional services candidates for SSIP Phase I First Source generated positions. Training and/or recruitment for the pool could be targeted to District 10 residents.

The CAPSA program trains individuals to enter the construction industry through an administrative portal. Program graduates pursue career paths in office administration, document control, office engineering, AutoCAD or project assistance. Some have gone on to pursue degrees in Construction Management. The program operates in partnership with CCSF.

CCSF has academic degree programs in Architecture, Construction Management, Business Office Technology and Computer Science as well as an Engineering Transfer Program. They also have a plethora of relevant Career and Technical Education program offerings.

These two programs offer SFPUC a dual opportunity to create a clear pathway for District 10 and San Francisco residents into SSIP Phase 1 professional services opportunities.

1. SFPUC could partner with CAPSA to recruit and train District 10 residents. Successful graduates could be referred to jobs with SSIP Phase 1 professional services firms.

2. Similarly, SFPUC could partner with CCSF and its SSIP Professional Services firms to establish a paid SSIP summer internship program that would place District 10 CCSF students with SSIP professional services firms. Such a program would support District 10 students while they were studying and serve as a potential recruiting arm for the firms for later hires.

III. RECOMMENDATIONS TO ADDRESS CONSTRUCTION WORKFORCE PIPELINE ISSUES

As noted in Sections 4 and 5, the pipeline of San Francisco residents into the construction industry remains constricted. Large numbers of San Francisco residents are not entering the construction workforce despite the sector's employment and earning potential. This is particularly true for younger residents. CBA participants noted that they did not know about the apprenticeship training or employment opportunities available in the skilled trades prior to learning about CityBuild. This is not surprising as for the most part local school districts have abandoned construction related vocational education. At one time, San Francisco high schools offered shop classes and John O'Connell High School operated in partnership with the union locals.

While John O'Connell continues to have a small construction program, it is not directly connected to the construction building trades apprenticeship programs. Yet, the City of San Francisco is experiencing a construction boom that promises to generate additional skilled trades and related professional services positions over the next decade.

The SFPUC and the City should consider leading an effort to address these pipeline issues with other key local industry stakeholders to include: major employers such as the University of California, San Francisco, California Pacific Medical Center and Kaiser Permanente that have an interest in hiring local residents; union affiliates that will need to replenish their ranks as older workers retire; City contractors that must comply with local hiring requirements; and professional services firms under contract with the City that need new workers and must comply with First Source Hiring requirements. The SFPUC and its partners could work jointly to raise the profile of the building industry to ensure local students, parents, educators and career counselors have a full and complete picture. The SFPUC with its regional perspective could also provide critical insights into how the workforce pipeline dialogue could be expanded beyond the city and throughout the Bay Area region.

1. Market the Construction Industry and its Variety of Career Options

- Engage with SFUSD and City College of San Francisco to market the variety of industry career opportunities to young people currently enrolled in high school or at CCSF.
- Expose young people, their families and school counselors/teachers to the full array of building industry career opportunities: skilled trades, engineering, architecture, contracting, inspecting, project and construction management, etc.

- Articulate the career pathways in construction industry; how one gains entry and prepares for a career in engineering, architecture, skilled trades and management without devaluing role of skilled trades.
- Explain the pathway from tradesperson or company worker to business owner

2. Create Opportunities for Young People to Gain Industry Experience

- The SFPUC and its partners could sponsor paid summer programs for high school students:
  - The SFPUC could target District 10 students for its Project Pull program or create a summer program akin to Project Pull or the ACE Mentor Program for District 10 students, placing them with SSIP Phase 1 consultants.
  - The SFPUC could sponsor a high school summer program for District 10 and other San Francisco students designed to provide basic skilled trades training and an orientation to the building trades
  - The SFPUC could work in partnership with organizations like National Association of Women In Construction (NAWIC) to sponsor a Camp NAWIC or Camp MAGIC to connect girls to careers in the construction industry.
- The SFPUC could extend internship opportunities to District 10 college students in engineering, architecture, human resources, document control, community outreach, etc. with SSIP Phase 1 contractors and consultants.

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