

# Victor Valley College

## Environmental Scan and Program Demand Gap Analysis

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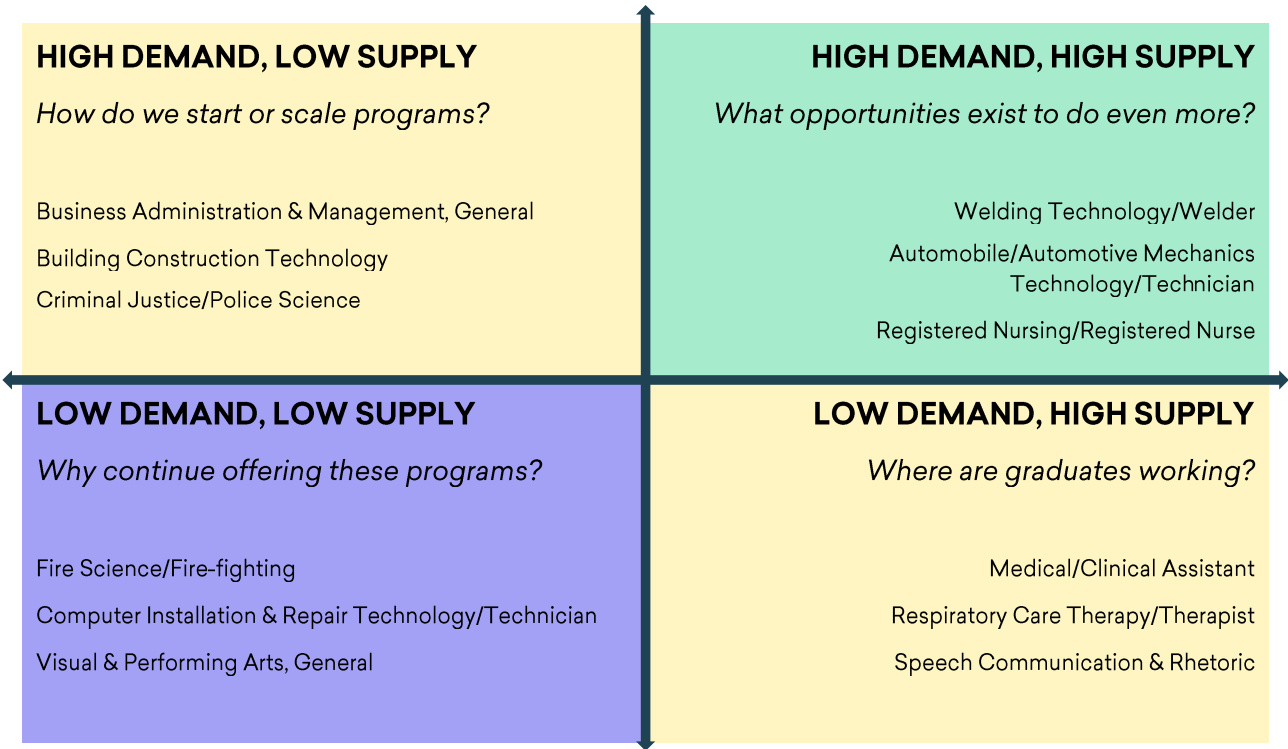




# Executive Summary

Victor Valley College (VVC) is a public, two-year postsecondary educational institution in California. To further its goal of providing the region with well-trained and well-educated residents, VVC continually pursues improvement in various forms. An up-to-date understanding of the regional economy and the demand for skilled labor is vital to the planning efforts of the college as it seeks to adapt its program offerings to the requirements of an ever-changing workforce. VVC partnered with Emsi, a leading provider of labor market data, to complete a Program Demand Gap Analysis (PDGA), which assesses regional job openings against educational program completions.

## RECOMMENDATIONS



*“Strong community colleges assess trends in job growth and salaries to determine what programs will be needed for high-demand jobs. They then structure their programs and enrollment in accordance with those demands.”*

*Josh Wyner in What Excellent Community Colleges Do: Preparing All Students for Success*

## **INTRODUCTION**

For purposes of the PDGA, VVC serves San Bernardino County, (Figure 1). This report outlines the region’s economy and uses the region’s average annual projected job openings between 2018 and 2028 as a measurement of labor market demand. When job openings are compared to the region’s supply of educational program completions, the analysis determines how well VVC’s program offerings satisfy regional workforce demand. In addition, this report offers recommendations for new program development. In its entirety, the PDGA is a starting point for VVC as the college continues to develop programs using data-based decision-making strategies. The following figures and table display key findings of the analyses.

Figure 1: Map of San Bernardino County

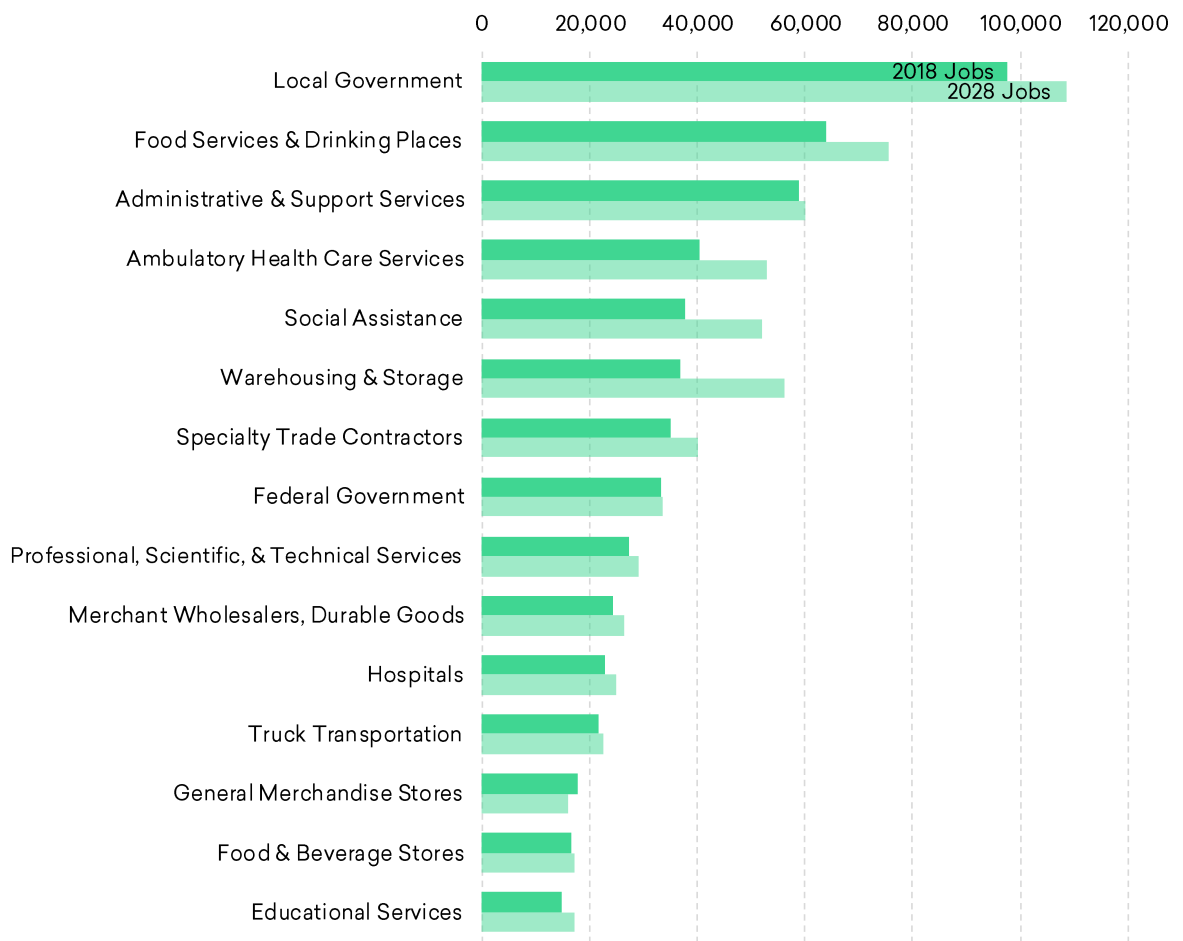


Source: Emsi Analyst. Region provided by VVC.

## ENVIRONMENTAL SCAN

Figure 2 displays the top industry subsectors in terms of employment in San Bernardino County, and Figure 3 shows the top industry subsectors in terms of employment concentrations, referred to as location quotients (LQs). High LQs (usually anything greater than 1.2) are an indication that the region has a comparative advantage or specialization in certain industry subsectors relative to the rest of the nation or potentially to other regions.

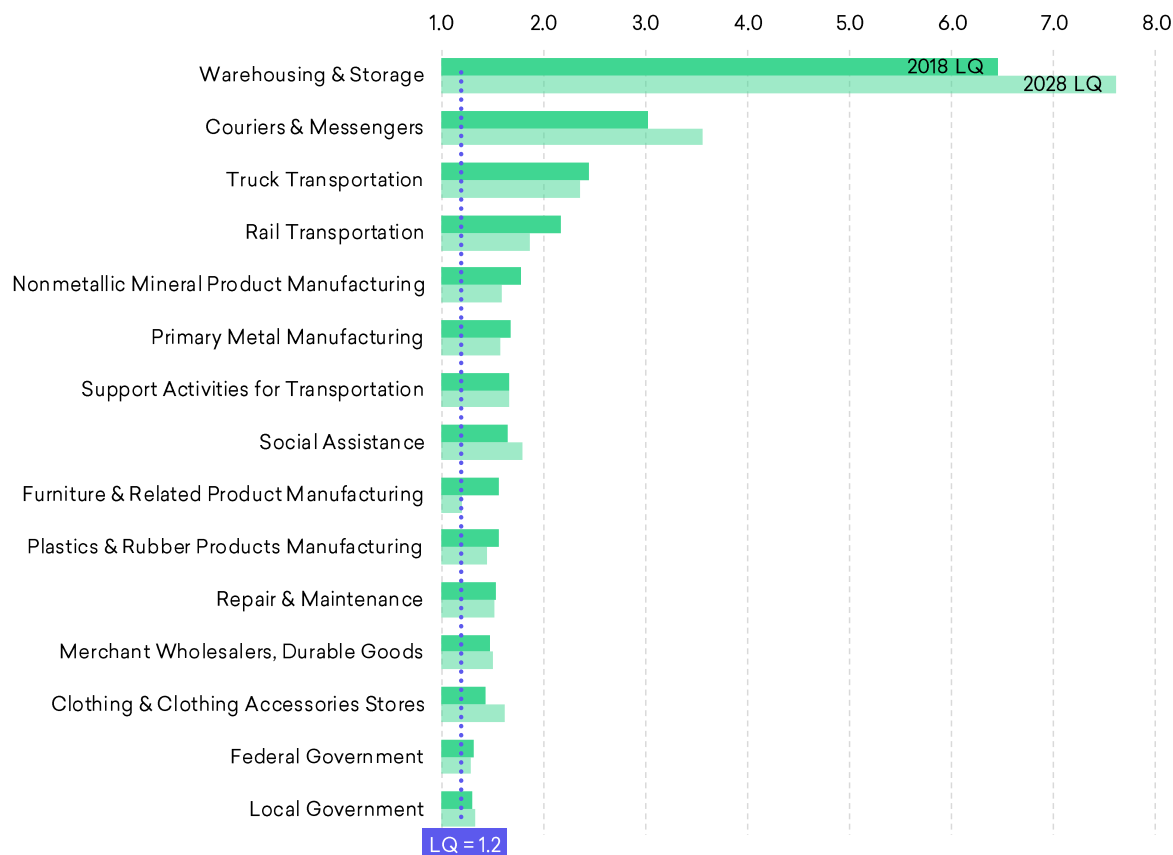
Figure 2: Top Industry Subsectors in San Bernardino County by Jobs



Source: Employees & Self-Employed 2019.1.



Figure 3: Top Industry Subsectors in San Bernardino County by Employment Concentration (LQ)



Source: Employees & Self-Employed 2019.1.

Across all of San Bernardino County’s industry subsectors, six are within the top 15 in terms of jobs with relatively high LQs. The appearance of these industry subsectors provides an indication of their strength in the region’s economy and offers the college insight into potential employment opportunities for its students. Additionally, these industry subsectors may be opportunities for VVC to offer programs or program tracks specific to local job opportunities. These industry subsectors, ranked by 2018 jobs, are:

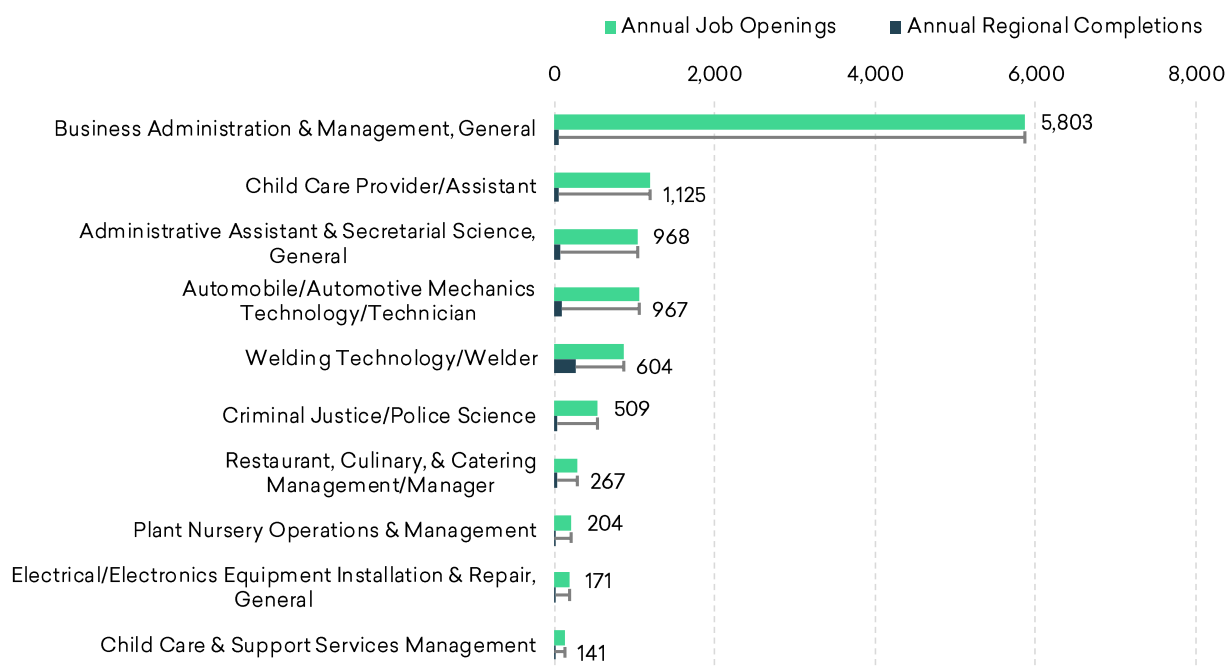
- Local Government
- Social Assistance
- Warehousing & Storage
- Federal Government
- Merchant Wholesalers, Durable Goods
- Truck Transportation

## PROGRAM DEMAND GAP ANALYSIS

The program demand gap analysis provides results across all of VVC’s certificate and degree level programs, which have been classified by their formal CIP code.<sup>1</sup> The analysis connects the college’s program completers with the availability of regional job openings. Furthermore, the analysis focuses on the gaps and surpluses in the programs by award level. A gap or surplus larger than 125 is considered beyond normal labor market fluctuations and therefore an area of consideration for program development.

VVC offers 19 certificate level programs, ten of which have a significant gap above the 125-job level of significance, as shown in Figure 5. The Medical/Clinical Assistant program has a significant surplus with an average annual oversupply of 207.

Figure 4: Top 10 VCC Certificate Program Gaps

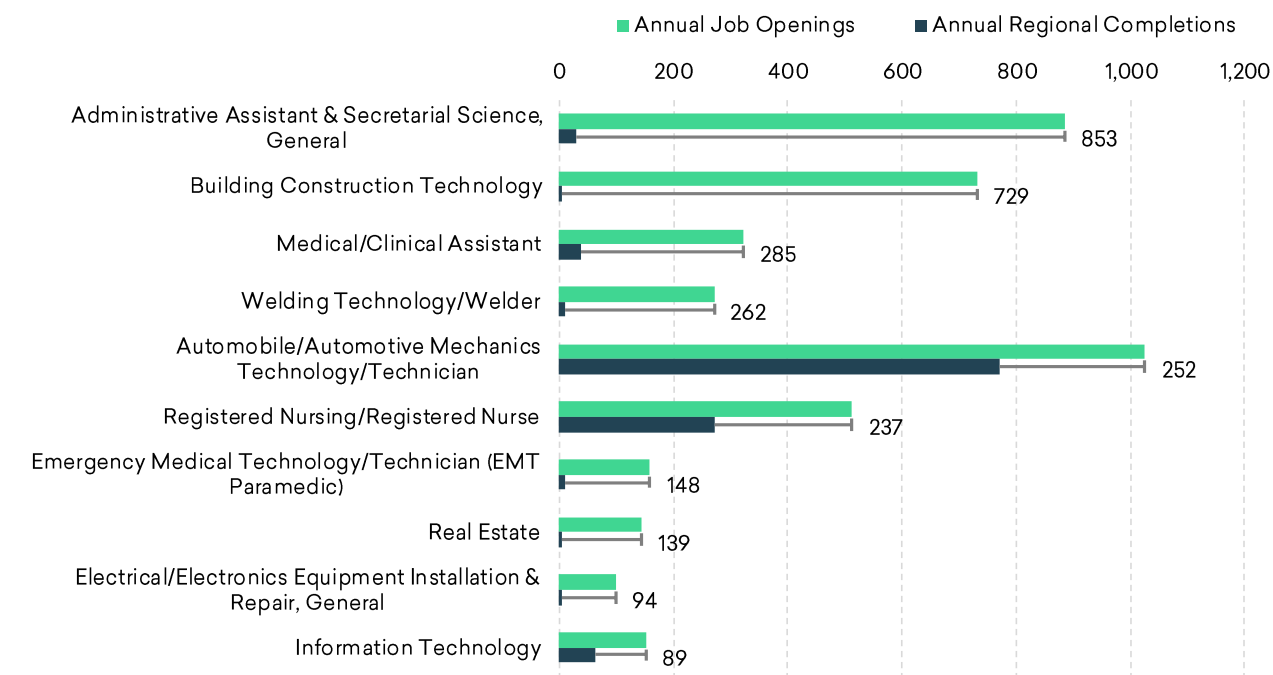


Source: Emsi program demand gap model.

1 CIP refers to the Classification of Instructional Program and was originally developed by the U.S. Department of Education’s National Center for Education Statistics (NCES).

At the associate degree level, eight programs have a significant gap. Several should be considered for a college-wide expansion, many of which are related to other associate degree level programs without a significant 125-job gap. Furthermore, if the associate degree level program is associated with a formal industry-specific certificate, permit, or license required for employment, it is also recommended for expansion.

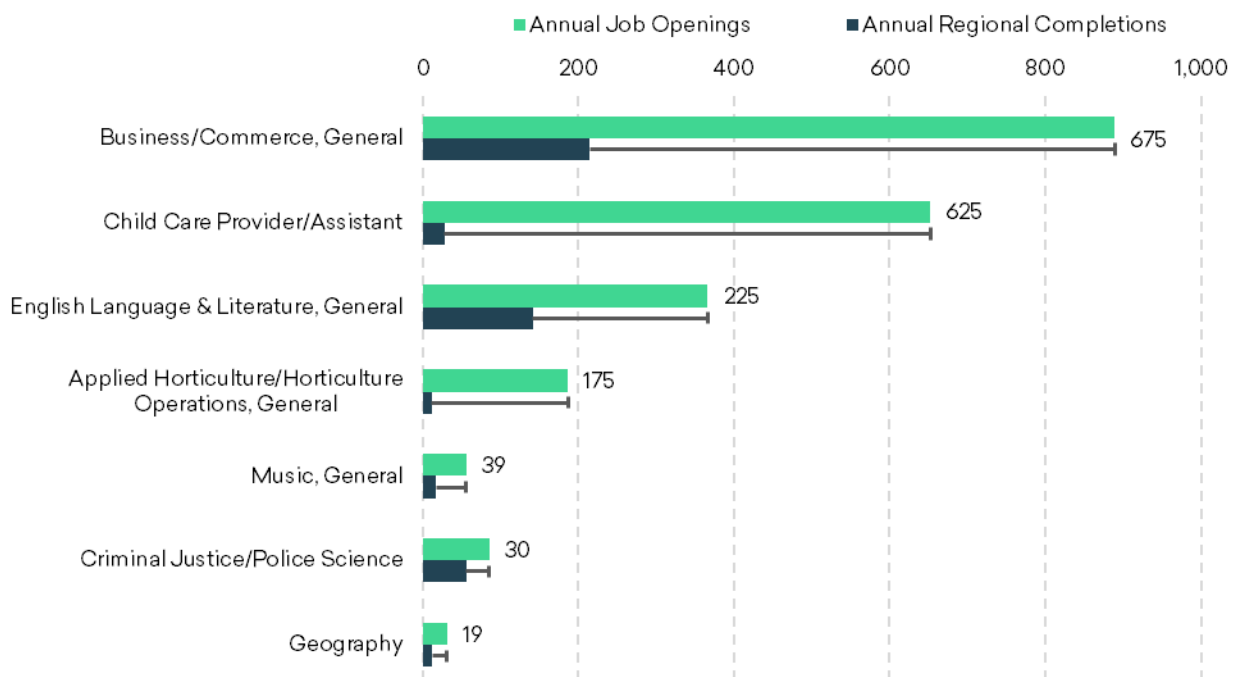
Figure 5: Top 10 VCC Associate Degree Program Gaps



Source: Emsi program demand gap model.

At the transfer-track degree level, four programs have a significant gap. Both the Business/Commerce, General and English Language & Literature, General programs should be considered for expansion. However, both the Child Care Provider/Assistant and Applied Horticulture/Horticulture Operations, General programs have low median hourly wages, meaning they may not be suitable for an expansion.

Figure 6: VCC Transfer-Track Degree Programs with a Gap



Source: Emsi program demand gap model.

A liberal arts program expansion is not recommended at this time, but VVC administrators should be aware that students can find success in a variety of business-related occupations. Using Emsi's Profile Analytics database, many liberal arts program completers are currently employed as retail salespersons, administrative assistants, and customer service representatives, as well as a variety of managers and supervisors. These occupations have a considerable number of job openings in San Bernardino County. The college's liberal arts program, therefore, serves as a starting point to students' career goals beyond an associate degree level of education.



## PROGRAM ADDITIONS

Forty-two certificate and seven associate degree level programmatic areas of opportunity have been identified in the program demand gap analysis, many of which are related to business, health, and transportation at the certificate level and various kinds of health occupations at the associate degree level. At the transfer-track degree level, the occupations relate to engineering and business and financial operations. Across all award levels, many program additions are related to VVC's current program offerings, which indicates an opportunity for a curriculum adjustment to better align with the region's current and projected labor market demand. A selection of these occupations, which have the most regional job openings by award level, appear in Table 1.

Table 1: Program Additions by Education Level

<b>SOC CODE</b>	<b>SOC TITLE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>ANNUAL regional COMPLETERS</b>	<b>GAP</b>	<b>MEDIAN HOURLY WAGE</b>	<b>EDUCATION LEVEL</b>
53-3032	Heavy and Tractor-Trailer Truck Drivers	1,940	2	1,938	\$20.84	Certificate
43-5071	Shipping, Receiving, and Traffic Clerks	727	2	725	\$15.09	Certificate
43-3031	Bookkeeping, Accounting, and Auditing Clerks	645	25	620	\$19.03	Certificate
53-1048	First-Line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	421	0	421	\$26.32	Certificate
47-2111	Electricians	416	37	379	\$27.12	Certificate
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	230	0	230	\$17.86	Certificate
51-1011	First-Line Supervisors of Production and Operating Workers	213	0	213	\$26.23	Certificate
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	194	2	192	\$24.96	Certificate
43-4151	Order Clerks	155	1	155	\$17.14	Certificate
51-4041	Machinists	160	9	150	\$18.52	Certificate
29-2021	Dental Hygienists	59	5	54	\$42.79	Associate
29-2081	Opticians, Dispensing	22	0	22	\$18.16	Associate
31-2011	Occupational Therapy Assistants	19	0	19	\$33.97	Associate
29-2031	Cardiovascular Technologists	13	0	13	\$26.32	Associate

<b>SOC CODE</b>	<b>SOC TITLE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>ANNUAL regional COMPLETERS</b>	<b>GAP</b>	<b>MEDIAN HOURLY WAGE</b>	<b>EDUCATION LEVEL</b>
	and Technicians					
29-2032	Diagnostic Medical Sonographers	16	8	8	\$37.14	Associate
41-3021	Insurance Sales Agents	152	0	152	\$19.71	Bachelor's
43-5061	Production, Planning, and Expediting Clerks	137	0	137	\$21.21	Bachelor's
13-1028	Buyers and Purchasing Agents	135	1	134	\$25.75	Bachelor's
43-4061	Eligibility Interviewers, Government Programs	116	2	115	\$21.16	Bachelor's
41-3031	Securities, Commodities, and Financial Services Sales Agents	85	0	85	\$18.82	Bachelor's
17-2051	Civil Engineers	82	0	82	\$52.44	Bachelor's
13-2072	Loan Officers	71	0	71	\$30.35	Bachelor's
13-1151	Training and Development Specialists	69	0	69	\$28.26	Bachelor's
13-1081	Logisticians	65	0	65	\$33.97	Bachelor's
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	62	0	62	\$31.76	Bachelor's

SOC refers to the Standard Occupational Classification system used to classify occupations. Average annual job openings represent regional data from 2018 to 2028. Numbers may not sum due to rounding.

Source: Emsi program demand gap model.



# Introduction

An efficient labor market requires a seamless flow of skilled workers, the institutions that educate and train them, and the employers that hire them. One factor behind workforce misalignment stems from when the needs of the employers evolve differently than the educational programs that train their workers. These misalignments may happen at different times and for different reasons:

- Employer training becomes more tailored and comprehensive;
- Businesses come and go, and certain educational programs become more or less pertinent to a specific region;
- Rapid advances in technology and business create curriculum needs that few educational institutions possess;
- As economic conditions shift, businesses have different hiring requirements of their employees.

In light of these dynamics, an up-to-date understanding of the regional economy and the demand for skilled labor is vital to the planning efforts of colleges and universities seeking to adapt their program offerings to the requirements of an ever-changing workforce.

To gain better insight into economic conditions and workforce trends, Victor Valley College (VVC) partnered with Emsi, a labor market analytics firm serving higher education, economic and workforce development, talent acquisition, and site selection. In this report, Emsi conducts an environmental scan of the region's economy, provides a program demand gap analysis of VVC program offerings, and makes recommendations for new program development.

The program demand gap analysis is performed by assessing the supply and demand of skilled workers and identifying the educational programs that need to be adapted in order to fill any existing or future gaps. The analysis weighs the educational output of VVC and other postsecondary educational institutions in the region against the number of job openings related to the college's program offerings to determine whether a deficit or an oversupply of skilled workers exists. The goal of the analysis is to provide VVC with relevant

data and information that it can use when solving problems and making decisions about current and future program development.

## **IMPORTANT NOTE**

This analysis is intended to serve as a starting point for VVC as the college discusses regional workforce needs. A deficit (gap) or oversupply (surplus) of workers in a particular occupation category represents a potential problem for the region, making it important for each program and occupation group to be evaluated by the college on a case-by-case basis. The purpose of this analysis is, therefore, to initiate the conversation on evaluating program effectiveness. Once evaluated internally within the college, specific implications may be considered for programs with substantial gaps or surpluses.

It must be noted that our analysis does have its limitations in that only the education supply pipeline is considered. This is due to data availability at the county and school levels. However, other sources—unemployed workers, industry trained pipelines, workers migrating to the region, and job changers from other occupational categories—can also be a source of skilled workers. These types of considerations are useful when evaluating specific types of occupations. Publicly available data sources are limited in accounting for this, and consequently these labor sources are unavailable for Emsi analysis. Primary data collection methods (i.e., interviews and surveys) are among the only ways to obtain information on the other sources for skilled workers.



# Environmental Scan

Before looking at the results of the program demand gap analysis, VVC should first consider the economic structure of its region, referred to in this report as San Bernardino County and defined as San Bernardino County in California (Figure 2.1). Identifying the economic conditions within the region is an important first step for several reasons:

- Help VVC administrators understand where the college should logically target its efforts, especially in regard to program development;
- Reveal whether there are industries that may be overlooked as a result of recent economic growth;
- Identify the top occupations within those key driving industries;
- Understand how connected regional workers are to the surrounding community;
- Give the college a deeper understanding of the regional population characteristics and the socioeconomic background of current and future VVC students.

Figure 2.1: Map of San Bernardino County



Source: Emsi Analyst. Region provided by VVC.

To these ends, this chapter provides an overview of San Bernardino County's industry composition and economic base, shows common occupations in the region's key industries, illustrates worker commuting patterns, discusses the highest educational attainments of the region's adult residents, and provides population and economic characteristic data. Supporting data tables are found in Appendix 3.

## INDUSTRY COMPOSITION

Evaluating current and future employment by industry provides information on the region's economic diversity. Understanding the industry mix is important for drawing connections to the occupations and companies that are in-demand, and students are likely to find employment in the largest region industries. The North American Industry Classification System (NAICS) is the structure used by federal agencies to classify business establishments based on their production process (although the final product or service is usually similar for the firms in a given industry). NAICS applies a six-digit hierarchical coding system to organize

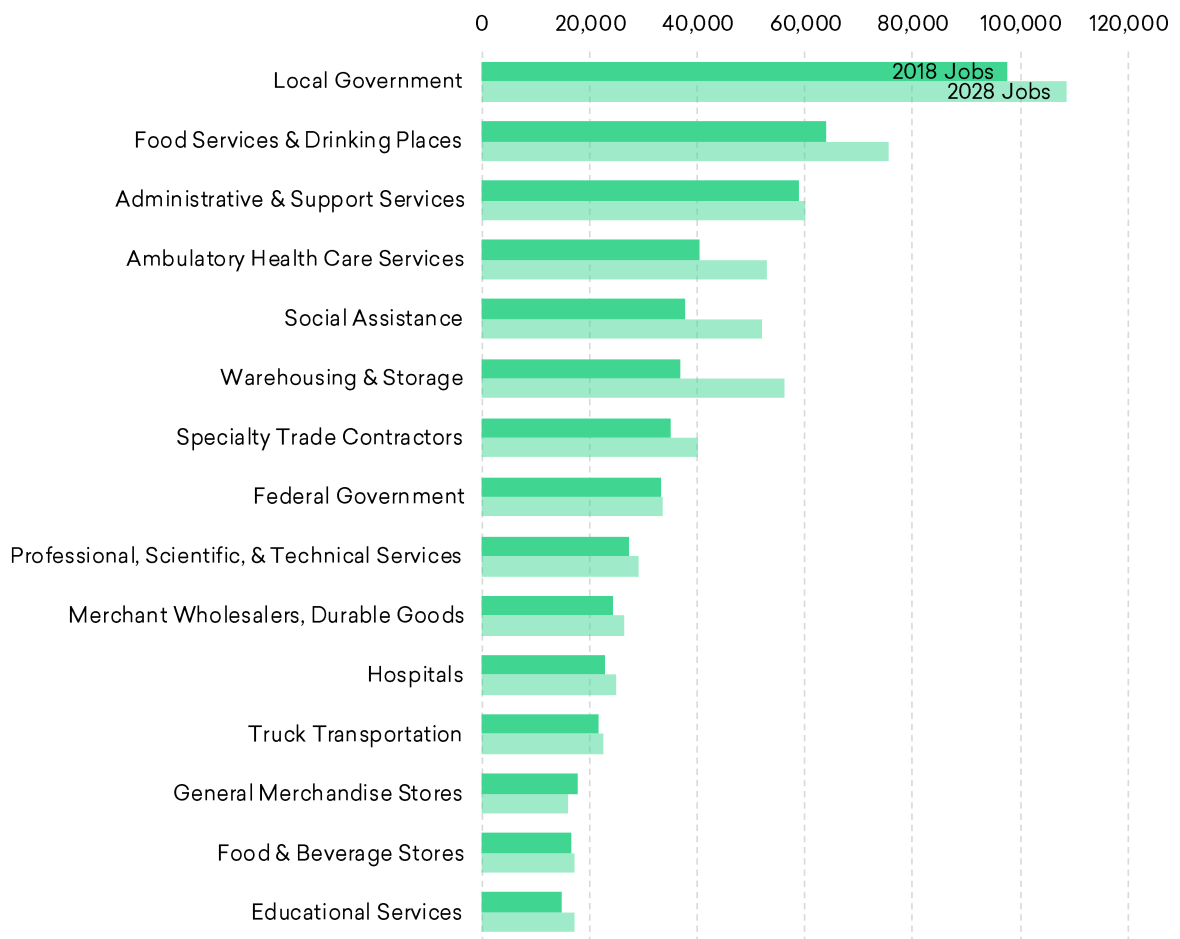
more than 1,000 detailed industries in the U.S. For the analysis in this section, Emsi has aggregated industries into their three-digit NAICS codes, referred to as industry subsectors.<sup>2</sup>

Figure 2.2 presents the 15 largest industry subsectors in San Bernardino County, by their 2018 job counts, and also shows the industry subsectors' projected change over the next decade. San Bernardino County supported 852,269 jobs in 2018, and by 2028, it is projected to add about 103,752 new jobs for a 12% job increase. As shown in the figure, the Local Government industry subsector supported the most jobs in San Bernardino County in 2018, with 97,661 jobs and is expected to remain the top regional employer. The Food Services & Drinking Places and Administrative & Support Services industry subsectors are the next largest in terms of jobs, with 63,876 jobs and 58,916 jobs in 2018, respectively. As for growth, Warehousing & Storage is projected to add the most jobs of the top 15 industry subsectors, with a 10-year increase of 52% or 19,133 new jobs. One of the top 15 industry subsectors is expected to contract between now and 2028 - the General Merchandise Stores industry subsector.

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2 In Emsi data, all establishments in the main NAICS hierarchy are private-sector only. Jobs in Educational Services and Ambulatory Health Care Service, for example, are not associated with local, state, or federal government jobs. Jobs for public school teachers and city firefighters are in Local Government, whereas college professors and forest firefighters are commonly employed by State Government. Mail carriers and transportation security screeners are examples of jobs in Federal Government.

Figure 2.2: Jobs by Industry Subsector in San Bernardino County, 2018 and 2028

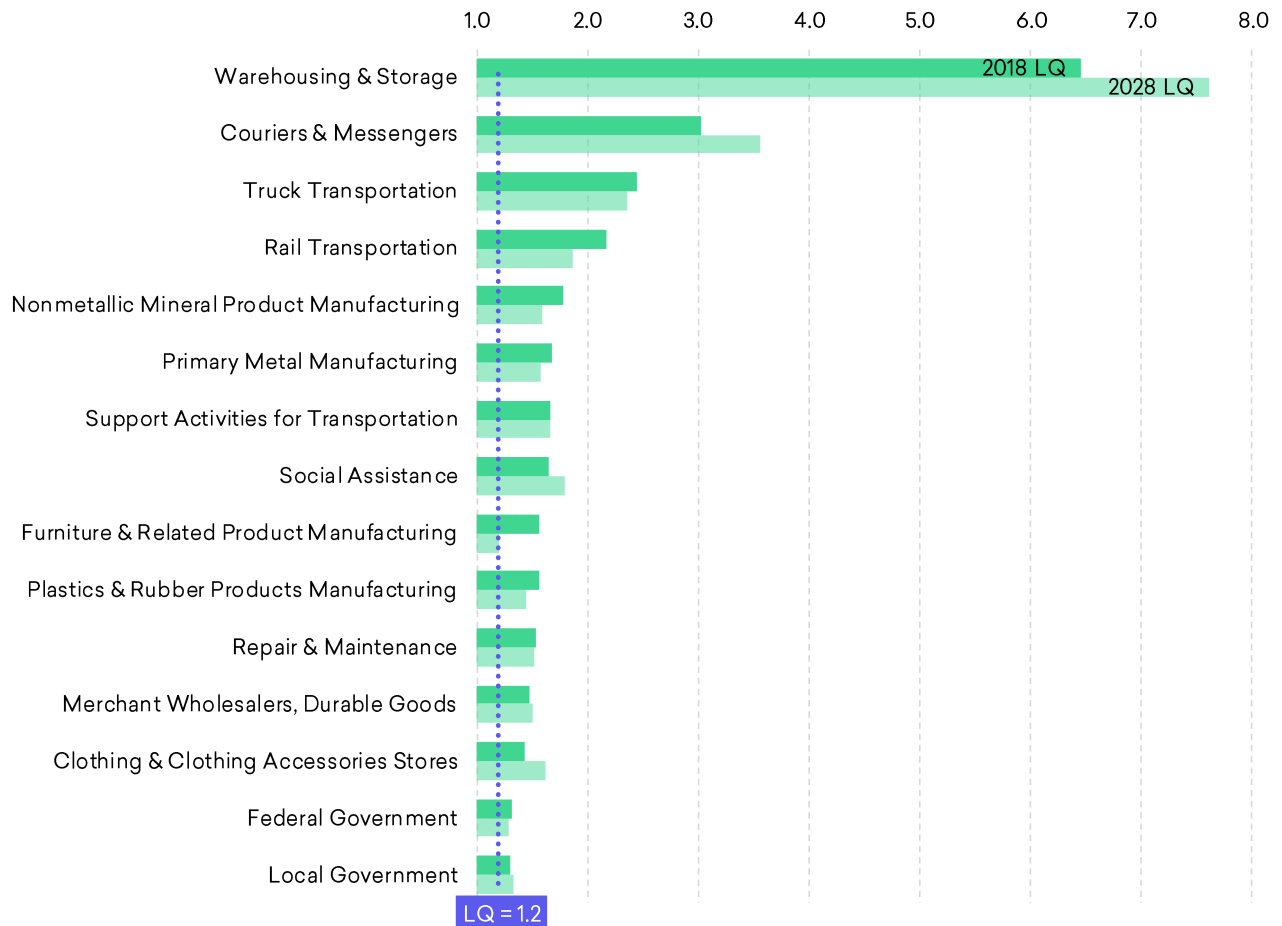


Source: Employees & Self-Employed 2019.1.

The employment concentration of San Bernardino County's industry subsectors is measured by a location quotient (LQ). LQs are used to assess regional competitiveness by comparing the concentration of employment in an industry in the region against the employment concentration for that same industry across the nation. An LQ equal to 1.0 indicates that the percentage of total employment comprised by an industry in the region matches the percentage of total employment of that industry in the U.S. An LQ greater than 1.0 means that the industry comprises a greater proportion of total employment in the region than it does in the U.S, and high LQs (greater than 1.2) are an indication that the region has a comparative advantage or specialization in an industry relative to the rest of the U.S.



Figure 2.3: Employment Concentration (LQ) by Industry Subsector in San Bernardino County, 2018 and 2028



Source: Employees & Self-Employed 2019.1.

Figure 2.3 shows the industry subsectors in San Bernardino County with the 15 highest LQs. The Warehousing & Storage industry subsector had the highest LQ in 2018 (LQ of 6.4), and is expected to increase in employment concentration between 2018 and 2028. The Couriers & Messengers, Truck Transportation, and Rail Transportation industry subsectors also have relatively large employment concentrations, with LQs of 3.0, 2.4, and 2.2 in 2018, respectively. As for the 10-year growth, the Warehousing & Storage industry subsector is projected to increase in LQ by 18%, which is the largest percentage increase among the top 15 industry subsectors in the figure. On the other hand, eight industry subsectors are expected to drop in LQ between 2018 and 2028. The industry subsector with the largest percentage decline is

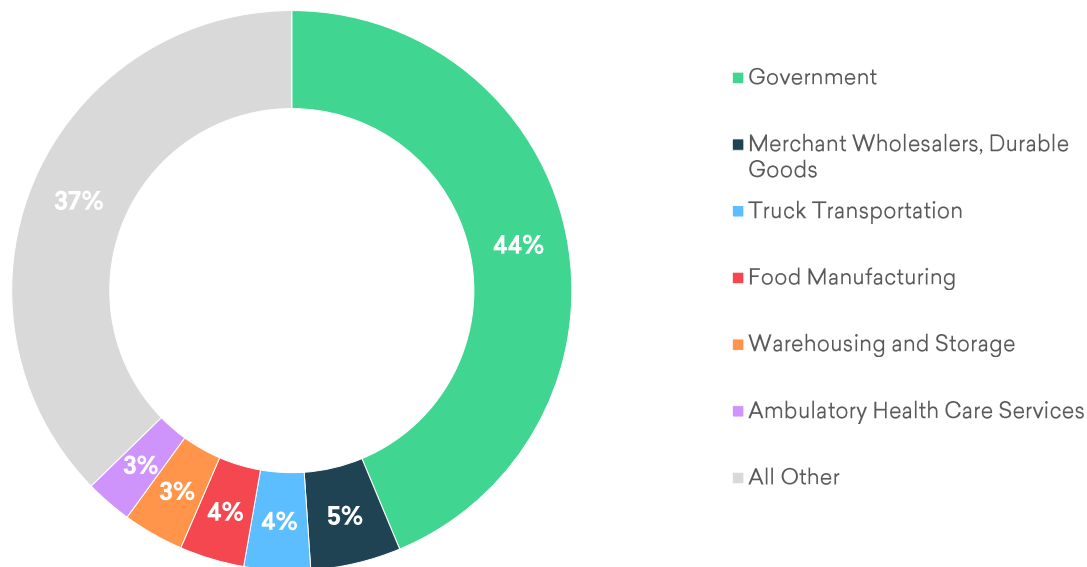
Furniture & Related Product Manufacturing, with a 23% decrease. Despite the declines, all the region's top 15 industry subsectors will remain at or above the 1.2 high-LQ threshold.

## **ECONOMIC BASE ANALYSIS**

Economic base theory is widely used as a component of strategic development and planning. Economic base analysis contextualizes the types of economic activities that drive the regional economy and assesses how those activities support earnings and create an economic impact across various industries.

The simplest way to think about a region's economic base is to think of a region's industries as composed of two fundamentally different types. One exports goods or services to non-residents, whether people or businesses, and thereby brings outside dollars into the region. These are known as basic industries. The other, known as non-basic, sells goods or services to local residents and thereby intercepts monies already in circulation within the region. Looking at which industries are basic, or essential to the economic base, gives us an idea of these industries' importance in bringing outside money into the region. A regional economy can grow by adding or growing basic industries (also known as "export promotion") or by adding or growing non-basic industries (also known as "import substitution").

Figure 2.4: Top Industry Subsectors by Exports in San Bernardino County, 2018



Source: Emsi Industry Data 2019.1

The contributions of these and other industry subsectors are critical to bringing in a fresh influx of new dollars. Table 2.1 displays detailed industry exports, along with the total earnings paid out annually by each industry sector and how much each industry sector contributes to regional “value added,” which is the primary component in calculating the region’s gross regional product (GRP).

As shown in the table, the Federal Government industry subsector leads all industry subsectors in terms of exports at \$23.8 billion. According to standard economic impact methodology, when an industry receives funds from outside its region, the industry is assumed to be exporting a good or a service. This can seem counter-intuitive in the context of government, because the government industry subsectors are not typically thought of as exporters of either goods or services. In this case, federal-funded institutions providing public services bring in money from outside San Bernardino County, thus counting as exports.

Table 2.1: Top 25 Industry Subsectors by Exports in San Bernardino County, 2018

<b>NAICS Code</b>	<b>Description</b>	<b>Total Exports (millions)</b>	<b>Total Earnings (millions)</b>	<b>Total Value Added (millions)</b>
901	Federal Government	\$23,752	\$2,438	\$5,159
902	State Government	\$8,500	\$1,249	\$1,582
903	Local Government	\$7,218	\$8,499	\$8,960
423	Merchant Wholesalers, Durable Goods	\$4,708	\$1,925	\$4,164
484	Truck Transportation	\$3,460	\$1,737	\$2,283
311	Food Manufacturing	\$3,376	\$477	\$1,191
493	Warehousing and Storage	\$3,178	\$1,745	\$2,069
621	Ambulatory Health Care Services	\$2,444	\$3,486	\$4,347
331	Primary Metal Manufacturing	\$2,156	\$330	\$713
332	Fabricated Metal Product Manufacturing	\$2,155	\$578	\$1,080
424	Merchant Wholesalers, Nondurable Goods	\$2,025	\$975	\$2,716
221	Utilities	\$1,921	\$530	\$2,079
326	Plastics and Rubber Products Manufacturing	\$1,838	\$437	\$856
561	Administrative and Support Services	\$1,606	\$2,671	\$3,294
541	Professional, Scientific, and Technical Services	\$1,426	\$2,247	\$2,984
325	Chemical Manufacturing	\$1,411	\$269	\$942
238	Specialty Trade Contractors	\$1,155	\$2,205	\$2,940
336	Transportation Equipment Manufacturing	\$1,097	\$353	\$703
722	Food Services and Drinking Places	\$1,030	\$1,487	\$2,322
327	Nonmetallic Mineral Product Manufacturing	\$968	\$321	\$720
492	Couriers and Messengers	\$933	\$640	\$861
333	Machinery Manufacturing	\$785	\$278	\$436
531	Real Estate	\$778	\$1,176	\$1,971
551	Management of Companies and Enterprises	\$650	\$562	\$613
441	Motor Vehicle and Parts Dealers	\$638	\$836	\$1,481
	All other	\$11,101	\$15,210	\$23,771
	<b>Total</b>	<b>\$90,310</b>	<b>\$52,661</b>	<b>\$80,235</b>

Source: Emsi Industry Data 2019.1.



## OCCUPATIONS WITHIN KEY INDUSTRY SUBSECTORS

Six industry subsectors are found in both Figures 2.2 and 2.3 because they are top employers and have high LQs, and all but one is in the top ten in terms of exports (Table 2.1). These industry subsectors are

- Local Government
- Social Assistance
- Warehousing & Storage
- Federal Government
- Merchant Wholesalers, Durable Goods
- Truck Transportation

Their appearance in the figures and table provides an indication of their relative strength in San Bernardino County, and thus, we identify the most common occupations within the six industry subsectors, called the staffing pattern.<sup>3</sup> Not only do the industry subsectors' staffing patterns provide insight into the region's labor market demand, but by extension, the demand for the college's program offerings.

The Local Government industry subsector employed 97,661 people in San Bernardino County and had an LQ of 1.3 in 2018. The top occupation employed by Local Government is elementary school teachers, except special education, which constitutes 9% of the industry subsector's jobs. It is followed by teacher assistants (8%) and secondary school teachers, except special & career/technical education (5%). Out of the top 25 occupations within the industry subsector, the top five highest paying occupations in terms of median hourly earnings are education administrators, elementary & secondary school (\$60.37), police & sheriff's patrol officers (\$45.49), registered nurses (\$44.98), elementary school teachers, except special education (\$41.64), and middle school teachers, except special & career/technical education (\$40.81).

The Social Assistance industry subsector employed 37,707 people in San Bernardino County and had an LQ of 1.7 in 2018. The top occupation employed by Social Assistance is personal care aides, which constitutes 55% of the industry subsector's jobs. It is followed by childcare workers (11%) and social & human service assistants (2%). Out of the top 25

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3 The top occupations, in terms of the percent of total jobs in an industry, are identified using data from the National Occupational Employment Statistics program, projections from the National Industry-Occupation Employment Matrix, and Emsi's proprietary employment data.

occupations within the industry subsector, the top five highest paying occupations in terms of median hourly earnings are general & operations managers (\$47.02), registered nurses (\$44.99), healthcare social workers (\$35.14), community & social service specialists, all other (\$26.80), and child, family, & school social workers (\$24.97). VVC has many programs that train for these occupations, such as nursing and childcare.

The Warehousing & Storage industry subsector employed 36,987 people in San Bernardino County and had an LQ of 6.4 in 2018. The top occupation employed by Warehousing & Storage is laborers & freight, stock, & material movers, hand, which constitutes 30% of the industry subsector's jobs. It is followed by industrial truck & tractor operators (14%) and stock clerks & order fillers (8%). Out of the top 25 occupations within the industry subsector, the top five highest paying occupations in terms of median hourly earnings are general & operations managers (\$47.02), transportation, storage, & distribution managers (\$40.47), business operations specialists, all other (\$29.87), sales representatives, wholesale & manufacturing, except technical & scientific products (\$26.42), and first-line supervisors of transportation & material moving workers, except aircraft cargo handling supervisors (\$26.32). While VVC trains for many of these occupations through the business program, there may be opportunities to incorporate specific industry knowledge to make completers more competitive for these occupations.

The Federal Government industry subsector employed 33,394 people in San Bernardino County and had an LQ of 1.3 in 2018. The top occupation employed by Federal Government is military-only occupations, which constitutes 26% of the industry subsector's jobs. It is followed by postal service mail carriers (5%) and business operations specialists, all other (3%). Out of the top 25 occupations within the industry subsector, the top five highest paying occupations in terms of median hourly earnings are airline pilots, copilots, & flight engineers (\$115.89), human resources managers (\$54.21), general & operations managers (\$47.02), police & sheriff's patrol officers (\$45.48), and registered nurses (\$44.99). With a large number of military employees in the area, VVC may consider offering programs that veterans would be interested in to help bridge any skills gaps between their military experience and the private sector.

The Merchant Wholesalers, Durable Goods industry subsector employed 24,306 people in San Bernardino County and had an LQ of 1.5 in 2018. The top occupation employed by Merchant Wholesalers, Durable Goods is sales representatives, wholesale & manufacturing, except technical & scientific products, which constitutes 15% of the industry subsector's jobs. It is followed by laborers & freight, stock, & material movers, hand (11%) and stock clerks & order fillers (4%). Out of the top 25 occupations within the industry subsector, the top five

highest paying occupations in terms of median hourly earnings are general & operations managers (\$47.02), sales managers (\$40.50), sales representatives, wholesale & manufacturing, technical & scientific products (\$31.76), mobile heavy equipment mechanics, except engines (\$28.94), and sales representatives, wholesale & manufacturing, except technical & scientific products (\$26.42).

The Truck Transportation industry subsector employed 21,679 people in San Bernardino County and had an LQ of 2.4 in 2018. The top occupation employed by Truck Transportation is heavy & tractor-trailer truck drivers, which constitutes 59% of the industry subsector's jobs. It is followed by laborers & freight, stock, & material movers, hand (10%) and light truck or delivery services drivers (3%). Out of the top 25 occupations within the industry subsector, the top five highest paying occupations in terms of median hourly earnings are general & operations managers (\$47.02), transportation, storage, & distribution managers (\$40.47), first-line supervisors of mechanics, installers, & repairers (\$32.56), first-line supervisors of transportation & material moving workers, except aircraft cargo handling supervisors (\$26.32), and first-line supervisors of office & administrative support workers (\$26.06).

## WORKFORCE COMMUTING PATTERNS

The Longitudinal Employer-Household Dynamics (LEHD) program<sup>4</sup> at the U.S. Census Bureau provides information on the residential and employment locations of workers. Such data shows the commuting patterns of regional employees. More specifically, the LEHD data demonstrate the extent to which employees commute to the region for work and how many residents commute to surrounding communities for work. Workers from outside the region could be filling current employment gaps, or the region's residents could be out-commuting when there is a surplus of available jobs. The concepts of a "gap" and "surplus" are discussed in greater detail in the first section of Chapter 3.

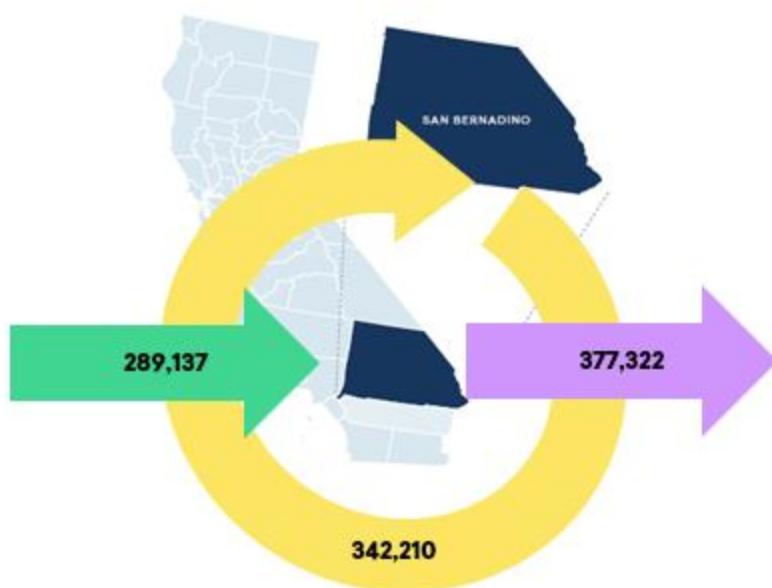
Figure 2.5 presents the inflow and outflow of jobs to and from San Bernardino County. According to the LEHD data, there are 631,347 jobs in the region, with 342,210 jobs filled by residents and 289,137 jobs going to people living outside the region. In addition, 377,322 jobs are held by the region's residents outside San Bernardino County. In other words, 377,322

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4 LEHD is an innovative program that uses modern statistical and computing techniques to combine federal and state administrative data on employers and employees with core Census Bureau censuses and surveys while protecting the confidentiality of people and firms that provide the data.

residents commute outside the region for work. The job counts represent primary jobs, as opposed to all jobs, and differ slightly from job counts in the previous sections, which use Emsi’s complete employment data (see industry data in Appendix 2). As shown in the figure, more workers out-commute than in-commute.

Figure 2.5: San Bernardino County Job Inflow and Outflow



- 289,137      Employed in San Bernardino County but living outside
- 342,210      Living and employed in San Bernardino County
- 377,322      Living in San Bernardino County but employed outside

Source: Census Bureau, Center for Economic Studies.

Table 2.2 provides further insight into the places where the region’s residents work. Table 2.3 also shows commuting patterns, except the data highlight the counties in which the region’s workers reside.



Table 2.2: Counties Where San Bernardino County Residents Work

COUNTY OF EMPLOYMENT	JOBS	% JOBS
San Bernardino	342,210	47.6%
Los Angeles	174,656	24.3%
Riverside	77,867	10.8%
Orange	67,904	9.4%
San Diego	19,918	2.8%
Ventura	4,588	0.6%
Kern	3,702	0.5%
Alameda	2,458	0.3%
Santa Clara	2,204	0.3%
Sacramento	2,144	0.3%
All Other Counties	21,850	3%
<b>Total Primary Jobs, San Bernardino County Residents</b>	<b>719,532</b>	<b>100%</b>

Source: Census Bureau, Center for Economic Studies.

Table 2.3: Counties Where High San Bernardino Live

COUNTY OF RESIDENCE	JOBS	% JOBS
San Bernardino	342,210	54.2%
Riverside	108,016	17.1%
Los Angeles	97,921	15.5%
Orange	34,165	5.4%
San Diego	16,226	2.6%
Kern	4,863	0.8%
Ventura	4,749	0.8%
Alameda	1,776	0.3%
Clark	1,702	0.3%
Sacramento	1,587	0.3%
All Other Locations	18,132	2.9%
<b>Total Primary Jobs, San Bernardino County Workers</b>	<b>631,347</b>	<b>100%</b>



Source: Census Bureau, Center for Economic Studies.

## EDUCATIONAL ATTAINMENT

Educational attainment data are useful for targeting specific population groups with low education levels. The population and educational attainment numbers in this section are based on Emsi's demographic data and publicly available sources from state and federal agencies. Sources include annual population estimates and population projections from the U.S. Census Bureau and birth and mortality rates from the U.S. Health Department. In addition, demographic information relies on the annual results of the American Community Survey. Educational attainment data cover the population in San Bernardino County aged 25 years or more, referred to as adults, and indicate the highest award level achieved.

Demographic information is presented by gender and the major race and ethnic groups, and educational attainment data are broken out according to the following award categories:

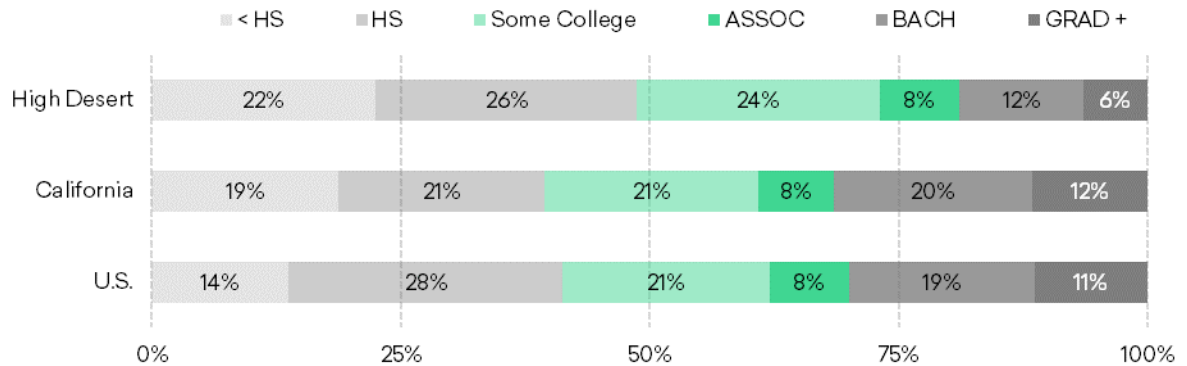
- Less than a high school diploma (<HS)
- High school diploma or equivalent (HS)
- Some college<sup>5</sup>
- Associate degree (Assoc)
- Bachelor's degree (Bach)
- Graduate degree and higher (Grad+)

About 1.4 million adults live in San Bernardino County, and Figure 2.6 displays their educational attainments, without reference to gender and the major race and ethnic groups. State and national data are also presented for context. In San Bernardino County, 49% of adults have a high school diploma or less, which is more than the state average (39%) and more than the national average (41%). Out of all the award categories in the figure, the people who are most likely to seek education and training from VVC are those in the "Less than High School Diploma," "High School Diploma," and "Some College" categories. Together, these categories total 1.0 million people or 73% of the region's adults.

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5 The "Some College" category includes individuals who attended college but did not successfully obtain a degree and individuals who have received a postsecondary vocational award or professional certification but did not receive an associate or bachelor's degree.

Figure 2.6: Highest Educational Attainments of Adults in San Bernardino County, California, and the U.S.

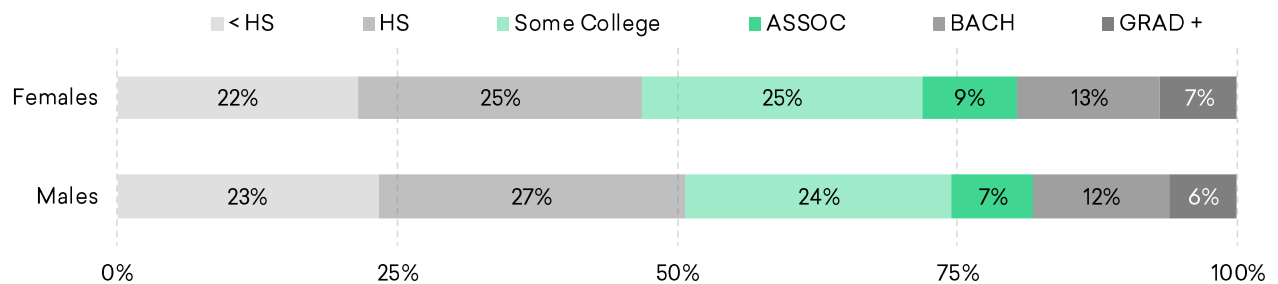


Numbers may not sum due to rounding.

Source: Emsi demographics data and U.S. Census Bureau, 2017 American Community Survey.

Between female and male adults in San Bernardino County, there is little variation in the distribution of their award categories. Twenty-five percent of the region’s female adults and 24% of the region’s male adults have some college education but no degree, which represent 175,821 females and 159,445 males. Nine percent of female adults and 7% of male adults in the region have an associate degree as their highest award level. This information appears in Figure 2.7.

Figure 2.7: Highest Educational Attainments of Adults in San Bernardino County by Gender



Numbers may not sum due to rounding.

Source: Emsi demographics data and U.S. Census Bureau, 2017 American Community Survey.

Table 2.4 and Figure 2.8 show the adults in San Bernardino County by the major race and ethnic groups. As shown, 48% of the region’s adults are Hispanic, all types. Another 33% of adults are White, non-Hispanic, and 8% are Black, non-Hispanic, the next largest groups. Altogether, less than three percent of the region’s adults are Two or more races, non-



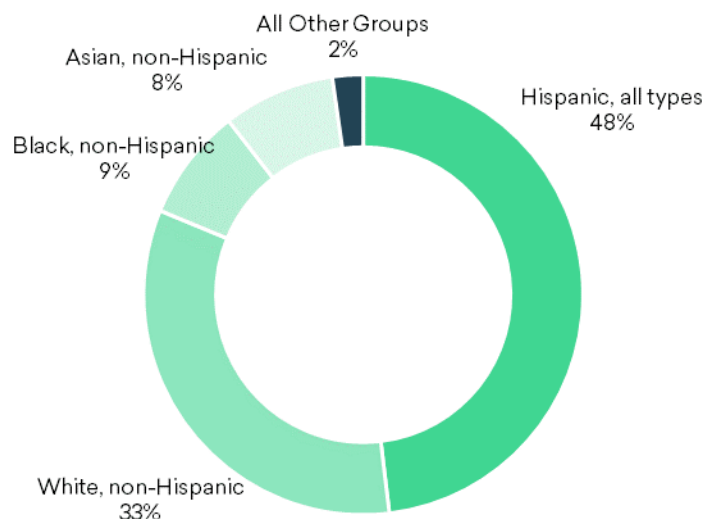
Hispanic; American Indian or Alaskan Native, non-Hispanic; and Native Hawaiian or Pacific Islander, non-Hispanic.

Table 2.4: Adults in San Bernardino County by Major Race and Ethnic Groups

GROUP	POPULATION	% POPULATION
Hispanic, all types	662,014	48.1%
White, non-Hispanic	455,893	33.1%
Black, non-Hispanic	113,707	8.3%
Asian, non-Hispanic	113,440	8.2%
Two or more races, non-Hispanic	20,928	1.5%
American Indian or Alaskan Native, non-Hispanic	5,961	0.4%
Native Hawaiian or Pacific Islander, non-Hispanic	4,193	0.3%
<b>Total</b>	<b>1,376,136</b>	<b>100.0%</b>

Source: Emsi demographics data and U.S. Census Bureau, 2017 American Community Survey.

Figure 2.8: Adults in San Bernardino County by Major Race and Ethnic Groups

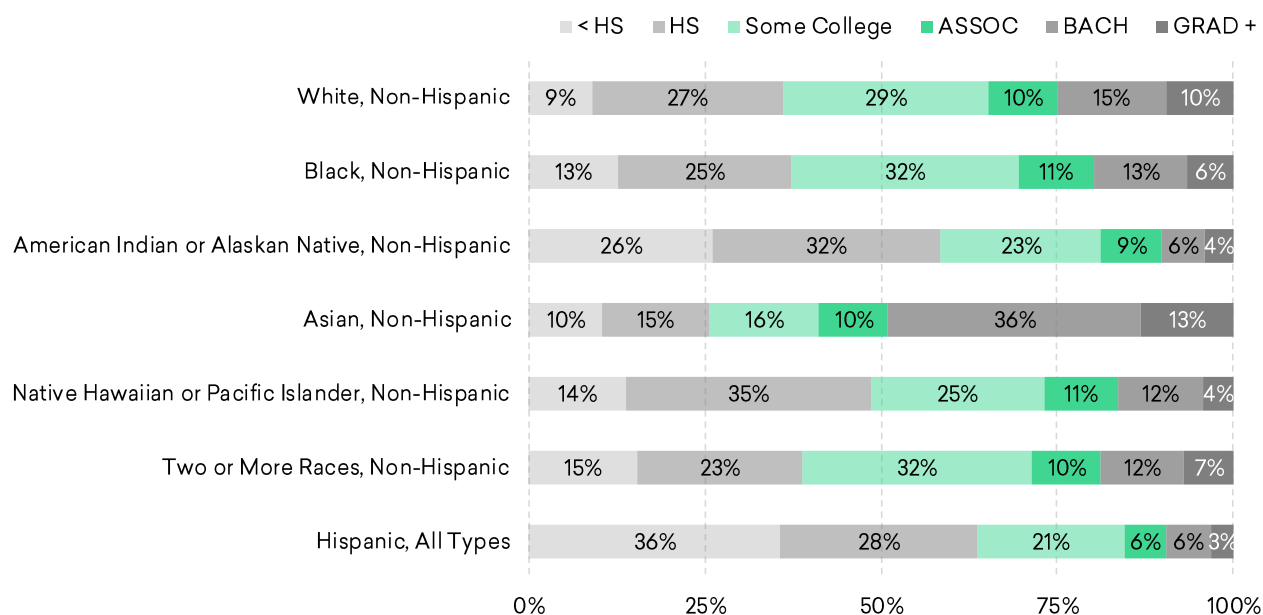


Source: Emsi demographics data and U.S. Census Bureau, 2017 American Community Survey.

Figure 2.9 displays the highest educational attainment of San Bernardino County’s adults by their major race and ethnic groups. Asian, non-Hispanic adults have the highest percentage of adults with a postsecondary education (74%) among all the groups. However, the group

accounts for a relatively small portion of the region’s adults. The White, non-Hispanic group follows with 64%. Hispanic, all types adults and American Indian or Alaskan Native, non-Hispanic adults have the lowest levels of educational attainment in the region. For these groups, only 36% and 41%, respectively, of the adults in the groups have had education beyond high school. Across all groups, these data suggest that there are many opportunities to increase the educational attainments of the region’s adults, whether such actions involve outreach to local high schools or supporting VVC students who plan to transfer into a bachelor’s degree level program.

Figure 2.9: Highest Educational Attainments of Adults in San Bernardino County by Major Race and Ethnic Groups



Numbers may not sum due to rounding.

Source: Emsi demographics data and U.S. Census Bureau, 2017 American Community Survey.

## CURRENT AND PROJECTED POPULATION

Table 2.5 shows the current (2018) and projected (2028) population across the 115 ZIP codes in San Bernardino County. As of 2018, the population in San Bernardino County was 2.2 million, and over the next decade the county is expected to grow 5% to 2.3 million. Most of the projected growth is expected to occur in the southwest corner of San Bernardino County

in areas such as Fontana, San Bernardino, Ontario, and Rialto. With that said, the region around VVC is also expected to grow including Victorville and Hesperia. Population is expected to decline in the mid-south portion of the county, including Twentynine Palms, Joshua Tree, and Yucca Valley.

Table 2.5: Current and Projected Population Change within San Bernardino County

ZIP	ZIP Name	2018 Population	2028 Population	Change	% Change
92335	Fontana	98,901	106,338	7,437	8%
92376	Rialto	84,745	91,016	6,271	7%
91710	Chino	81,927	87,349	5,422	7%
92336	Fontana	97,504	102,674	5,170	5%
91762	Ontario	65,853	70,329	4,476	7%
91709	Chino Hills	81,701	86,126	4,425	5%
92324	Colton	60,019	64,301	4,282	7%
91761	Ontario	63,211	67,301	4,090	6%
91764	Ontario	51,696	55,299	3,603	7%
92410	San Bernardino	48,743	52,092	3,349	7%
91763	Montclair	40,149	43,329	3,180	8%
92404	San Bernardino	62,663	65,631	2,968	5%
92411	San Bernardino	26,626	29,269	2,643	10%
92407	San Bernardino	68,043	70,563	2,520	4%
92392	Victorville	59,953	62,458	2,505	4%
92337	Fontana	37,610	40,099	2,489	7%
92346	Highland	63,521	65,926	2,405	4%
91730	Rancho Cucamonga	69,057	71,457	2,400	3%
92345	Hesperia	78,640	80,946	2,306	3%
92316	Bloomington	30,553	32,810	2,257	7%
91786	Upland	52,751	54,880	2,129	4%
92394	Victorville	37,202	39,173	1,971	5%
92395	Victorville	39,076	41,028	1,952	5%
92301	Adelanto	34,353	36,196	1,843	5%
92354	Loma Linda	24,256	25,862	1,606	7%
91739	Rancho Cucamonga	44,030	45,630	1,600	4%
92405	San Bernardino	28,931	30,451	1,520	5%
92374	Redlands	44,770	46,270	1,500	3%
92311	Barstow	33,610	35,038	1,428	4%
92377	Rialto	21,266	22,481	1,215	6%
92308	Apple Valley	38,358	39,312	954	2%
91784	Upland	26,128	27,017	889	3%
92408	San Bernardino	13,010	13,838	828	6%



91701	Rancho Cucamonga	40,406	41,196	790	2%
92307	Apple Valley	42,925	43,713	788	2%
92344	Hesperia	23,372	23,974	602	3%
91708	Chino	10,464	11,004	540	5%
92313	Grand Terrace	12,077	12,603	526	4%
92334	Fontana	2,613	2,982	369	14%
91737	Rancho Cucamonga	25,346	25,674	328	1%
92363	Needles	6,455	6,775	320	5%
92393	Victorville	4,282	4,522	240	6%
92399	Yucaipa	52,847	53,083	236	0%
92402	San Bernardino	1,256	1,466	210	17%
92371	Phelan	13,489	13,696	207	2%
92342	Helendale	8,849	9,040	191	2%
92427	San Bernardino	3,166	3,355	189	6%
92331	Fontana	2,171	2,344	173	8%
91785	Upland	1,818	1,966	148	8%
92423	San Bernardino	1,937	2,085	148	8%
92406	San Bernardino	2,494	2,632	138	6%
92373	Redlands	31,065	31,196	131	0%
92401	San Bernardino	1,873	1,995	122	7%
92372	Pinon Hills	6,273	6,391	118	2%
92312	Barstow	2,189	2,291	102	5%
92365	Newberry Springs	2,847	2,945	98	3%
92340	Hesperia	3,832	3,924	92	2%
92242	Earp	1,287	1,374	87	7%
92359	Mentone	9,540	9,622	82	1%
92369	Patton	1,666	1,734	68	4%
92413	San Bernardino	2,310	2,371	61	3%
92368	Oro Grande	968	1,028	60	6%
92375	Redlands	1,167	1,212	45	4%
92356	Lucerne Valley	6,393	6,433	40	1%
91743	Guasti	925	957	32	3%
92315	Big Bear Lake	4,567	4,589	22	0%
92284	Yucca Valley	23,296	23,314	18	0%
92358	Lytle Creek	1,008	1,021	13	1%
92318	Bryn Mawr	158	168	10	6%
92385	Skyforest	307	315	8	3%
91729	Rancho Cucamonga	3,059	3,066	7	0%
92364	Nipton	202	209	7	3%
92347	Hinkley	1,089	1,095	6	1%
92327	Daggett	196	201	5	3%
92280	Vidal	46	51	5	11%

92332	Essex	58	61	3	5%
92338	Ludlow	88	91	3	3%
92323	Cima	67	70	3	4%
92309	Baker	52	54	2	4%
92366	Mountain Pass	26	27	1	4%
92333	Fawnskin	20	21	1	5%
92321	Cedar Glen	8	8	0	0%
92268	Pioneertown	6	6	0	0%
92322	Cedarpines Park	0	0	0	0%
92350	Loma Linda	0	0	0	0%
92357	Loma Linda	0	0	0	0%
92386	Sugarloaf	44	44	0	0%
93592	Trona	0	0	0	0%
92415	San Bernardino	0	0	0	0%
92304	Amboy	0	0	0	0%
92418	San Bernardino	0	0	0	0%
92267	Parker Dam	0	0	0	0%
92398	Yermo	37	37	0	0%
92278	Twentynine Palms	0	0	0	0%
92403	San Bernardino	0	0	0	0%
91759	Mt Baldy	0	0	0	0%
92341	Green Valley Lake	143	141	(2)	(1%)
92317	Blue Jay	90	87	(3)	(3%)
92378	Rimforest	686	682	(4)	(1%)
92305	Angelus Oaks	274	263	(11)	(4%)
92285	Landers	3,127	3,109	(18)	(1%)
93562	Trona	1,848	1,815	(33)	(2%)
92329	Phelan	4,163	4,112	(51)	(1%)
92339	Forest Falls	1,286	1,233	(53)	(4%)
92286	Yucca Valley	3,045	2,976	(69)	(2%)
92382	Running Springs	3,240	3,168	(72)	(2%)
92352	Lake Arrowhead	3,583	3,510	(73)	(2%)
92256	Morongo Valley	3,375	3,273	(102)	(3%)
92397	Wrightwood	4,628	4,485	(143)	(3%)
92391	Twin Peaks	5,149	4,996	(153)	(3%)
92252	Joshua Tree	9,031	8,877	(154)	(2%)
92325	Crestline	6,005	5,826	(179)	(3%)
92314	Big Bear City	14,037	13,799	(238)	(2%)
92310	Fort Irwin	9,400	9,008	(392)	(4%)
92277	Twentynine Palms	29,330	28,052	(1,278)	(4%)
	<b>Totals</b>	<b>2,173,928</b>	<b>2,271,930</b>	<b>98,002</b>	<b>4.5%</b>

Source: Emsi demographics data and U.S. Census Bureau, 2017 American Community Survey.



## ECONOMIC CHARACTERISTICS

Table 2.6 shows a selection of economic characteristics for the 12 Census County Subdivisions (CCD) in San Bernardino County. This includes population estimates, median household income, poverty for those 18 years and over, and the unemployment rate. This data, from the Census Bureau, represents the 2017 five-year estimates. Many of the variables are strongly correlated; for example, low median household income often corresponds with both high poverty and unemployment rates. Barstow CCD has the highest poverty rate across the 12 CCDs in San Bernardino County at 23%. Ontario CCD has the highest median household income at \$73,280.

Table 2.6: Selected Economic Characteristics for San Bernardino County

<b>Census County Subdivision</b>	<b>Population 16 years and over</b>	<b>Median household income (dollars)</b>	<b>Poverty 18 years and over</b>	<b>Unemployment Rate</b>
Barstow CCD	31,781	\$44,676	23.0%	11.9%
Big Bear CCD	21,145	\$50,480	14.3%	8.0%
Lake Arrowhead CCD	17,758	\$60,497	14.1%	6.3%
Mount Baldy-Wrightwood CCD	5,167	\$59,813	11.2%	7.4%
Needles CCD	5,155	\$32,555	21.7%	7.0%
Newberry Springs-Baker CCD	8,508	\$51,205	8.3%	11.9%
Ontario CCD	510,004	\$73,280	10.2%	7.6%
San Bernardino CCD	633,376	\$52,802	17.4%	10.5%
Searles Valley CCD	1,551	\$32,200	22.6%	18.8%
Twentynine Palms-Yucca Valley CCD	55,993	\$39,674	20.4%	14.5%
Victorville-Hesperia CCD	282,580	\$49,848	18.5%	13.1%
Yucaipa CCD	41,318	\$58,273	13.2%	6.7%

Source: U.S. Census Bureau, 2017 American Community Survey.

## HOUSING CHARACTERISTICS

Table 2.7 displays housing data related to the census county subdivisions within San Bernardino County along with reference points for other areas. Table 2.7 displays housing data related to the CCD's within San Bernardino County along with reference points for other areas in California. There are a couple of interesting things to note with regard to the Victorville-Hesperia CCD. The rental vacancy rate is similar to many of the larger CCD's that appear in the table, at 5.1%. However, the number of people living in vehicles/RV's was significantly higher than many other CCD's. Additionally, the percentage of two-bedroom units was significantly lower than the other CCD's examined. This could explain why the median gross rent for two-bedroom units, as seen in Table 2.8, is higher than both Bakersfield and Fresno. Based on this data it appears that studios, one bedroom, and two-bedroom units may be undersupplied within the Victorville-Hesperia CCD. With regards to student demand for on-campus housing at VVC, further research should be done to determine the demand for on-campus housing. This could be accomplished through a complete housing feasibility study that investigates students' attitudes towards on-campus housing and their ability to find affordable housing locally.

Table 2.7: Housing and Population in San Bernardino Census County Subdivisions

Census County Subdivision	Population	Rental Vacancy Rate	Vehicle Housing Units	Housing Units	Units by Number of Bedrooms					
					Zero	One	Two	Three	Four	Five+
Barstow CCD	44,020	9.0%	16	17,524	292	1,551	4,231	8,452	2,803	195
Percent of Total Housing Units					2%	9%	24%	48%	16%	1%
Big Bear CCD	26,234	4.3%	9	30,799	825	3,658	12,354	10,098	3,095	769
Percent of Total Housing Units					3%	12%	40%	33%	10%	2%
Lake Arrowhead CCD	22,000	5.0%	0	20,159	282	1,685	5,554	8,097	3,321	1,220
Percent of Total Housing Units					1%	8%	28%	40%	16%	6%
Mount Baldy-Wrightwood CCD	6,754	6.8%	30	4,070	57	597	1,278	1,417	531	190
Percent of Total Housing Units					1%	15%	31%	35%	13%	5%
Needles CCD	6,615	11.9%	71	5,841	67	688	2,371	2,202	445	68
Percent of Total Housing Units					1%	12%	41%	38%	8%	1%
Newberry Springs-Baker CCD	12,639	11.2%	10	4,787	38	230	1,787	2,204	512	16
Percent of Total Housing Units					1%	5%	37%	46%	11%	0%
Ontario CCD	649,899	3.9%	112	202,946	3,304	17,890	48,852	67,445	54,217	11,238
Percent of Total Housing Units					2%	9%	24%	33%	27%	6%
San Bernardino CCD	843,918	4.8%	96	246,399	4,572	24,878	64,693	89,685	53,018	9,553
Percent of Total Housing Units					2%	10%	26%	36%	22%	4%
Searles Valley CCD	2,003	3.0%	0	1,273	0	105	417	575	154	22
Percent of Total Housing Units					0%	8%	33%	45%	12%	2%
Twentynine Palms-Yucca Valley CCD	70,746	6.7%	77	36,006	2,525	4,869	12,960	12,549	2,903	200
Percent of Total Housing Units					7%	14%	36%	35%	8%	1%
Victorville-Hesperia CCD	382,977	5.1%	264	122,472	1,550	5,007	22,823	54,206	31,235	7,651
Percent of Total Housing Units					1%	4%	19%	44%	26%	6%
Yucaipa CCD	53,415	3.2%	9	19,624	251	1,741	6,360	6,684	3,375	1,213

Percent of Total Housing Units					1%	9%	32%	34%	17%	6%
<b>Comparison Regions</b>										
Fresno CCD	698,889	4.2%	220	240,099	6,324	21,688	65,693	99,359	39,095	7,940
Percent of Total Housing Units					3%	9%	27%	41%	16%	3%
Bakersfield CCD	412,743	4.8%	170	140,140	3,833	12,699	38,618	61,805	20,490	2,695
Percent of Total Housing Units					3%	9%	28%	44%	15%	2%
Los Angeles CCD	2,593,246	3.6%	417	1,017,641	126,511	282,887	338,304	188,399	60,162	21,378
Percent of Total Housing Units					12%	28%	33%	19%	6%	2%
Santa Monica CCD	92,495	2.0%	17	51,426	4,556	17,013	19,368	7,383	1,944	1,162
Percent of Total Housing Units					9%	33%	38%	14%	4%	2%
San Francisco CCD	864,263	2.7%	276	390,376	56,530	102,008	119,221	74,431	27,993	10,193
Percent of Total Housing Units					14%	26%	31%	19%	7%	3%
Tulare CCD	71,532	3.6%	12	22,737	460	1,012	4,806	12,266	3,667	526
Percent of Total Housing Units					2%	4%	21%	54%	16%	2%
Visalia CCD	142,674	5.0%	17	48,668	947	2,361	11,278	23,709	9,172	1,201
Percent of Total Housing Units					2%	5%	23%	49%	19%	2%

Source: U.S. Census Bureau, 2017 American Community Survey.



Table 2.8: Median Gross Rent by Census County Subdivision in San Bernardino

Census County Subdivision	Median Gross Rent by Number of Bedrooms						
	Median Gross Rent	Zero	One	Two	Three	Four	Five+
Barstow CCD	\$770	\$541	\$572	\$709	\$984	\$1,034	NA
Big Bear CCD	\$1,038	\$768	\$695	\$974	\$1,356	\$1,546	NA
Lake Arrowhead CCD	\$997	NA	\$648	\$1,001	\$1,376	\$1,186	\$1,902
Mount Baldy-Wrightwood CCD	\$1,190	\$612	\$837	\$1,087	\$1,438	NA	\$1,867
Needles CCD	\$576	NA	\$473	\$593	\$721	\$739	NA
Newberry Springs-Baker CCD	\$1,214	NA	\$1,380	\$1,077	\$1,362	\$1,576	NA
Ontario CCD	\$1,466	\$1,108	\$1,149	\$1,392	\$1,825	\$2,176	\$2,570
San Bernardino CCD	\$1,112	\$812	\$821	\$1,064	\$1,432	\$1,710	\$1,978
Searles Valley CCD	\$564	NA	\$334	\$505	\$595	NA	NA
Twentynine Palms-Yucca Valley CCD	\$918	\$580	\$648	\$804	\$1,117	\$1,243	NA
Victorville-Hesperia CCD	\$1,119	\$636	\$674	\$916	\$1,205	\$1,434	\$1,582
Yucaipa CCD	\$1,034	NA	\$794	\$946	\$1,374	\$1,597	\$2,135
<b>Comparison Regions</b>							
Fresno CCD	\$958	\$699	\$731	\$906	\$1,229	\$1,566	\$1,693
Bakersfield CCD	\$941	\$678	\$687	\$887	\$1,185	\$1,455	\$1,837
Los Angeles CCD	\$1,288	\$923	\$1,181	\$1,503	\$1,728	\$1,793	\$1,424
Santa Monica CCD	\$1,669	\$1,198	\$1,588	\$1,995	\$2,096	\$2,737	\$2,092
San Francisco CCD	\$1,709	\$1,069	\$1,702	\$2,012	\$2,183	\$2,434	\$1,728
Tulare CCD	\$964	\$736	\$560	\$871	\$1,093	\$1,144	\$1,238
Visalia CCD	\$951	\$814	\$582	\$847	\$1,222	\$1,490	\$1,655

Source: U.S. Census Bureau, 2017 American Community Survey.

## LOCAL SCHOOL DISTRICT CHARACTERISTICS

Table 2.9 displays data across the 34 school districts in San Bernardino county for the 2018-19 academic year. The largest school district in the county is San Bernardino City Unified, with nearly 53 thousand students enrolled, of which 88.3% are eligible for free and reduced-price meals (FRPM). Enrollment numbers are the total count of students enrolled on the first Wednesday in October, referred to as Census Day. Eligibility for FRPM's is based on one or more reasons such as applying for the National School Lunch Program, alternative household income forms, and/or student homelessness or migrant status in the California Longitudinal Pupil Achievement Data System.

Table 2.9: San Bernardino School District Data 2018-19

<b>School District</b>	<b>Enrollment (K-12)</b>	<b>Number Eligible for Free Meal (K-12)</b>	<b>Percent Eligible for Free Meal (K-12)</b>	<b>Number Eligible for FRPM (K-12)</b>	<b>Percent Eligible for FRPM (K-12)</b>
Adelanto Elementary	8,671	6,270	72.3%	6,833	78.8%
Alta Loma Elementary	6,050	1,866	30.8%	2,277	37.6%
Apple Valley Unified	14,643	8,626	58.9%	9,957	68.0%
Baker Valley Unified	134	110	82.1%	122	91.0%
Barstow Unified	6,344	4,949	78.0%	5,004	78.9%
Bear Valley Unified	2,456	1,462	59.5%	1,736	70.7%
Central Elementary	4,487	2,319	51.7%	2,637	58.8%
Chaffey Joint Union High	23,883	11,970	50.1%	14,619	61.2%
Chino Valley Unified	28,063	11,361	40.5%	12,989	46.3%
Colton Joint Unified	22,014	15,551	70.6%	17,092	77.6%
Cucamonga Elementary	2,431	1,442	59.3%	1,734	71.3%
Etiwanda Elementary	14,082	4,954	35.2%	5,666	40.2%
Fontana Unified	36,335	25,827	71.1%	30,689	84.5%
Helendale Elementary	5,062	1,812	35.8%	2,221	43.9%
Hesperia Unified	24,132	15,439	64.0%	16,684	69.1%
Lucerne Valley Unified	5,416	2,719	50.2%	2,952	54.5%
Morongo Unified	8,616	5,230	60.7%	6,075	70.5%
Mountain View Elementary	2,532	1,265	50.0%	1,527	60.3%
Mt. Baldy Joint Elementary	94	26	27.7%	28	29.8%
Needles Unified	993	752	75.7%	752	75.7%
Ontario-Montclair	20,606	15,713	76.3%	17,939	87.1%
Oro Grande	4,332	3,031	70.0%	3,381	78.0%

Redlands Unified	21,240	11,136	52.4%	12,512	58.9%
Rialto Unified	25,066	19,786	78.9%	22,272	88.9%
Rim of the World Unified	3,236	1,724	53.3%	1,926	59.5%
San Bernardino City Unified	52,773	43,229	81.9%	46,624	88.3%
San Bernardino County Office of Education	5,305	3,414	64.4%	3,711	70.0%
Silver Valley Unified	2,167	731	33.7%	1,214	56.0%
Snowline Joint Unified	7,439	4,404	59.2%	4,993	67.1%
Trona Joint Unified	2,746	1,199	43.7%	1,398	50.9%
Upland Unified	10,702	5,262	49.2%	6,034	56.4%
Victor Elementary	12,772	9,747	76.3%	10,443	81.8%
Victor Valley Union High	11,327	8,398	74.1%	9,512	84.0%
Yucaipa-Calimesa Joint Unified	9,982	4,346	43.5%	5,060	50.7%

Source: California Department of Education: Analysis, Measurement, & Accountability Reporting Division. 2018-19 California Longitudinal Pupil Achievement Data System (CALPADS) Fall 1



# Program Demand Gap Analysis

With the region's top industry subsectors and workforce in mind, the program demand gap analysis can now be conducted, answering the following question:

*Where are there misalignments between the workforce demand and the supply of college completers?*

This chapter outlines the deficit of VVC's program completers to the workforce (gap), as well as the oversupply of completers to the workforce (surplus). The occupations directly related or mapped to the significant gaps are also displayed. Before providing and discussing the results, we will go over the interpretation of the results.

## INTERPRETATION

The terms used in the analysis are as follows:

**Gap** Represents a deficit, or when there are more job openings in an occupation than there are completions. If left unaddressed, a gap may lead to missed opportunities for economic growth and put stress on local businesses to find the necessary talent elsewhere. Significant gaps translate into higher human resources costs and decreased efficiencies in the economic system. They also provide an opportunity for postsecondary educational institutions to develop new programs and/or strengthen their current programs.

**Surplus** Represents an oversupply, or when there are more completions than there are job openings in an occupation. If left unaddressed, significant surpluses may lead to higher unemployment rates or higher attrition rates—the college could be educating a workforce that is leaving the region after program completion because of a lack of job opportunities.

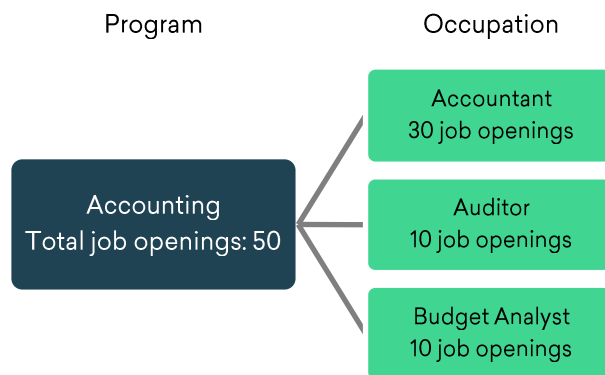
When reviewing the results of the analysis, consider that not all gaps or surpluses indicate necessary program adjustments. Due to labor market inefficiencies, it is common for most programs to face a certain level of gap or surplus. This means only significant gaps or surpluses should be reviewed or further developed. Given the size and characteristics of San



Bernardino County, any gap or surplus within 125 jobs either above or below zero should be considered within the normal range of labor market fluctuations. In the following sections, the program gaps and surpluses are discussed by award level and presented as figures and tables.

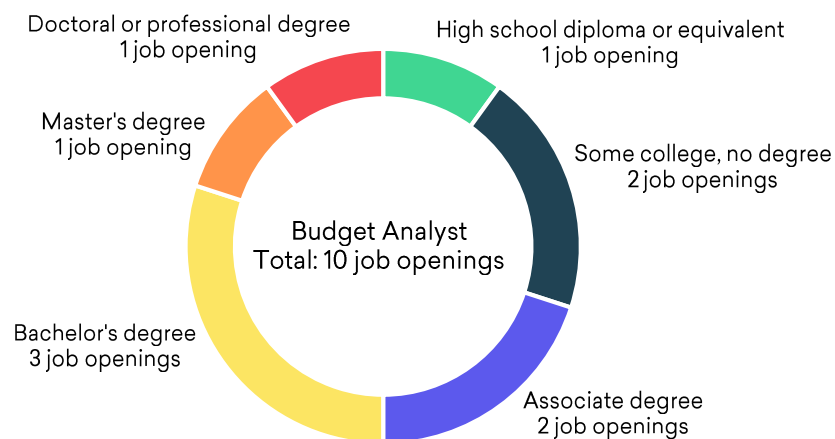
The figures show the gap between job demand and the supply of program completers. An explanation of job demand is warranted here, and a more detailed description can be found in Appendix 5. A program's job demand is measured as its total number of annual job openings, on average, from 2018 to 2028. The total is calculated as the sum of the regional job openings for each occupation mapped to the program, as illustrated in Figure 3.1.

Figure 3.1: Example of One Program Mapped to Three Occupations



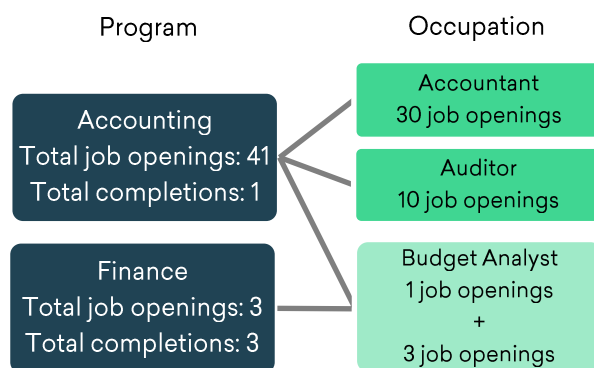
Furthermore, an occupation's job openings are not a gross measure of job openings available in the region. For every occupation, job openings have been weighted by the program's award level and one level below and account for the highest educational attainments of those employed in the position. The educational attainments in this chapter (and the following) are for adults less than 34 years, which differ from the previous chapter but better reflect the college's student population. Figure 3.2 illustrates how this methodology applies to an occupation's total job openings. For example, four job openings or 40% of total job openings are available to budget analysts at the associate degree level, seeing that there are a total of 10 job openings, 20% of those working in the occupation have an associate degree level of education, and another 20% have some college education and no degree.

Figure 3.2: Example of an Occupation's Weighted Job Openings by Award Level



Finally, job openings are de-duplicated and scaled across programs, when an occupation is mapped to more than one program. As illustrated in Figure 3.3, budget analysts, which have four total job openings, are mapped to two programs. However, the Finance program is three-times the size of the Accounting program, measured in terms of completions. Thus, one job opening is portioned to the Accounting program and three job openings to the Finance program.

Figure 3.3: Example of Two Programs with One Shared Occupation



Supply is shown as the average number of program completions in the region, by award level, between 2015 and 2017.<sup>6</sup> VVC is not the only postsecondary educational institution in San Bernardino County reporting to IPEDS,<sup>7</sup> the source of the completions data. The gap, then, is the difference between job openings and program completers. Appendix 4 has VVC's program to occupation map with adjusted employment, and Appendix 5 identifies all the certificate and degree-granting institutions in San Bernardino County.

A great amount of data is presented in the tables. The first set shows the gaps and surpluses across all the programs offered at VVC by award level. The tables include the Classification of Instructional Program (CIP) code and title, the average annual number of job openings associated with the program (which have been de-duplicated using the process outlined in Appendix 5), the average annual program completions from the region and from VVC, and the gap or surplus for San Bernardino County. The programs' median hourly wage rates are specific to San Bernardino County and tailored for each award level.

The second set of tables identify the occupations mapped to the programs with a significant gap or surplus, by award level, and show detailed occupational data. The tables include the CIP code, CIP title, and occupations mapped to the program, by their Standard Occupational Classification (SOC) codes and titles. The regional job counts, by occupation, are shown for 2018 and 2028 with the change in jobs and average annual job openings for those years. The occupations' median hourly wage rates are specific to San Bernardino County and tailored for each award level. See Appendix 6 for a complete list of job projections and Appendix 7 for unemployment information by industry and occupation.

## CERTIFICATE LEVEL ANALYSIS

Certificates are reported to IPEDS as awards of less than one academic year and awards of at least one but less than two academic years. In this section, some of VVC's unique certificate level programs are aggregated, when they are classified by their six-digit CIP codes. Average projected annual job openings consider someone with a high school diploma level of education and some college education but no degree. Furthermore, an

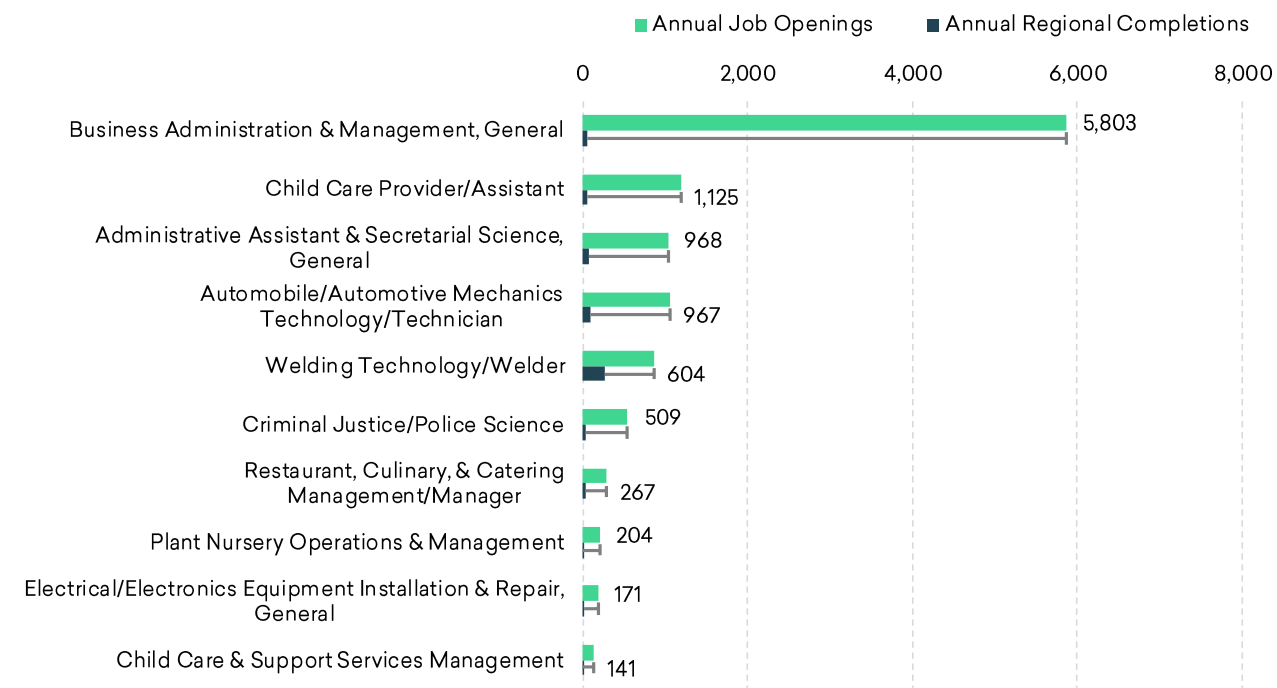
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6 The average annual completers' data for VVC was updated to the years 2015 to 2018 and reviewed for accuracy by VVC.

7 IPEDS refers to the Integrated Postsecondary Education Data System, which gathers information from every college, university, and technical and vocational institution that participates in the federal student financial aid program.

occupation's job openings are weighted by the number of other programs mapped to an occupation and scaled according to a program's completions.

Figure 3.4: VVC's Certificate Programs with a Significant Gap



Source: Emsi program demand gap model.

The largest certificate level gap, at 5,803 job openings, is in the Business Administration & Management, General program (Figure 3.4). Within the program, VVC has five average annual completions and is not the only institution with completers in this program. Table 3.1 shows all the award level's program gaps and surplus. One program has a significant surplus of program completions above the 125-job level of significance, Medical/Clinical Assistant.



Table 3.1: Gaps and Surpluses for VVC's Certificate Level Programs

CIP CODE	CIP TITLE	ANNUAL JOB OPENINGS	ANNUAL REGIONAL COMPLETIONS	ANNUAL VVC COMPLETIONS	GAP (+) OR SURPLUS (-)	MEDIAN HOURLY WAGE
52.0201	Business Administration & Management, General	5,861	59	5	5,803	\$21.60
19.0709	Child Care Provider/Assistant	1,190	66	24	1,125	\$12.72
52.0401	Administrative Assistant & Secretarial Science, General	1,047	79	6	968	\$16.86
47.0604	Automobile/Automotive Mechanics Technology/Technician	1,055	89	13	967	\$15.36
48.0508	Welding Technology/Welder	864	261	6	604	\$22.47
43.0107	Criminal Justice/Police Science	548	39	2	509	\$23.21
12.0504	Restaurant, Culinary, & Catering Management/Manager	297	30	4	267	\$14.65
01.0606	Plant Nursery Operations & Management	207	4	4	204	\$14.09
47.0101	Electrical/Electronics Equipment Installation & Repair, General	186	15	0	171	\$19.71
19.0708	Child Care & Support Services Management	143	2	2	141	\$13.85
52.1501	Real Estate	131	7	3	123	\$22.23
51.0904	Emergency Medical Technology/Technician (EMT Paramedic)	276	198	10	78	\$16.47
22.0302	Legal Assistant/Paralegal	109	40	9	69	\$27.90
47.0607	Airframe Mechanics & Aircraft Maintenance Technology/Technician	68	42	4	26	\$32.49
47.0608	Aircraft Powerplant Technology/Technician	56	40	8	16	\$32.92
51.0716	Medical Administrative/Executive Assistant & Medical Secretary	14	1	0	14	\$17.87
11.0201	Computer Programming/Programmer, General	7	3	0	4	\$36.27
43.0203	Fire Science/Fire-fighting	5	12	0	-7	\$26.29
51.0801	Medical/Clinical Assistant	343	550	4	-207	\$14.58

Numbers may not sum due to rounding.  
Source: Emsi program demand gap model.



Several occupations are mapped to Business Administration & Management, General, such as retail salespersons, general & operations managers, and first-line supervisors of retail sales workers (Table 3.2). The median hourly wage across all occupations mapped to this program, weighted by job openings, is \$21.60. For context, California's state minimum wage is \$11.00<sup>8</sup> per hour, and the state's living wage is \$12.39 for one adult.<sup>9</sup> Program expansion looks promising, and while a general business background may be applicable to many of these occupations, there could be opportunities for specialization. For example, creating tracks around specific occupations or industries relevant to San Bernardino County may better help completers secure jobs upon graduation.<sup>10</sup>

While the gaps are important for building or expanding VVC's programs, the surpluses are equally important. An analysis of the surplus programs ensures that the college is educating and training students with the skills the region's workforce requires. One certificate program has a significant surplus beyond the 125-job level of significance – the Medical/Clinical Assistant program, with a surplus of 207. Although VVC only produces four annual completers for the 343 annual job openings, when combined with the other regional institutions, there are a total of 550 completers per year, resulting in the large surplus.

This step-by-step analysis of evaluating a program by its occupational job openings, job counts, and wage rates can be applied to the other programs in Table 3.2. In general, occupations with high wages are more noteworthy than those with low wages. Also, if occupational forecasts are not positive, program development may not be a priority at this time. Keep in mind that there could be other sources of skilled workers filling the gaps, such as unemployed workers or workers from outside San Bernardino County. On the other hand, VVC students completing programs with a significant surplus may be finding employment opportunities outside the region.

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8 California's minimum wage as of January 1, 2019 is \$11.00 per hour. Source: California Department of Industrial Relations.

9 Living wage calculations provided by Dr. Amy K. Glasmeier and the Massachusetts Institute of Technology. See Appendix 8.

10 Further research must be conducted before making a final determination. Emsi is available to conduct this research; see your Emsi contact for details. Further research must be conducted before making a final determination, such as top employer identification within the region; business surveys to verify the data; resume and job postings analysis to determine trending skills for individuals with similar educations; industry recommendations on curriculum development; and analysis of the strengths, weaknesses, and capacities of similar programs at other regional higher education institutions. Emsi is available to conduct this research; see your Emsi contact for details.

Table 3.2: Occupations Mapped to VVC's Certificate Level Programs with a Significant Gap

SOC CODE	SOC TITLE	2018 JOBS	2028 JOBS	JOB CHANGE	ANNUAL JOB OPENINGS	MEDIAN HOURLY WAGE
BUSINESS ADMINISTRATION & MANAGEMENT, GENERAL (CIP 52.0201)						
41-2031	Retail Salespersons	24,172	25,822	1,650	2,735	\$12.17
11-1021	General & Operations Managers	10,272	11,748	1,477	914	\$47.02
41-1011	First-Line Supervisors of Retail Sales Workers	8,050	8,349	300	529	\$16.19
43-4051	Customer Service Representatives	9,354	10,312	958	513	\$17.15
41-4012	Sales Representatives, Wholesale & Manufacturing, Except Technical & Scientific Products	9,026	10,030	1,005	432	\$26.42
43-6014	Secretaries & Administrative Assistants, Except Legal, Medical, & Executive	11,683	11,776	93	208	\$17.52
43-1011	First-Line Supervisors of Office & Administrative Support Workers	7,787	8,470	683	129	\$26.06
13-1071	Human Resources Specialists	2,612	2,888	276	61	\$29.83
11-9199	Managers, All Other	4,566	5,131	565	50	\$21.52
11-3031	Financial Managers	2,003	2,303	300	46	\$49.71
11-2022	Sales Managers	3,084	3,313	229	41	\$40.50
15-1151	Computer User Support Specialists	2,085	2,341	256	39	\$25.72
13-1161	Market Research Analysts & Marketing Specialists	2,214	2,636	422	38	\$26.72
13-1111	Management Analysts	2,835	3,077	242	31	\$34.60
11-1011	Chief Executives	1,445	1,487	42	26	\$70.80
13-2011	Accountants & Auditors	4,167	4,717	551	23	\$32.19
13-1199	Business Operations Specialists, All Other	4,670	5,227	558	18	\$29.87
11-3121	Human Resources Managers	844	925	81	16	\$54.21
11-2021	Marketing Managers	608	687	78	9	\$49.30
11-3021	Computer & Information Systems Managers	723	839	117	3	\$60.35
CHILD CARE PROVIDER/ASSISTANT (CIP 19.0709)						
39-9011	Childcare Workers	7,233	6,506	(728)	693	\$9.94
25-9041	Teacher Assistants	9,359	10,466	1,107	412	\$15.94
21-1093	Social & Human Service Assistants	1,822	2,403	581	69	\$18.48
21-1021	Child, Family, & School Social Workers	1,092	1,459	368	16	\$24.97
ADMINISTRATIVE ASSISTANT & SECRETARIAL SCIENCE, GENERAL (CIP 52.0401)						



<b>SOC CODE</b>	<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>JOB CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
43-9061	Office Clerks, General	14,658	15,476	819	446	\$16.31
43-6014	Secretaries & Administrative Assistants, Except Legal, Medical, & Executive	11,683	11,776	93	279	\$17.52
43-4171	Receptionists & Information Clerks	4,845	5,398	553	194	\$13.87
43-6011	Executive Secretaries & Executive Administrative Assistants	2,137	1,974	(163)	65	\$26.62
43-4071	File Clerks	747	722	(25)	25	\$15.49
43-9022	Word Processors & Typists	575	481	(94)	21	\$20.27
43-9021	Data Entry Keyers	994	884	(110)	16	\$14.80
<b>AUTOMOBILE/AUTOMOTIVE MECHANICS TECHNOLOGY/TECHNICIAN (CIP 47.0604)</b>						
53-7061	Cleaners of Vehicles & Equipment	4,030	4,468	438	458	\$11.90
49-3023	Automotive Service Technicians & Mechanics	5,403	5,924	521	307	\$16.99
49-9071	Maintenance & Repair Workers, General	6,685	7,698	1,013	101	\$18.34
49-3093	Tire Repairers & Changers	903	932	29	67	\$13.18
49-3021	Automotive Body & Related Repairers	723	825	102	48	\$15.46
49-1011	First-Line Supervisors of Mechanics, Installers, & Repairers	2,376	2,661	286	41	\$32.56
49-3022	Automotive Glass Installers & Repairers	105	127	21	9	\$13.23
53-6051	Transportation Inspectors	192	203	11	8	\$27.17
49-2096	Electronic Equipment Installers & Repairers, Motor Vehicles	101	89	(12)	6	\$18.33
49-2093	Electrical & Electronics Installers & Repairers, Transportation Equipment	87	87	0	5	\$28.78
17-3027	Mechanical Engineering Technicians	82	89	7	5	\$25.50
<b>WELDING TECHNOLOGY/WELDER (CIP 48.0508)</b>						
49-9071	Maintenance & Repair Workers, General	6,685	7,698	1,013	296	\$18.34
47-1011	First-Line Supervisors of Construction Trades & Extraction Workers	2,851	3,047	196	152	\$29.66
47-2152	Plumbers, Pipefitters, & Steamfitters	2,104	2,509	405	150	\$21.13
51-4121	Welders, Cutters, Solderers, & Brazers	1,559	1,647	89	137	\$18.07
47-2221	Structural Iron & Steel Workers	512	663	152	62	\$36.70
47-2211	Sheet Metal Workers	675	776	101	45	\$26.98
47-2171	Reinforcing Iron & Rebar Workers	179	218	38	16	\$15.55
51-4122	Welding, Soldering, & Brazing Machine Setters, Operators, & Tenders	70	67	(4)	6	\$16.58
<b>CRIMINAL JUSTICE/POLICE SCIENCE (CIP 43.0107)</b>						



<b>SOC CODE</b>	<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>JOB CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
33-9032	Security Guards	6,912	8,213	1,301	381	\$13.73
33-3051	Police & Sheriff's Patrol Officers	3,197	3,694	497	133	\$45.48
33-3021	Detectives & Criminal Investigators	590	664	74	10	\$45.06
33-9021	Private Detectives & Investigators	167	184	16	7	\$23.57
33-1012	First-Line Supervisors of Police & Detectives	215	260	45	7	\$70.73
25-1099	Postsecondary Teachers	10,106	11,519	1,413	6	\$35.16
11-9161	Emergency Management Directors	59	64	5	2	\$17.25
33-3011	Bailiffs	9	14	6	1	\$33.40
33-3052	Transit & Railroad Police	26	28	2	1	\$28.99
<b>RESTAURANT, CULINARY, &amp; CATERING MANAGEMENT/MANAGER (CIP 12.0504)</b>						
35-1012	First-Line Supervisors of Food Preparation & Serving Workers	4,458	5,413	956	216	\$13.71
11-9051	Food Service Managers	2,087	2,275	188	54	\$16.72
35-1011	Chefs & Head Cooks	862	978	115	26	\$18.13
35-2013	Cooks, Private Household	10	11	1	0	\$18.33
<b>PLANT NURSERY OPERATIONS &amp; MANAGEMENT (CIP 01.0606)</b>						
45-2092	Farmworkers & Laborers, Crop, Nursery, & Greenhouse	2,013	1,749	(264)	121	\$11.33
37-1012	First-Line Supervisors of Landscaping, Lawn Service, & Groundskeeping Workers	816	837	20	48	\$17.09
37-3012	Pesticide Handlers, Sprayers, & Applicators, Vegetation	218	224	6	17	\$21.36
11-9013	Farmers, Ranchers, & Other Agricultural Managers	404	228	(176)	13	\$12.25
45-1011	First-Line Supervisors of Farming, Fishing, & Forestry Workers	110	101	(9)	7	\$25.11
25-1099	Postsecondary Teachers	10,106	11,519	1,413	1	\$35.16
<b>ELECTRICAL/ELECTRONICS EQUIPMENT INSTALLATION &amp; REPAIR, GENERAL (CIP 47.0101)</b>						
49-9099	Installation, Maintenance, & Repair Workers, All Other	1,375	1,467	93	112	\$16.58
49-9071	Maintenance & Repair Workers, General	6,685	7,698	1,013	17	\$18.34
49-2097	Electronic Home Entertainment Equipment Installers & Repairers	150	160	10	14	\$20.45
49-2092	Electric Motor, Power Tool, & Related Repairers	80	101	21	8	\$37.77
49-2021	Radio, Cellular, & Tower Equipment Installers & Repairs	80	85	5	7	\$22.51
49-1011	First-Line Supervisors of Mechanics, Installers, & Repairers	2,376	2,661	286	7	\$32.56

SOC CODE	SOC TITLE	2018 JOBS	2028 JOBS	JOB CHANGE	ANNUAL JOB OPENINGS	MEDIAN HOURLY WAGE
49-2011	Computer, Automated Teller, & Office Machine Repairers	545	516	(29)	7	\$17.19
49-2095	Electrical & Electronics Repairers, Powerhouse, Substation, & Relay	249	246	(3)	4	\$42.60
49-9031	Home Appliance Repairers	322	359	37	3	\$21.14
49-2094	Electrical & Electronics Repairers, Commercial & Industrial Equipment	447	474	27	2	\$31.42
51-2021	Coil Winders, Tapers, & Finishers	19	19	(0)	2	\$10.97
49-9061	Camera & Photographic Equipment Repairers	17	17	(0)	1	\$21.19
49-9097	Signal & Track Switch Repairers	83	79	(5)	1	\$36.92
CHILD CARE & SUPPORT SERVICES MANAGEMENT (CIP 19.0708)						
25-2011	Preschool Teachers, Except Special Education	1,964	2,180	216	110	\$13.94
39-9011	Childcare Workers	7,233	6,506	(728)	21	\$9.94
11-9031	Education Administrators, Preschool & Childcare Center/Program	316	335	19	6	\$18.52
21-1093	Social & Human Service Assistants	1,822	2,403	581	2	\$18.48
11-9151	Social & Community Service Managers	1,138	1,462	324	2	\$24.61
21-1021	Child, Family, & School Social Workers	1,092	1,459	368	0	\$24.97
25-1099	Postsecondary Teachers	10,106	11,519	1,413	0	\$35.16

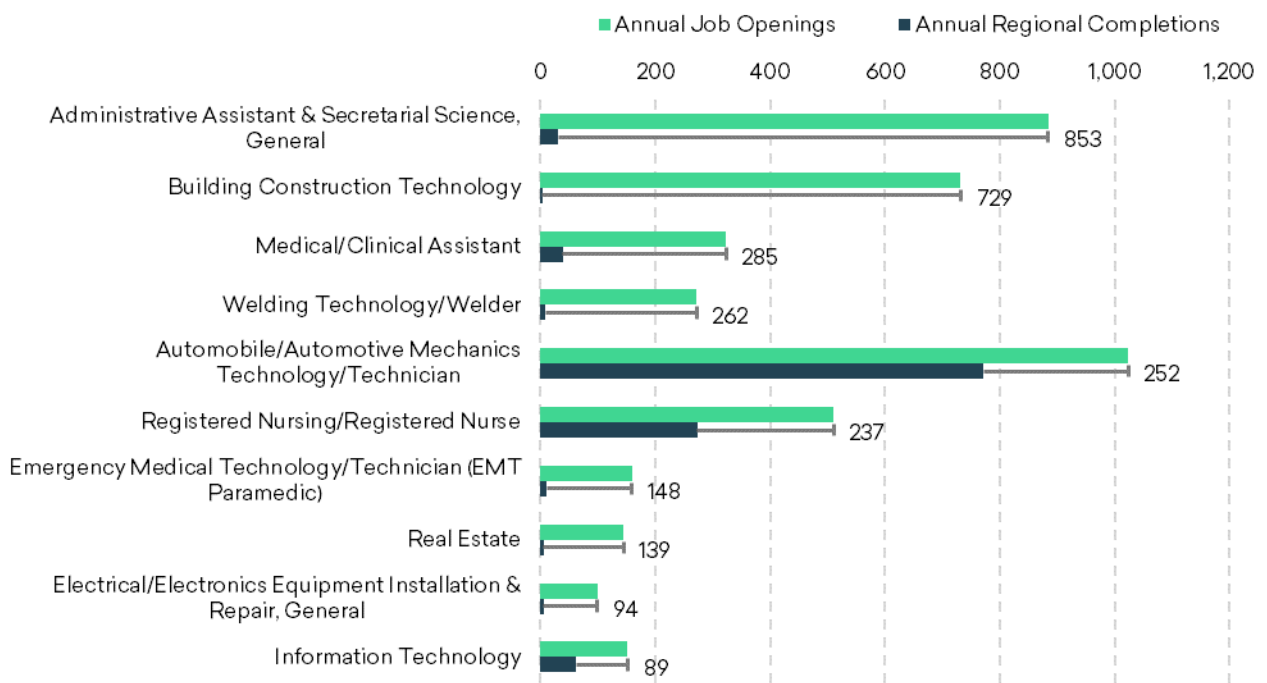
Numbers may not sum due to rounding.  
Source: Emsi program demand gap model.

## ASSOCIATE DEGREE LEVEL ANALYSIS

VVC offers 17 programs in which students receive an Associate in Applied Science (AAS), Art (AA), Fine Arts (AFA), or Science (AS) degrees in one of many subject areas. Like the previous section, job openings consider this award level and one below – an associate degree and some college education in this section. An occupation’s job openings are weighted by the number of other programs mapped to the occupation and scaled according to a program’s completions.



Figure 3.5: VVC's Top 10 Associate Degree Level Programs with a Gap



Source: Emsi program demand gap model.

As shown in Figure 3.5, eight programs have a significant gap above the 125-job level of significance. The Administrative Assistant & Secretarial Science, General program has the largest, followed by the Building Construction Technology and Medical/Clinical Assistant programs. As shown in Table 3.3, the Administrative Assistant & Secretarial Science, General program has 884 average annual job openings, considering the region's labor market. On average, the college has 16 annual completions, and combined with the other postsecondary educational institutions in the region, there are a total of 31 annual completions. At the certificate level, the Medical/Clinical Assistant program had a large surplus, so completers at the certificate level may be filling much of the demand seen at the associate degree level.

Table 3.3: Gaps and Surpluses for VVC's Associate Degree Level Programs

CIP CODE	CIP TITLE	ANNUAL JOB OPENINGS	ANNUAL REGIONAL COMPLETERS	ANNUAL VVC COMPLETERS	GAP (+) OR SURPLUS (-)	MEDIAN HOURLY WAGE
52.0401	Administrative Assistant & Secretarial Science, General	884	31	16	853	\$16.94
46.0415	Building Construction Technology	732	4	4	729	\$19.25
51.0801	Medical/Clinical Assistant	324	39	5	285	\$14.58
48.0508	Welding Technology/Welder	272	9	3	262	\$23.49
47.0604	Automobile/Automotive Mechanics Technology/Technician	1,024	771	8	252	\$18.42
51.3801	Registered Nursing/Registered Nurse	511	274	112	237	\$45.59
51.0904	Emergency Medical Technology/Technician (EMT Paramedic)	159	11	5	148	\$14.60
52.1501	Real Estate	145	6	4	139	\$21.79
47.0101	Electrical/Electronics Equipment Installation & Repair, General	100	6	0	94	\$21.47
11.0103	Information Technology	152	63	15	89	\$31.04
12.0504	Restaurant, Culinary, & Catering Management/Manager	78	15	3	62	\$14.67
47.0607	Airframe Mechanics & Aircraft Maintenance Technology/Technician	69	10	3	58	\$33.93
15.1301	Drafting & Design Technology/Technician, General	56	20	17	36	\$26.51
50.0101	Visual & Performing Arts, General	81	60	47	21	\$19.34
47.0104	Computer Installation & Repair Technology/Technician	32	13	11	19	\$21.02
43.0201	Fire Prevention & Safety Technology/Technician	71	54	19	17	\$28.47
51.0908	Respiratory Care Therapy/Therapist	51	191	30	-140	\$34.00

Numbers may not sum due to rounding.  
Source: Emsi program demand gap model.



The Administrative Assistant & Secretarial Science, General program has a median hourly wage of \$16.94 across all occupations. Office clerks, receptionists & information clerks, and executive secretaries & executive administrative assistants are the top three occupations mapped to the program with the highest average annual job openings. Within the program, executive secretaries & executive administrative assistants have the highest median hourly wage rate at \$26.62; there are 77 annual job openings for the occupation in the region. As stated previously, California's state minimum wage is \$11.00 per hour, and the state's living wage is \$12.39 for one adult. There appears to be enough evidence to support a program expansion, although it should be noted that four of the seven occupations mapped to the program are due to decline in employment over the next decade. However, due to retirement there are an ample number of annual openings despite employment decreasing over this period.<sup>11</sup>

While the gaps are important to keep in mind for building or expanding programs, the surpluses are equally important to ensure the college is training students with skills the regional workforce requires. There is one program at VVC with a significant surplus – Respiratory Care Therapy/Therapist, with a surplus of 140. VVC has 30 completions in this program, but when combined with other institutions in the county there are a total of 191 completions for 51 annual job openings.

Using Table 3.4, this step-by-step process of evaluating occupational gaps by their job openings, job counts, and median hourly wage rates can be applied to the other VVC associate degree level programs with a significant gap. In general, occupations with high wages should be considered more noteworthy than those with low wages. If an occupation's job projections are not positive, then it may not be worth further consideration, in terms of its mapped programs. Also, there could be other sources of skilled workers filling the gaps, such as unemployed workers or workers from outside the region.

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11 As stated previously, further research must be conducted before making a final determination. Emsi is available to conduct this research; see your Emsi contact for details.

Table 3.4: Occupations Mapped to VVC's Associate Degree Level Programs with a Significant Gap

SOC CODE	SOC TITLE	2018 JOBS	2028 JOBS	JOB CHANGE	ANNUAL JOB OPENINGS	MEDIAN HOURLY WAGE
ADMINISTRATIVE ASSISTANT & SECRETARIAL SCIENCE, GENERAL (CIP 52.0401)						
43-9061	Office Clerks, General	14,658	15,476	819	536	\$16.31
43-4171	Receptionists & Information Clerks	4,845	5,398	553	149	\$13.87
43-6011	Executive Secretaries & Executive Administrative Assistants	2,137	1,974	(163)	77	\$26.62
43-6014	Secretaries & Administrative Assistants, Except Legal, Medical, & Executive	11,683	11,776	93	42	\$17.52
43-9022	Word Processors & Typists	575	481	(94)	33	\$20.27
43-4071	File Clerks	747	722	(25)	32	\$15.49
43-9021	Data Entry Keyers	994	884	(110)	16	\$14.80
BUILDING CONSTRUCTION TECHNOLOGY (CIP 46.0415)						
47-2061	Construction Laborers	7,852	8,467	615	227	\$14.76
47-2031	Carpenters	8,167	8,408	241	220	\$17.15
47-2073	Operating Engineers & Other Construction Equipment Operators	1,647	1,762	115	63	\$32.85
47-2141	Painters, Construction & Maintenance	2,829	3,029	201	60	\$14.24
47-2051	Cement Masons & Concrete Finishers	1,015	1,138	124	30	\$23.75
47-2121	Glaziers	437	584	146	21	\$21.77
47-2181	Roofers	916	990	74	17	\$20.07
47-4011	Construction & Building Inspectors	570	641	71	17	\$40.46
47-1011	First-Line Supervisors of Construction Trades & Extraction Workers	2,851	3,047	196	16	\$29.66
47-2081	Drywall & Ceiling Tile Installers	933	885	(48)	12	\$21.39
47-2044	Tile & Marble Setters	453	459	5	8	\$21.10
47-2211	Sheet Metal Workers	675	776	101	7	\$26.98
17-3022	Civil Engineering Technicians	377	428	52	7	\$29.20
13-1051	Cost Estimators	1,266	1,418	153	6	\$28.69
47-2041	Carpet Installers	302	315	13	6	\$17.49
11-9021	Construction Managers	2,348	2,449	102	5	\$24.42
47-2042	Floor Layers, Except Carpet, Wood, & Hard Tiles	200	211	11	4	\$15.77
47-2132	Insulation Workers, Mechanical	39	63	24	2	\$18.16



<b>SOC CODE</b>	<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>JOB CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
47-2131	Insulation Workers, Floor, Ceiling, & Wall	57	64	7	2	\$11.65
49-9071	Maintenance & Repair Workers, General	6,685	7,698	1,013	2	\$18.34
13-1199	Business Operations Specialists, All Other	4,670	5,227	558	1	\$29.87
25-2032	Career/Technical Education Teachers, Secondary School	15	56	41	1	\$39.38
47-2043	Floor Sanders & Finishers	26	21	(5)	0	\$13.27
47-2142	Paperhangers	14	12	(3)	0	\$13.31
47-2053	Terrazzo Workers & Finishers	3	4	1	0	\$12.42
<b>MEDICAL/CLINICAL ASSISTANT (CIP 51.0801)</b>						
31-9092	Medical Assistants	4,938	5,845	907	324	\$14.58
<b>Welding Technology/Welder (CIP 48.0508)</b>						
47-2152	Plumbers, Pipefitters, & Steamfitters	2,104	2,509	405	99	\$21.13
51-4121	Welders, Cutters, Solderers, & Brazers	1,559	1,647	89	71	\$18.07
47-1011	First-Line Supervisors of Construction Trades & Extraction Workers	2,851	3,047	196	42	\$29.66
47-2221	Structural Iron & Steel Workers	512	663	152	29	\$36.70
47-2211	Sheet Metal Workers	675	776	101	19	\$26.98
47-2171	Reinforcing Iron & Rebar Workers	179	218	38	5	\$15.55
49-9071	Maintenance & Repair Workers, General	6,685	7,698	1,013	5	\$18.34
51-4122	Welding, Soldering, & Brazing Machine Setters, Operators, & Tenders	70	67	(4)	3	\$16.58
<b>AUTOMOBILE/AUTOMOTIVE MECHANICS TECHNOLOGY/TECHNICIAN (CIP 47.0604)</b>						
49-9071	Maintenance & Repair Workers, General	6,685	7,698	1,013	370	\$18.34
49-3023	Automotive Service Technicians & Mechanics	5,403	5,924	521	221	\$16.99
53-7061	Cleaners of Vehicles & Equipment	4,030	4,468	438	203	\$11.90
49-1011	First-Line Supervisors of Mechanics, Installers, & Repairers	2,376	2,661	286	130	\$32.56
49-3093	Tire Repairers & Changers	903	932	29	41	\$13.18
49-3021	Automotive Body & Related Repairers	723	825	102	32	\$15.46
53-6051	Transportation Inspectors	192	203	11	9	\$27.17
49-3022	Automotive Glass Installers & Repairers	105	127	21	5	\$13.23
17-3027	Mechanical Engineering Technicians	82	89	7	5	\$25.50
49-2093	Electrical & Electronics Installers & Repairers, Transportation Equipment	87	87	0	4	\$28.78



<b>SOC CODE</b>	<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>JOB CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
49-2096	Electronic Equipment Installers & Repairers, Motor Vehicles	101	89	(12)	3	\$18.33
<b>REGISTERED NURSING/REGISTERED NURSE (CIP 51.3801)</b>						
29-1141	Registered Nurses	16,930	19,959	3,029	437	\$44.99
11-9111	Medical & Health Services Managers	1,581	2,045	463	58	\$52.63
25-1099	Postsecondary Teachers	10,106	11,519	1,413	15	\$35.16
29-1171	Nurse Practitioners	811	1,085	274	0	\$58.24
29-1151	Nurse Anesthetists	55	76	21	0	\$98.10
29-1161	Nurse Midwives	6	13	7	0	\$37.05
<b>EMERGENCY MEDICAL TECHNOLOGY/TECHNICIAN (EMT PARAMEDIC) (CIP 51.0904)</b>						
29-2041	Emergency Medical Technicians & Paramedics	1,328	1,711	383	74	\$14.53
33-9092	Lifeguards, Ski Patrol, & Other Recreational Protective Service Workers	414	488	74	52	\$11.89
53-3011	Ambulance Drivers & Attendants, Except Emergency Medical Technicians	170	208	38	19	\$11.68
33-2011	Firefighters	1,194	1,428	235	13	\$27.94
33-1021	First-Line Supervisors of Fire Fighting & Prevention Workers	83	110	28	1	\$38.47
<b>REAL ESTATE (CIP 52.1501)</b>						
41-9022	Real Estate Sales Agents	1,931	1,890	(41)	70	\$19.91
11-9141	Property, Real Estate, & Community Association Managers	1,281	1,374	93	47	\$22.89
41-9021	Real Estate Brokers	524	511	(13)	19	\$25.16
13-2021	Appraisers & Assessors of Real Estate	381	392	11	9	\$23.60

Numbers may not sum due to rounding.  
Source: Emsi program demand gap model.

## TRANSFER-TRACK DEGREE LEVEL ANALYSIS

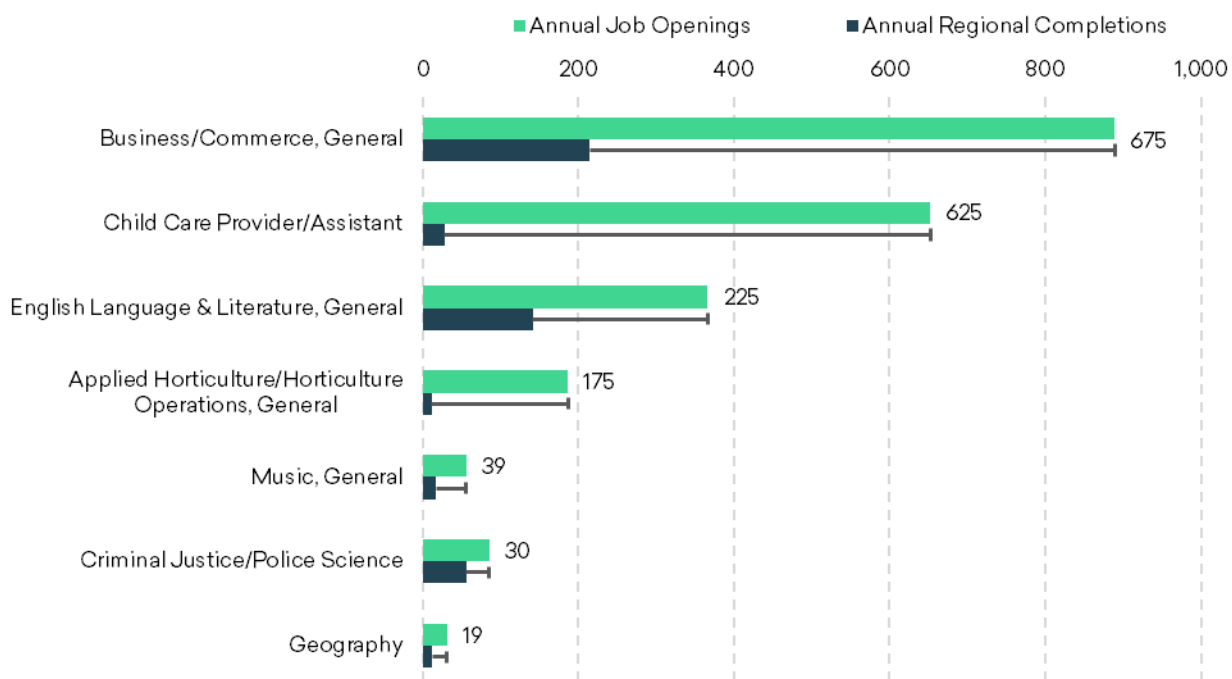
The analysis in this section again evaluates VVC's associate degree level programs but at the bachelor's degree level. The programs are referred to as transfer-track degree level programs, and a program completer could readily transfer into a similar bachelor's degree level program. At VVC, there are 15 such transfer-track degree level programs, when the programs are classified by their six-digit CIP codes. VVC is one of many postsecondary educational institutions in the county, and several other institutions offer bachelor's degree





level programs. Job openings at this award level consider someone with a bachelor’s degree or associate degree level of education. Again, an occupation’s job openings are weighted by the number of other programs mapped to the occupation and scaled according to a program’s completions.

Figure 3.6: VVC’s Top Transfer-Track Degree\* Level Programs with a Gap



\*The programs award completers with an associate degree, but the demand for jobs considers a bachelor’s degree level of education.

Source: Emsi program demand gap model.

Figure 3.6 shows the programs with a significant gap. The Business/Commerce, General program has the largest, followed by the Child Care Provider/Assistant; English Language & Literature, General; and Applied Horticulture/Horticulture Operations, General programs. As shown in Table 3.5, there are 890 average annual job openings in the region for occupations related to the Business/Commerce, General program. On average, the college graduates 84 annual completers, and the region’s other postsecondary educational institutions graduate another 130 annual completers.

Table 3.5: Gaps and Surpluses for VVC's Transfer-Track Degree Level Programs

CIP CODE	CIP TITLE	ANNUAL JOB OPENINGS	ANNUAL REGIONAL COMPLETERS	ANNUAL VVC COMPLETERS	GAP (+) OR SURPLUS (-)	MEDIAN HOURLY WAGE
52.0101	Business/Commerce, General	890	214	84	675	\$38.65
19.0709	Child Care Provider/Assistant	653	28	28	625	\$13.78
23.0101	English Language & Literature, General	366	142	6	225	\$36.84
01.0601	Applied Horticulture/Horticulture Operations, General	187	12	12	175	\$13.94
50.0901	Music, General	56	17	0	39	\$31.53
43.0107	Criminal Justice/Police Science	86	56	56	30	\$27.05
45.0701	Geography	31	12	0	19	\$31.63
31.0505	Kinesiology & Exercise Science	0	0	0	0	\$26.51
45.1001	Political Science & Government, General	43	69	2	-26	\$29.86
54.0101	History, General	49	87	9	-38	\$35.58
27.0101	Mathematics, General	58	101	8	-43	\$38.14
09.0101	Speech Communication & Rhetoric	99	187	16	-88	\$30.03
42.0101	Psychology, General	537	626	29	-89	\$26.86
30.0101	Biological & Physical Sciences	250	344	344	-94	\$36.03
45.1101	Sociology	94	236	9	-142	\$30.77

\* The program awards completers with an associate degree, but the demand for jobs considers a bachelor's degree level of education.

Numbers may not sum due to rounding.

Source: Emsi program demand gap model.

For the Business/Commerce, General program, general & operations managers, construction managers, and cost estimators are the top three occupations mapped to the program with the highest average annual job openings, and these three occupations have median hourly wage rates above \$20.00 for entry level positions. Within the program, chief executives have the highest median hourly wage rate at \$70.80. For context, California's state minimum wage is \$11.00 per hour, and the state's living wage is \$12.39 for one adult. There

appears to be enough evidence to support a program expansion, especially considering the results of the key industry subsectors in Chapter 2.<sup>12</sup>

While the gaps are important to keep in mind for building or expanding programs, the surpluses are equally important to ensure the college is training students with skills the regional workforce requires. Sociology is the only program with a surplus above the 125-level of significance. However, Biological & Physical Sciences; Psychology, General; and Speech Communication & Rhetoric all have surplus near 100. More research should be done around the programs these completers ultimately obtain their bachelor’s degree in and the universities they choose to attend upon completion of their studies at VVC. This research will ensure both the occupation mapping and number of graduates entering San Bernardino County workforce are accurate.

Using Table 3.6, this step-by-step process of evaluating occupational gaps by their median hourly wage rates can be applied to the other VVC transfer-track degree programs with a significant gap. In general, gaps around occupations with high wages should be considered more noteworthy than gaps around occupations with low wages. Also, if the occupational forecasts around a certain gap are not positive, the gap may not be worth further consideration. Keep in mind that there could be other sources of skilled workers filling the gaps, such as unemployed workers or workers from outside the region.

Table 3.6: Occupations Mapped to VVC’s Transfer-Track Degree Level Programs with a Significant Gap

<b>SOC CODE</b>	<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>JOB CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
<b>BUSINESS ADMINISTRATION &amp; MANAGEMENT, GENERAL (CIP 52.0201)</b>						
11-1021	General & Operations Managers	10,272	11,748	1,477	328	\$47.02
11-9021	Construction Managers	2,348	2,449	102	96	\$24.42
13-1051	Cost Estimators	1,266	1,418	153	77	\$28.69
11-3011	Administrative Services Managers	1,460	1,672	212	68	\$47.42
11-3071	Transportation, Storage, & Distribution Managers	1,510	1,827	317	53	\$40.47
13-1199	Business Operations Specialists, All Other	4,670	5,227	558	38	\$29.87

12 As stated previously, further research must be conducted before making a final determination. Emsi is available to conduct this research; see your Emsi contact for details.



<b>SOC CODE</b>	<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>JOB CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
13-1121	Meeting, Convention, & Event Planners	393	468	75	37	\$22.36
11-9151	Social & Community Service Managers	1,138	1,462	324	35	\$24.61
11-2022	Sales Managers	3,084	3,313	229	32	\$40.50
11-3051	Industrial Production Managers	791	819	28	29	\$46.09
13-1111	Management Analysts	2,835	3,077	242	26	\$34.60
15-1199	Computer Occupations, All Other	1,174	1,287	112	23	\$36.78
25-1099	Postsecondary Teachers	10,106	11,519	1,413	19	\$35.16
11-9199	Managers, All Other	4,566	5,131	565	16	\$21.52
11-1011	Chief Executives	1,445	1,487	42	10	\$70.80
<b>CHILD CARE PROVIDER/ASSISTANT (CIP 19.0709)</b>						
25-9041	Teacher Assistants	9,359	10,466	1,107	394	\$15.94
39-9011	Childcare Workers	7,233	6,506	(728)	244	\$9.94
21-1093	Social & Human Service Assistants	1,822	2,403	581	12	\$18.48
21-1021	Child, Family, & School Social Workers	1,092	1,459	368	3	\$24.97
<b>ENGLISH LANGUAGE &amp; LITERATURE, GENERAL (CIP 23.0101)</b>						
25-2021	Elementary School Teachers, Except Special Education	9,523	10,773	1,250	216	\$41.64
25-2031	Secondary School Teachers, Except Special & Career/Technical Education	5,046	5,840	794	30	\$37.37
27-3041	Editors	338	386	48	26	\$24.45
25-2022	Middle School Teachers, Except Special & Career/Technical Education	1,712	2,131	419	22	\$40.81
25-4031	Library Technicians	498	570	71	17	\$18.08
27-3043	Writers & Authors	605	659	54	15	\$18.92
25-4021	Librarians	282	346	65	13	\$33.04
25-1099	Postsecondary Teachers	10,106	11,519	1,413	13	\$35.16
27-3042	Technical Writers	115	128	13	8	\$29.92
43-9081	Proofreaders & Copy Markers	30	30	0	3	\$15.53
43-9031	Desktop Publishers	33	35	2	2	\$23.15
27-3022	Reporters & Correspondents	67	42	(25)	2	\$20.23
<b>APPLIED HORTICULTURE/HORTICULTURE OPERATIONS, GENERAL (CIP 01.0601)</b>						
37-3011	Landscaping & Groundskeeping Workers	8,212	8,772	560	102	\$12.97



SOC CODE	SOC TITLE	2018 JOBS	2028 JOBS	JOB CHANGE	ANNUAL JOB OPENINGS	MEDIAN HOURLY WAGE
45-2092	Farmworkers & Laborers, Crop, Nursery, & Greenhouse	2,013	1,749	(264)	25	\$11.33
37-1012	First-Line Supervisors of Landscaping, Lawn Service, & Groundskeeping Workers	816	837	20	24	\$17.09
27-1023	Floral Designers	247	232	(16)	16	\$14.27
11-9013	Farmers, Ranchers, & Other Agricultural Managers	404	228	(176)	8	\$12.25
37-3013	Tree Trimmers & Pruners	376	392	15	5	\$17.11
45-1011	First-Line Supervisors of Farming, Fishing, & Forestry Workers	110	101	(9)	3	\$25.11
37-3012	Pesticide Handlers, Sprayers, & Applicators, Vegetation	218	224	6	3	\$21.36
25-1099	Postsecondary Teachers	10,106	11,519	1,413	1	\$35.16

The programs award completers with an associate degree, but the demand for jobs considers a bachelor's degree level of education. Numbers may not sum due to rounding.

Source: Emsi program demand gap model.

## LIBERAL ARTS AND GENERAL STUDIES TRANSFER STUDENTS

A number of students attend VVC with the intention of transferring to a four-year institution to receive a bachelor's degree. Although these students study any number of topics at VVC, a large portion of them receive an Associate of Arts in Liberal Arts. In fact, over the past three years, 153 students, on average, have completed such a program, which accounts for 13% of the college's annual production of certificates and degrees.

Once liberal arts students leave VVC, their educational and career track is difficult to predict. They could attend a nearby four-year institution, and they could study any number of different programs that will ultimately determine their future careers. What can be shown is that over the next 10 years, jobs that require a bachelor's degree are projected to be in high demand. In any given year between 2018 and 2028, 35,614 job openings will require a bachelor's degree level of education.

This section shows the top occupations mapped to liberal arts programs, using Emsi's Profile Analytics database, which contains more than 97.4 million profiles of people in the U.S. from all the major professional social media websites. To identify the top occupations, the Profile Analytics database is filtered in several ways. First, profiles include people who have an associate degree or a bachelor's degree level of education. Second, the profiles list liberal arts as the person's program of study. Liberal arts programs are classified as CIP codes 24 and 30 at the two-digit level. Finally, the database includes those profiles most recently

updated, from as early as 2010. Using these search parameters, about 372,700 profiles are found in the database, and the occupations in Table 3.7 represent the most common jobs of the liberal arts alumni.

As shown in the table, a considerable number of job openings are for retail salespersons, secretaries & administrative assistants, and customer service representatives. Together, the three occupations account for half of all the liberal arts program's job openings. The profiles data also include various kinds of managers and supervisors, which are occupations with relatively higher wage rates. A liberal arts program expansion is not warranted at this time, but VVC administrators should be aware that liberal arts graduates can find success in a variety of business-related occupations beyond retail sales and customer service.

Table 3.7: Occupations Related to Liberal Arts Programs

<b>SOC CODE</b>	<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>JOB CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
41-2031	Retail Salespersons	24,172	25,822	1,650	4,128	\$12.17
43-4051	Customer Service Representatives	9,354	10,312	958	1,474	\$17.15
43-6014	Secretaries & Administrative Assistants, Except Legal, Medical, & Executive	11,683	11,776	93	1,397	\$17.52
41-4012	Sales Representatives, Wholesale & Manufacturing, Except Technical & Scientific Products	9,026	10,030	1,005	1,163	\$26.42
11-1021	General & Operations Managers	10,272	11,748	1,477	1,129	\$47.02
41-1011	First-Line Supervisors of Retail Sales Workers	8,050	8,349	300	993	\$16.19
43-1011	First-Line Supervisors of Office & Administrative Support Workers	7,787	8,470	683	944	\$26.06
13-1199	Business Operations Specialists, All Other*	4,670	5,227	558	545	\$29.87
13-2011	Accountants & Auditors	4,167	4,717	551	484	\$32.19
21-1093	Social & Human Service Assistants	1,822	2,403	581	333	\$18.48
13-1071	Human Resources Specialists	2,612	2,888	276	319	\$29.83
11-2022	Sales Managers	3,084	3,313	229	317	\$40.50
13-1111	Management Analysts	2,835	3,077	242	299	\$34.60
13-1161	Market Research Analysts & Marketing Specialists	2,214	2,636	422	299	\$26.72
43-6011	Executive Secretaries & Executive Administrative Assistants	2,137	1,974	(163)	240	\$26.62
11-3031	Financial Managers	2,003	2,303	300	205	\$49.71
15-1151	Computer User Support Specialists	2,085	2,341	256	203	\$25.72



SOC CODE	SOC TITLE	2018 JOBS	2028 JOBS	JOB CHANGE	ANNUAL JOB OPENINGS	MEDIAN HOURLY WAGE
11-1011	Chief Executives	1,445	1,487	42	118	\$70.80
11-3121	Human Resources Managers	844	925	81	85	\$54.21
11-2021	Marketing Managers	608	687	78	68	\$49.30

\* See Appendix 2 for job postings related to this occupation.  
Source: Emsi gap model.

## SUMMARY

Across the three award levels, there are a total of 22 programs associated with significant workforce gaps—with three programs having gaps at multiple levels. There are 10 certificate level programs with significant gaps. Business Administration & Management, General has the largest certificate level gap in San Bernardino County (gap of 5,803; median hourly wage \$21.60). Child Care Provider/Assistant (gap of 1,125; median hourly wage \$12.72) and Administrative Assistant & Secretarial Science, General (gap of 968; median hourly wage \$16.86) are the second and third largest gaps at the certificate level in San Bernardino County. There are eight associate degree level programs that also registered a gap. The top three are Administrative Assistant & Secretarial Science, General (gap of 853; median hourly wage \$16.94), Building Construction Technology (gap of 729; median hourly wage \$19.25), and Medical/Clinical Assistant (gap of 285; median hourly wage \$14.58). There are four transfer-track degree level programs with significant gaps. Business/Commerce, General has the largest transfer-track degree level gap in San Bernardino County (gap of 675; median hourly wage \$38.65). Child Care Provider/Assistant (gap of 625; median hourly wage \$13.78) and English Language & Literature, General (gap of 225; median hourly wage \$36.84) are the second and third largest gaps at the transfer-track degree level in San Bernardino County.

There are three programs, one at each award level, associated with a significant workforce surplus. The surplus at the certificate level is Medical/Clinical Assistant (surplus of 207; median hourly wage \$14.58). The surplus at the associate degree level is Respiratory Care Therapy/Therapist (surplus of 140; median hourly wage \$34.00). The significant surplus at the transfer-track degree level is Sociology (surplus of 142; median hourly wage \$30.77), although three other programs have surpluses close to 100. These programs are Biological & Physical Sciences (surplus of 94; median hourly wage \$36.03), Psychology, General (surplus of 89; median hourly wage \$26.86), and Speech Communication and Rhetoric (surplus of 88;

median hourly wage \$30.03). Some of the completers are likely getting jobs outside San Bernardino County.



## CHAPTER 4:

# New Program Additions

Thus far, the analysis has centered around programs offered by VVC. This chapter looks at workforce gaps that exist within occupations that VVC does not currently train for and provides new program recommendations. Please note that these recommendations are based solely on the gap and whether or not the occupation looks promising (job growth, wages, etc.). These are initial findings and should serve as a starting point for further research. The college will still need to undergo steps before deciding whether or not these programs would be a good fit for the college and the region. This future work could include surveying local employers, analyzing skills and similar programs offered elsewhere, calculating program specific economic impacts, and looking at capacity and capital requirements for building these programs.

The tables below contain lists of programmatic areas of opportunity that could fill gaps in the labor market at each respective award level. These selected occupations present unmet annual job openings within the region. Please note that these tables highlight particular occupations, and in many cases a program can be designed to train for multiple occupations. Once these occupations are grouped with other similar occupations, the actual workforce gap may be larger. Therefore, several occupations with relatively small gaps are included. The occupations are placed into a recommended level of education for the program; this is a mere suggestion of what credential level the potential program could be offered at based on the education required to perform in the occupation. Again, it is up to the college to determine what degree level each potential program should be offered, based on all capacity and capital requirements for building new programs.

## **ADDITIONS AT THE CERTIFICATE LEVEL**

As seen in Table 4.1, skilled trades and blue-collar occupations like machinists, industrial machinery mechanics, heavy & tractor-trailer truck drivers, and electricians appear to be undersupplied in San Bernardino County. Medical occupations such as pharmacy

technicians, licensed practical & vocational nurses, and phlebotomists are also undersupplied.

Median hourly wage rates range between \$15.09 for shipping, receiving, & traffic clerks to \$40.66 for paving, surfacing, & tamping equipment operators. Most occupations require a certificate level of education or lower, but creating an associate degree program may capture more of the regional demand for these occupations and make completers more competitive in the labor market.

Table 4.1: VVC's Programmatic Areas of Opportunity at the Certificate Level

<b>SOC CODE</b>	<b>SOC TITLE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>ANNUAL REGIONAL COMPLETERS</b>	<b>GAP</b>	<b>MEDIAN HOURLY WAGE</b>
53-3032	Heavy and Tractor-Trailer Truck Drivers	1,940	2	1,938	\$20.84
43-5071	Shipping, Receiving, and Traffic Clerks	727	2	725	\$15.09
43-3031	Bookkeeping, Accounting, and Auditing Clerks	645	25	620	\$19.03
53-1048	First-Line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	421	0	421	\$26.32
47-2111	Electricians	416	37	379	\$27.12
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	230	0	230	\$17.86
51-1011	First-Line Supervisors of Production and Operating Workers	213	0	213	\$26.23
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	194	2	192	\$24.96
43-4151	Order Clerks	155	1	155	\$17.14
51-4041	Machinists	160	9	150	\$18.52
29-2061	Licensed Practical and Licensed Vocational Nurses	316	167	149	\$22.89
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	154	7	146	\$24.03
33-3012	Correctional Officers and Jailers	144	1	143	\$38.62
49-9041	Industrial Machinery Mechanics	136	2	134	\$25.55
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	144	10	134	\$19.80
29-2052	Pharmacy Technicians	131	21	110	\$17.56
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	91	0	91	\$28.94
31-9097	Phlebotomists	69	0	69	\$19.24

<b>SOC CODE</b>	<b>SOC TITLE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>ANNUAL REGIONAL COMPLETERS</b>	<b>GAP</b>	<b>MEDIAN HOURLY WAGE</b>
43-3051	Payroll and Timekeeping Clerks	70	3	67	\$21.95
49-9043	Maintenance Workers, Machinery	63	1	63	\$22.26
43-5011	Cargo and Freight Agents	56	1	55	\$22.44
51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic	58	3	54	\$17.50
43-4161	Human Resources Assistants, Except Payroll and Timekeeping	53	1	53	\$18.98
49-9052	Telecommunications Line Installers and Repairers	53	3	51	\$23.97
49-9051	Electrical Power-Line Installers and Repairers	48	2	47	\$38.52
51-8031	Water and Wastewater Treatment Plant and System Operators	47	6	41	\$31.23
49-2098	Security and Fire Alarm Systems Installers	41	4	36	\$20.99
51-9122	Painters, Transportation Equipment	36	1	35	\$18.89
31-9093	Medical Equipment Preparers	39	6	33	\$22.19
29-2055	Surgical Technologists	42	9	33	\$26.11
17-3023	Electrical and Electronics Engineering Technicians	32	0	32	\$27.18
49-9062	Medical Equipment Repairers	22	0	22	\$21.32
47-4051	Highway Maintenance Workers	21	0	21	\$20.96
49-9012	Control and Valve Installers and Repairers, Except Mechanical Door	20	0	20	\$31.93
47-2231	Solar Photovoltaic Installers	20	0	19	\$19.36
47-4021	Elevator Installers and Repairers	19	0	19	\$34.30
47-2071	Paving, Surfacing, and Tamping Equipment Operators	19	0	19	\$40.66
29-2053	Psychiatric Technicians	39	22	18	\$27.87
29-2056	Veterinary Technologists and Technicians	22	5	17	\$22.13
51-9081	Dental Laboratory Technicians	16	0	16	\$18.25
17-3026	Industrial Engineering Technicians	15	0	15	\$27.29
49-2091	Avionics Technicians	15	0	15	\$35.47

Numbers may not sum due to rounding.  
Source: Emsi program demand gap model.

## ADDITIONS AT THE ASSOCIATE DEGREE LEVEL

As seen in Table 4.2, some medical occupations appear to be undersupplied in San Bernardino County, most notably dental hygienists. Dental hygienists have a median hourly wage of \$42.79 and there are only five annual completions for 59 annual job openings. Many of these occupations have small gaps so VVC should consider whether these programs are feasible to operate without oversaturating the region with completers. As stated previously, some of the certificate new program opportunities may be suitable at an associate degree level to capture more of the regional demand. Median hourly wage rates range between \$16.01 for occupational therapy aides to \$42.79 for dental hygienists.

Table 4.2: VVC's Programmatic Areas of Opportunity at the Associate Degree Level

SOC CODE	SOC TITLE	ANNUAL JOB OPENINGS	ANNUAL REGIONAL COMPLETERS	GAP	MEDIAN HOURLY WAGE
29-2021	Dental Hygienists	59	5	54	\$42.79
29-2081	Opticians, Dispensing	22	0	22	\$18.16
31-2011	Occupational Therapy Assistants	19	0	19	\$33.97
29-2031	Cardiovascular Technologists and Technicians	13	0	13	\$26.32
29-2032	Diagnostic Medical Sonographers	16	8	8	\$37.14
29-2035	Magnetic Resonance Imaging Technologists	7	0	7	\$37.98
31-2012	Occupational Therapy Aides	5	0	5	\$16.01

Numbers may not sum due to rounding.

Source: Emsi program demand gap model.

## ADDITIONS AT THE TRANSFER-TRACK DEGREE LEVEL

As seen in Table 4.3, business, finance, and engineering occupations appear to be undersupplied in San Bernardino County. A number of the occupations likely relate to the Warehousing & Storage, Truck Transportation and Merchant Wholesalers, Durable Goods industry subsectors. For example, production, planning, & expediting clerks; logisticians; and sales representatives, wholesale & manufacturing, technical & scientific products would all support these key industry subsectors. Median hourly wage rates range between \$17.27 for advertising sales agents to \$57.29 for training & development managers.

Table 4.3: VVC's Programmatic Areas of Opportunity at the Bachelor's Degree Level

<b>SOC CODE</b>	<b>SOC TITLE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>ANNUAL REGIONAL COMPLETERS</b>	<b>GAP</b>	<b>MEDIAN HOURLY WAGE</b>
41-3021	Insurance Sales Agents	152	0	152	\$19.71
43-5061	Production, Planning, and Expediting Clerks	137	0	137	\$21.21
13-1028	Buyers and Purchasing Agents	135	1	134	\$25.75
43-4061	Eligibility Interviewers, Government Programs	116	2	115	\$21.16
41-3031	Securities, Commodities, and Financial Services Sales Agents	85	0	85	\$18.82
17-2051	Civil Engineers	82	0	82	\$52.44
13-2072	Loan Officers	71	0	71	\$30.35
13-1151	Training and Development Specialists	69	0	69	\$28.26
13-1081	Logisticians	65	0	65	\$33.97
41-4011	Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	62	0	62	\$31.76
29-2018	Clinical Laboratory Technologists and Technicians	49	5	44	\$23.02
17-2141	Mechanical Engineers	41	0	41	\$37.63
17-2112	Industrial Engineers	41	0	41	\$39.54
13-2051	Financial Analysts	38	1	36	\$36.71
13-2052	Personal Financial Advisors	35	0	35	\$37.89
27-1025	Interior Designers	30	1	29	\$21.29
41-3011	Advertising Sales Agents	29	1	28	\$17.27
43-3061	Procurement Clerks	26	0	26	\$20.89
17-2071	Electrical Engineers	24	1	23	\$39.09
19-4093	Forest and Conservation Technicians	22	0	22	\$18.96
17-1011	Architects, Except Landscape and Naval	22	0	22	\$33.57
17-2072	Electronics Engineers, Except Computer	22	0	22	\$51.14
13-2082	Tax Preparers	20	1	19	\$21.20
41-9031	Sales Engineers	18	0	18	\$43.08
11-3061	Purchasing Managers	15	0	15	\$47.28
13-2031	Budget Analysts	14	0	14	\$32.33
13-1141	Compensation, Benefits, and Job Analysis Specialists	14	0	14	\$29.53



<b>SOC CODE</b>	<b>SOC TITLE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>ANNUAL REGIONAL COMPLETERS</b>	<b>GAP</b>	<b>MEDIAN HOURLY WAGE</b>
21-1094	Community Health Workers	17	3	14	\$22.80
11-3131	Training and Development Managers	13	0	13	\$57.29
29-9011	Occupational Health and Safety Specialists	11	0	11	\$37.21

Numbers may not sum due to rounding.  
Source: Emsi program demand gap model.

## SUMMARY

There are 79 certificate, associate, and transfer-track level programmatic areas of opportunity that have been identified, many of which are related to transportation, healthcare, and business programs. Some of the suggested potential new programs are related to current programs, indicating that there may be an opportunity to adjust current programming to align with the labor market demand. Even though many of these suggested occupations require a certificate level of education or lower, more of the regional labor market demand may be captured by developing an associate degree program around some of these occupations, and completers of an associate degree program will be more competitive in the labor market. While the size of the gap is important, special attention should be given to the occupations with high wages.

## APPENDIX 1: Glossary of Terms

**Associate Degree** A degree granted for the successful completion of a sub-baccalaureate program of study, usually requiring at least two years (or equivalent) of full-time college-level study. This includes degrees granted in a cooperative or work-study program. For the program demand gap analysis, degrees of greater than two years but less than four, as defined by IPEDS, are included in the associate degree category.

**Certificate** A formal award certifying the satisfactory completion of a postsecondary education program. Certificates can be awarded at any level of postsecondary education and include awards below the associate degree level. For the program demand gap analysis, this includes awards of less than one year and greater than one year but less than two, as defined by IPEDS.

**Gap** Represents a deficit, or when there are more job openings in a particular occupation than there are completers from higher education institutions within the region. If left unaddressed, a gap may lead to missed opportunities for economic growth and put stress on local businesses to find the necessary talent elsewhere. Significant gaps translate into higher human resources costs and decreased efficiencies in the economic system. They also provide an opportunity for educational institutions to develop new programs and/or strengthen their current programs.

**Industry Jobs** Emsi industry data have various sources depending on the class of worker. Emsi primarily uses the QCEW (Quarterly Census of Employment and Wages), with supplemental estimates from County Business Patterns. Non-QCEW employees data are based on a number of sources including QCEW, Current Employment Statistics, County Business Patterns, BEA State and Local Personal Income reports, the National Industry-Occupation Employment Matrix (NIOEM), the American Community Survey, and Railroad Retirement Board statistics. Self-Employed class of worker data are primarily based on the American Community Survey, Nonemployer Statistics, and BEA State and Local Personal Income Reports. The Extended Proprietor class of worker is not included in the analysis. Projections for QCEW and non-QCEW Employees are informed by NIOEM and long-term industry projections published by individual states.

**IPEDS** The Integrated Postsecondary Education Data System (IPEDS) aggregates interrelated surveys conducted annually by the U.S. Department of Education's National Center for Education Statistics (NCES). IPEDS gathers information from every educational institution in the U.S. that participates in the federal student financial aid programs authorized by Title IV of the Higher Education Act of 1965. These educational institutions include

research universities, state colleges and universities, private religious and liberal arts colleges, for-profit institutions, community and technical colleges, non-degree-granting institutions such as beauty colleges, and others.

**Job Openings** Job openings are a combination of job growth, which occurs when an employer experiences greater demand for its products and hires new employees to increase production, and replacement needs, which occurs when employees leave the workforce or change occupations. Throughout the program demand gap analysis, they represent the average number of projected openings between 2018 and 2028. Job openings are calculated for each occupation mapped to a program and are de-duplicated across programs mapped to the same occupation using Emsi's weighting methodology. For each award level, the number of openings is reported for that educational level and one education level below it.

**Location Quotient (LQ)** A comparative statistic used to calculate the relative employment concentration of an industry or occupation against the employment of the industry in a larger geographic region (i.e. a county's LQ relative to the U.S.). Industries with a higher location quotient (usually greater than 1.2) indicate that the smaller geographic region has a comparative advantage or specialization in the production of that good or service or has a high degree of specialization within its workforce.

**NAICS** The North American Industry Classification System (NAICS) classifies North American business establishment in order to better collect, analyze, and publish statistical data related to the business economy.

**New Programs Additions** New program additions are workforce gaps that exist for occupations the institution does not currently train for, based on the mapping of the institution's current programs. The award level recommended for the occupations is determined based by the level of education of workers currently employed in the occupation.

**Program Completions** For the program demand gap analysis, program completions are the average number of students, over a three-year period, who receive an award or degree for a program of study, as reported to IPEDS. An average over three years is used to control for upward or downward spikes in completions in any one year.

**Staffing Patterns** show the percentage of total industry jobs a specific occupation makes up. For example, a (simplified) staffing pattern for the Hospitals industry might show that 20% of all industry jobs are occupied by registered nurses, 15% by general practitioners, 10% by



surgeons, five percent by information technology support staff, five percent by janitors, one percent by chief executives, and so on.

**Transfer-Track** degrees are not a formal award level according to IPEDS. They are associate degrees, as defined by IPEDS, that prepare students to pursue a baccalaureate degree, as opposed to a two-year terminal degree. Transfer-track degrees are usually awarded as Associate of Arts (AA) or Associate of Science (AS) degrees, compared to terminal associate degrees, usually awarded as Associate of Applied Science (AAS) or Associate of Applied Arts (AAA) degrees.

**Surplus** Represents an oversupply, or when there are more completers from regional educational institutions than there are job openings in a particular occupation. If left unaddressed, significant surpluses may lead to higher unemployment rates or higher attrition rates—the institution could be educating a workforce that is leaving the region after program completion because of a lack of job opportunities. In the tables, values in parentheses represent a surplus.

## APPENDIX 2: About Emsi Data

### LABOR MARKET INFORMATION

Traditional labor market information (LMI) helps us to identify those occupations with good jobs and projected growth in the coming decade. This provides a robust, market-driven foundation upon which to build out programmatic recommendations. Emsi's data then allows us to map these occupations back to programs that train for them, and to extrapolate other occupational outcomes for potential graduates. Emsi data are used to calculate the projected number of annual job openings from 2018 to 2028. These projections account for openings due to job growth and openings due to replacement needs, such as when an employee retires or leaves the position. To capture a complete picture of industry employment, Emsi gathers and integrates economic, labor market, demographic, and educational data from over 40 government and private-sector sources. In doing so, Emsi creates a comprehensive and current database that includes both published data and detailed estimates, with full coverage of the U.S.

More specifically, Emsi combines covered employment data from the Quarterly Census of Employment and Wages (QCEW-produced by the Department of Labor) with total employment data in Regional Economic Information System (REIS-published by the Bureau of Economic Analysis or BEA). The data are augmented with County Business Patterns (CBP) and Non-Employer Statistics (NES) published by the Census Bureau. Job projections are based on the latest-available Emsi industry data, 15-year past local trends in each industry, growth rates in statewide and, where available, sub-state area industry projections published by individual state agencies and, in part, growth rates in national projections from the Bureau of Labor Statistics (BLS).

Through this combination of data sources, Emsi is able to fill gaps in individual sources (such as suppressions), yielding a composite database that leverages the strengths of all its sources. Finally, Emsi's database is updated quarterly, providing the most up-to-date integrated information possible.

## JOB POSTING ANALYTICS

Job postings are online advertisements for jobs, posted by companies trying to attract applicants. Analyzing job postings for information on the labor market can yield valuable insight, such as skills that employers are requesting, the companies that are posting jobs, where those jobs are located, and greater specificity in job titles. In addition, job postings also have virtually no lag time, as they can be collected from sites soon after being posted. However, not all jobs are posted online, and in some cases, companies post far more positions than they intend to hire in an effort to cast a broad net for talent. Many factors can influence the number of postings that appear on the web for a particular job or company, including:

- Fluctuating prices of job postings
- Building waiting lists of potential hires should positions become vacant
- The hiring of new employees immediately or in six months
- Postings left online after positions have been filled
- Duplicate postings for a given position

It can be helpful to think of LMI as measuring the actions of all employers, whereas job postings analyses measure the intentions of those who post jobs. For postsecondary educational institutions, job postings indicate what is currently in demand across county or regional employers, including emerging needs. As such, job postings information can be used to help tailor program curricula so that graduates will be competitive in the job market. The sources collect about 100 million job postings per month from more than 90,000 companies. Emsi de-duplicates these postings down to approximately 8 million unique job postings per month. In the process, geographies are assigned to the postings as well as company names, job locations, skills, and so on.

Tables A2.1 to A2.3 show job postings for three occupations found throughout this report, selected because the occupations' titles are not helpful in a program's development. Note that the tables identify job postings using the SOC-O\*NET<sup>13</sup> system. LMI data are not available at the SOC-O\*NET level, but Emsi's job posting database has the ability for such searches. The tables also include data on unique job postings and posting intensity. Posting intensity is the ratio between total and unique job postings and can be seen as an indication

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13 O\*NET refers to Occupational Information Network. Based on the SOC, the O\*NET-SOC taxonomy currently includes 974 occupations, developed under the sponsorship of the U.S. Department of Labor's Employment & Training Administration through a grant to the North Carolina Department of Commerce.

of the intensity or effort by the poster to advertise and fill the position in question. The largest job poster is also identified, as well as the number of total and unique job postings by the company for the O\*NET occupation. Data for non-staffing companies are shown. Job postings include advertisements in the U.S. from February 2018 to January 2019 using Emsi's 2019.1 data run.

Table A2.1: Job Postings in the U.S. for Computer Occupations, All Other

O*NET CODE	O*NET TITLE	UNIQUE POSTINGS	% TOTAL	POSTING INTENSITY	TOP COMPANY (TOTAL / UNIQUE)
15-1199.09	Information Technology Project Managers	226,652	39.4%	5 : 1	Oracle Corporation (90,999 / 18,789)
15-1199.02	Computer Systems Engineers/Architects	183,312	31.9%	5 : 1	Oracle Corporation (59,991 / 15,010)
15-1199.01	Software Quality Assurance Engineers & Testers	136,840	23.8%	5 : 1	Anthem, Inc. (14,214 / 4,748)
15-1199.08	Business Intelligence Analysts	11,716	2.0%	4 : 1	Oracle Corporation (2,583 / 828)
15-1199.10	Search Marketing Strategists	6,631	1.2%	3 : 1	Deloitte LLP (613 / 186)
15-1199.05	Geographic Information Systems Technicians <sup>☛</sup>	3,308	0.6%	4 : 1	Arcadis U.S., Inc. (184 / 129)
15-1199.12	Document Management Specialists	1,976	0.3%	4 : 1	HCA-HealthONE LLC (209 / 77)
15-1199.06	Database Architects	1,645	0.3%	5 : 1	Zapier, Inc. (53 / 42)
15-1199.04	Geospatial Information Scientists & Technologists <sup>☛</sup>	1,380	0.2%	6 : 1	Army National Guard (1,698 / 246)
15-1199.03	Web Administrators	1,045	0.2%	3 : 1	U.S. Department of the Army (307 / 119)
15-1199.11	Video Game Designers	285	<0.1%	3 : 1	Booz Allen Hamilton Holding Corporation (113 / 12)
15-1199.07	Data Warehousing Specialists	136	<0.1%	6 : 1	Pharmalynx LLC (118 / 9)

<sup>☛</sup> The green economy will cause a change in occupations' employment demand or work and worker requirements such as tasks, skills, knowledge, and credentials. Green occupations are linked to Green Economy Sectors.  
 Source: Emsi Job Posting Analytics February 2018 to January 2019. National Center for O\*NET Development. O\*NET OnLine. Retrieved February 2019, from <https://www.onetonline.org>.

Table A2.2: Job Postings in the U.S. for Managers, All Other

O*NET CODE	O*NET TITLE	UNIQUE POSTINGS	% TOTAL	POSTING INTENSITY	TOP COMPANY (TOTAL / UNIQUE)
11-9199.02	Compliance Managers <sup>☛</sup>	29,921	41.5%	3 : 1	Anthem, Inc. (21,328 / 9,584)



O*NET CODE	O*NET TITLE	UNIQUE POSTINGS	% TOTAL	POSTING INTENSITY	TOP COMPANY (TOTAL / UNIQUE)
11-9199.04	Supply Chain Managers 🍃	26,181	36.3%	5:1	Deloitte LLP (29,207 / 3,187)
11-9199.01	Regulatory Affairs Managers 🍃	12,399	17.2%	4:1	Sterling Life Sciences LLC (1564 / 973)
11-9199.08	Loss Prevention Managers	1,685	2.3%	4:1	Amazon, Inc. (398 / 108)
11-9199.07	Security Managers	1171	1.6%	4:1	The GEO Group, Inc. (305 / 27)
11-9199.10	Wind Energy Project Managers 🍃	351	0.5%	3:1	Fieldco (113 / 43)
11-9199.03	Investment Fund Managers	311	0.4%	4:1	Deloitte LLP (36 / 14)
11-9199.09	Wind Energy Operations Managers 🍃	116	0.2%	3:1	General Electric Company (233 / 72)

🍃 The green economy will cause a change in occupations' employment demand or work and worker requirements such as tasks, skills, knowledge, and credentials. Green occupations are linked to Green Economy Sectors. No job postings are reported for brownfield redevelopment specialists & site managers.  
 Source: Emsi Job Posting Analytics February 2018 to January 2019. National Center for O\*NET Development. O\*NET OnLine. Retrieved February 2019, from <https://www.onetonline.org>.

Table A2.3: Job Postings in the U.S. for Business Operations Specialists, All Other

O*NET CODE	O*NET TITLE	UNIQUE POSTINGS	% TOTAL	POSTING INTENSITY	TOP COMPANY (TOTAL / UNIQUE)
13-1199.01	Energy Auditors * 🍃	2,656	26.1%	4:1	Tesla, Inc. (2,741 / 410)
13-1199.04	Business Continuity Planners *	2,297	22.5%	5:1	U.S. Bancorp (137 / 80)
13-1199.02	Security Management Specialists *	1,742	17.1%	4:1	The Home Depot, Inc. (1,476 / 760)
13-1199.03	Customs Brokers *	1,729	17.0%	5:1	Kuehne + Nagel, Inc. (673 / 121)
13-1199.06	Online Merchants *	1,004	9.8%	3:1	Safeway, Inc. (116 / 71)
13-1199.05	Sustainability Specialists * 🍃	766	7.5%	4:1	Stericycle, Inc. (191 / 23)

\* Bright Outlook occupations are expected to grow rapidly in the next several years or will have large numbers of job openings. 🍃 The green economy will cause a change in occupations' employment demand or work and worker requirements such as tasks, skills, knowledge, and credentials. Green occupations are linked to Green Economy Sectors.  
 Source: Emsi Job Posting Analytics February 2018 to January 2019. National Center for O\*NET Development. O\*NET OnLine. Retrieved February 2019, from <https://www.onetonline.org>.



## APPENDIX 3: Environmental Scan Tables

### INDUSTRY COMPOSITION

Table A3.1: Current and Projected Jobs by Industry Subsector in San Bernardino County, 2018 and 2028

NAICS CODE	NAICS TITLE	2018 JOBS	2028 JOBS	CHANGE	% CHANGE
903	Local Government	97,661	108,570	10,908	11%
722	Food Services & Drinking Places	63,876	75,626	11,750	18%
561	Administrative & Support Services	58,916	60,047	1,130	2%
621	Ambulatory Health Care Services	40,465	52,899	12,435	31%
624	Social Assistance	37,707	51,976	14,269	38%
493	Warehousing & Storage	36,987	56,121	19,133	52%
238	Specialty Trade Contractors	35,188	40,227	5,039	14%
901	Federal Government	33,394	33,499	106	0%
541	Professional, Scientific, & Technical Services	27,218	29,237	2,018	7%
423	Merchant Wholesalers, Durable Goods	24,306	26,537	2,230	9%
622	Hospitals	22,805	25,041	2,236	10%
484	Truck Transportation	21,679	22,482	803	4%
452	General Merchandise Stores	17,848	16,112	(1,736)	(10%)
445	Food & Beverage Stores	16,710	17,293	584	3%
611	Educational Services	14,856	17,184	2,328	16%
424	Merchant Wholesalers, Nondurable Goods	13,835	16,312	2,477	18%
811	Repair & Maintenance	13,756	14,937	1,180	9%
902	State Government	13,744	15,366	1,622	12%
623	Nursing & Residential Care Facilities	13,088	15,399	2,311	18%
441	Motor Vehicle & Parts Dealers	12,991	14,415	1,424	11%
812	Personal & Laundry Services	12,183	14,336	2,153	18%
492	Couriers & Messengers	11,593	15,396	3,803	33%



NAICS CODE	NAICS TITLE	2018 JOBS	2028 JOBS	CHANGE	% CHANGE
448	Clothing & Clothing Accessories Stores	10,890	11,855	965	9%
813	Religious, Grantmaking, Civic, Professional, & Similar Organizations	9,998	10,366	369	4%
236	Construction of Buildings	9,870	10,198	328	3%
531	Real Estate	8,904	9,264	360	4%
332	Fabricated Metal Product Manufacturing	8,178	7,809	(369)	(5%)
522	Credit Intermediation & Related Activities	7,714	6,837	(877)	(11%)
311	Food Manufacturing	7,448	8,294	846	11%
524	Insurance Carriers & Related Activities	7,155	6,781	(374)	(5%)
713	Amusement, Gambling, & Recreation Industries	7,087	8,039	952	13%
488	Support Activities for Transportation	6,611	7,769	1,157	18%
444	Building Material & Garden Equipment & Supplies Dealers	6,448	6,249	(199)	(3%)
326	Plastics & Rubber Products Manufacturing	5,936	5,488	(448)	(8%)
551	Management of Companies & Enterprises	5,931	5,410	(521)	(9%)
446	Health & Personal Care Stores	5,807	6,991	1,184	20%
721	Accommodation	5,131	5,886	756	15%
447	Gasoline Stations	4,976	6,085	1,109	22%
453	Miscellaneous Store Retailers	4,951	4,726	(225)	(5%)
237	Heavy & Civil Engineering Construction	4,881	5,119	238	5%
336	Transportation Equipment Manufacturing	4,578	4,771	193	4%
327	Nonmetallic Mineral Product Manufacturing	3,957	3,587	(370)	(9%)
221	Utilities	3,811	3,407	(405)	(11%)
333	Machinery Manufacturing	3,704	3,412	(292)	(8%)
451	Sporting Goods, Hobby, Musical Instrument, & Book Stores	3,541	4,347	806	23%
454	Nonstore Retailers	3,531	4,389	858	24%
337	Furniture & Related Product Manufacturing	3,436	2,754	(683)	(20%)
331	Primary Metal Manufacturing	3,296	2,914	(382)	(12%)
485	Transit & Ground Passenger Transportation	2,902	3,461	559	19%
442	Furniture & Home Furnishings Stores	2,850	2,811	(39)	(1%)
443	Electronics & Appliance Stores	2,821	3,041	220	8%



NAICS CODE	NAICS TITLE	2018 JOBS	2028 JOBS	CHANGE	% CHANGE
711	Performing Arts, Spectator Sports, & Related Industries	2,812	3,006	194	7%
339	Miscellaneous Manufacturing	2,765	2,678	(86)	(3%)
517	Telecommunications	2,716	2,669	(47)	(2%)
532	Rental & Leasing Services	2,669	2,779	110	4%
325	Chemical Manufacturing	2,577	2,338	(239)	(9%)
482	Rail Transportation	2,545	2,294	(251)	(10%)
425	Wholesale Electronic Markets & Agents & Brokers	2,486	2,578	92	4%
562	Waste Management & Remediation Services	2,237	2,567	330	15%
335	Electrical Equipment, Appliance, & Component Manufacturing	2,209	2,100	(109)	(5%)
321	Wood Product Manufacturing	2,131	1,940	(191)	(9%)
322	Paper Manufacturing	1,770	2,239	470	27%
323	Printing & Related Support Activities	1,685	1,663	(22)	(1%)
334	Computer & Electronic Product Manufacturing	1,685	1,780	95	6%
312	Beverage & Tobacco Product Manufacturing	1,623	1,776	153	9%
512	Motion Picture & Sound Recording Industries	1,422	1,701	279	20%
814	Private Households	1,222	176	(1,047)	(86%)
112	Animal Production & Aquaculture	968	475	(493)	(51%)
523	Securities, Commodity Contracts, & Other Financial Investments & Related Activities	961	931	(30)	(3%)
111	Crop Production	858	718	(140)	(16%)
511	Publishing Industries (except Internet)	851	727	(124)	(15%)
115	Support Activities for Agriculture & Forestry	666	712	46	7%
212	Mining (except Oil & Gas)	609	743	134	22%
515	Broadcasting (except Internet)	493	402	(90)	(18%)
314	Textile Product Mills	460	352	(109)	(24%)
481	Air Transportation	409	137	(273)	(67%)
315	Apparel Manufacturing	379	315	(64)	(17%)
712	Museums, Historical Sites, & Similar Institutions	207	271	65	31%
486	Pipeline Transportation	191	188	(3)	(2%)
518	Data Processing, Hosting, & Related Services	165	109	(55)	(34%)



NAICS CODE	NAICS TITLE	2018 JOBS	2028 JOBS	CHANGE	% CHANGE
519	Other Information Services	147	197	51	35%
324	Petroleum & Coal Products Manufacturing	119	98	(21)	(18%)
483	Water Transportation	70	110	40	57%
213	Support Activities for Mining	58	63	6	10%
316	Leather & Allied Product Manufacturing	56	36	(20)	(36%)
113	Forestry & Logging	37	29	(8)	(21%)
525	Funds, Trusts, & Other Financial Vehicles	33	45	12	37%
491	Postal Service	28	31	3	10%
487	Scenic & Sightseeing Transportation	22	22	(0)	(2%)
533	Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	14	13	(1)	(4%)
313	Textile Mills	13	6	(7)	(54%)
114	Fishing, Hunting & Trapping	10	6	(4)	(40%)
521	Monetary Authorities-Central Bank	2	1	(0)	(18%)
211	Oil & Gas Extraction	1	1	(0)	(21%)
<b>Total</b>		<b>849,533</b>	<b>952,094</b>	<b>102,562</b>	<b>1%</b>

Source: Employees & Self-Employed 2019.1.

Table A3.2: Employment Concentration (LQ) by Industry Subsector in San Bernardino County, 2018 and 2028

NAICS CODE	NAICS TITLE	2018 LQ	2028 LQ
493	Warehousing & Storage	6.45	7.61
492	Couriers & Messengers	3.03	3.56
484	Truck Transportation	2.45	2.36
482	Rail Transportation	2.17	1.87
327	Nonmetallic Mineral Product Manufacturing	1.78	1.59
331	Primary Metal Manufacturing	1.67	1.58
488	Support Activities for Transportation	1.67	1.67
624	Social Assistance	1.65	1.80
326	Plastics & Rubber Products Manufacturing	1.56	1.45



NAICS CODE	NAICS TITLE	2018 LQ	2028 LQ
337	Furniture & Related Product Manufacturing	1.56	1.20
811	Repair & Maintenance	1.53	1.52
423	Merchant Wholesalers, Durable Goods	1.48	1.51
448	Clothing & Clothing Accessories Stores	1.44	1.62
901	Federal Government	1.32	1.29
903	Local Government	1.30	1.33
221	Utilities	1.29	1.07
424	Merchant Wholesalers, Nondurable Goods	1.22	1.34
441	Motor Vehicle & Parts Dealers	1.20	1.18
561	Administrative & Support Services	1.16	1.04
238	Specialty Trade Contractors	1.15	1.17
312	Beverage & Tobacco Product Manufacturing	1.13	1.09
452	General Merchandise Stores	1.09	0.92
335	Electrical Equipment, Appliance, & Component Manufacturing	1.07	1.00
442	Furniture & Home Furnishings Stores	1.07	1.03
332	Fabricated Metal Product Manufacturing	1.06	0.98
451	Sporting Goods, Hobby, Musical Instrument, & Book Stores	1.06	1.16
812	Personal & Laundry Services	1.06	1.08
443	Electronics & Appliance Stores	1.04	1.22
722	Food Services & Drinking Places	1.02	1.05
445	Food & Beverage Stores	1.01	0.99
446	Health & Personal Care Stores	1.01	1.08
447	Gasoline Stations	1.01	1.11
621	Ambulatory Health Care Services	0.99	0.99
453	Miscellaneous Store Retailers	0.98	0.88
562	Waste Management & Remediation Services	0.96	0.92
321	Wood Product Manufacturing	0.95	0.82
454	Nonstore Retailers	0.94	1.00
322	Paper Manufacturing	0.92	1.22
444	Building Material & Garden Equipment & Supplies Dealers	0.92	0.81



<b>NAICS CODE</b>	<b>NAICS TITLE</b>	<b>2018 LQ</b>	<b>2028 LQ</b>
236	Construction of Buildings	0.89	0.81
532	Rental & Leasing Services	0.89	0.84
237	Heavy & Civil Engineering Construction	0.88	0.74
311	Food Manufacturing	0.87	0.90
622	Hospitals	0.86	0.84
485	Transit & Ground Passenger Transportation	0.83	0.83
339	Miscellaneous Manufacturing	0.81	0.75
531	Real Estate	0.79	0.74
713	Amusement, Gambling, & Recreation Industries	0.76	0.74
486	Pipeline Transportation	0.74	0.66
623	Nursing & Residential Care Facilities	0.74	0.75
314	Textile Product Mills	0.70	0.58
323	Printing & Related Support Activities	0.70	0.78
611	Educational Services	0.68	0.66
517	Telecommunications	0.66	0.70
425	Wholesale Electronic Markets & Agents & Brokers	0.65	0.62
333	Machinery Manufacturing	0.64	0.58
813	Religious, Grantmaking, Civic, Professional, & Similar Organizations	0.64	0.60
711	Performing Arts, Spectator Sports, & Related Industries	0.63	0.60
212	Mining (except Oil & Gas)	0.61	0.73
325	Chemical Manufacturing	0.59	0.52
315	Apparel Manufacturing	0.55	0.60
522	Credit Intermediation & Related Activities	0.55	0.45
512	Motion Picture & Sound Recording Industries	0.53	0.54
336	Transportation Equipment Manufacturing	0.52	0.51
541	Professional, Scientific, & Technical Services	0.49	0.45
551	Management of Companies & Enterprises	0.49	0.40
902	State Government	0.49	0.51
524	Insurance Carriers & Related Activities	0.48	0.41
721	Accommodation	0.48	0.51



<b>NAICS CODE</b>	<b>NAICS TITLE</b>	<b>2018 LQ</b>	<b>2028 LQ</b>
525	Funds, Trusts, & Other Financial Vehicles	0.45	0.50
491	Postal Service	0.44	0.31
112	Animal Production & Aquaculture	0.43	0.21
316	Leather & Allied Product Manufacturing	0.35	0.23
515	Broadcasting (except Internet)	0.34	0.29
334	Computer & Electronic Product Manufacturing	0.30	0.34
814	Private Households	0.26	0.04
115	Support Activities for Agriculture & Forestry	0.23	0.21
712	Museums, Historical Sites, & Similar Institutions	0.23	0.25
511	Publishing Industries (except Internet)	0.21	0.17
111	Crop Production	0.20	0.16
324	Petroleum & Coal Products Manufacturing	0.20	0.16
483	Water Transportation	0.20	0.27
523	Securities, Commodity Contracts, & Other Financial Investments & Related Activities	0.18	0.15
481	Air Transportation	0.15	0.05
487	Scenic & Sightseeing Transportation	0.11	0.09
533	Lessors of Nonfinancial Intangible Assets (except Copyrighted Works)	0.11	0.10
518	Data Processing, Hosting, & Related Services	0.10	0.05
113	Forestry & Logging	0.09	0.08
519	Other Information Services	0.09	0.08
114	Fishing, Hunting & Trapping	0.06	0.04
213	Support Activities for Mining	0.03	0.03
313	Textile Mills	0.02	0.01
521	Monetary Authorities-Central Bank	0.01	0.01
211	Oil & Gas Extraction	0.00	0.00

Source: Employees & Self-Employed 2019.1.



## INDUSTRY STAFFING PATTERNS

The following tables show the staffing patterns of the industry subsectors discussed in Chapter 2. The Entry Ed Level Column describes the typical award level required for an entry level position in the occupation. “None” or “<HS/GED” indicates that the occupation typically requires no formal educational credential; “HS/GED” refers to a high school diploma or its equivalent, a General Equivalency Development or General Equivalency Diploma test; “Cert” refers to a postsecondary nondegree award or some college education with no degree; and “Doctoral” refers to a doctoral or professional degree level of education. The other education classifications are straightforward.

Table A3.3: Employment Projections in San Bernardino County for the Top 25 Occupations Related to the Local Government Industry Subsector

<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>JOB OPENINGS</b>	<b>% JOBS IN INDUSTRY</b>	<b>MEDIAN HOURLY WAGE</b>	<b>ENTRY ED LEVEL</b>
Elementary School Teachers, Except Special Education	8,859	9,911	912	9.0%	\$41.64	BACH
Teacher Assistants	8,299	9,152	1,219	8.4%	\$15.94	CERT
Secondary School Teachers, Except Special and Career/Technical Education	4,640	5,313	490	4.7%	\$37.37	BACH
Postsecondary Teachers	4,117	4,763	1,041	4.2%	\$35.16	DOC
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	3,194	3,523	1,583	3.2%	\$14.07	HS/GED
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	2,943	2,855	1,397	3.0%	\$17.51	HS/GED
Substitute Teachers	2,872	3,263	471	2.9%	\$15.77	BACH
Police and Sheriff's Patrol Officers	2,551	3,022	290	2.6%	\$45.49	HS/GED
Office Clerks, General	2,472	2,496	2,020	2.5%	\$16.31	HS/GED
Registered Nurses	2,321	2,402	1,330	2.4%	\$44.98	BACH
Middle School Teachers, Except Special and Career/Technical Education	1,526	1,874	192	1.5%	\$40.81	BACH
Childcare Workers	1,407	1,535	1,101	1.4%	\$9.93	HS/GED
Combined Food Preparation and Serving Workers, Including Fast Food	1,347	1,489	5,585	1.4%	\$11.28	HS/GED
Maintenance and Repair Workers, General	1,286	1,455	871	1.3%	\$18.35	HS/GED

<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>JOB OPENINGS</b>	<b>% JOBS IN INDUSTRY</b>	<b>MEDIAN HOURLY WAGE</b>	<b>ENTRY ED LEVEL</b>
Correctional Officers and Jailers	1,282	1,342	212	1.3%	\$38.62	HS/GED
Bus Drivers, School or Special Client	1,138	1,236	351	1.2%	\$18.91	HS/GED
Firefighters	1,075	1,292	118	1.1%	\$27.94	CERT
Gaming Dealers	1,022	1,147	212	1.0%	\$11.92	HS/GED
Special Education Teachers, Kindergarten and Elementary School	941	1,070	96	1.0%	\$37.03	BACH
Education Administrators, Elementary and Secondary School	895	1,043	110	0.9%	\$60.37	MAST
Landscaping and Groundskeeping Workers	840	950	1,185	0.9%	\$12.97	HS/GED
Educational, Guidance, School, and Vocational Counselors	836	949	161	0.8%	\$37.82	MAST
Bookkeeping, Accounting, and Auditing Clerks	823	848	1,031	0.8%	\$19.02	CERT
Eligibility Interviewers, Government Programs	772	874	212	0.8%	\$21.16	HS/GED
Office and Administrative Support Workers, All Other	758	823	288	0.8%	\$13.20	HS/GED

Source: Employees & Self-Employed 2019.1.

Table A3.4: Employment Projections in San Bernardino County for the Top 25 Occupations Related to the Social Assistance Industry Subsector

<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>JOB OPENINGS</b>	<b>% JOBS IN INDUSTRY</b>	<b>MEDIAN HOURLY WAGE</b>	<b>ENTRY ED LEVEL</b>
Personal Care Aides	20,756	30,629	6,216	55.0%	\$11.32	CERT
Childcare Workers	4,315	3,682	1,101	11.4%	\$9.94	CERT
Social and Human Service Assistants	878	1,293	333	2.3%	\$18.48	BACH
Preschool Teachers, Except Special Education	838	939	243	2.2%	\$13.94	CERT
Home Health Aides	656	1,622	474	1.7%	\$14.17	CERT
Social and Community Service Managers	645	898	156	1.7%	\$24.61	BACH
Rehabilitation Counselors	507	577	109	1.3%	\$13.98	MAST
Marriage and Family Therapists	434	536	161	1.2%	\$19.10	MAST
Substance Abuse, Behavioral Disorder, and Mental Health Counselors	422	575	230	1.1%	\$19.62	MAST
Office Clerks, General	404	533	2,020	1.1%	\$16.31	CERT



<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>JOB OPENINGS</b>	<b>% JOBS IN INDUSTRY</b>	<b>MEDIAN HOURLY WAGE</b>	<b>ENTRY ED LEVEL</b>
Child, Family, and School Social Workers	385	608	179	1.0%	\$24.97	BACH
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	362	466	1,397	1.0%	\$17.52	CERT
First-Line Supervisors of Personal Service Workers	351	520	175	0.9%	\$16.16	CERT
Teacher Assistants	310	394	1,219	0.8%	\$15.94	CERT
Registered Nurses	277	402	1,330	0.7%	\$44.99	BACH
Nursing Assistants	264	462	701	0.7%	\$14.46	CERT
Healthcare Social Workers	251	386	151	0.7%	\$35.14	BACH
General and Operations Managers	220	307	1,129	0.6%	\$47.02	BACH
Recreation Workers	201	308	365	0.5%	\$12.11	CERT
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	197	234	1,583	0.5%	\$14.07	HS/GED
Community and Social Service Specialists, All Other	189	251	121	0.5%	\$26.80	BACH
Education Administrators, Preschool and Childcare Center/Program	188	195	30	0.5%	\$18.52	BACH
Licensed Practical and Licensed Vocational Nurses	152	216	417	0.4%	\$22.89	CERT
Mental Health and Substance Abuse Social Workers	145	207	90	0.4%	\$24.50	BACH
Laborers and Freight, Stock, and Material Movers, Hand	142	140	6,997	0.4%	\$13.53	HS/GED

Source: Employees & Self-Employed 2019.1.

Table A3.5: Employment Projections in San Bernardino County for the Top 25 Occupations Related to the Warehousing & Storage Industry Subsector

<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>JOB OPENINGS</b>	<b>% JOBS IN INDUSTRY</b>	<b>MEDIAN HOURLY WAGE</b>	<b>ENTRY ED LEVEL</b>
Laborers and Freight, Stock, and Material Movers, Hand	11,116	17,008	6,997	30.1%	\$13.53	HS/GED
Industrial Truck and Tractor Operators	5,163	7,561	1,492	14.0%	\$15.35	HS/GED
Stock Clerks and Order Fillers	3,001	4,271	2,746	8.1%	\$12.12	HS/GED
Packers and Packagers, Hand	2,960	4,556	1,436	8.0%	\$12.12	HS/GED
Shipping, Receiving, and Traffic Clerks	2,373	3,470	981	6.4%	\$15.09	HS/GED



<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>JOB OPENINGS</b>	<b>% JOBS IN INDUSTRY</b>	<b>MEDIAN HOURLY WAGE</b>	<b>ENTRY ED LEVEL</b>
First-line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	1,388	2,161	665	3.8%	\$26.32	CERT
Heavy and Tractor-Trailer Truck Drivers	1,262	2,140	2,622	3.4%	\$20.84	HS/GED
Light Truck or Delivery Services Drivers	663	1,049	1,309	1.8%	\$16.36	HS/GED
Machine Feeders and Offbearers	529	772	218	1.4%	\$14.52	HS/GED
Maintenance and Repair Workers, General	465	788	871	1.3%	\$18.34	HS/GED
Customer Service Representatives	450	714	1,474	1.2%	\$17.15	CERT
Transportation, Storage, and Distribution Managers	446	675	173	1.2%	\$40.47	CERT
First-Line Supervisors of Office and Administrative Support Workers	437	641	944	1.2%	\$26.06	CERT
Production, Planning, and Expediting Clerks	401	615	300	1.1%	\$21.21	BACH
General and Operations Managers	346	552	1,129	0.9%	\$47.02	BACH
Office Clerks, General	341	520	2,020	0.9%	\$16.31	CERT
Order Clerks	262	350	247	0.7%	\$17.14	CERT
Inspectors, Testers, Sorters, Samplers, and Weighers	250	406	359	0.7%	\$17.86	HS/GED
Weighers, Measurers, Checkers, and Samplers, Recordkeeping	245	341	99	0.7%	\$15.68	HS/GED
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	240	395	1,583	0.6%	\$14.07	HS/GED
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	192	277	1,397	0.5%	\$17.52	CERT
Packaging and Filling Machine Operators and Tenders	156	254	298	0.4%	\$12.29	HS/GED
Business Operations Specialists, All Other	149	227	545	0.4%	\$29.87	BACH
Bookkeeping, Accounting, and Auditing Clerks	148	216	1,031	0.4%	\$19.03	CERT
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	145	233	1,163	0.4%	\$26.42	BACH

Source: Employees & Self-Employed 2019.1.





Table A3.6: Employment Projections in San Bernardino County for the Top 25 Occupations Related to the Federal Government Industry Subsector

<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>JOB OPENINGS</b>	<b>% JOBS IN INDUSTRY</b>	<b>MEDIAN HOURLY WAGE</b>	<b>ENTRY ED LEVEL</b>
Military-only occupations	8,679	8,642	1,038	26.0%	\$20.93	CERT
Postal Service Mail Carriers	1,661	1,454	115	5.0%	\$29.00	CERT
Business Operations Specialists, All Other	966	1,029	545	2.9%	\$29.87	BACH
Claims Adjusters, Examiners, and Investigators	882	857	228	2.6%	\$13.56	BACH
Aircraft Mechanics and Service Technicians	616	618	133	1.8%	\$35.82	CERT
Managers, All Other	532	545	427	1.6%	\$21.52	BACH
Police and Sheriff's Patrol Officers	485	484	290	1.5%	\$45.48	BACH
Registered Nurses	474	501	1,330	1.4%	\$44.99	BACH
Postal Service Mail Sorters, Processors, and Processing Machine Operators	460	389	33	1.4%	\$26.64	CERT
Air Traffic Controllers	432	452	61	1.3%	\$28.20	CERT
Human Resources Specialists	430	432	319	1.3%	\$29.83	BACH
Computer Occupations, All Other	395	417	101	1.2%	\$36.78	BACH
Logisticians	391	398	135	1.2%	\$33.97	BACH
Airline Pilots, Copilots, and Flight Engineers	338	338	50	1.0%	\$115.89	BACH
Information and Record Clerks, All Other	329	351	140	1.0%	\$20.70	CERT
Eligibility Interviewers, Government Programs	324	343	212	1.0%	\$21.16	BACH
Postal Service Clerks	315	278	25	0.9%	\$28.38	CERT
Compliance Officers	314	334	135	0.9%	\$33.87	BACH
General and Operations Managers	298	306	1,129	0.9%	\$47.02	BACH
Forest and Conservation Technicians	294	310	51	0.9%	\$18.96	BACH
Maintenance and Repair Workers, General	287	286	871	0.9%	\$18.34	HS/GED
Office Clerks, General	282	279	2,020	0.8%	\$16.31	CERT
Human Resources Managers	279	278	85	0.8%	\$54.21	BACH
Management Analysts	269	286	299	0.8%	\$34.60	BACH
Social Workers, All Other	253	267	108	0.8%	\$31.37	BACH



Source: Employees & Self-Employed 2019.1.

Table A3.7: Employment Projections in San Bernardino County for the Top 25 Occupations Related to the Merchant Wholesalers, Durable Goods Industry Subsector

<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>JOB OPENINGS</b>	<b>% JOBS IN INDUSTRY</b>	<b>MEDIAN HOURLY WAGE</b>	<b>ENTRY ED LEVEL</b>
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	3,684	4,119	1,163	15.2%	\$26.42	BACH
Laborers and Freight, Stock, and Material Movers, Hand	2,661	2,962	6,997	10.9%	\$13.53	HS/GED
Stock Clerks and Order Fillers	1,038	1,142	2,746	4.3%	\$12.12	HS/GED
Shipping, Receiving, and Traffic Clerks	912	975	981	3.8%	\$15.09	HS/GED
Light Truck or Delivery Services Drivers	837	904	1,309	3.4%	\$16.36	HS/GED
General and Operations Managers	807	909	1,129	3.3%	\$47.02	BACH
Customer Service Representatives	647	693	1,474	2.7%	\$17.15	CERT
Office Clerks, General	641	675	2,020	2.6%	\$16.31	CERT
Heavy and Tractor-Trailer Truck Drivers	558	646	2,622	2.3%	\$20.84	HS/GED
Bookkeeping, Accounting, and Auditing Clerks	508	532	1,031	2.1%	\$19.03	CERT
Sales Managers	492	531	317	2.0%	\$40.50	BACH
Industrial Truck and Tractor Operators	492	557	1,492	2.0%	\$15.35	HS/GED
First-Line Supervisors of Non-Retail Sales Workers	459	444	232	1.9%	\$19.70	BACH
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	397	415	121	1.6%	\$31.76	BACH
First-Line Supervisors of Office and Administrative Support Workers	380	407	944	1.6%	\$26.06	CERT
Parts Salespersons	366	394	231	1.5%	\$15.46	HS/GED
Order Clerks	355	366	247	1.5%	\$17.14	CERT
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	350	351	1,397	1.4%	\$17.52	CERT
Bus and Truck Mechanics and Diesel Engine Specialists	340	372	282	1.4%	\$24.96	HS/GED
Buyers and Purchasing Agents	299	315	245	1.2%	\$25.75	BACH
Mobile Heavy Equipment Mechanics, Except Engines	288	327	131	1.2%	\$28.94	HS/GED



<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>JOB OPENINGS</b>	<b>% JOBS IN INDUSTRY</b>	<b>MEDIAN HOURLY WAGE</b>	<b>ENTRY ED LEVEL</b>
Assemblers and Fabricators, All Other, Including Team Assemblers	276	270	679	1.1%	\$13.14	HS/GED
First-line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	271	307	665	1.1%	\$26.32	CERT
Packers and Packagers, Hand	223	243	1,436	0.9%	\$12.12	HS/GED
Counter and Rental Clerks	217	241	493	0.9%	\$13.66	CERT

Source: Employees & Self-Employed 2019.1.

Table A3.8: Employment Projections in San Bernardino County for the Top 25 Occupations Related to the Truck Transportation Industry Subsector

<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>JOB OPENINGS</b>	<b>% JOBS IN INDUSTRY</b>	<b>MEDIAN HOURLY WAGE</b>	<b>ENTRY ED LEVEL</b>
Heavy and Tractor-Trailer Truck Drivers	12,847	13,466		59.3%	\$20.84	HS/GED
Laborers and Freight, Stock, and Material Movers, Hand	2,220	2,299		10.2%	\$13.53	HS/GED
Light Truck or Delivery Services Drivers	700	689		3.2%	\$16.36	HS/GED
Bus and Truck Mechanics and Diesel Engine Specialists	663	692		3.1%	\$24.96	HS/GED
First-line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	583	604		2.7%	\$26.32	CERT
Dispatchers, Except Police, Fire, and Ambulance	528	522		2.4%	\$18.64	CERT
Office Clerks, General	467	454		2.2%	\$16.31	CERT
Industrial Truck and Tractor Operators	310	324		1.4%	\$15.35	HS/GED
General and Operations Managers	267	281		1.2%	\$47.02	BACH
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	262	248		1.2%	\$17.52	CERT
Sales Representatives, Services, All Other	220	226		1.0%	\$22.27	BACH
Bookkeeping, Accounting, and Auditing Clerks	214	208		1.0%	\$19.03	CERT
Transportation, Storage, and Distribution Managers	208	210		1.0%	\$40.47	CERT
Customer Service Representatives	180	182		0.8%	\$17.15	CERT



<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>JOB OPENINGS</b>	<b>% JOBS IN INDUSTRY</b>	<b>MEDIAN HOURLY WAGE</b>	<b>ENTRY ED LEVEL</b>
First-Line Supervisors of Office and Administrative Support Workers	139	140		0.6%	\$26.06	CERT
Packers and Packagers, Hand	94	95		0.4%	\$12.12	HS/GED
Billing and Posting Clerks	85	90		0.4%	\$17.60	CERT
Stock Clerks and Order Fillers	74	76		0.3%	\$12.12	HS/GED
Cleaners of Vehicles and Equipment	72	75		0.3%	\$11.90	HS/GED
Managers, All Other	71	86		0.3%	\$21.52	BACH
Shipping, Receiving, and Traffic Clerks	63	63		0.3%	\$15.09	HS/GED
Maintenance and Repair Workers, General	51	54		0.2%	\$18.34	HS/GED
Cargo and Freight Agents	49	51		0.2%	\$22.44	CERT
First-Line Supervisors of Mechanics, Installers, and Repairers	48	51		0.2%	\$32.56	CERT
Production, Planning, and Expediting Clerks	47	48		0.2%	\$21.21	BACH

Source: Employees & Self-Employed 2019.1.

## WORKFORCE COMMUTING PATTERNS

Table A3.9: San Bernardino County Job Inflow and Outflow

	<b>JOBS</b>	<b>COMMUTE SHARE</b>
<b>EMPLOYMENT PATTERNS</b>		
Employed in San Bernardino County	631,347	100%
Employed in San Bernardino County but Living Outside	289,137	46%
Employed and Living in San Bernardino County	342,210	54%
<b>RESIDENTIAL PATTERNS</b>		
Living in San Bernardino County	719,532	100%
Living in San Bernardino County but Employed Outside	377,322	52%
Living and Employed in San Bernardino County	342,210	48%

Source: Census Bureau, Center for Economic Studies.

## EDUCATIONAL ATTAINMENT

Table A3.10: Highest Educational Attainments of Adults in San Bernardino County

EDUCATION LEVEL	2013 ADULTS	2013 % ADULTS	2018 ADULTS	2018 % ADULTS	CHANGE	% SHARE CHANGE
Less than high school diploma or equivalent	271,603	21%	308,692	22%	37,089	1.0%
High school diploma or equivalent	335,773	26%	362,065	26%	26,291	(0.1%)
Some college	317,029	25%	335,266	24%	18,237	(0.6%)
Associate degree	102,552	8%	109,859	8%	7,307	(0.1%)
Bachelor's degree	158,767	13%	171,315	12%	12,548	(0.1%)
Graduate degree or higher	83,737	7%	88,940	6%	5,203	(0.1%)
<b>Total</b>	<b>1,269,461</b>	<b>100%</b>	<b>1,376,136</b>	<b>100%</b>	<b>106,675</b>	<b>(0.0%)</b>

Source: Emsi demographics data and U.S. Census Bureau, 2017 American Community Survey.

Table A3.11: Highest Educational Attainments of Adults in San Bernardino County by Gender

EDUCATION LEVEL	ADULT MALES	% ADULT MALES	ADULT FEMALES	% ADULT FEMALES
Less than high school diploma or equivalent	156,786	23%	151,906	22%
High school diploma or equivalent	183,990	27%	178,075	25%
Some college	159,445	24%	175,821	25%
Associate degree	49,469	7%	60,390	9%
Bachelor's degree	81,690	12%	89,625	13%
Graduate degree and higher	40,598	6%	48,342	7%
<b>Total</b>	<b>671,977</b>	<b>100%</b>	<b>704,159</b>	<b>100%</b>

Source: Emsi demographics data and U.S. Census Bureau, 2017 American Community Survey.

Table A3.12: Highest Educational Attainments of Adults in San Bernardino County by Major Race and Ethnic Groups

GROUP		<HS	HS	SOME COLLEGE	ASSOC	BACH	GRAD+
White, non-Hispanic	Adults	41,210	122,985	133,443	44,161	70,551	43,544
	% Adults	9%	27%	29%	10%	15%	10%

Black, non-Hispanic	Adults	14,502	27,921	36,584	12,241	15,142	7,316
	% Adults	13%	25%	32%	11%	13%	6%
American Indian or Alaskan native, non-Hispanic	Adults	1,551	1,937	1,356	517	353	246
	% Adults	26%	32%	23%	9%	6%	4%
Asian, non-Hispanic	Adults	11,769	17,266	17,721	10,960	40,836	14,889
	% Adults	10%	15%	16%	10%	36%	13%
Native Hawaiian or Pacific Islander, non-Hispanic	Adults	576	1,461	1,028	445	500	183
	% Adults	14%	35%	25%	11%	12%	4%
Two or more races, non-Hispanic	Adults	3,232	4,914	6,777	2,068	2,491	1,446
	% Adults	15%	23%	32%	10%	12%	7%
Hispanic, all types	Adults	235,852	185,581	138,356	39,467	41,443	21,316
	% Adults	36%	28%	21%	6%	6%	3%

Source: Emsi demographics data and U.S. Census Bureau, 2017 American Community Survey.



## APPENDIX 4: Program to Occupation Map

Table A4.1 displays the crosswalk between educational programs (CIP codes) and occupations (SOC codes) that Emsi uses to complete the program demand gap analysis. Also listed are the adjustment factors which are applied to the annual job openings for each occupation in each program. The methodology for these factors is described in Appendix 5, with the program-based weight discussed under “De-duplication of Annual Openings” and the educational level adjustments explained under “Education Level Adjustments.”

Table A4.1: Program to Occupation Map with Employment Adjustment Factors

CIP CODE	CIP TITLE	SOC CODE	SOC TITLE	% WORKFORCE WITH EDUCATION LEVEL AND ONE LEVEL BELOW		
				CERT	ASSOC	BACH
01.0601	Applied Horticulture/Horticulture Operations, General	11-9013	Farmers, Ranchers, & Other Agricultural Managers	54	34	33
		25-1099	Postsecondary Teachers	13	13	38
		27-1023	Floral Designers	23	26	67
		37-1012	First-Line Supervisors of Landscaping, Lawn Service, & Groundskeeping Workers	53	34	26
		37-3011	Landscaping & Groundskeeping Workers	55	24	9
		37-3012	Pesticide Handlers, Sprayers, & Applicators, Vegetation	55	24	9
		37-3013	Tree Trimmers & Pruners	55	24	9
		45-1011	First-Line Supervisors of Farming, Fishing, & Forestry Workers	48	28	23
		45-2092	Farmworkers & Laborers, Crop, Nursery, & Greenhouse	39	19	8
01.0606	Plant Nursery Operations & Management	11-9013	Farmers, Ranchers, & Other Agricultural Managers	54	34	33
		25-1099	Postsecondary Teachers	13	13	38
		37-1012	First-Line Supervisors of Landscaping, Lawn Service, & Groundskeeping	53	34	26

CIP CODE	CIP TITLE	SOC CODE	SOC TITLE	% WORKFORCE WITH EDUCATION LEVEL AND ONE LEVEL BELOW		
				CERT	ASSOC	BACH
			Workers			
		37-3012	Pesticide Handlers, Sprayers, & Applicators, Vegetation	55	24	9
		45-1011	First-Line Supervisors of Farming, Fishing, & Forestry Workers	48	28	23
		45- 2092	Farmworkers & Laborers, Crop, Nursery, & Greenhouse	39	19	8
09.0101	Speech Communication & Rhetoric	11-2031	Public Relations & Fundraising Managers	9	10	70
		11-1031	Legislators	24	22	55
		25-1099	Postsecondary Teachers	13	13	38
		27-3011	Radio & Television Announcers	54	45	37
		27-3012	Public Address System & Other Announcers	54	45	37
		27- 3022	Reporters & Correspondents	16	16	68
		27-3031	Public Relations Specialists	13	14	69
		27- 3043	Writers & Authors	17	17	60
11.0103	Information Technology	11-3021	Computer & Information Systems Managers	20	22	60
		15-1111	Computer & Information Research Scientists	11	6	46
		15-1121	Computer Systems Analysts	13	15	64
		15-1122	Information Security Analysts	25	29	56
		15-1131	Computer Programmers	20	22	61
		15-1132	Software Developers, Applications	9	11	60
		15-1133	Software Developers, Systems Software	9	11	60
		15-1141	Database Administrators	15	16	59
		15-1142	Network & Computer Systems Administrators	30	37	59
		15-1143	Computer Network Architects	26	36	59
		15-1151	Computer User Support Specialists	45	47	48





CIP CODE	CIP TITLE	SOC CODE	SOC TITLE	% WORKFORCE WITH EDUCATION LEVEL AND ONE LEVEL BELOW		
				CERT	ASSOC	BACH
		15-1152	Computer Network Support Specialists	45	47	48
		15-1199	Computer Occupations, All Other	36	41	52
		43-9011	Computer Operators	55	47	38
		43-9021	Data Entry Keyers	62	50	33
11.0201	Computer Programming/Programmer, General	11-3021	Computer & Information Systems Managers	20	22	60
		15-1111	Computer & Information Research Scientists	11	6	46
		15-1121	Computer Systems Analysts	13	15	64
		15-1131	Computer Programmers	20	22	61
		15-1132	Software Developers, Applications	9	11	60
		15-1133	Software Developers, Systems Software	9	11	60
		15-1134	Web Developers	25	27	65
		15-1152	Computer Network Support Specialists	45	47	48
		15-1199	Computer Occupations, All Other	36	41	52
		25-1099	Postsecondary Teachers	13	13	38
12.0504	Restaurant, Culinary, & Catering Management/Manager	11-9051	Food Service Managers	64	44	25
		35-1011	Chefs & Head Cooks	56	47	29
		35-1012	First-Line Supervisors of Food Preparation & Serving Workers	70	46	18
		35-2013	Cooks, Private Household	64	31	8
15.1301	Drafting & Design Technology/Technician, General	17-3011	Architectural & Civil Drafters	36	57	58
		17-3012	Electrical & Electronics Drafters	36	57	58
		17-3013	Mechanical Drafters	36	57	58
		17-3019	Drafters, All Other	36	57	58
		27-1021	Commercial & Industrial Designers	23	26	67



CIP CODE	CIP TITLE	SOC CODE	SOC TITLE	% WORKFORCE WITH EDUCATION LEVEL AND ONE LEVEL BELOW		
				CERT	ASSOC	BACH
		51-4012	Computer Numerically Controlled Machine Tool Programmers, Metal & Plastic	74	47	18
19.0708	Child Care & Support Services Management	11-9031	Education Administrators, Preschool & Childcare Center/Program	21	22	41
		11-9151	Social & Community Service Managers	19	18	55
		21-1021	Child, Family, & School Social Workers	13	12	55
		21-1093	Social & Human Service Assistants	39	36	48
		25-1099	Postsecondary Teachers	13	13	38
		25-2011	Preschool Teachers, Except Special Education	45	45	45
		39-9011	Childcare Workers	65	46	22
19.0709	Child Care Provider/Assistant	21-1021	Child, Family, & School Social Workers	13	12	55
		21-1093	Social & Human Service Assistants	39	36	48
		25-9041	Teacher Assistants	60	45	32
		39-9011	Childcare Workers	65	46	22
22.0302	Legal Assistant/Paralegal	13-1041	Compliance Officers	23	23	55
		23-2011	Paralegals & Legal Assistants	27	34	64
		23-2093	Title Examiners, Abstractors, & Searchers	32	31	54
		23-2099	Legal Support Workers, All Other	32	31	54
		43-6012	Legal Secretaries	56	49	39
23.0101	English Language & Literature, General	25-1099	Postsecondary Teachers	13	13	38
		25-2021	Elementary School Teachers, Except Special Education	4	6	58
		25-2022	Middle School Teachers, Except Special & Career/Technical Education	4	6	58
		25-2031	Secondary School Teachers, Except Special & Career/Technical Education	6	7	57



CIP CODE	CIP TITLE	SOC CODE	SOC TITLE	% WORKFORCE WITH EDUCATION LEVEL AND ONE LEVEL BELOW		
				CERT	ASSOC	BACH
		25-4021	Librarians	21	24	34
		25-4031	Library Technicians	73	44	20
		27-3022	Reporters & Correspondents	16	16	68
		27-3041	Editors	18	18	66
		27-3042	Technical Writers	18	19	62
		27-3043	Writers & Authors	17	17	60
		43-9031	Desktop Publishers	45	40	46
		43-9081	Proofreaders & Copy Markers	32	27	57
27.0101	Mathematics, General	11-9121	Natural Sciences Managers	2	3	52
		15-2021	Mathematicians	7	8	46
		15-2031	Operations Research Analysts	16	16	51
		15-2041	Statisticians	7	8	46
		15-2098	Miscellaneous Mathematical Science Occupations	7	8	46
		25-1099	Postsecondary Teachers	13	13	38
		25-2022	Middle School Teachers, Except Special & Career/Technical Education	4	6	58
		25-2031	Secondary School Teachers, Except Special & Career/Technical Education	6	7	57
		43-9111	Statistical Assistants	52	43	37
30.0101	Biological & Physical Sciences	11-9121	Natural Sciences Managers	2	3	52
		17-2041	Chemical Engineers	11	10	68
		17-2081	Environmental Engineers	10	8	62
		17-2151	Mining & Geological Engineers, Including Mining Safety Engineers	9	7	68
		17-2161	Nuclear Engineers	10	11	62
		17-2171	Petroleum Engineers	9	7	68



CIP CODE	CIP TITLE	SOC CODE	SOC TITLE	% WORKFORCE WITH EDUCATION LEVEL AND ONE LEVEL BELOW		
				CERT	ASSOC	BACH
		17-2199	Engineers, All Other	10	11	62
		19-1012	Food Scientists & Technologists	9	12	62
		19-1013	Soil & Plant Scientists	9	12	62
		19-1021	Biochemists & Biophysicists	1	2	61
		19-1031	Conservation Scientists	4	5	77
		19-2011	Astronomers	3	3	34
		19-2012	Physicists	3	3	34
		19-2021	Atmospheric & Space Scientists	21	25	54
		19-2031	Chemists	3	3	71
		19-2032	Materials Scientists	3	3	71
		19-2041	Environmental Scientists & Specialists, Including Health	3	3	65
		19-2042	Geoscientists, Except Hydrologists & Geographers	3	3	65
		19-2043	Hydrologists	3	3	65
		19-4031	Chemical Technicians	41	35	49
		19-4041	Geological & Petroleum Technicians	47	35	45
		19-4051	Nuclear Technicians	47	35	45
		19-4092	Forensic Science Technicians	45	41	44
		25-1099	Postsecondary Teachers	13	13	38
		25-2031	Secondary School Teachers, Except Special & Career/Technical Education	6	7	57
		25-4013	Museum Technicians & Conservators	20	17	42
		15-2041	Statisticians	7	8	46
		19-1011	Animal Scientists	9	12	62
		19-1022	Microbiologists	1	2	61
		19-1023	Zoologists & Wildlife Biologists	1	2	61
		19-1029	Biological Scientists, All	1	2	61



CIP CODE	CIP TITLE	SOC CODE	SOC TITLE	% WORKFORCE WITH EDUCATION LEVEL AND ONE LEVEL BELOW		
				CERT	ASSOC	BACH
			Other			
		19-1041	Epidemiologists	1	2	20
		19-1042	Medical Scientists, Except Epidemiologists	1	2	20
		19-1099	Life Scientists, All Other	1	2	20
		19-4021	Biological Technicians	33	32	54
		19-4091	Environmental Science & Protection Technicians, Including Health	45	41	44
31.0505	Kinesiology & Exercise Science	11-9039	Education Administrators, All Other	21	22	41
		15-2041	Statisticians	7	8	46
		19-1021	Biochemists & Biophysicists	1	2	61
		29-1128	Exercise Physiologists	8	13	42
		29- 9091	Athletic Trainers	26	22	48
		39- 9031	Fitness Trainers & Aerobics Instructors	54	43	39
42.0101	Psychology, General	11-9199	Managers, All Other	32	26	50
		19-3031	Clinical, Counseling, & School Psychologists	0	0	14
		19-3032	Industrial-Organizational Psychologists	0	0	14
		19- 3039	Psychologists, All Other	0	0	14
		21-1012	Educational, Guidance, School, & Vocational Counselors	22	20	38
		21-1013	Marriage & Family Therapists	22	20	38
		21-1015	Rehabilitation Counselors	22	20	38
		21-1018	Substance Abuse, Behavioral Disorder, & Mental Health Counselors	22	20	38
		21-1021	Child, Family, & School Social Workers	13	12	55
		21-1022	Healthcare Social Workers	13	12	55
		21-1023	Mental Health & Substance Abuse Social Workers	13	12	55



CIP CODE	CIP TITLE	SOC CODE	SOC TITLE	% WORKFORCE WITH EDUCATION LEVEL AND ONE LEVEL BELOW		
				CERT	ASSOC	BACH
		25-1099	Postsecondary Teachers	13	13	38
		29-1066	Psychiatrists	0	0	1
		31-1013	Psychiatric Aides	72	55	17
43.0107	Criminal Justice/Police Science	11-9161	Emergency Management Directors	32	34	52
		25-1099	Postsecondary Teachers	13	13	38
		33-1012	First-Line Supervisors of Police & Detectives	52	54	39
		33-3011	Bailiffs	68	54	30
		33-3021	Detectives & Criminal Investigators	24	29	59
		33-3051	Police & Sheriff's Patrol Officers	46	49	49
		33-3052	Transit & Railroad Police	46	49	49
		33-9021	Private Detectives & Investigators	34	31	52
		33-9032	Security Guards	71	50	22
43.0201	Fire Prevention & Safety Technology/Technician	17-2111	Health & Safety Engineers, Except Mining Safety Engineers & Inspectors	13	13	70
		33-1021	First-Line Supervisors of Fire Fighting & Prevention Workers	63	60	31
		33-2011	Firefighters	59	65	38
		33-2021	Fire Inspectors & Investigators	60	50	35
		33-2022	Forest Fire Inspectors & Prevention Specialists	60	50	35
43.0203	Fire Science/Fire-fighting	33-1021	First-Line Supervisors of Fire Fighting & Prevention Workers	63	60	31
		33-2011	Firefighters	59	65	38
		33-2021	Fire Inspectors & Investigators	60	50	35
		33-2022	Forest Fire Inspectors & Prevention Specialists	60	50	35
45.0701	Geography	11-9199	Managers, All Other	32	26	50
		15-1199	Computer Occupations, All Other	36	41	52



CIP CODE	CIP TITLE	SOC CODE	SOC TITLE	% WORKFORCE WITH EDUCATION LEVEL AND ONE LEVEL BELOW		
				CERT	ASSOC	BACH
		17-1021	Cartographers & Photogrammetrists	18	21	70
		17-3022	Civil Engineering Technicians	59	54	35
		17-3031	Surveying & Mapping Technicians	65	52	28
		19-2021	Atmospheric & Space Scientists	21	25	54
		19-2041	Environmental Scientists & Specialists, Including Health	3	3	65
		19-3051	Urban & Regional Planners	4	3	38
		19-3092	Geographers	14	15	50
		19-4041	Geological & Petroleum Technicians	47	35	45
		19-4061	Social Science Research Assistants	45	41	44
		25-1099	Postsecondary Teachers	13	13	38
		25-4011	Archivists	20	17	42
		25-4012	Curators	20	17	42
45.1001	Political Science & Government, General	11-9199	Managers, All Other	32	26	50
		11-1031	Legislators	24	22	55
		13-1041	Compliance Officers	23	23	55
		13-1075	Labor Relations Specialists	26	25	59
		19-2041	Environmental Scientists & Specialists, Including Health	3	3	65
		19-3094	Political Scientists	14	15	50
		25-1099	Postsecondary Teachers	13	13	38
		27-3031	Public Relations Specialists	13	14	69
45.1101	Sociology	11-9199	Managers, All Other	32	26	50
		13-1041	Compliance Officers	23	23	55
		13-1075	Labor Relations Specialists	26	25	59
		19-2041	Environmental Scientists & Specialists, Including Health	3	3	65



CIP CODE	CIP TITLE	SOC CODE	SOC TITLE	% WORKFORCE WITH EDUCATION LEVEL AND ONE LEVEL BELOW		
				CERT	ASSOC	BACH
		19-3041	Sociologists	14	15	50
		19-3093	Historians	14	15	50
		19-4061	Social Science Research Assistants	45	41	44
		25-1099	Postsecondary Teachers	13	13	38
46.0415	Building Construction Technology	11-9021	Construction Managers	39	27	50
		13-1051	Cost Estimators	44	39	50
		13-1199	Business Operations Specialists, All Other	26	23	54
		17-3022	Civil Engineering Technicians	59	54	35
		25-2032	Career/Technical Education Teachers, Secondary School	6	7	57
		47-1011	First-Line Supervisors of Construction Trades & Extraction Workers	66	33	19
		47-2031	Carpenters	65	26	9
		47-2041	Carpet Installers	58	18	4
		47-2042	Floor Layers, Except Carpet, Wood, & Hard Tiles	58	18	4
		47-2043	Floor Sanders & Finishers	58	18	4
		47-2044	Tile & Marble Setters	58	18	4
		47-2051	Cement Masons & Concrete Finishers	56	21	7
		47-2053	Terrazzo Workers & Finishers	56	21	7
		47-2061	Construction Laborers	58	23	7
		47-2073	Operating Engineers & Other Construction Equipment Operators	71	29	10
		47-2081	Drywall & Ceiling Tile Installers	52	15	3
		47-2121	Glaziers	71	26	7
		47-2131	Insulation Workers, Floor, Ceiling, & Wall	64	28	8
		47-2132	Insulation Workers, Mechanical	64	28	8





CIP CODE	CIP TITLE	SOC CODE	SOC TITLE	% WORKFORCE WITH EDUCATION LEVEL AND ONE LEVEL BELOW		
				CERT	ASSOC	BACH
		47-2141	Painters, Construction & Maintenance	58	20	6
		47-2142	Paperhangers	58	20	6
		47-2181	Roofers	49	15	4
		47-2211	Sheet Metal Workers	75	35	11
		47-4011	Construction & Building Inspectors	58	45	36
		49-9071	Maintenance & Repair Workers, General	70	44	17
47.0101	Electrical/Electronics Equipment Installation & Repair, General	49-1011	First-Line Supervisors of Mechanics, Installers, & Repairers	61	51	31
		49-2011	Computer, Automated Teller, & Office Machine Repairers	59	57	37
		49-2021	Radio, Cellular, & Tower Equipment Installers & Repairs	72	51	22
		49-2092	Electric Motor, Power Tool, & Related Repairers	72	49	20
		49-2094	Electrical & Electronics Repairers, Commercial & Industrial Equipment	78	52	17
		49-2095	Electrical & Electronics Repairers, Powerhouse, Substation, & Relay	78	52	17
		49-2097	Electronic Home Entertainment Equipment Installers & Repairers	71	49	20
		49-9031	Home Appliance Repairers	74	45	13
		49-9061	Camera & Photographic Equipment Repairers	57	53	37
		49-9071	Maintenance & Repair Workers, General	70	44	17
		49-9097	Signal & Track Switch Repairers	71	39	15
		49-9099	Installation, Maintenance, & Repair Workers, All Other	71	39	15
		51-2021	Coil Winders, Tapers, & Finishers	69	38	14
47.0104	Computer Installation & Repair Technology/Technician	15-1151	Computer User Support Specialists	45	47	48



CIP CODE	CIP TITLE	SOC CODE	SOC TITLE	% WORKFORCE WITH EDUCATION LEVEL AND ONE LEVEL BELOW		
				CERT	ASSOC	BACH
		49-2011	Computer, Automated Teller, & Office Machine Repairers	59	57	37
		49-2094	Electrical & Electronics Repairers, Commercial & Industrial Equipment	78	52	17
47.0604	Automobile/Automotive Mechanics Technology/Technician	17-3027	Mechanical Engineering Technicians	59	54	35
		49-1011	First-Line Supervisors of Mechanics, Installers, & Repairers	61	51	31
		49-2093	Electrical & Electronics Installers & Repairers, Transportation Equipment	78	52	17
		49-2096	Electronic Equipment Installers & Repairers, Motor Vehicles	79	31	13
		49-3021	Automotive Body & Related Repairers	68	35	12
		49-3022	Automotive Glass Installers & Repairers	83	33	4
		49-3023	Automotive Service Technicians & Mechanics	68	43	17
		49-3093	Tire Repairers & Changers	68	33	9
		49-9071	Maintenance & Repair Workers, General	70	44	17
		53-6051	Transportation Inspectors	71	51	23
		53-7061	Cleaners of Vehicles & Equipment	66	29	6
47.0607	Airframe Mechanics & Aircraft Maintenance Technology/Technician	17-3021	Aerospace Engineering & Operations Technicians	59	54	35
		49-3011	Aircraft Mechanics & Service Technicians	75	60	21
		51-2011	Aircraft Structure, Surfaces, Rigging, & Systems Assemblers	71	32	14
		53-6051	Transportation Inspectors	71	51	23
47.0608	Aircraft Powerplant Technology/Technician	49-3011	Aircraft Mechanics & Service Technicians	75	60	21
		51-2011	Aircraft Structure, Surfaces, Rigging, & Systems Assemblers	71	32	14



CIP CODE	CIP TITLE	SOC CODE	SOC TITLE	% WORKFORCE WITH EDUCATION LEVEL AND ONE LEVEL BELOW				
				CERT	ASSOC	BACH		
48.050 8	Welding Technology/Welder	47-1011	First-Line Supervisors of Construction Trades & Extraction Workers	66	33	19		
		47-2152	Plumbers, Pipefitters, & Steamfitters	73	32	10		
		47-2171	Reinforcing Iron & Rebar Workers	60	18	4		
		47-2211	Sheet Metal Workers	75	35	11		
		47-2221	Structural Iron & Steel Workers	73	34	12		
		49- 9071	Maintenance & Repair Workers, General	70	44	17		
		51-4121	Welders, Cutters, Solderers, & Brazers	70	36	12		
		51-4122	Welding, Soldering, & Brazing Machine Setters, Operators, & Tenders	70	36	12		
		50.0101	Visual & Performing Arts, General	25-1099	Postsecondary Teachers	13	13	38
				27-1011	Art Directors	31	27	59
27-1012	Craft Artists			31	27	59		
27-1013	Fine Artists, Including Painters, Sculptors, & Illustrators			31	27	59		
27-1014	Multimedia Artists & Animators			31	27	59		
27-1019	Artists & Related Workers, All Other			31	27	59		
27-1021	Commercial & Industrial Designers			23	26	67		
27-1024	Graphic Designers			23	26	67		
27-2011	Actors			39	28	50		
27-2012	Producers & Directors			19	18	71		
27-2031	Dancers			65	36	22		
27- 2032	Choreographers			65	36	22		
27-2041	Music Directors & Composers			46	34	36		
27- 2042	Musicians & Singers			46	34	36		
27-4021	Photographers	46	40	47				
50.090 1	Music, General	25-2021	Elementary School Teachers, Except Special	4	6	58		



CIP CODE	CIP TITLE	SOC CODE	SOC TITLE	% WORKFORCE WITH EDUCATION LEVEL AND ONE LEVEL BELOW		
				CERT	ASSOC	BACH
			Education			
		25-2022	Middle School Teachers, Except Special & Career/Technical Education	4	6	58
		25-2031	Secondary School Teachers, Except Special & Career/Technical Education	6	7	57
		27-2041	Music Directors & Composers	46	34	36
		27-2042	Musicians & Singers	46	34	36
		27-4011	Audio & Video Equipment Technicians	56	47	40
		27-4014	Sound Engineering Technicians	56	47	40
		29-1125	Recreational Therapists	16	14	74
		49-9063	Musical Instrument Repairers & Tuners	57	53	37
51.0716	Medical Administrative/Executive Assistant & Medical Secretary	29-2071	Medical Records & Health Information Technicians	58	57	37
		31-9092	Medical Assistants	66	67	31
		31-9094	Medical Transcriptionists	37	42	58
		43-1011	First-Line Supervisors of Office & Administrative Support Workers	50	42	41
		43-3021	Billing & Posting Clerks	61	51	34
		43-4071	File Clerks	67	49	27
		43-4171	Receptionists & Information Clerks	71	54	24
		43-6011	Executive Secretaries & Executive Administrative Assistants	56	49	39
		43-6013	Medical Secretaries	56	49	39
		43-9021	Data Entry Keyers	62	50	33
		43-9041	Insurance Claims & Policy Processing Clerks	55	48	40
		43-9061	Office Clerks, General	66	53	28



CIP CODE	CIP TITLE	SOC CODE	SOC TITLE	% WORKFORCE WITH EDUCATION LEVEL AND ONE LEVEL BELOW		
				CERT	ASSOC	BACH
51.0801	Medical/Clinical Assistant	31-9092	Medical Assistants	66	67	31
51.0904	Emergency Medical Technology/Technician (EMT Paramedic)	29-2041	Emergency Medical Technicians & Paramedics	61	68	36
		33-1021	First-Line Supervisors of Fire Fighting & Prevention Workers	63	60	31
		33-2011	Firefighters	59	65	38
		33-9092	Lifeguards, Ski Patrol, & Other Recreational Protective Service Workers	80	40	11
		53-3011	Ambulance Drivers & Attendants, Except Emergency Medical Technicians	78	56	15
51.0908	Respiratory Care Therapy/Therapist	29-1126	Respiratory Therapists	8	66	89
		29-2054	Respiratory Therapy Technicians	57	60	40
51.3801	Registered Nursing/Registered Nurse	11-9111	Medical & Health Services Managers	25	30	50
		25-1099	Postsecondary Teachers	13	13	38
		29-1141	Registered Nurses	5	33	88
		29-1151	Nurse Anesthetists	3	2	15
		29-1161	Nurse Midwives	1	0	6
		29-1171	Nurse Practitioners	1	0	6
52.0101	Business/Commerce, General	11-2022	Sales Managers	21	20	65
		11-3011	Administrative Services Managers	43	40	48
		11-3051	Industrial Production Managers	38	28	48
		11-3071	Transportation, Storage, & Distribution Managers	59	40	31
		11-9021	Construction Managers	39	27	50
		11-9151	Social & Community Service Managers	19	18	55
		11-9199	Managers, All Other	32	26	50
		11-1011	Chief Executives	24	22	55
		11-1021	General & Operations Managers	42	36	47



CIP CODE	CIP TITLE	SOC CODE	SOC TITLE	% WORKFORCE WITH EDUCATION LEVEL AND ONE LEVEL BELOW		
				CERT	ASSOC	BACH
		13-1051	Cost Estimators	44	39	50
		13-1111	Management Analysts	15	14	56
		13-1121	Meeting, Convention, & Event Planners	30	28	60
		13-1199	Business Operations Specialists, All Other	26	23	54
		15-1199	Computer Occupations, All Other	36	41	52
		25-1099	Postsecondary Teachers	13	13	38
52.0201	Business Administration & Management, General	11-2021	Marketing Managers	21	20	65
		11-2022	Sales Managers	21	20	65
		11-3021	Computer & Information Systems Managers	20	22	60
		11-3031	Financial Managers	32	30	52
		11-3121	Human Resources Managers	33	30	50
		11-9199	Managers, All Other	32	26	50
		11-1011	Chief Executives	24	22	55
		11-1021	General & Operations Managers	42	36	47
		13-1071	Human Resources Specialists	26	25	59
		13-1111	Management Analysts	15	14	56
		13-1161	Market Research Analysts & Marketing Specialists	14	14	68
		13-1199	Business Operations Specialists, All Other	26	23	54
		13-2011	Accountants & Auditors	9	12	66
		15-1151	Computer User Support Specialists	45	47	48
		41-1011	First-Line Supervisors of Retail Sales Workers	61	45	31
		41-2031	Retail Salespersons	70	50	22
		41-4012	Sales Representatives, Wholesale & Manufacturing, Except Technical & Scientific Products	40	31	51
		43-1011	First-Line Supervisors of Office & Administrative	50	42	41



CIP CODE	CIP TITLE	SOC CODE	SOC TITLE	% WORKFORCE WITH EDUCATION LEVEL AND ONE LEVEL BELOW		
				CERT	ASSOC	BACH
			Support Workers			
		43-4051	Customer Service Representatives	67	47	27
		43-6014	Secretaries & Administrative Assistants, Except Legal, Medical, & Executive	56	49	39
52.0401	Administrative Assistant & Secretarial Science, General	43-4071	File Clerks	67	49	27
		43-4171	Receptionists & Information Clerks	71	54	24
		43-6011	Executive Secretaries & Executive Administrative Assistants	56	49	39
		43-6014	Secretaries & Administrative Assistants, Except Legal, Medical, & Executive	56	49	39
		43-9021	Data Entry Keyers	62	50	33
		43-9022	Word Processors & Typists	59	51	36
		43-9061	Office Clerks, General	66	53	28
52.1501	Real Estate	11-9141	Property, Real Estate, & Community Association Managers	44	39	45
		13-2021	Appraisers & Assessors of Real Estate	32	30	57
		41-9021	Real Estate Brokers	40	36	52
		41-9022	Real Estate Sales Agents	40	36	52
54.0101	History, General	11-9199	Managers, All Other	32	26	50
		19-3091	Anthropologists & Archeologists	14	15	50
		19-3093	Historians	14	15	50
		19-3094	Political Scientists	14	15	50
		25-1099	Postsecondary Teachers	13	13	38
		25-2022	Middle School Teachers, Except Special & Career/Technical Education	4	6	58
		25-2031	Secondary School Teachers, Except Special	6	7	57



CIP CODE	CIP TITLE	SOC CODE	SOC TITLE	% WORKFORCE WITH EDUCATION LEVEL AND ONE LEVEL BELOW		
				CERT	ASSOC	BACH
			& Career/Technical Education			
		25-4011	Archivists	20	17	42
		25-4012	Curators	20	17	42
		25-4013	Museum Technicians & Conservators	20	17	42

Source: Emsi program demand gap model.





## APPENDIX 5: Program Demand Gap Analysis

### Methodology

This appendix focuses on describing and understanding the methodology used in the program demand gap analysis. This requires data on both occupation demand (e.g., annual job openings) and education supply (e.g., number of postsecondary degree completions). These are then compared through an education “gap” analysis to determine whether an education program is potentially producing a surplus or shortage of workforce talent relative to the number of job openings. In this way, it is possible to see how the institution’s current programs are satisfying the region’s workforce needs.

#### SUPPLY AND DEMAND MODEL

Emsi builds a model using demand-side data (average annual projected job openings) and supply-side data (postsecondary education output) to compare workforce demand with education supply. The purpose of this analysis is to find the difference or “gap” between the annual job openings for an occupation and the number of people completing postsecondary degrees for that occupation, whether at VVC or at another postsecondary institution in the region, making it possible to identify talent shortages or surpluses.

The first step involves the link between annual job openings for a SOC code and the number of completions for an education program, defined by its CIP code. The BLS provides information on the occupations that completers of specific CIP codes are more likely to enter. Specific connections have been refined through previous engagements with postsecondary institutions and state departments of labor. Some programs have direct occupational ties. For example, a physical therapist assistant is a specific occupation that requires specialized postsecondary training. In this case, one CIP code (Physical Therapy Technician/Assistant) maps to only one SOC code (physical therapist assistants). This provides an easy comparison of annual job openings for physical therapist assistants to the number of people completing the relevant program to see whether a talent shortage or surplus exists.

Unfortunately, this one-to-one mapping of a CIP code to a SOC code is not always the case. More often than not, an educational program maps to multiple occupations and an occupation maps to multiple educational programs at multiple award levels. For this reason,



Emsi has pioneered a method of de-duplicating job openings, such that the potential sources of demand are not double-represented for any occupation. The details of this process are outlined in this chapter, under “De-duplication of Annual Openings.”

## OCCUPATION DEMAND

### *Educational Level Adjustments*

To capture occupation demand, Emsi uses a proprietary employment dataset that reflects total employment. Emsi uses the QCEW data source, which measures employment covered by unemployment insurance (UI). According to the BLS, “employment covered by these UI programs represents about 97% of all wage and salary civilian employment in the country.” Through a proprietary process, Emsi removes BLS local area employment suppressions to yield the best employment data available at local levels, using Emsi’s Employees & Self-Employed 2019.1 datarun.

In the datarun, Emsi calculates the number of regional job openings for the occupations that require different levels of education for entry-level positions.<sup>14</sup> The BLS also provides educational attainment data of current workers, ages 16 years to 34 years, for each SOC code, broken out by their highest level of education attained. The data are presented as the percentage of workers in the SOC code with educational attainment ranging from less than a high school diploma to a doctoral degree level of education. Using these data, Emsi adjusts the annual job opening estimates for each SOC code to only incorporate the percentage of workers that correspond with VVC’s program offerings.

For example, as shown in Table A5.1, three occupations are mapped to Accounting: accountants, auditors, and budget analysts. Among accountants, the majority of job openings (80%) are available to program completers with a master’s degree or bachelor’s degree level of education, less so for auditors. The weighted average of job openings, in the last row of the table, is calculated for each program and at each award level where VVC has produced completions over the past three years. Not accounting for these dynamics in

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14 See Appendix 1 for a description of the sources and processes of Emsi data.



educational attainments would bias the programs' demands by over-counting potential job opportunities for the completers.<sup>15</sup>

Table A5.1: Example of Educational Level Adjustments for a Program

<b>PROGRAM</b>	<b>OCCUPATION</b>	<b>ASSOC AND ONE LEVEL BELOW</b>	<b>BACH AND ONE LEVEL BELOW</b>	<b>MAST AND ONE LEVEL BELOW</b>	<b>PHD AND ONE LEVEL BELOW</b>
Accounting	Accountant	10%	65%	80%	25%
	Auditor	5%	70%	75%	20%
	Budget analyst	15%	70%	80%	30%
<b>Weighted average</b>		<b>10%</b>	<b>68%</b>	<b>78%</b>	<b>25%</b>

### ***De-Duplication of Annual Openings***

Most programs are designed to train people for multiple occupational types, many of which are simultaneously linked with other educational programs. This presents a complexity when comparing supply and demand for any one program. For instance, the Accounting program is mapped to three different occupations: accountants, auditors, and budget analysts. If we focus on one of the occupations for this list—accountants—it is also mapped to three different educational programs, for example, Business, Medical Office Administration, and Commerce.

To ensure that double-counting does not occur, it is necessary to either realign the program groupings to eliminate the mapping of occupations to multiple programs or to determine what proportion of job openings should be compared with program completions. Emsi takes the second approach in this analysis, which has the advantage of maintaining program titles and descriptions in roughly the same format of the completion data originally delivered to Emsi. Emsi also uses a formula that favors programs with the largest completions, attributing a greater proportion of job openings to programs with a large number of completions by award level. This method utilizes the assumption that the higher output programs are likely

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15 Given the changing dynamics and need for more education in the existing workforce (i.e., skills-biased technology change in many occupations and industry sectors), this assumption is considered conservative.



feeding a higher degree of demand in San Bernardino County.<sup>16</sup> Appendix 4 contains the detailed mapping of each CIP code to all relevant occupations, by their six-digit SOC codes. A result of de-duplication is that in a region where a unique program, Commercial & Advertising Art for example, is larger than Graphic Design, it is assumed that completers of the Commercial & Advertising Art program will be offered a proportional, therefore larger number of job openings than students from the Graphic Design program.

Emsi also provides an alternative program demand gap analysis, which does not de-duplicate the average number of projected annual job openings based on the size of each program. Rather, the total number of job openings available for completers at each award level for each program is provided without further modification. Due to this modification, these numbers have not been de-duplicated, unlike the job openings shown in Chapter 3. As a result, job openings overstate the occupational demand for all postsecondary program completers. While these figures have not been provided in this analysis, they are available upon request.

## EDUCATION OUTPUT

There are several educational institutions in San Bernardino County, some of which have programs similar to those offered at VVC. Hence, completers at VVC will be competing for some jobs with completers from other regional institutions. Emsi determined education output by CIP codes and identified the number of completers for every award level within those CIP codes. To find the output for all public and private educational institutions in San Bernardino County, Emsi uses data from the Integrated Postsecondary Educational System (IPEDS).<sup>17</sup> These data are publicly available through the National Center for Educational Statistics. Completions data are averaged for a three-year period, 2015 through 2017, to smooth out any bumps in enrollment that may be unique to a particular academic year. Data

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16 Note this adjustment is performed on a program-by-program basis without consideration of individual colleges or training providers. Therefore, a single program offered at one large institution has no advantage over a group of similar programs offered at several smaller educational providers given that the aggregate output of the smaller schools is near the output of the single larger school.

17 These data come with inherent weaknesses. Primarily, numbers are only available for institutions that participate in or are applicants for any federal financial assistance program authorized by the Higher Education Act (HEA). Also, IPEDS does not collect data on non-credit courses and programs. Nevertheless, this system is the best source for collecting information on a broad range of educational institutions.

gathered for VVC from IPEDS were reviewed for accuracy by VVC and updated with 2018 completers' data.

Tables A5.2 through A5.4 display the completion breakdown by institution in San Bernardino County at the certificate, associate, and bachelor's degree levels, respectively. VVC is one of several institutions in the region. Using a three-year average, VVC grants 101 certificates, 510 associate degrees, and 601 transfer-track degrees every year, which is 2%, 7%, and 10% of the totals, respectively.

Table A5.2: Certificate Level Regional Completions by Institution

<b>INSTITUTION</b>	<b>3-YEAR AVERAGE</b>	<b>% TOTAL</b>
Chaffey College	1,519	26%
American Career College-Ontario	783	13%
Summit College	782	13%
Concorde Career College-San Bernardino	415	7%
San Bernardino Valley College	351	6%
Crafton Hills College	335	6%
United Education Institute-Ontario	264	5%
Westech College	229	4%
University of Redlands	153	3%
CET-Colton	128	2%
The Fab School	122	2%
Salon Success Academy-Upland	110	2%
Victor Valley College	101	2%
Copper Mountain Community College	75	1%
Salon Success Academy-Redlands	71	1%
Colton-Redlands-Yucaipa Regional Occupational Program	61	1%
Elite Cosmetology School	48	1%
Loma Linda University	41	1%
Victor Valley Beauty College Inc	41	1%
Coast Career Institute	37	1%
Salon Success Academy-Fontana	35	1%



<b>INSTITUTION</b>	<b>3-YEAR AVERAGE</b>	<b>% TOTAL</b>
Argosy University-The Art Institute of California-Inland Empire	28	0%
Barstow Community College	26	0%
Baldy View Regional Occupational Program	25	0%
Westwood College-Inland Empire	19	0%
Ashdown College of Health Sciences	1	0%
<b>Total</b>	<b>5,804</b>	<b>100%</b>

Source: IPEDS.

Table A5.3: Associate Degree Level Regional Completions by Institution

<b>INSTITUTION</b>	<b>3-YEAR AVERAGE</b>	<b>% TOTAL</b>
Chaffey College	2,587	36%
San Bernardino Valley College	1,138	16%
Universal Technical Institute of California Inc	912	13%
Crafton Hills College	653	9%
Victor Valley College	510	7%
Barstow Community College	305	4%
Argosy University-The Art Institute of California-Inland Empire	233	3%
Copper Mountain Community College	209	3%
Platt College-Ontario	190	3%
American Career College-Ontario	120	2%
Loma Linda University	101	1%
Concorde Career College-San Bernardino	75	1%
Westwood College-Inland Empire	60	1%
ITT Technical Institute-San Bernardino	52	1%
Community Christian College	11	0%
Argosy University-Inland Empire	9	0%
Ashdown College of Health Sciences	6	0%
<b>Total</b>	<b>7,170</b>	<b>100%</b>

Source: IPEDS.



Table A5.4: Bachelor's/Transfer-Track Degree Level Regional Completions by Institution

<b>INSTITUTION</b>	<b>3-YEAR AVERAGE</b>	<b>% TOTAL</b>
California State University-San Bernardino	3,689	59%
University of Redlands	931	15%
Victor Valley College	601	10%
Loma Linda University	331	5%
West Coast University-Ontario	306	5%
Argosy University-The Art Institute of California-Inland Empire	197	3%
Westwood College-Inland Empire	60	1%
Platt College-Ontario	54	1%
Argosy University-Inland Empire	41	1%
ITT Technical Institute-San Bernardino	19	0%
<b>Total</b>	<b>6,230</b>	<b>100%</b>

Source: IPEDS.



## APPENDIX 6: Employment Projections

Table A6.1: Employment Projections in San Bernardino County by Occupation, 2018 and 2028

SOC TITLE	2018 JOBS	2028 JOBS	CHANGE	% CHANGE	ANNUAL JOB OPENINGS	MEDIAN HOURLY WAGE
Laborers and Freight, Stock, and Material Movers, Hand	37,555	44,943	7,388	20%	6,997	\$13.53
Personal Care Aides	26,445	37,788	11,343	43%	6,216	\$11.32
Combined Food Preparation and Serving Workers, Including Fast Food	21,599	27,559	5,960	28%	5,585	\$11.28
Cashiers	21,532	22,320	788	4%	4,587	\$11.42
Retail Salespersons	24,172	25,822	1,650	7%	4,128	\$12.17
Stock Clerks and Order Fillers	17,525	19,217	1,692	10%	2,746	\$12.12
Heavy and Tractor-Trailer Truck Drivers	19,809	21,753	1,944	10%	2,622	\$20.84
Waiters and Waitresses	10,306	11,806	1,500	15%	2,455	\$11.52
Office Clerks, General	14,658	15,476	819	6%	2,020	\$16.31
Janitors and Cleaners, Except Maids and Housekeeping Cleaners	10,439	11,070	631	6%	1,583	\$14.07
Industrial Truck and Tractor Operators	8,701	11,181	2,481	29%	1,492	\$15.35
Customer Service Representatives	9,354	10,312	958	10%	1,474	\$17.15
Packers and Packagers, Hand	6,816	8,400	1,584	23%	1,436	\$12.12
Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	11,683	11,776	93	1%	1,397	\$17.52
Registered Nurses	16,930	19,959	3,029	18%	1,330	\$44.99
Light Truck Or Delivery Services Drivers	8,370	10,369	1,998	24%	1,309	\$16.36
Security Guards	6,912	8,213	1,301	19%	1,230	\$13.73
Teacher Assistants	9,359	10,466	1,107	12%	1,219	\$15.94
Cooks, Fast Food	7,461	7,648	186	2%	1,192	\$11.01
Landscaping and Groundskeeping Workers	8,212	8,772	560	7%	1,185	\$12.97
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	9,026	10,030	1,005	11%	1,163	\$26.42
General and Operations Managers	10,272	11,748	1,477	14%	1,129	\$47.02





<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>CHANGE</b>	<b>% CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
Childcare Workers	7,233	6,506	(728)	(10%)	1,101	\$9.94
Cooks, Restaurant	5,570	6,592	1,021	18%	1,045	\$12.71
Postsecondary Teachers, General	10,106	11,519	1,413	14%	1,041	\$35.16
Military occupations	8,679	8,642	(36)	(0%)	1,038	\$20.93
Bookkeeping, Accounting, and Auditing Clerks	7,951	8,339	387	5%	1,031	\$19.03
First-Line Supervisors of Retail Sales Workers	8,050	8,349	300	4%	993	\$16.19
Shipping, Receiving, and Traffic Clerks	7,052	8,313	1,261	18%	981	\$15.09
Construction Laborers	7,852	8,467	615	8%	971	\$14.76
First-Line Supervisors of Office and Administrative Support Workers	7,787	8,470	683	9%	944	\$26.06
Food Preparation Workers	4,423	5,044	621	14%	943	\$11.87
Elementary School Teachers, Except Special Education	9,523	10,773	1,250	13%	912	\$41.64
Maintenance and Repair Workers, General	6,685	7,698	1,013	15%	871	\$18.34
First-Line Supervisors of Food Preparation and Serving Workers	4,458	5,413	956	21%	870	\$13.71
Carpenters	8,167	8,408	241	3%	862	\$17.15
Maids and Housekeeping Cleaners	5,666	5,785	119	2%	845	\$11.48
Receptionists and Information Clerks	4,845	5,398	553	11%	788	\$13.87
Medical Assistants	4,938	5,845	907	18%	719	\$14.58
Sales Representatives, Services, All Other	4,612	5,193	581	13%	702	\$22.27
Nursing Assistants	4,270	5,329	1,059	25%	701	\$14.46
Cleaners of Vehicles and Equipment	4,030	4,468	438	11%	694	\$11.90
Hairdressers, Hairstylists, and Cosmetologists	4,421	5,129	708	16%	692	\$12.02
Assemblers and Fabricators, All Other, Including Team Assemblers	5,856	4,956	(900)	(15%)	679	\$13.14
First-Line Supervisors of Transportation and Material Moving Workers, Except Aircraft Cargo Handling Supervisors	4,258	5,397	1,139	27%	665	\$26.32
Dining Room and Cafeteria Attendants and Bartender Helpers	3,145	3,500	355	11%	656	\$10.94
Automotive Service Technicians and Mechanics	5,403	5,924	521	10%	629	\$16.99
Dishwashers	3,336	3,644	307	9%	628	\$10.92



<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>CHANGE</b>	<b>% CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
Medical Secretaries	3,917	4,614	697	18%	572	\$16.19
Electricians	3,590	4,426	836	23%	572	\$27.12
Business Operations Specialists, All Other	4,670	5,227	558	12%	545	\$29.87
Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	1,792	2,130	339	19%	507	\$11.59
Hosts and Hostesses, Restaurant, Lounge, and Coffee Shop	1,773	2,028	255	14%	502	\$11.54
Counter and Rental Clerks	3,194	3,466	272	9%	493	\$13.66
Secondary School Teachers, Except Special and Career/Technical Education	5,046	5,840	794	16%	490	\$37.37
Accountants and Auditors	4,167	4,717	551	13%	484	\$32.19
Home Health Aides	1,501	3,225	1,724	115%	474	\$14.17
Substitute Teachers	3,393	3,803	410	12%	471	\$15.81
Amusement and Recreation Attendants	1,553	1,746	192	12%	430	\$11.55
Bartenders	2,125	2,349	224	11%	429	\$11.70
Managers, All Other	4,566	5,131	565	12%	427	\$21.52
Licensed Practical and Licensed Vocational Nurses	4,223	4,862	639	15%	417	\$22.89
Dental Assistants	2,602	3,234	632	24%	414	\$14.81
Helpers--Production Workers	2,225	2,255	30	1%	373	\$11.88
Recreation Workers	1,670	1,970	299	18%	365	\$12.11
Inspectors, Testers, Sorters, Samplers, and Weighers	2,763	2,707	(56)	(2%)	359	\$17.86
Fitness Trainers and Aerobics Instructors	1,596	1,891	295	18%	351	\$20.28
Bus Drivers, School Or Special Client	2,345	2,595	250	11%	351	\$18.91
First-Line Supervisors of Construction Trades and Extraction Workers	2,851	3,047	196	7%	345	\$29.66
First-Line Supervisors of Production and Operating Workers	3,031	3,117	86	3%	337	\$26.23
Production Workers, All Other	2,802	2,598	(205)	(7%)	334	\$12.51
Social and Human Service Assistants	1,822	2,403	581	32%	333	\$18.48
Billing and Posting Clerks	2,393	2,818	425	18%	327	\$17.60
Human Resources Specialists	2,612	2,888	276	11%	319	\$29.83
Sales Managers	3,084	3,313	229	7%	317	\$40.50

<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>CHANGE</b>	<b>% CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	2,013	1,749	(264)	(13%)	310	\$11.33
Plumbers, Pipefitters, and Steamfitters	2,104	2,509	405	19%	305	\$21.13
Protective Service Workers, All Other	996	1,131	134	13%	302	\$17.72
Insurance Sales Agents	2,831	2,850	19	1%	301	\$19.71
Production, Planning, and Expediting Clerks	2,208	2,550	342	15%	300	\$21.21
Management Analysts	2,835	3,077	242	9%	299	\$34.60
Market Research Analysts and Marketing Specialists	2,214	2,636	422	19%	299	\$26.72
Packaging and Filling Machine Operators and Tenders	2,141	2,300	159	7%	298	\$12.29
Painters, Construction and Maintenance	2,829	3,029	201	7%	294	\$14.24
Police and Sheriff's Patrol Officers	3,197	3,694	497	16%	290	\$45.48
Office and Administrative Support Workers, All Other	2,165	2,362	197	9%	288	\$13.19
Bus and Truck Mechanics and Diesel Engine Specialists	2,490	2,746	256	10%	282	\$24.96
Food Service Managers	2,087	2,275	188	9%	278	\$16.72
First-Line Supervisors of Mechanics, Installers, and Repairers	2,376	2,661	286	12%	264	\$32.56
Cooks, Institution and Cafeteria	1,457	1,643	186	13%	258	\$15.34
Order Clerks	1,717	1,917	200	12%	247	\$17.14
Taxi Drivers and Chauffeurs	1,562	2,015	452	29%	247	\$10.90
Teachers and Instructors, All Other	1,736	1,975	239	14%	246	\$16.57
Buyers and Purchasing Agents	2,256	2,338	82	4%	245	\$25.75
Preschool Teachers, Except Special Education	1,964	2,180	216	11%	243	\$13.94
Executive Secretaries and Executive Administrative Assistants	2,137	1,974	(163)	(8%)	240	\$26.62
Nonfarm Animal Caretakers	1,129	1,394	266	24%	237	\$12.49
First-Line Supervisors of Non-Retail Sales Workers	2,140	2,280	141	7%	232	\$19.70
Pharmacy Technicians	1,997	2,419	422	21%	231	\$17.56
Parts Salespersons	1,527	1,658	131	9%	231	\$15.46
Substance Abuse, Behavioral Disorder, and Mental Health Counselors	1,484	1,869	385	26%	230	\$19.62



<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>CHANGE</b>	<b>% CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
Claims Adjusters, Examiners, and Investigators	2,715	2,433	(282)	(10%)	228	\$13.56
Machinists	1,888	1,944	55	3%	220	\$18.52
Machine Feeders and Offbearers	1,196	1,412	216	18%	218	\$14.52
Operating Engineers and Other Construction Equipment Operators	1,647	1,762	115	7%	217	\$32.85
Cooks, Short Order	1,332	1,386	54	4%	216	\$12.28
Telecommunications Equipment Installers and Repairers, Except Line Installers	1,788	1,844	56	3%	213	\$24.03
Correctional Officers and Jailers	2,284	2,355	71	3%	212	\$38.62
Gaming Dealers	1,159	1,285	126	11%	212	\$11.92
Eligibility Interviewers, Government Programs	1,873	2,087	215	11%	212	\$21.16
Financial Managers	2,003	2,303	300	15%	205	\$49.71
Ushers, Lobby Attendants, and Ticket Takers	645	768	123	19%	205	\$11.38
Computer User Support Specialists	2,085	2,341	256	12%	203	\$25.72
Medical and Health Services Managers	1,581	2,045	463	29%	200	\$52.63
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	1,450	1,747	297	21%	199	\$19.80
Tellers	1,682	1,484	(198)	(12%)	197	\$13.61
Welders, Cutters, Solderers, and Brazers	1,559	1,647	89	6%	196	\$18.07
Construction Managers	2,348	2,449	102	4%	194	\$24.42
Real Estate Sales Agents	1,931	1,890	(41)	(2%)	194	\$19.91
Middle School Teachers, Except Special and Career/Technical Education	1,712	2,131	419	24%	192	\$40.81
Massage Therapists	1,283	1,579	296	23%	191	\$14.18
Industrial Machinery Mechanics	1,786	1,936	150	8%	191	\$25.55
Health Technologists and Technicians, All Other	1,682	2,224	542	32%	188	\$19.91
Manicurists and Pedicurists	1,143	1,420	277	24%	186	\$10.59
Self-Enrichment Education Teachers	1,259	1,466	207	16%	184	\$19.95
Coaches and Scouts	1,085	1,236	151	14%	184	\$15.56
Child, Family, and School Social Workers	1,092	1,459	368	34%	179	\$24.97

<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>CHANGE</b>	<b>% CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
First-Line Supervisors of Personal Service Workers	1,255	1,525	270	22%	175	\$16.16
Transportation, Storage, and Distribution Managers	1,510	1,827	317	21%	173	\$40.47
Bakers	996	1,103	107	11%	173	\$12.34
Food Batchmakers	1,040	1,097	57	6%	170	\$13.70
Dispatchers, Except Police, Fire, and Ambulance	1,544	1,645	101	7%	168	\$18.64
Clergy	1,186	1,353	167	14%	167	\$22.19
Food Servers, Nonrestaurant	839	1,001	161	19%	166	\$11.82
Educational, Guidance, School, and Vocational Counselors	1,146	1,343	197	17%	161	\$37.87
Marriage and Family Therapists	1,136	1,340	203	18%	161	\$19.10
Administrative Services Managers	1,460	1,672	212	15%	159	\$47.42
Cost Estimators	1,266	1,418	153	12%	158	\$28.69
Installation, Maintenance, and Repair Workers, All Other	1,375	1,467	93	7%	157	\$16.58
Social and Community Service Managers	1,138	1,462	324	29%	156	\$24.61
Bill and Account Collectors	1,294	1,323	29	2%	152	\$17.53
Healthcare Social Workers	909	1,223	314	35%	151	\$35.14
Butchers and Meat Cutters	1,030	1,107	77	7%	151	\$15.54
Demonstrators and Product Promoters	787	794	6	1%	148	\$16.66
Training and Development Specialists	1,096	1,296	200	18%	147	\$28.26
Interviewers, Except Eligibility and Loan	1,013	1,090	77	8%	144	\$17.09
Information and Record Clerks, All Other	976	1,098	122	12%	140	\$20.70
Insurance Claims and Policy Processing Clerks	1,294	1,274	(19)	(2%)	140	\$17.60
Cement Masons and Concrete Finishers	1,015	1,138	124	12%	140	\$23.75
Lawyers	2,356	2,621	265	11%	139	\$42.81
Emergency Medical Technicians and Paramedics	1,328	1,711	383	29%	139	\$14.53
Securities, Commodities, and Financial Services Sales Agents	1,443	1,336	(107)	(7%)	139	\$18.82
Chefs and Head Cooks	862	978	115	13%	137	\$18.13
Hotel, Motel, and Resort Desk Clerks	683	788	105	15%	137	\$12.09

<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>CHANGE</b>	<b>% CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
Compliance Officers	1,307	1,460	153	12%	135	\$33.87
Logisticians	1,091	1,217	125	11%	135	\$33.97
First-Line Supervisors of Housekeeping and Janitorial Workers	981	1,067	86	9%	135	\$16.08
Graphic Designers	1,211	1,281	71	6%	134	\$19.73
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic	1,165	1,006	(158)	(14%)	134	\$15.05
Bus Drivers, Transit and Intercity	894	990	95	11%	134	\$19.25
Paralegals and Legal Assistants	979	1,134	155	16%	133	\$31.74
Aircraft Mechanics and Service Technicians	1,336	1,486	150	11%	133	\$35.82
Loan Officers	1,571	1,443	(128)	(8%)	131	\$30.35
Mobile Heavy Equipment Mechanics, Except Engines	1,086	1,201	115	11%	131	\$28.94
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	1,119	1,005	(114)	(10%)	131	\$15.15
Lifeguards, Ski Patrol, and Other Recreational Protective Service Workers	414	488	74	18%	130	\$11.89
Payroll and Timekeeping Clerks	1,123	1,160	37	3%	128	\$21.95
Tire Repairers and Changers	903	932	29	3%	128	\$13.18
Sales and Related Workers, All Other	846	880	35	4%	126	\$17.96
Civil Engineers	1,282	1,448	166	13%	124	\$52.44
Software Developers, Applications	1,101	1,431	330	30%	122	\$45.07
Community and Social Service Specialists, All Other	743	879	135	18%	121	\$26.80
Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products	956	1,043	87	9%	121	\$31.76
Data Entry Keyers	994	884	(110)	(11%)	121	\$14.80
Property, Real Estate, and Community Association Managers	1,281	1,374	93	7%	120	\$22.89
Helpers--Installation, Maintenance, and Repair Workers	763	853	91	12%	120	\$13.49
Healthcare Support Workers, All Other	778	861	83	11%	119	\$19.69
Automotive and Watercraft Service Attendants	574	652	79	14%	119	\$13.24
Chief Executives	1,445	1,487	42	3%	118	\$70.80

<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>CHANGE</b>	<b>% CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
Firefighters	1,194	1,428	235	20%	118	\$27.94
Veterinary Assistants and Laboratory Animal Caretakers	550	681	132	24%	117	\$13.66
Electrical, Electronic, and Electromechanical Assemblers, Except Coil Winders, Tapers, and Finishers	957	850	(107)	(11%)	116	\$14.16
Clinical, Counseling, and School Psychologists	1,298	1,479	181	14%	115	\$40.12
Postal Service Mail Carriers	1,670	1,468	(203)	(12%)	115	\$29.00
Driver/Sales Workers	556	853	297	53%	115	\$13.85
Roofers	916	990	74	8%	111	\$20.07
Education Administrators, Elementary and Secondary School	1,025	1,208	183	18%	110	\$60.42
Rehabilitation Counselors	805	914	109	14%	109	\$13.98
Education, Training, and Library Workers, All Other	943	1,060	117	12%	109	\$19.44
Social Workers, All Other	850	939	89	11%	108	\$31.37
Computer Systems Analysts	1,238	1,364	126	10%	104	\$36.99
Directors, Religious Activities and Education	727	773	46	6%	104	\$15.93
Human Resources Assistants, Except Payroll and Timekeeping	825	850	24	3%	104	\$18.98
Cabinetmakers and Bench Carpenters	1,015	863	(152)	(15%)	104	\$13.22
Mixing and Blending Machine Setters, Operators, and Tenders	812	822	10	1%	103	\$16.26
Computer Occupations, All Other	1,174	1,287	112	10%	101	\$36.78
Dental Hygienists	928	1,224	296	32%	101	\$42.79
Pharmacists	1,527	1,747	220	14%	99	\$68.24
File Clerks	747	722	(25)	(3%)	99	\$15.49
Library Assistants, Clerical	549	627	78	14%	99	\$13.46
Weighers, Measurers, Checkers, and Samplers, Recordkeeping	710	850	141	20%	99	\$15.68
Phlebotomists	696	815	119	17%	97	\$19.24
Food Processing Workers, All Other	708	770	62	9%	97	\$11.52
Special Education Teachers, Kindergarten and Elementary School	978	1,125	147	15%	96	\$37.03
Couriers and Messengers	723	856	133	18%	94	\$12.61
Sheet Metal Workers	675	776	101	15%	93	\$26.98



<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>CHANGE</b>	<b>% CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
Medical Records and Health Information Technicians	1,060	1,227	167	16%	92	\$19.16
First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers	816	837	20	2%	92	\$17.09
Automotive Body and Related Repairers	723	825	102	14%	92	\$15.46
Laundry and Dry-Cleaning Workers	554	596	42	8%	91	\$12.22
Mental Health and Substance Abuse Social Workers	583	739	156	27%	90	\$24.50
Instructional Coordinators	737	859	123	17%	90	\$47.72
Loan Interviewers and Clerks	920	836	(84)	(9%)	90	\$19.56
Maintenance Workers, Machinery	740	787	47	6%	90	\$22.26
Paper Goods Machine Setters, Operators, and Tenders	615	733	118	19%	88	\$15.49
Personal Care and Service Workers, All Other	428	529	101	24%	87	\$13.34
Cargo and Freight Agents	496	775	279	56%	87	\$22.44
Musicians and Singers	743	793	49	7%	86	\$20.27
Gaming Change Persons and Booth Cashiers	371	415	44	12%	86	\$20.36
Drywall and Ceiling Tile Installers	933	885	(48)	(5%)	86	\$21.39
Human Resources Managers	844	925	81	10%	85	\$54.21
Clinical Laboratory Technologists and Technicians	903	1,078	176	19%	85	\$23.02
Telemarketers	531	479	(52)	(10%)	85	\$11.76
Network and Computer Systems Administrators	1,030	1,138	108	10%	84	\$36.21
Library Technicians	498	570	71	14%	84	\$18.08
Food Preparation and Serving Related Workers, All Other	388	444	56	14%	84	\$10.51
Structural Iron and Steel Workers	512	663	152	30%	84	\$36.70
Kindergarten Teachers, Except Special Education	625	729	104	17%	83	\$34.51
Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	757	672	(86)	(11%)	83	\$12.93
Material Moving Workers, All Other	580	624	44	8%	83	\$12.20
Printing Press Operators	682	699	17	2%	81	\$16.75





<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>CHANGE</b>	<b>% CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
Public Relations Specialists	631	714	83	13%	80	\$28.34
Barbers	603	730	126	21%	80	\$11.43
Glaziers	437	584	146	33%	80	\$21.77
Nurse Practitioners	811	1,085	274	34%	78	\$58.24
Construction and Building Inspectors	570	641	71	12%	78	\$40.46
Computer-Controlled Machine Tool Operators, Metal and Plastic	686	704	18	3%	78	\$17.50
Motor Vehicle Operators, All Other	374	408	34	9%	78	\$19.34
Respiratory Therapists	1,052	1,234	182	17%	77	\$34.15
Radiologic Technologists	976	1,136	160	16%	76	\$33.86
Computer and Information Systems Managers	723	839	117	16%	74	\$60.35
Surgical Technologists	609	757	148	24%	74	\$26.11
Food Cooking Machine Operators and Tenders	464	485	21	5%	73	\$12.21
Telecommunications Line Installers and Repairers	602	649	47	8%	72	\$23.97
Pest Control Workers	461	466	5	1%	70	\$14.26
Legal Secretaries	629	577	(52)	(8%)	70	\$23.03
Water and Wastewater Treatment Plant and System Operators	730	755	25	3%	70	\$31.23
Psychiatric Technicians	864	767	(96)	(11%)	69	\$27.87
Marketing Managers	608	687	78	13%	68	\$49.30
Merchandise Displayers and Window Trimmers	553	628	75	14%	68	\$13.26
Sewing Machine Operators	582	565	(17)	(3%)	68	\$13.47
Crossing Guards	271	337	66	24%	67	\$13.40
Skincare Specialists	440	519	79	18%	67	\$13.31
Meat, Poultry, and Fish Cutters and Trimmers	357	464	107	30%	67	\$12.37
Electrical Power-Line Installers and Repairers	664	724	60	9%	66	\$38.52
Molders, Shapers, and Casters, Except Metal and Plastic	621	572	(49)	(8%)	66	\$13.68
Industrial Production Managers	791	819	28	4%	65	\$46.09
Writers and Authors	605	659	54	9%	65	\$18.92



<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>CHANGE</b>	<b>% CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
Photographers	659	655	(4)	(1%)	65	\$17.56
Word Processors and Typists	575	481	(94)	(16%)	65	\$20.27
Parking Lot Attendants	337	388	51	15%	65	\$11.40
Probation Officers and Correctional Treatment Specialists	561	646	86	15%	64	\$39.12
Physical Therapists	784	1,018	234	30%	64	\$44.30
Reservation and Transportation Ticket Agents and Travel Clerks	493	539	46	9%	64	\$16.64
First-Line Supervisors of Gaming Workers	325	363	38	12%	63	\$24.03
Meeting, Convention, and Event Planners	393	468	75	19%	62	\$22.36
Switchboard Operators, Including Answering Service	467	404	(63)	(14%)	62	\$12.87
First-Line Supervisors of Protective Service Workers, All Other	469	541	72	15%	61	\$22.42
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	535	516	(19)	(3%)	61	\$14.73
Pressers, Textile, Garment, and Related Materials	414	433	19	5%	61	\$11.55
Air Traffic Controllers	551	586	36	6%	61	\$28.20
Mechanical Engineers	713	791	78	11%	60	\$37.63
Court, Municipal, and License Clerks	494	590	96	19%	60	\$22.32
Conveyor Operators and Tenders	337	392	55	16%	60	\$16.46
Software Developers, Systems Software	632	739	107	17%	59	\$47.17
Computer Network Support Specialists	612	682	70	11%	59	\$29.57
Architectural and Civil Drafters	540	595	56	10%	59	\$25.81
Crane and Tower Operators	483	509	25	5%	59	\$14.81
Refuse and Recyclable Material Collectors	443	443	(0)	(0%)	59	\$20.04
Industrial Engineers	606	714	108	18%	58	\$39.54
Door-To-Door Sales Workers, News and Street Vendors, and Related Workers	523	483	(40)	(8%)	58	\$13.05
Financial Analysts	514	575	60	12%	57	\$36.71
Dentists, General	1,143	1,309	166	15%	57	\$62.34
Computer, Automated Teller, and Office Machine Repairers	545	516	(29)	(5%)	57	\$17.19



<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>CHANGE</b>	<b>% CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
Special Education Teachers, Secondary School	542	639	98	18%	56	\$41.05
Security and Fire Alarm Systems Installers	373	445	71	19%	56	\$20.99
Structural Metal Fabricators and Fitters	499	444	(54)	(11%)	56	\$15.68
Commercial Pilots	464	522	58	13%	56	\$32.20
Electrical and Electronics Engineering Technicians	543	571	28	5%	55	\$27.18
Physicians and Surgeons, All Other	1,544	1,624	80	5%	55	\$118.51
Medical Equipment Preparers	326	390	63	19%	55	\$22.19
Helpers--Electricians	237	335	98	41%	55	\$16.42
Tree Trimmers and Pruners	376	392	15	4%	54	\$17.11
Web Developers	550	630	79	14%	53	\$22.65
Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	506	461	(45)	(9%)	53	\$12.65
Extruding, Forming, Pressing, and Compacting Machine Setters, Operators, and Tenders	412	396	(16)	(4%)	53	\$16.07
Financial Specialists, All Other	511	550	39	8%	52	\$24.61
Real Estate Brokers	524	511	(13)	(2%)	52	\$25.16
Painters, Transportation Equipment	391	439	48	12%	52	\$18.89
Education Administrators, All Other	510	573	63	12%	51	\$47.58
Personal Financial Advisors	638	617	(21)	(3%)	51	\$37.89
Forest and Conservation Technicians	370	393	22	6%	51	\$18.96
Detectives and Criminal Investigators	590	664	74	13%	51	\$45.06
Residential Advisors	192	274	82	43%	51	\$15.43
Hazardous Materials Removal Workers	279	365	87	31%	51	\$19.47
Airline Pilots, Copilots, and Flight Engineers	441	471	30	7%	50	\$115.89
Tax Preparers	382	414	32	8%	49	\$21.20
Cutting and Slicing Machine Setters, Operators, and Tenders	370	385	16	4%	49	\$12.20
Coating, Painting, and Spraying Machine Setters, Operators, and Tenders	432	423	(9)	(2%)	49	\$14.10
Audio and Video Equipment Technicians	425	463	38	9%	48	\$15.34



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Interpreters and Translators	385	448	62	16%	47	\$23.18
Physician Assistants	486	629	143	29%	47	\$55.42
Speech-Language Pathologists	556	689	134	24%	47	\$40.87
Electrical and Electronics Repairers, Commercial and Industrial Equipment	447	474	27	6%	47	\$31.42
Advertising Sales Agents	360	315	(44)	(12%)	46	\$17.27
Procurement Clerks	349	375	26	7%	46	\$20.89
Tile and Marble Setters	453	459	5	1%	46	\$21.10
Tailors, Dressmakers, and Custom Sewers	303	325	21	7%	46	\$13.24
Education Administrators, Postsecondary	444	507	63	14%	45	\$56.63
Interior Designers	422	439	17	4%	45	\$21.29
Physical Therapist Assistants	228	315	86	38%	45	\$33.01
Police, Fire, and Ambulance Dispatchers	343	416	73	21%	45	\$28.41
Architectural and Engineering Managers	481	534	54	11%	44	\$69.38
Engineering Technicians, Except Drafters, All Other	470	469	(1)	(0%)	44	\$31.81
Railroad Conductors and Yardmasters	458	422	(37)	(8%)	44	\$33.78
Civil Engineering Technicians	377	428	52	14%	43	\$29.20
Editors	338	386	48	14%	43	\$24.45
Orderlies	307	338	30	10%	43	\$18.01
Coin, Vending, and Amusement Machine Servicers and Repairers	335	334	(1)	(0%)	43	\$15.71
Labor Relations Specialists	398	396	(1)	(0%)	42	\$27.13
Religious Workers, All Other	254	281	27	11%	42	\$15.20
Dietitians and Nutritionists	412	520	108	26%	42	\$33.76
Occupational Therapists	490	617	126	26%	42	\$46.05
Graders and Sorters, Agricultural Products	275	280	6	2%	42	\$10.90
Computer Programmers	589	588	(1)	(0%)	41	\$34.76
Medical Scientists, Except Epidemiologists	383	423	40	11%	41	\$45.40
Architects, Except Landscape and Naval	415	460	45	11%	40	\$33.57



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Electrical Engineers	450	510	60	13%	40	\$39.09
Special Education Teachers, Middle School	403	469	66	16%	40	\$38.00
Baggage Porters and Bellhops	218	255	37	17%	40	\$12.12
Gaming Cage Workers	202	231	29	14%	40	\$12.40
Woodworking Machine Setters, Operators, and Tenders, Except Sawing	355	316	(39)	(11%)	40	\$11.89
Librarians	282	346	65	23%	39	\$33.04
Veterinary Technologists and Technicians	281	380	99	35%	39	\$22.13
Opticians, Dispensing	401	458	58	14%	39	\$18.16
Home Appliance Repairers	322	359	37	11%	39	\$21.14
Medical Equipment Repairers	350	383	33	10%	38	\$21.32
Fundraisers	280	323	44	16%	37	\$23.17
Electronics Engineers, Except Computer	461	495	34	7%	37	\$51.14
Environmental Scientists and Specialists, Including Health	335	351	16	5%	36	\$36.78
Health Educators	186	252	67	36%	36	\$28.23
Community Health Workers	178	250	72	40%	36	\$22.80
Physical Therapist Aides	217	261	44	20%	36	\$13.38
Brickmasons and Blockmasons	411	365	(46)	(11%)	36	\$19.18
Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic	353	314	(39)	(11%)	36	\$15.66
Pharmacy Aides	211	226	15	7%	34	\$11.79
Cooks, All Other	201	218	16	8%	34	\$11.41
Slaughterers and Meat Packers	177	235	58	33%	34	\$10.51
Ambulance Drivers and Attendants, Except Emergency Medical Technicians	170	208	38	22%	34	\$11.68
Engineers, All Other	402	435	33	8%	33	\$40.99
Tour and Travel Guides	157	173	15	10%	33	\$17.27
Postal Service Mail Sorters, Processors, and Processing Machine Operators	460	389	(71)	(15%)	33	\$26.64
Computer Operators	282	285	4	1%	33	\$24.62



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Carpet Installers	302	315	13	4%	32	\$17.49
Locomotive Engineers	379	344	(35)	(9%)	32	\$38.43
Appraisers and Assessors of Real Estate	381	392	11	3%	31	\$23.60
Food and Tobacco Roasting, Baking, and Drying Machine Operators and Tenders	226	244	17	8%	31	\$10.89
Education Administrators, Preschool and Childcare Center/Program	316	335	19	6%	30	\$18.52
Life, Physical, and Social Science Technicians, All Other	228	232	4	2%	30	\$26.99
Medical Transcriptionists	226	232	6	3%	30	\$15.80
Pesticide Handlers, Sprayers, and Applicators, Vegetation	218	224	6	3%	30	\$21.36
Paving, Surfacing, and Tamping Equipment Operators	247	265	18	7%	30	\$40.66
Solar Photovoltaic Installers	130	221	91	70%	30	\$19.36
Training and Development Managers	281	296	16	6%	29	\$57.29
Tapers	316	289	(28)	(9%)	29	\$26.03
Crushing, Grinding, and Polishing Machine Setters, Operators, and Tenders	235	235	(1)	(0%)	29	\$14.05
Transportation Workers, All Other	175	214	40	23%	29	\$16.96
Purchasing Managers	272	305	32	12%	28	\$47.28
Locker Room, Coatroom, and Dressing Room Attendants	104	115	12	11%	28	\$14.61
Travel Agents	197	217	20	10%	28	\$15.27
Office Machine Operators, Except Computer	225	225	0	0%	28	\$16.97
Separating, Filtering, Clarifying, Precipitating, and Still Machine Setters, Operators, and Tenders	206	229	23	11%	28	\$19.41
Art Directors	249	285	35	14%	27	\$18.82
Producers and Directors	251	269	18	7%	27	\$24.39
Diagnostic Medical Sonographers	325	390	65	20%	27	\$37.14
Psychiatric Aides	203	212	9	5%	27	\$15.40
Animal Trainers	205	218	12	6%	27	\$13.18
Reinforcing Iron and Rebar Workers	179	218	38	21%	27	\$15.55



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Explosives Workers, Ordnance Handling Experts, and Blasters	207	208	1	0%	27	\$31.39
Tool Grinders, Filers, and Sharpeners	205	198	(8)	(4%)	27	\$13.53
Captains, Mates, and Pilots of Water Vessels	218	236	18	8%	27	\$11.29
Surveying and Mapping Technicians	180	210	30	17%	26	\$29.84
Mail Clerks and Mail Machine Operators, Except Postal Service	207	214	7	3%	26	\$15.06
Farmworkers, Farm, Ranch, and Aquacultural Animals	163	146	(18)	(11%)	26	\$14.57
Pipelayers	209	220	11	5%	26	\$22.64
Helpers--Carpenters	149	167	18	12%	26	\$13.46
Helpers, Construction Trades, All Other	144	167	23	16%	26	\$13.43
Highway Maintenance Workers	152	207	55	36%	26	\$20.96
Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	249	234	(15)	(6%)	26	\$15.85
Jewelers and Precious Stone and Metal Workers	222	224	2	1%	26	\$16.12
Dental Laboratory Technicians	166	192	26	16%	26	\$18.25
Budget Analysts	267	293	25	9%	25	\$32.33
Industrial Engineering Technicians	246	257	11	5%	25	\$27.29
Urban and Regional Planners	211	253	42	20%	25	\$40.65
Postal Service Clerks	315	278	(38)	(12%)	25	\$28.38
Septic Tank Servicers and Sewer Pipe Cleaners	129	170	41	32%	25	\$22.28
Miscellaneous Construction and Related Workers	197	213	16	8%	25	\$13.93
Motorboat Mechanics and Service Technicians	194	211	17	9%	25	\$19.85
Control and Valve Installers and Repairers, Except Mechanical Door	330	297	(33)	(10%)	25	\$31.93
Sawing Machine Setters, Operators, and Tenders, Wood	201	200	(1)	(1%)	25	\$12.37
Woodworkers, All Other	189	199	10	5%	25	\$16.09
Sailors and Marine Oilers	163	182	19	12%	25	\$17.93
Farmers, Ranchers, and Other Agricultural Managers	404	228	(176)	(44%)	24	\$12.25
Compensation, Benefits, and Job Analysis Specialists	222	251	29	13%	24	\$29.53



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Database Administrators	265	302	37	14%	24	\$41.05
Mechanical Drafters	245	253	9	4%	24	\$21.96
Counselors, All Other	162	200	38	23%	24	\$22.81
Title Examiners, Abstractors, and Searchers	270	273	3	1%	24	\$24.02
Floral Designers	247	232	(16)	(6%)	24	\$14.27
Music Directors and Composers	205	223	18	9%	24	\$17.97
Dietetic Technicians	225	255	30	13%	24	\$13.78
Occupational Therapy Assistants	125	168	42	34%	24	\$33.97
First-Line Supervisors of Correctional Officers	327	332	6	2%	24	\$46.51
Sales Engineers	184	205	20	11%	24	\$43.08
Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	249	246	(3)	(1%)	24	\$42.60
Surveyors	236	270	34	14%	23	\$47.28
Biological Scientists, All Other	227	241	14	6%	23	\$35.09
Chemists	234	232	(2)	(1%)	23	\$30.27
Fine Artists, Including Painters, Sculptors, and Illustrators	240	254	14	6%	23	\$10.20
Family and General Practitioners	525	584	59	11%	23	\$103.28
Occupational Health and Safety Specialists	323	363	40	12%	23	\$37.21
Elevator Installers and Repairers	112	166	55	49%	23	\$34.30
Excavating and Loading Machine and Dragline Operators	173	179	6	3%	23	\$27.97
Chemical Technicians	233	210	(23)	(10%)	22	\$23.01
Legal Support Workers, All Other	211	234	23	11%	22	\$23.45
Adult Basic and Secondary Education and Literacy Teachers and Instructors	162	174	12	7%	22	\$36.13
Stonemasons	251	229	(22)	(9%)	22	\$19.38
Helpers--Brickmasons, Blockmasons, Stonemasons, and Tile and Marble Setters	147	139	(8)	(5%)	22	\$16.64
Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	206	167	(39)	(19%)	22	\$17.70
Power Distributors and Dispatchers	180	212	32	18%	22	\$37.37





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Stationary Engineers and Boiler Operators	183	191	8	5%	22	\$33.61
Grinding and Polishing Workers, Hand	205	160	(45)	(22%)	22	\$13.75
Airfield Operations Specialists	191	209	18	10%	22	\$24.02
Transportation Inspectors	192	203	11	5%	22	\$27.17
Tax Examiners and Collectors, and Revenue Agents	236	255	19	8%	21	\$34.23
Fashion Designers	162	190	28	17%	21	\$25.67
Healthcare Practitioners and Technical Workers, All Other	290	331	41	14%	21	\$32.87
Private Detectives and Investigators	167	184	16	10%	21	\$23.57
Floor Layers, Except Carpet, Wood, and Hard Tiles	200	211	11	6%	21	\$15.77
Plasterers and Stucco Masons	218	204	(14)	(6%)	21	\$18.71
Fence Erectors	161	170	9	6%	21	\$17.01
Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	164	180	16	9%	21	\$13.95
Tool and Die Makers	207	200	(7)	(3%)	21	\$23.25
Painting, Coating, and Decorating Workers	192	179	(13)	(7%)	21	\$13.46
Tire Builders	192	142	(50)	(26%)	21	\$13.64
Biological Technicians	171	187	15	9%	20	\$19.07
Veterinarians	285	361	76	27%	20	\$47.48
Cardiovascular Technologists and Technicians	297	325	28	9%	20	\$26.32
First-Line Supervisors of Police and Detectives	215	260	45	21%	20	\$70.73
Avionics Technicians	208	223	16	8%	20	\$35.47
Electronic Home Entertainment Equipment Installers and Repairers	150	160	10	7%	20	\$20.45
Upholsterers	176	178	2	1%	20	\$15.04
Photographic Process Workers and Processing Machine Operators	136	105	(31)	(23%)	20	\$12.45
Tank Car, Truck, and Ship Loaders	101	139	38	38%	20	\$13.92
Entertainers and Performers, Sports and Related Workers, All Other	141	154	13	10%	19	\$21.61
Rail Car Repairers	182	173	(9)	(5%)	19	\$28.81



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Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic	150	165	15	10%	19	\$30.05
Petroleum Pump System Operators, Refinery Operators, and Gaugers	176	169	(7)	(4%)	19	\$26.77
Flight Attendants	297	83	(214)	(72%)	19	\$13.42
Public Relations and Fundraising Managers	173	194	20	12%	18	\$54.60
Lodging Managers	148	148	0	0%	18	\$18.75
Environmental Engineers	218	235	17	8%	18	\$47.27
Electro-Mechanical Technicians	186	190	4	2%	18	\$30.11
Forensic Science Technicians	112	137	26	23%	18	\$31.82
Transportation Security Screeners	160	173	12	8%	18	\$19.99
Agricultural Inspectors	111	121	10	9%	18	\$16.23
Recreational Vehicle Service Technicians	121	128	7	6%	18	\$19.15
Plant and System Operators, All Other	163	165	2	1%	18	\$30.02
Cooling and Freezing Equipment Operators and Tenders	120	139	19	15%	18	\$19.53
Computer Network Architects	186	212	27	14%	17	\$44.71
Operations Research Analysts	156	207	52	33%	17	\$40.28
Environmental Engineering Technicians	171	179	8	4%	17	\$30.60
Social Scientists and Related Workers, All Other	154	166	12	8%	17	\$36.61
Environmental Science and Protection Technicians, Including Health	128	133	5	4%	17	\$24.90
Commercial and Industrial Designers	155	162	7	5%	17	\$25.83
Actors	131	151	20	15%	17	\$18.91
Therapists, All Other	187	234	47	25%	17	\$26.82
Animal Control Workers	121	139	17	14%	17	\$22.24
Meter Readers, Utilities	208	211	2	1%	17	\$25.00
Helpers--Pipelayers, Plumbers, Pipefitters, and Steamfitters	61	101	41	67%	17	\$14.62
Locksmiths and Safe Repairers	180	167	(13)	(7%)	17	\$22.28
Cleaning, Washing, and Metal Pickling Equipment Operators and Tenders	116	121	5	5%	17	\$12.20
Legislators	151	181	31	20%	16	\$27.69



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Credit Counselors	161	174	13	8%	16	\$23.76
Umpires, Referees, and Other Sports Officials	95	108	13	14%	16	\$12.35
Concierges	86	101	15	18%	16	\$13.42
Transportation Attendants, Except Flight Attendants	95	107	12	13%	16	\$14.46
Electrical and Electronics Drafters	137	151	14	11%	15	\$33.39
Agricultural and Food Science Technicians	129	135	6	5%	15	\$19.62
Health Diagnosing and Treating Practitioners, All Other	193	226	34	17%	15	\$27.75
Credit Authorizers, Checkers, and Clerks	134	133	(1)	(1%)	15	\$16.77
First-Line Supervisors of Farming, Fishing, and Forestry Workers	110	101	(9)	(8%)	15	\$25.11
Agricultural Equipment Operators	101	86	(14)	(14%)	15	\$15.12
Earth Drillers, Except Oil and Gas	136	132	(4)	(3%)	15	\$38.29
Rolling Machine Setters, Operators, and Tenders, Metal and Plastic	145	127	(19)	(13%)	15	\$17.70
Metal-Refining Furnace Operators and Tenders	143	138	(5)	(3%)	15	\$16.75
Textile Cutting Machine Setters, Operators, and Tenders	106	92	(15)	(14%)	15	\$13.99
Power Plant Operators	136	148	12	8%	15	\$39.41
Semiconductor Processors	112	118	6	5%	15	\$16.30
Geoscientists, Except Hydrologists and Geographers	136	140	4	3%	14	\$45.51
Technical Writers	115	128	13	11%	14	\$29.92
Gaming Service Workers, All Other	76	85	9	11%	14	\$11.84
Funeral Attendants	63	80	17	26%	14	\$13.97
Financial Clerks, All Other	106	115	9	9%	14	\$19.37
Automotive Glass Installers and Repairers	105	127	21	20%	14	\$13.23
Outdoor Power Equipment and Other Small Engine Mechanics	113	118	5	4%	14	\$15.10
Mechanical Door Repairers	123	148	25	20%	14	\$18.66
Ophthalmic Laboratory Technicians	85	103	18	22%	14	\$13.87
Advertising and Promotions Managers	105	112	7	7%	13	\$34.89
Information Security Analysts	121	150	29	24%	13	\$47.65



<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>CHANGE</b>	<b>% CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
Craft Artists	134	144	10	8%	13	\$7.42
Athletes and Sports Competitors	86	90	3	4%	13	\$28.50
Roustabouts, Oil and Gas	96	96	(0)	(0%)	13	\$14.75
Motorcycle Mechanics	101	111	10	10%	13	\$23.63
Bicycle Repairers	65	91	26	40%	13	\$13.39
Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	119	99	(20)	(17%)	13	\$15.29
Metal Workers and Plastic Workers, All Other	117	101	(16)	(13%)	13	\$16.68
Chemical Equipment Operators and Tenders	114	109	(5)	(4%)	13	\$21.25
Railroad Brake, Signal, and Switch Operators	133	120	(13)	(10%)	13	\$34.39
Credit Analysts	119	128	9	8%	12	\$31.08
Court Reporters	123	130	6	5%	12	\$30.28
Multimedia Artists and Animators	129	134	5	4%	12	\$14.79
Media and Communication Workers, All Other	110	118	9	8%	12	\$26.87
Optometrists	235	272	37	16%	12	\$52.81
Rail-Track Laying and Maintenance Equipment Operators	113	110	(3)	(3%)	12	\$39.34
Helpers--Extraction Workers	90	86	(4)	(4%)	12	\$15.26
Extruding and Forming Machine Setters, Operators, and Tenders, Synthetic and Glass Fibers	91	87	(4)	(4%)	12	\$11.02
Furniture Finishers	111	116	6	5%	12	\$14.88
Insurance Underwriters	132	123	(9)	(7%)	11	\$29.61
Landscape Architects	122	132	9	8%	11	\$31.20
Food Scientists and Technologists	89	95	6	6%	11	\$26.53
Microbiologists	115	113	(2)	(2%)	11	\$32.38
Media and Communication Equipment Workers, All Other	108	111	4	3%	11	\$33.66
Magnetic Resonance Imaging Technologists	140	165	24	17%	11	\$37.98
Electric Motor, Power Tool, and Related Repairers	80	101	21	26%	11	\$37.77
Millwrights	68	99	31	46%	11	\$42.19



<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>CHANGE</b>	<b>% CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
Musical Instrument Repairers and Tuners	88	108	20	22%	11	\$17.48
Print Binding and Finishing Workers	74	74	0	0%	11	\$11.67
Film and Video Editors	73	84	11	16%	10	\$25.99
First-Line Supervisors of Fire Fighting and Prevention Workers	83	110	28	34%	10	\$38.47
Forest and Conservation Workers	59	55	(3)	(5%)	10	\$27.69
Radio, Cellular, and Tower Equipment Installers and Repairs	80	85	5	6%	10	\$22.51
Electronic Equipment Installers and Repairers, Motor Vehicles	101	89	(12)	(12%)	10	\$18.33
Shoe and Leather Workers and Repairers	92	96	4	4%	10	\$15.23
Chemical Engineers	120	122	2	1%	9	\$28.77
Aerospace Engineering and Operations Technicians	74	85	12	16%	9	\$31.70
Mechanical Engineering Technicians	82	89	7	9%	9	\$25.50
Special Education Teachers, All Other	67	96	29	43%	9	\$11.42
Public Address System and Other Announcers	80	81	1	2%	9	\$23.12
Building Cleaning Workers, All Other	61	61	0	1%	9	\$15.87
Gaming and Sports Book Writers and Runners	50	56	6	12%	9	\$13.43
Shampooers	67	69	2	3%	9	\$8.61
Insulation Workers, Mechanical	39	63	24	62%	9	\$18.16
Electrical and Electronics Installers and Repairers, Transportation Equipment	87	87	0	0%	9	\$28.78
Forging Machine Setters, Operators, and Tenders, Metal and Plastic	91	77	(14)	(15%)	9	\$17.01
Sewers, Hand	52	61	9	18%	9	\$10.54
Adhesive Bonding Machine Operators and Tenders	75	75	0	0%	9	\$14.79
Aircraft Cargo Handling Supervisors	59	75	16	27%	9	\$22.78
Pump Operators, Except Wellhead Pumpers	62	69	8	13%	9	\$22.32
Natural Sciences Managers	77	88	11	14%	8	\$52.93
Agents and Business Managers of Artists, Performers, and Athletes	59	61	3	4%	8	\$22.55
Statisticians	64	82	18	28%	8	\$34.39

<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>CHANGE</b>	<b>% CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
Aerospace Engineers	75	102	27	35%	8	\$47.97
Psychologists, All Other	88	103	15	18%	8	\$42.03
Audio-Visual and Multimedia Collections Specialists	66	74	9	13%	8	\$21.67
Radio and Television Announcers	92	63	(29)	(31%)	8	\$20.90
Psychiatrists	232	239	7	3%	8	\$144.52
Ophthalmic Medical Technicians	60	79	19	31%	8	\$15.13
Grounds Maintenance Workers, All Other	59	62	3	5%	8	\$15.07
Models	37	41	4	12%	8	\$21.13
Insulation Workers, Floor, Ceiling, and Wall	57	64	7	12%	8	\$11.65
Helpers--Painters, Paperhangers, Plasterers, and Stucco Masons	46	53	7	16%	8	\$16.97
Signal and Track Switch Repairers	83	79	(5)	(6%)	8	\$36.92
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	70	67	(4)	(5%)	8	\$16.58
Prepress Technicians and Workers	62	60	(2)	(4%)	8	\$17.73
Textile Knitting and Weaving Machine Setters, Operators, and Tenders	64	58	(7)	(10%)	8	\$14.25
Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders	73	70	(3)	(4%)	8	\$20.83
Subway and Streetcar Operators	69	78	9	14%	8	\$25.56
Gaming Managers	53	59	6	12%	7	\$40.77
Soil and Plant Scientists	68	67	(0)	(1%)	7	\$28.45
Physical Scientists, All Other	186	77	7	9%	7	\$67.87
Career/Technical Education Teachers, Middle School	76	86	10	13%	7	\$27.55
Career/Technical Education Teachers, Secondary School	15	56	41	264%	7	\$39.38
Recreational Therapists	95	103	8	9%	7	\$34.51
Nuclear Medicine Technologists	108	118	11	10%	7	\$47.84
Athletic Trainers	74	93	19	26%	7	\$28.26
Occupational Therapy Aides	37	47	10	27%	7	\$16.01
Morticians, Undertakers, and Funeral Directors	42	50	8	20%	7	\$44.27
Brokerage Clerks	67	67	(0)	(0%)	7	\$25.48



<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>CHANGE</b>	<b>% CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
Logging Equipment Operators	50	51	1	1%	7	\$24.23
Wind Turbine Service Technicians	41	60	20	48%	7	\$20.41
Fiberglass Laminators and Fabricators	79	45	(34)	(43%)	7	\$15.22
Cutters and Trimmers, Hand	56	53	(3)	(5%)	7	\$12.84
Medical Appliance Technicians	41	51	10	24%	7	\$20.34
Emergency Management Directors	59	64	5	8%	6	\$17.25
Financial Examiners	55	64	9	16%	6	\$43.06
Biomedical Engineers	68	73	6	9%	6	\$41.13
Health and Safety Engineers, Except Mining Safety Engineers and Inspectors	62	71	9	14%	6	\$48.41
Zoologists and Wildlife Biologists	50	56	6	13%	6	\$24.01
Special Education Teachers, Preschool	39	62	23	60%	6	\$21.07
Designers, All Other	55	55	0	0%	6	\$31.95
Dancers	36	36	1	1%	6	\$17.11
Reporters and Correspondents	67	42	(25)	(38%)	6	\$20.23
Sound Engineering Technicians	57	55	(2)	(4%)	6	\$28.83
Camera Operators, Television, Video, and Motion Picture	54	58	4	7%	6	\$21.57
Internists, General	128	143	15	12%	6	\$42.18
Communications Equipment Operators, All Other	49	50	1	2%	6	\$28.69
Agricultural Workers, All Other	34	32	(2)	(6%)	6	\$16.90
Boilermakers	49	57	8	15%	6	\$48.25
Rotary Drill Operators, Oil and Gas	48	44	(4)	(8%)	6	\$41.67
Farm Equipment Mechanics and Service Technicians	59	60	1	2%	6	\$11.77
Precision Instrument and Equipment Repairers, All Other	58	61	3	5%	6	\$32.35
Riggers	47	54	7	14%	6	\$38.65
Engine and Other Machine Assemblers	55	48	(7)	(12%)	6	\$24.51
Layout Workers, Metal and Plastic	51	47	(4)	(9%)	6	\$18.54
Chemical Plant and System Operators	58	51	(7)	(12%)	6	\$32.56
Etchers and Engravers	40	47	6	16%	6	\$14.87



<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>CHANGE</b>	<b>% CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
Computer and Information Research Scientists	54	63	9	16%	5	\$54.99
Computer Hardware Engineers	55	67	12	22%	5	\$48.44
Drafters, All Other	48	52	4	9%	5	\$29.22
Conservation Scientists	45	52	7	15%	5	\$33.80
Physicists	52	58	6	12%	5	\$27.66
Atmospheric and Space Scientists	64	65	1	1%	5	\$46.11
Social Science Research Assistants	29	34	5	18%	5	\$34.86
Judges, Magistrate Judges, and Magistrates	68	83	15	22%	5	\$104.37
Set and Exhibit Designers	48	51	3	5%	5	\$19.12
Broadcast Technicians	52	48	(4)	(8%)	5	\$21.83
Chiropractors	164	156	(8)	(5%)	5	\$35.88
Pediatricians, General	142	149	8	5%	5	\$83.65
Radiation Therapists	59	71	12	21%	5	\$50.22
Exercise Physiologists	78	84	6	8%	5	\$24.12
Nurse Anesthetists	55	76	21	37%	5	\$98.10
Occupational Health and Safety Technicians	68	78	11	16%	5	\$25.49
Costume Attendants	17	18	2	11%	5	\$18.98
Proofreaders and Copy Markers	30	30	0	1%	5	\$15.53
Statistical Assistants	34	37	3	8%	5	\$22.82
Service Unit Operators, Oil, Gas, and Mining	44	41	(4)	(8%)	5	\$39.66
Continuous Mining Machine Operators	27	33	6	24%	5	\$22.11
Foundry Mold and Coremakers	43	38	(5)	(12%)	5	\$13.49
Gas Plant Operators	57	46	(12)	(21%)	5	\$45.68
Compensation and Benefits Managers	39	43	4	11%	4	\$53.43
Funeral Service Managers	35	42	7	21%	4	\$26.92
Postmasters and Mail Superintendents	52	44	(8)	(16%)	4	\$39.78
Cartographers and Photogrammetrists	32	39	7	23%	4	\$40.87
Materials Engineers	38	44	5	14%	4	\$43.71





<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>CHANGE</b>	<b>% CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
Petroleum Engineers	54	51	(3)	(6%)	4	\$58.35
Geological and Petroleum Technicians	35	33	(2)	(6%)	4	\$30.26
Museum Technicians and Conservators	27	33	5	18%	4	\$21.16
Hearing Aid Specialists	49	57	8	16%	4	\$26.86
Fire Inspectors and Investigators	26	31	5	21%	4	\$15.06
Parking Enforcement Workers	51	41	(10)	(19%)	4	\$21.69
Correspondence Clerks	32	33	1	2%	4	\$17.90
Desktop Publishers	33	35	2	7%	4	\$23.15
Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic	38	36	(2)	(4%)	4	\$24.03
Textile, Apparel, and Furnishings Workers, All Other	26	31	5	19%	4	\$16.33
Rail Transportation Workers, All Other	34	33	(1)	(3%)	4	\$32.04
Ship Engineers	31	33	2	5%	4	\$30.25
Insurance Appraisers, Auto Damage	29	28	(0)	(1%)	3	\$59.25
Actuaries	40	39	(1)	(3%)	3	\$47.66
Marine Engineers and Naval Architects	38	38	1	2%	3	\$46.57
Nuclear Engineers	32	34	2	5%	3	\$65.63
Biochemists and Biophysicists	27	30	3	11%	3	\$54.58
Epidemiologists	22	26	4	19%	3	\$29.88
Anthropologists and Archeologists	29	27	(2)	(5%)	3	\$31.25
Administrative Law Judges, Adjudicators, and Hearing Officers	49	56	7	14%	3	\$63.27
Curators	22	27	5	23%	3	\$30.27
Farm and Home Management Advisors	26	31	5	19%	3	\$39.88
Artists and Related Workers, All Other	37	36	(1)	(1%)	3	\$12.21
Anesthesiologists	96	95	(1)	(1%)	3	\$133.10
Obstetricians and Gynecologists	80	87	7	9%	3	\$141.15
Surgeons	84	85	0	0%	3	\$238.08
Podiatrists	52	54	1	2%	3	\$43.67
Audiologists	41	49	8	20%	3	\$44.12

<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>CHANGE</b>	<b>% CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
Orthotists and Prosthetists	35	43	8	22%	3	\$28.44
Gaming Surveillance Officers and Gaming Investigators	17	21	4	24%	3	\$15.17
Entertainment Attendants and Related Workers, All Other	9	11	2	21%	3	\$10.53
Rock Splitters, Quarry	17	19	2	14%	3	\$26.00
Watch Repairers	31	26	(5)	(15%)	3	\$15.97
Rail Yard Engineers, Dinkey Operators, and Hostlers	37	31	(6)	(17%)	3	\$23.89
Bridge and Lock Tenders	20	21	1	7%	3	\$20.56
Traffic Technicians	18	21	3	20%	3	\$34.24
Gas Compressor and Gas Pumping Station Operators	23	23	(0)	(1%)	3	\$31.40
Wellhead Pumpers	19	19	(0)	(1%)	3	\$25.56
Mining and Geological Engineers, Including Mining Safety Engineers	24	27	2	9%	2	\$66.17
Foresters	20	22	2	12%	2	\$31.34
Life Scientists, All Other	17	18	1	6%	2	\$40.34
Materials Scientists	15	16	1	7%	2	\$41.10
Economists	21	25	4	18%	2	\$50.15
Survey Researchers	19	20	1	3%	2	\$21.77
Sociologists	17	18	2	10%	2	\$41.45
Historians	16	19	3	15%	2	\$33.13
Arbitrators, Mediators, and Conciliators	27	34	6	23%	2	\$23.90
Archivists	17	20	3	17%	2	\$25.64
Choreographers	14	16	2	15%	2	\$24.43
Broadcast News Analysts	14	17	3	21%	2	\$35.97
Orthodontists	52	57	5	9%	2	\$110.41
Respiratory Therapy Technicians	29	19	(10)	(34%)	2	\$27.89
Bailiffs	9	14	6	66%	2	\$33.40
Transit and Railroad Police	26	28	2	8%	2	\$28.99
Cooks, Private Household	10	11	1	12%	2	\$18.33
Makeup Artists, Theatrical and Performance	14	15	1	10%	2	\$27.85



<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>CHANGE</b>	<b>% CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
Telephone Operators	9	10	1	14%	2	\$21.00
New Accounts Clerks	9	12	3	32%	2	\$25.97
Animal Breeders	13	12	(1)	(9%)	2	\$31.36
Fallers	14	13	(0)	(1%)	2	\$19.44
Floor Sanders and Finishers	26	21	(5)	(20%)	2	\$13.27
Helpers--Roofers	8	14	6	74%	2	\$17.41
Mine Cutting and Channeling Machine Operators	12	16	3	29%	2	\$45.21
Extraction Workers, All Other	14	14	0	0%	2	\$12.81
Camera and Photographic Equipment Repairers	17	17	(0)	(2%)	2	\$21.19
Commercial Divers	19	21	3	15%	2	\$20.36
Coil Winders, Tapers, and Finishers	19	19	(0)	(1%)	2	\$10.97
Model Makers, Metal and Plastic	22	20	(2)	(8%)	2	\$28.74
Patternmakers, Wood	12	13	1	9%	2	\$23.19
Motorboat Operators	17	18	1	5%	2	\$25.53
Loading Machine Operators, Underground Mining	12	14	3	23%	2	\$27.77
Hoist and Winch Operators	14	13	(1)	(6%)	2	\$23.13
Animal Scientists	5	5	1	11%	1	\$23.07
Electro-Mechanical Technicians	5	190	1	2%	1	\$30.11
Political Scientists	11	13	2	15%	1	\$54.12
Nuclear Technicians	11	11	(0)	(0%)	1	\$40.69
Judicial Law Clerks	1	5	4	363%	1	\$12.55
Oral and Maxillofacial Surgeons	29	31	2	7%	1	\$119.54
Dentists, All Other Specialists	11	12	1	10%	1	\$92.23
Nurse Midwives	6	13	7	108%	1	\$37.05
Genetic Counselors	5	7	2	44%	1	\$51.92
Forest Fire Inspectors and Prevention Specialists	9	11	3	34%	1	\$12.92
Motion Picture Projectionists	5	9	4	70%	1	\$10.51
Embalmers	2	3	1	62%	1	\$18.72

<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>CHANGE</b>	<b>% CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
Fishers and Related Fishing Workers	13	10	(3)	(25%)	1	\$16.97
Hunters and Trappers	6	6	(0)	(1%)	1	\$16.10
Log Graders and Scalers	8	8	0	6%	1	\$17.53
Logging Workers, All Other	7	7	(0)	(4%)	1	\$14.35
Terrazzo Workers and Finishers	3	4	1	17%	1	\$12.42
Pile-Driver Operators	6	8	2	27%	1	\$34.53
Paperhangers	14	12	(3)	(18%)	1	\$13.31
Derrick Operators, Oil and Gas	8	7	(0)	(5%)	1	\$27.36
Mining Machine Operators, All Other	7	8	1	17%	1	\$37.10
Refractory Materials Repairers, Except Brickmasons	12	12	(0)	(2%)	1	\$33.93
Manufactured Building and Mobile Home Installers	9	9	(1)	(7%)	1	\$13.24
Pourers and Casters, Metal	10	12	2	18%	1	\$15.74
Patternmakers, Metal and Plastic	9	9	0	1%	1	\$18.41
Textile Bleaching and Dyeing Machine Operators and Tenders	7	7	(1)	(11%)	1	\$12.00
Textile Winding, Twisting, and Drawing Out Machine Setters, Operators, and Tenders	8	11	3	33%	1	\$17.76
Fabric and Apparel Patternmakers	9	10	1	16%	1	\$16.33
Model Makers, Wood	7	6	(1)	(10%)	1	\$21.77
Nuclear Power Reactor Operators	7	7	(0)	(4%)	1	\$27.29
Dredge Operators	5	6	1	12%	1	\$22.21
Farm Labor Contractors	1	1	0	9%	0	\$22.22
Mathematicians	3	4	1	16%	0	\$48.22
Miscellaneous Mathematical Science Occupations	3	3	0	12%	0	\$16.23
Agricultural Engineers	4	4	0	9%	0	\$31.96
Astronomers	2	2	0	21%	0	\$27.35
Industrial-Organizational Psychologists	3	3	(0)	(9%)	0	\$43.87
Geographers	2	3	0	19%	0	\$36.53
Radio Operators	3	3	0	19%	0	\$14.82
Prosthodontists	1	1	0	24%	0	\$85.51

<b>SOC TITLE</b>	<b>2018 JOBS</b>	<b>2028 JOBS</b>	<b>CHANGE</b>	<b>% CHANGE</b>	<b>ANNUAL JOB OPENINGS</b>	<b>MEDIAN HOURLY WAGE</b>
Fish and Game Wardens	1	3	2	137%	0	\$44.31
Roof Bolters, Mining	0	0	0	47%	0	\$44.50
Fabric Menders, Except Garment	2	2	(0)	(4%)	0	\$11.52
Timing Device Assemblers and Adjusters	2	2	(0)	(3%)	0	\$21.01
Shoe Machine Operators and Tenders	2	1	(1)	(36%)	0	\$13.60
Locomotive Firers	7	4	(3)	(38%)	0	\$28.98
Mine Shuttle Car Operators	1	1	0	10%	0	\$37.19

Source: Employees & Self-Employed 2019.1.

## APPENDIX 7: Unemployment

Data on unemployment give researchers an idea of where skills mismatches may exist in the region. Unemployment data can also provide important context when identifying the training programs that are best suited to transitioning unemployed workers into in-demand occupations.

The tables and figures present the number of people unemployed by two-digit industry sector and the two-digit occupational group<sup>18</sup> in San Bernardino County. Data reflect October 2018 and follow the same methodology used by the federal statistical agencies to determine the number of workers in an industry or occupation not currently employed. The unemployment rate is not provided because it is difficult to accurately determine the size of the labor force in an industry every month. Rather than the unemployment rate, the percent of all unemployed workers in the region, state, and U.S. are provided.

Table A7.1: Unemployed Workers by Industry Sector in San Bernardino County with State and National Comparisons

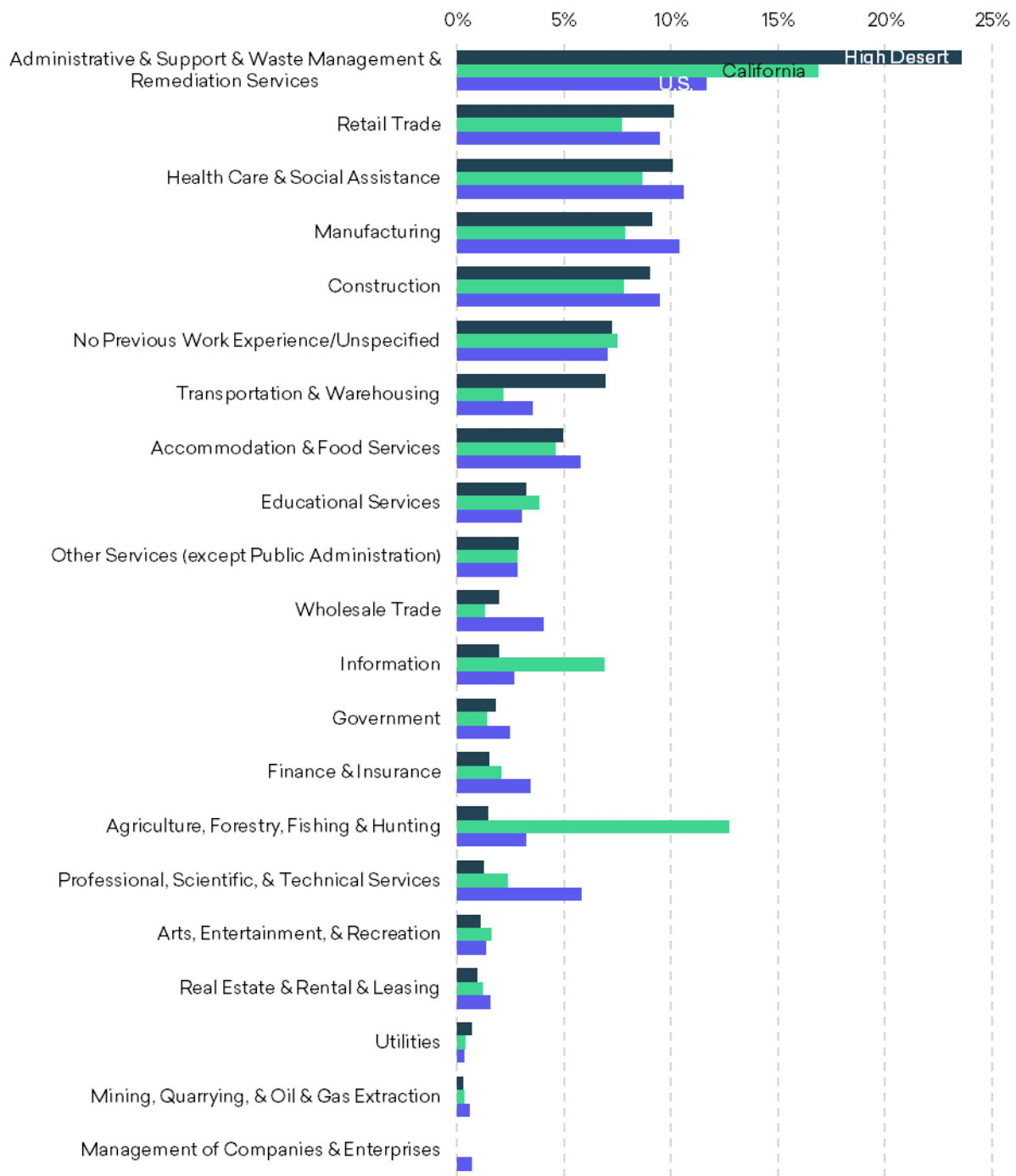
NAICS CODE	NAICS TITLE	REGIONAL UNEMPLOYED	REGIONAL % UNEMPLOYED	STATE % UNEMPLOYED	NATIONAL % UNEMPLOYED
56	Administrative & Support & Waste Management & Remediation Services	8,938	24%	17%	12%
44	Retail Trade	3,845	10%	8%	9%
62	Health Care & Social Assistance	3,811	10%	9%	11%
31	Manufacturing	3,447	9%	8%	10%
23	Construction	3,409	9%	8%	9%
99	No Previous Work Experience/Unspecified	2,733	7%	8%	7%
48	Transportation & Warehousing	2,630	7%	2%	4%
72	Accommodation & Food Services	1,876	5%	5%	6%
61	Educational Services	1,222	3%	4%	3%
81	Other Services (except Public Administration)	1,088	3%	3%	3%

18 Unemployment by industry data is only available at the two-digit level whereas the industry data reported elsewhere in this analysis is at the three-digit level.

NAICS CODE	NAICS TITLE	REGIONAL UNEMPLOYED	REGIONAL % UNEMPLOYED	STATE % UNEMPLOYED	NATIONAL % UNEMPLOYED
42	Wholesale Trade	747	2%	1%	4%
51	Information	746	2%	7%	3%
90	Government	681	2%	1%	2%
52	Finance & Insurance	561	1%	2%	3%
11	Agriculture, Forestry, Fishing & Hunting	556	1%	13%	3%
54	Professional, Scientific, & Technical Services	471	1%	2%	6%
71	Arts, Entertainment, & Recreation	415	1%	2%	1%
53	Real Estate & Rental & Leasing	358	1%	1%	2%
22	Utilities	251	1%	0%	0%
21	Mining, Quarrying, & Oil & Gas Extraction	101	0%	0%	1%
55	Management of Companies & Enterprises	0	0%	0%	1%

Source: Emsi Total Unemployment (January 2019).

Figure A7.1: Unemployed Workers by Industry Sector in San Bernardino County with State and National Comparisons



Source: Emsi Total Unemployment (January 2019).





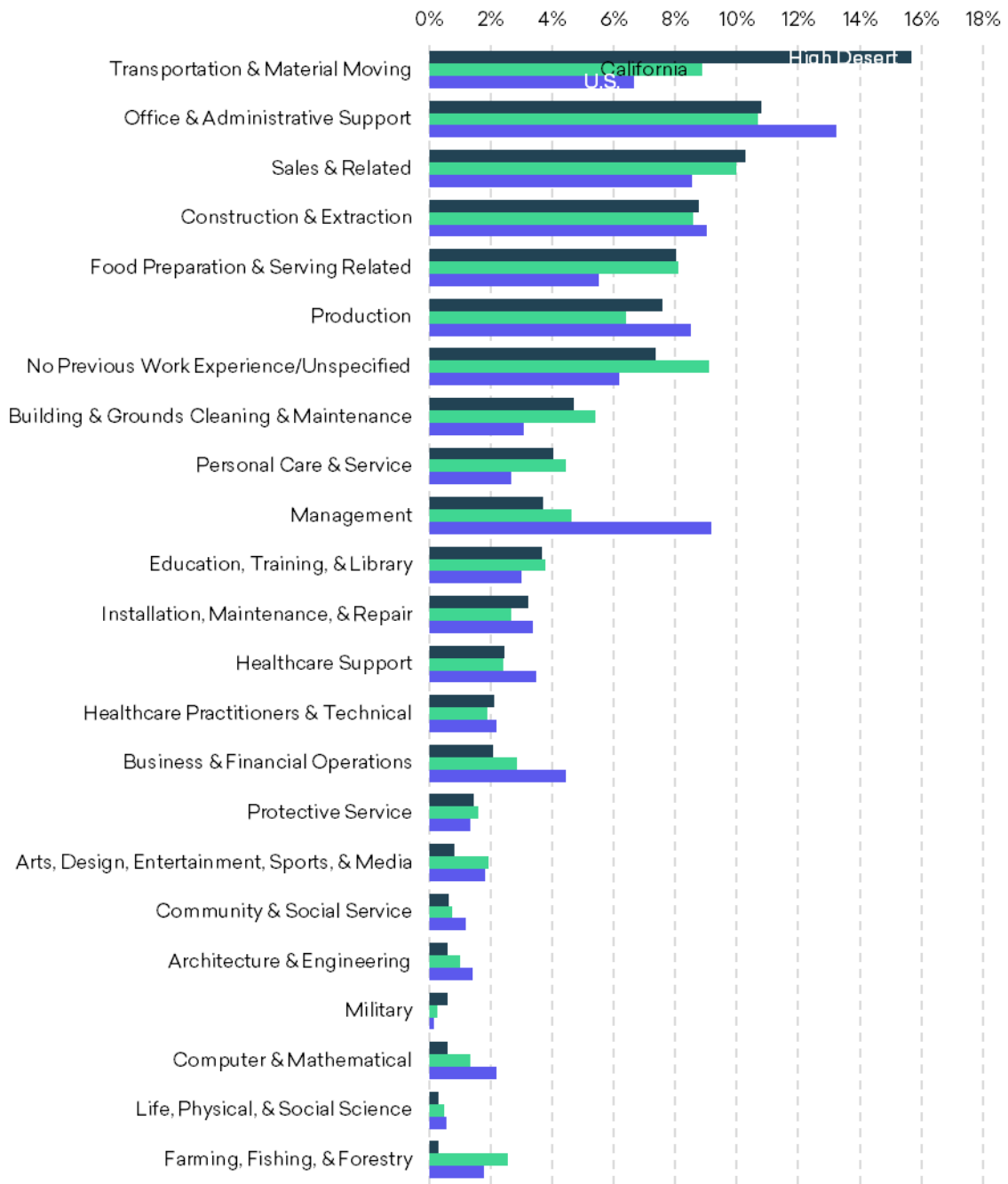
Table A7.2: Unemployed Workers by Occupational Group in San Bernardino County with State and National Comparisons

<b>SOC CODE</b>	<b>SOC TITLE</b>	<b>REGIONAL UNEMPLOYED</b>	<b>REGIONAL % UNEMPLOYED</b>	<b>STATE % UNEMPLOYED</b>	<b>NATIONAL % UNEMPLOYED</b>
53-0000	Transportation & Material Moving	5,939	16%	9%	7%
43-0000	Office & Administrative Support	4,091	11%	11%	13%
41-0000	Sales & Related	3,897	10%	10%	9%
47-0000	Construction & Extraction	3,327	9%	9%	9%
35-0000	Food Preparation & Serving Related	3,038	8%	8%	6%
51-0000	Production	2,871	8%	6%	8%
99-0000	No Previous Work Experience/Unspecified	2,783	7%	9%	6%
37-0000	Building & Grounds Cleaning & Maintenance	1,781	5%	5%	3%
39-0000	Personal Care & Service	1,533	4%	4%	3%
11-0000	Management	1,402	4%	5%	9%
25-0000	Education, Training, & Library	1,392	4%	4%	3%
49-0000	Installation, Maintenance, & Repair	1,224	3%	3%	3%
31-0000	Healthcare Support	923	2%	2%	3%
29-0000	Healthcare Practitioners & Technical	808	2%	2%	2%
13-0000	Business & Financial Operations	784	2%	3%	4%
33-0000	Protective Service	552	1%	2%	1%
27-0000	Arts, Design, Entertainment, Sports, & Media	308	1%	2%	2%
21-0000	Community & Social Service	243	1%	1%	1%
17-0000	Architecture & Engineering	233	1%	1%	1%
55-0000	Military	233	1%	0%	0%
15-0000	Computer & Mathematical	223	1%	1%	2%
19-0000	Life, Physical, & Social Science	116	0%	0%	1%
45-0000	Farming, Fishing, & Forestry	112	0%	3%	2%

Source: Emsi Total Unemployment (January 2019).



Figure A7.2: Unemployed Workers by Occupational Group in San Bernardino County with State and National Comparisons



Source: Emsi Total Unemployment (January 2019).



## APPENDIX 8: Living Wage

As shown in the following table, the living wage is the hourly rate that an individual must earn to support his or her family as a sole income provider working full-time or 2,080 hours annually. Part-time is defined as less than 35 hours per week of work. State minimum wage rates are the same for all individuals, regardless of the number of dependents in the household. Values are reported per adult in the household. The poverty rate is typically reported as gross annual income and has been adjusted to an hourly wage rate.

Table A8.1: Living Wage Calculations for San Bernardino County

ADULTS IN HOUSEHOLD	CHILDREN IN HOUSEHOLD	LIVING WAGE	POVERTY WAGE	MINIMUM WAGE
One adult	No children	\$12.39	\$5.84	\$11.00
	One child	\$26.94	\$7.91	\$11.00
	Two children	\$32.73	\$9.99	\$11.00
	Three children	\$42.42	\$12.07	\$11.00
Two adults, one working	No children	\$20.14	\$7.91	\$11.00
	One child	\$24.58	\$9.99	\$11.00
	Two children	\$27.39	\$12.07	\$11.00
	Three children	\$31.80	\$14.14	\$11.00
Two adults, one working part-time	One child	\$28.71	--	--
Two adults	No children	\$10.07	\$3.96	\$11.00
	One child	\$14.75	\$5.00	\$11.00
	Two children	\$17.84	\$6.03	\$11.00
	Three children	\$21.73	\$7.07	\$11.00

Source: "Living Wage Calculation for California," Dr. Amy K. Glasmeier and the Massachusetts Institute of Technology, last modified March 2018, accessed May 2018, <http://livingwage.mit.edu>.