

CLOVIS COMMUNITY COLLEGE

ECONOMIC OVERVIEW & PROGRAM GAP ANALYSIS

emsi

PREPARED BY EMSI
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EXECUTIVE SUMMARY

Clovis Community College (CCC) is located in the city of Fresno and serves four counties in central California. This report outlines the economy of this four-county region (Fresno, Kings, Madera, and Tulare Counties) and provides a “gap” analysis to determine how well the College’s program offerings are satisfying regional workforce demand. The report also offers recommendations for new program development. The following are some of the key findings of the analysis:

OVERVIEW OF REGIONAL ECONOMY

- The economy of the region served by CCC (“the CCC Economic Region”) is primarily driven by the Government; Agriculture, Forestry, Fishing, & Hunting; and Health Care & Social Assistance industries. The Agriculture, Forestry, Fishing, & Hunting and Health Care & Social Assistance sectors added new jobs between 2009 and 2014, but the only the Health Care & Social Assistance and Government sectors are projected to grow through 2024 of the top three. Management of Companies & Enterprises and Agriculture, Forestry, Fishing, & Hunting are projected to lose jobs over the next decade. Overall the regional job growth is expected to be 13% over the next decade.
- Some high-skill occupational categories are projected to see high job growth over the next ten years, including healthcare practitioners & technical occupations (21% job growth), computer & mathematical occupations (20% job growth), and architecture & engineering occupations (12% job growth).
- Between 2014 and 2024, the highest number of average annual job openings for workers with postsecondary certificates and above are projected to occur within office & administrative support occupations; sales & related occupations; and education, training, & library occupations.
- Around 21% of residents in the area commute outside the CCC Economic Region for work and roughly 18% of

the CCC Economic Region workers reside outside the area, indicating that there are economic links between the CCC Economic Region and the surrounding communities for both out-commuters and in-commuters.

- The educational composition of the adult population in the CCC Economic Region (people age 25 and older) has seen a small shift in recent years. Between 2009 and 2014, the proportion of adults with less than a high school diploma increased by 2.7 percentage points and the proportion with a high school diploma decreased by 1.3 percentage points. Meanwhile, the proportion of adults with other levels of education decreased slightly in the past five years; notably those with some college and bachelor’s degree levels (decreased by 0.6 and 0.4 percentage points, respectively).

PROGRAM GAP ANALYSIS

- Between both levels of postsecondary certificate and associate’s degree, there are a total of seven programs associated with significant workforce gaps.
- General Office Occupations & Clerical Services has the largest certificate level gap (gap of 645), but compensation from related occupations is relatively low (median hourly earnings \$13.89). Accounting is the second largest certificate level gap (gap of 110; median hourly wage \$16.67). Business Administration, the third largest certificate level gap, has a large gap and is mapped to higher paying occupations (gap of 79, median hourly earnings \$34.71).
- The two associate’s degree level gaps are: Child Development (gap of 72; median hourly earnings \$9.90) and Accounting (gap of 27; median hourly earnings \$26.45). Some of the associate’s degree level programs that would have gaps are transfer programs, and are covered in the Transfer Track section of Chapter 2.
- Licensed Vocational Nursing (surplus 182), Child Development/Early Care & Education (surplus 114), and

Administration of Justice (surplus 61) are the three programs associated with the largest surpluses of completers at the certificate level.

- Nursing (surplus of 511), General Social Sciences (surplus of 244), and Administration of Justice (surplus of 176) are top three associate's degree level surpluses.
- For some of the programs, CCC is producing a moderate number of new completers, but additional supply from other regional institutions, leads to the surplus. It is possible that some of the completers are seeking employment outside the CCC Economic Region.
- There are 26 postsecondary certificate level areas of opportunity identified. Wage rates are in a range between \$12.63 for light truck or deliver services drivers to a high of \$44.23 for correctional officers & jailers.
- Some of the largest gaps in the programmatic areas of opportunity were for blue collar occupations like heavy & tractor-trailer truck drivers, general maintenance & repair workers, and industrial machinery mechanics appear to be undersupplied in the CCC Economic Region. Some skilled trades are also among the top areas of opportunity: electricians; plumbers, pipefitters, & steamfitters; and carpenters.
- An additional five areas of opportunity are at the associate's degree level. Medical & clinical laboratory technicians have the largest gap (gap of 10), but also pay only \$16.93 an hour. Other healthcare related occupations, diagnostic medical sonographers and medical equipment repairers, have small gaps but high wages (gap of 8 each; median hourly earnings over \$20 an hour).

INTRODUCTION

Colleges face many challenges in their efforts to identify the training needs of their Economic Regions. They must account for regional economic trends and the changing quality of the workforce. Furthermore, as technology progresses, colleges need to address the increasingly complex and specialized skills required by employers. In light of these dynamics, an understanding of the regional economy and the demand for skilled labor is vital to the planning efforts of colleges seeking to adapt their program offerings to the requirements of an ever-changing workforce.

To gain better insight into economic conditions and workforce trends, Clovis Community College (CCC) partnered with Economic Modeling Specialists Intl. (EMSI) to conduct an economic overview of the college's Economic Region and a workforce "gap" analysis of the college's program offerings. Gap analysis is a technique used to assess the supply and demand of skilled workers and identify the educational programs that need to be adapted in order to fill any existing or future gaps. The analysis weighs the educational output of CCC and other regional institutions against the number of job openings related to the institutions' program offerings to determine whether an

oversupply or an undersupply of skilled workers exists. The goal of the analysis is to provide CCC with relevant data and information that it can use when solving problems and making decisions about current and future program development.

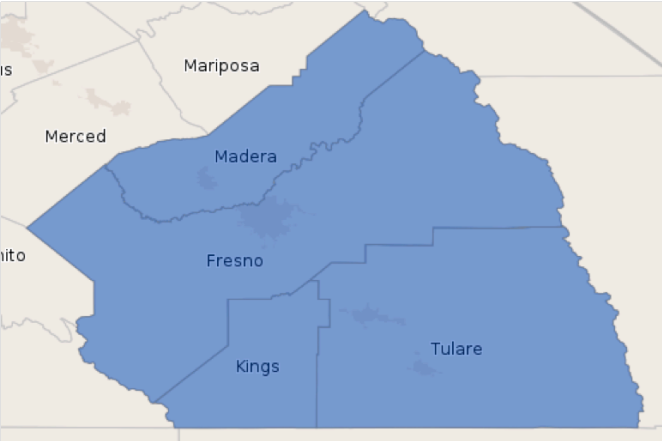
The regional backdrop used in this report is defined by Fresno, Kings, Madera, and Tulare Counties. This regional backdrop will be referred to as "the CCC Economic Region". CCC is located in Fresno, CA.¹ See Figure 1.1 for a map of the region.

The report is broken into two chapters. Chapter 1 provides an overview of employment in the CCC Economic Region economy with high-level information about current and projected job trends, resident commuting patterns, and unemployment. Chapter 1 also provides further information specifically related to the educational characteristics of the population by gender and ethnicity. Chapter 2 summarizes the results of the program gap analysis and provides recommendations for possible future program needs. After a brief conclusion, detailed information and data are provided in the appendices.

¹ The industry and occupation data presented in this report reflect the number of jobs by place of work, not by place of residence. However, the report does assess the commuting patterns of residents to determine where they live and work both within and outside of the region.

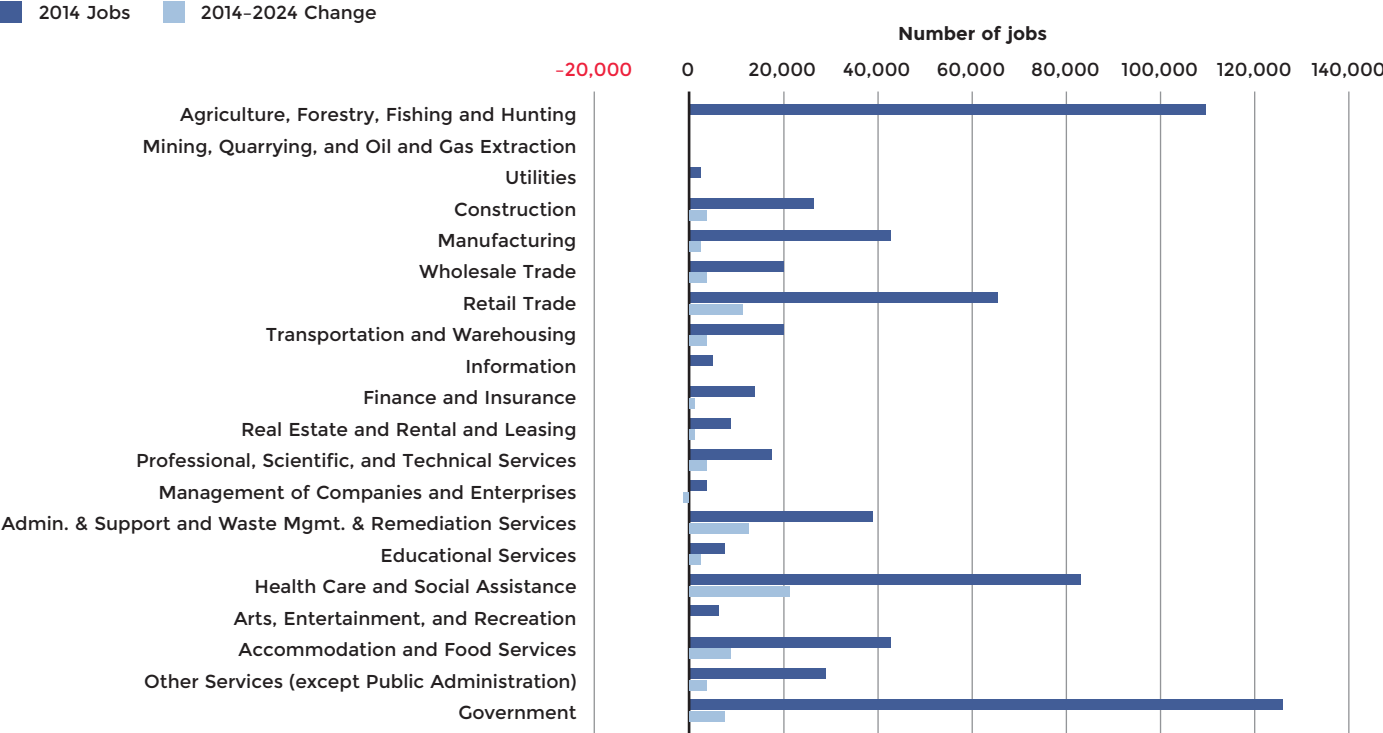
CHAPTER 1: OVERVIEW OF THE ECONOMY

FIGURE 1.1: MAP OF CCC ECONOMIC REGION



This chapter provides a high-level overview of employment and demographics in the economy of the CCC Economic Region, defined by Fresno, Kings, Madera, and Tulare Counties (see Figure 1.1). The goal of the chapter is to provide data on the economic and workforce employment trends that either already exist or are developing in the region. Such information is crucial in building awareness of the region’s labor force – both now and in the future – and identifying priority areas where educators can focus their attention. The chapter examines employment and demographics in the CCC Economic Region according to the following five indicators: jobs by industry, jobs by occupation, commuting patterns, unemployment, and educational attainment.

FIGURE 1.2: JOBS AND JOB CHANGE BY INDUSTRY SECTOR IN CCC ECONOMIC REGION, 2014 TO 2024



Source: EMSI Complete Data 2014.3

JOBS BY INDUSTRY

Evaluating current and future employment by industry provides information on the economic diversification of a given region. Industries consist of groups of companies that are primarily engaged in producing the same product or service. The North American Industry Classification System (NAICS) is the structure used by the U.S. Census Bureau to classify establishments into industries 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 1,100 detailed industries into twenty larger industry sectors. The breakdown of current and future employment by major industry sector in the CCC Economic Region appears in Table 1.1 and Figure 1.2 on the previous page.

As shown, the three largest industry sectors in the CCC Economic Region are Government; Agriculture, Forestry, Fishing, & Hunting; and Health Care & Social Assistance.

Together these sectors made up 319,508 jobs or approximately 48% of total regional employment in 2014. The Agriculture, Forestry, Fishing, & Hunting and Health Care & Social Assistance sectors added new jobs between 2009 and 2014 but the Health Care & Social Assistance and Government sectors are projected to grow through 2024. Other industry sectors with notable projected growth are Administrative & Support & Waste Management & Remediation Services (+12,064 jobs), Retail Trade (+11,348 jobs), and Accommodation & Food Services (+8,366 jobs). The industry sectors that are expected to contract between 2014 and 2024 are Management of Companies & Enterprises (-1,469 jobs) and Agriculture, Forestry, Fishing, & Hunting (-488 jobs).

Table 1.2 on the next page shows the employment concentration of the industry sectors in the CCC Economic Region, measured in terms of location quotients (LQs). LQs are used to assess national competitiveness by comparing the concentration of employment in a given industry against the concentration of employment for that same

TABLE 1.1: CURRENT AND PROJECTED JOBS AND JOB CHANGE BY INDUSTRY SECTOR, 2014 TO 2024

NAICS CODE	DESCRIPTION	2014 JOBS	2024 JOBS	CHANGE	% CHANGE
11	Agriculture, Forestry, Fishing and Hunting	109,735	109,247	(488)	(0%)
21	Mining, Quarrying, and Oil and Gas Extraction	343	406	63	18%
22	Utilities	2,955	3,363	408	14%
23	Construction	26,694	30,908	4,214	16%
31	Manufacturing	42,572	45,552	2,980	7%
42	Wholesale Trade	20,234	24,070	3,836	19%
44	Retail Trade	65,776	77,124	11,348	17%
48	Transportation and Warehousing	20,688	24,084	3,396	16%
51	Information	5,565	5,954	389	7%
52	Finance and Insurance	13,963	14,938	975	7%
53	Real Estate and Rental and Leasing	8,321	8,989	668	8%
54	Professional, Scientific, and Technical Services	17,984	21,478	3,494	19%
55	Management of Companies and Enterprises	3,373	1,904	(1,469)	(44%)
56	Admin. & Support and Waste Mgmt. & Remediation Services	39,064	51,128	12,064	31%
61	Educational Services	7,772	10,010	2,238	29%
62	Health Care and Social Assistance	83,778	104,960	21,182	25%
71	Arts, Entertainment, and Recreation	6,228	6,651	423	7%
72	Accommodation and Food Services	42,639	51,005	8,366	20%
81	Other Services (except Public Administration)	28,547	31,964	3,417	12%
90	Government	125,995	133,469	7,474	6%
	Total	672,227	757,205	84,978	13%

Source: EMSI Complete Data 2014.3

TABLE 1.2: EMPLOYMENT CONCENTRATION BY INDUSTRY SECTOR IN CCC ECONOMIC REGION, 2014 AND 2024

NAICS CODE	DESCRIPTION	2014 LOCATION QUOTIENT	2024 LOCATION QUOTIENT
11	Agriculture, Forestry, Fishing and Hunting	13.28	13.39
21	Mining, Quarrying, and Oil and Gas Extraction	0.09	0.09
22	Utilities	1.22	1.38
23	Construction	0.77	0.79
31	Manufacturing	0.79	0.83
42	Wholesale Trade	0.76	0.81
44	Retail Trade	0.93	1.00
48	Transportation and Warehousing	0.95	0.98
51	Information	0.45	0.46
52	Finance and Insurance	0.51	0.50
53	Real Estate and Rental and Leasing	0.75	0.76
54	Professional, Scientific, and Technical Services	0.43	0.42
55	Management of Companies and Enterprises	0.36	0.18
56	Administrative and Support and Waste Management and Remediation Services	0.92	1.01
61	Educational Services	0.46	0.49
62	Health Care and Social Assistance	1.00	1.02
71	Arts, Entertainment, and Recreation	0.56	0.52
72	Accommodation and Food Services	0.76	0.80
81	Other Services (except Public Administration)	0.89	0.89
90	Government	1.19	1.18

Source: EMSI Complete Data 2014.3

industry across the nation. An LQ equal to 1 means that the percentage of total employment comprised by an industry in the region exactly matches the percentage of total employment comprised by that industry in the nation. An LQ greater than 1 means that the industry comprises a greater proportion of total employment in the region than it does in the nation.

High LQs (usually anything greater than 1.2) are an indication that the region has a comparative advantage or specialization in certain industries relative to the rest of the nation, or potentially to other competing regions. When evaluated jointly with job counts and expected job growth, high LQs give a sense of the industry sectors that have the greatest potential for workforce investment and where regional economic development professionals are likely to be focusing their efforts. This information is of particular importance to educators seeking to engage in larger conversations with other organizations about aligning program offerings with workforce needs.

The following three industry sectors have the highest

location quotients in the CCC Economic Region: Agriculture, Forestry, Fishing, & Hunting (13.28); Utilities (1.22); and Government (1.19). The Agriculture, Forestry, Fishing, & Hunting and Utilities industry sectors are considered to have a comparative advantage. The relative concentrations are expected to undergo some changes over the next decade, yet the same industry sectors are expected to be above the 1.2 cutoff.²

JOBS BY OCCUPATION

Researchers often refer to industry data to get a sense of regional economic trends, but in order to better understand the quality of the jobs contained within that region, some knowledge of occupations is needed. This is because the

² Note that because LQs represent regional employment relative to national employment, a decreasing LQ does not necessarily mean decreasing employment, and likewise an increasing LQ does not necessarily mean increasing employment.

earning levels and education requirements of workers bear more of a relationship to their occupation than to the industry in which they work. For example, the Manufacturing industry – while employing a number of assemblers and machine operators – also employs people in management occupations and in professional occupations such as engineering. All of these occupations have different pay scales and require varying levels of education and training.

Federal agencies use the Standard Occupational Classification (SOC) system to classify workers into occupational categories based on work performed. The 2010 SOC system contains more than 800 detailed occupations organized according to a five-digit hierarchical coding structure. Detailed occupations with similar job duties are further combined to form 23 major groups. Table 1.3 shows the breakdown of employment in the CCC Economic Region

by major group, with information on current and projected jobs, job change, average annual openings, and wage rates.

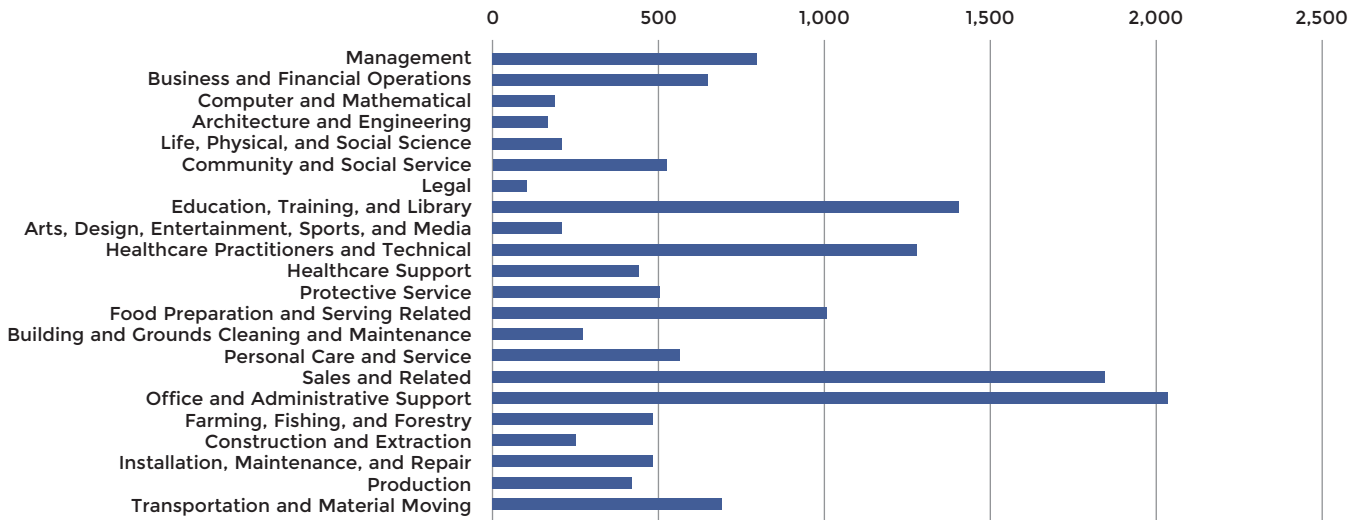
Office & administrative support occupations comprise the largest occupation group in the CCC Economic Region at 89,685 jobs, followed by farming, fishing, & forestry occupations at 84,209 jobs. Neither of these occupation groups ranks among the highest paid, however. Healthcare practitioners & technical occupations have median earnings of \$39.22 an hour, the highest on the regional pay scale. Legal occupations – while the smallest occupation group – have median earnings of \$37.16 an hour, ranking second highest on the regional pay scale. Several of the higher-paying occupation groups are also projected to experience job growth over the next ten years, such as healthcare practitioners & technical services occupations (21%) and computer & mathematical occupations (20%).

TABLE 1.3: CURRENT AND PROJECTED JOBS, JOB CHANGE, AND MEDIAN HOURLY EARNINGS BY MAJOR OCCUPATION GROUP IN CCC ECONOMIC REGION, 2014 TO 2024

SOC CODE	DESCRIPTION	2014 JOBS	2024 JOBS	CHANGE	% CHANGE	MEDIAN HOURLY EARNINGS	AVERAGE ANNUAL OPENINGS
11-0000	Management	34,033	35,509	1,479	4%	\$33.44	805
13-0000	Business and Financial Operations	21,122	23,536	2,412	11%	\$27.50	657
15-0000	Computer and Mathematical	5,405	6,506	1,102	20%	\$31.17	196
17-0000	Architecture and Engineering	5,034	5,660	629	12%	\$37.13	175
19-0000	Life, Physical, and Social Science	5,372	5,995	623	11%	\$29.29	216
21-0000	Community and Social Service	14,172	16,376	2,204	16%	\$21.05	518
23-0000	Legal	3,605	4,072	467	13%	\$37.16	107
25-0000	Education, Training, and Library	44,176	49,596	5,420	12%	\$23.84	1,399
27-0000	Arts, Design, Entertainment, Sports, and Media	6,647	7,396	749	11%	\$16.91	216
29-0000	Healthcare Practitioners and Technical	31,824	38,547	6,723	21%	\$39.22	1,280
31-0000	Healthcare Support	16,010	20,037	4,027	25%	\$12.99	446
33-0000	Protective Service	18,698	20,752	2,054	11%	\$28.47	512
35-0000	Food Preparation and Serving Related	45,785	54,406	8,621	19%	\$9.70	1,014
37-0000	Building and Grounds Cleaning and Maintenance	24,967	28,700	3,733	15%	\$11.15	263
39-0000	Personal Care and Service	24,501	29,342	4,841	20%	\$9.73	572
41-0000	Sales and Related	60,828	70,148	9,320	15%	\$13.88	1,841
43-0000	Office and Administrative Support	89,685	100,229	10,544	12%	\$15.53	2,037
45-0000	Farming, Fishing, and Forestry	84,209	85,088	879	1%	\$9.32	491
47-0000	Construction and Extraction	21,896	24,869	2,973	14%	\$18.99	262
49-0000	Installation, Maintenance, and Repair	24,002	28,205	4,203	18%	\$19.66	490
51-0000	Production	32,364	36,691	4,327	13%	\$14.17	410
53-0000	Transportation and Material Moving	50,817	59,168	8,351	16%	\$13.51	693

Source: EMSI Complete Data 2014.3

FIGURE 1.3: AVERAGE ANNUAL OPENINGS BETWEEN 2014 AND 2024 FOR WORKERS WITH SOME COLLEGE AND ABOVE BY OCCUPATION GROUP IN THE CCC ECONOMIC REGION



Source: EMSI Complete Data 2014.3

Figure 1.3 provides a look at the average annual job openings for workers with some college or above by occupation group. Job openings refer to new jobs due to growth plus replacement jobs due to worker turnover. Between 2014 and 2024, the occupations with the highest number of average annual job openings for workers with some college or above occurs in office & administrative support occupations; sales & related occupations; and education, training, & library occupations.

COMMUTING PATTERNS

The Longitudinal Employer-Household Dynamics (LEHD) program³ at the U.S. Census Bureau provides information on the residential and employment locations of workers. “Jobs by place of work” refers to where residents of the region commute to work, and “Jobs by place of residence” refers to where workers in the region live. Data for the CCC Economic Region appears in Tables 1.4 and 1.5, with the same information displayed in Figures 1.4 and 1.5.

Approximately 20.9% of residents commute outside the CCC Economic Region for work, indicating that there are economic links between the county and surrounding

3 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.

FIGURE 1.4: JOBS BY PLACE OF WORK

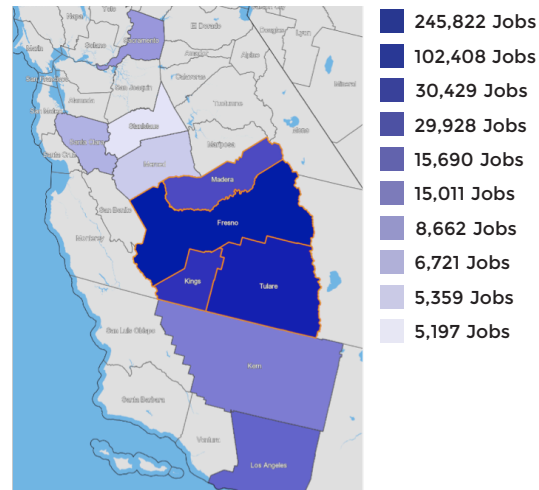


TABLE 1.4: JOBS BY PLACE OF WORK

COUNTY	JOBS	COMMUTE SHARE
Fresno County	245,822	47.6%
Tulare County	102,408	19.8%
Kings County	30,429	5.9%
Madera County	29,928	5.8%
Los Angeles County	15,690	3.0%
Kern County	15,011	2.9%
Sacramento County	8,662	1.7%
Santa Clara County	6,721	1.3%
Merced County	5,359	1.0%
Stanislaus County	5,197	1.0%
All Other Locations	51,360	9.9%

Source: Census LEHD

FIGURE 1.5: JOBS BY PLACE OF RESIDENCE

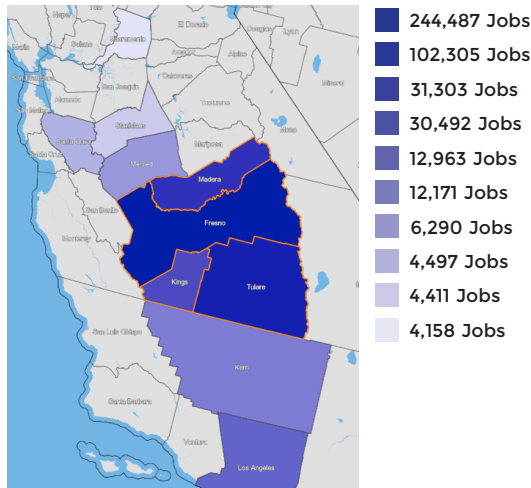


TABLE 1.5: JOBS BY PLACE OF RESIDENCE

COUNTY	COUNT	COMMUTE SHARE
Fresno County	244,487	49.1%
Tulare County	102,305	20.6%
Madera County	31,303	6.3%
Kings County	30,492	6.1%
Los Angeles County	12,963	2.6%
Kern County	12,171	2.4%
Merced County	6,290	1.3%
Santa Clara County	4,497	0.9%
Stanislaus County	4,411	0.9%
Sacramento County	4,158	0.8%
All Other Locations	44,746	9.0%

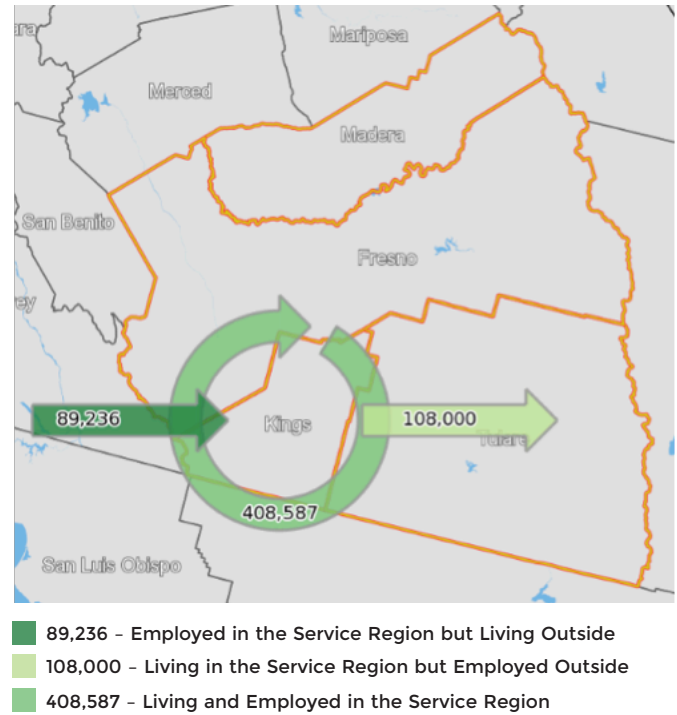
Source: Census LEHD

communities. Nearly half of the residents work in Fresno County (47.6%), and a significant portion of residents work in Tulare County (19.8%). Table 1.4 and Figure 1.4 display the top ten employment counties for CCC Economic Region residents.

Table 1.5 and Figure 1.5 display the top ten counties by place of residency. Of the people who work in the CCC Economic Region, 82.1% also live in the region. Almost half of the residents in the region live in Fresno County (49.1%). Los Angeles County supplies the most commuters from outside the area at 2.6%.

Figure 1.6 presents the inflow and outflow of jobs to and from the CCC Economic Region. There are 497,823 jobs in the region with 408,587 of these jobs filled by residents and 89,236 jobs going to people living outside the region. Additionally, 108,000 residents commute outside the region

FIGURE 1.6: IN-FLOW/OUT-FLOW JOB COUNT



for work. The figure clearly illustrates the fact that more workers out-commute than in-commute.

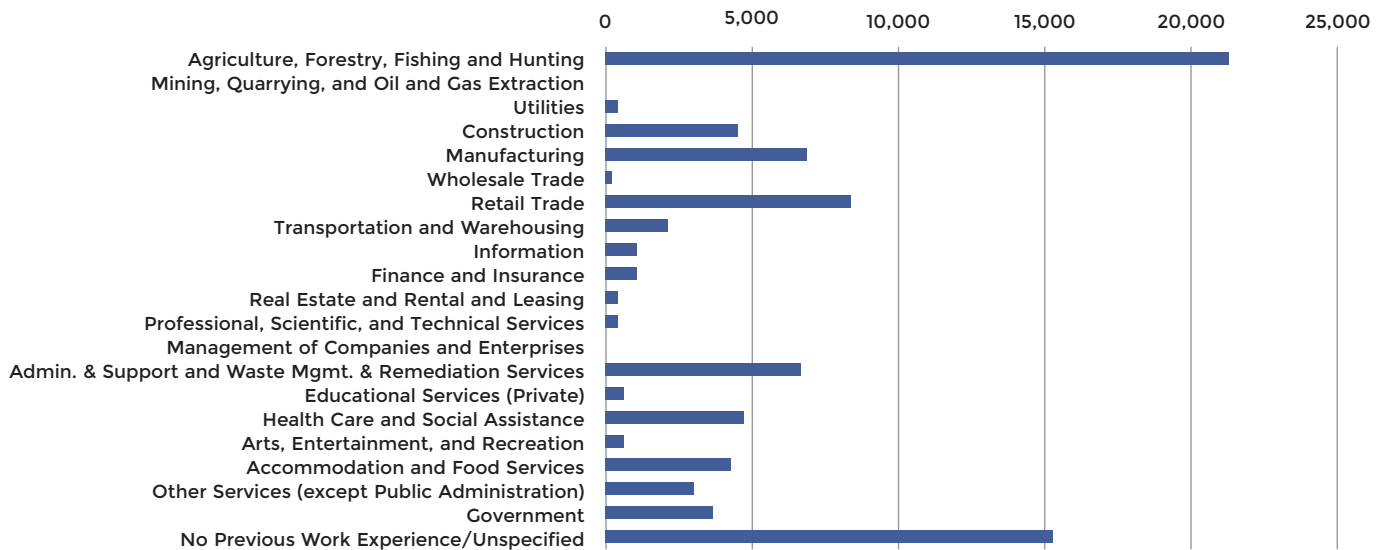
UNEMPLOYMENT

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.

Table 1.6 and Figure 1.7 on the next page present the number of people unemployed by industry sector in the CCC Economic Region. Data reflect May 2014 and follow the same methodology used by the federal statistical agencies to determine the number of workers in an industry that are not currently employed. The unemployment rate is not provided because it is difficult to accurately determine the size of the labor force in a given industry on a monthly basis. Rather than the unemployment rate, the percent of all unemployed for the region and for the nation are provided to display which industry sectors have the highest concentration of unemployed workers.

As shown in Table 1.6, the category with the highest number of unemployed is in Agriculture, Forestry, Fishing,

FIGURE 1.7: NUMBER OF UNEMPLOYED WORKERS BY INDUSTRY SECTOR IN CCC ECONOMIC REGION



Source: EMSI Total Unemployment (5/2014)

TABLE 1.6: NUMBER OF UNEMPLOYED WORKERS BY INDUSTRY SECTOR IN CCC ECONOMIC REGION

NAICS CODE	DESCRIPTION	NO. OF UNEMPLOYED	% OF UNEMPLOYED	NATIONAL % OF UNEMPLOYED
11	Agriculture, Forestry, Fishing and Hunting	21,212	25%	1%
21	Mining, Quarrying, and Oil and Gas Extraction	13	0%	1%
22	Utilities	420	0%	0%
23	Construction	4,488	5%	8%
31	Manufacturing	6,804	8%	9%
42	Wholesale Trade	154	0%	2%
44	Retail Trade	8,310	10%	12%
48	Transportation and Warehousing	2,135	2%	3%
51	Information	1,133	1%	2%
52	Finance and Insurance	995	1%	3%
53	Real Estate and Rental and Leasing	488	1%	1%
54	Professional, Scientific, and Technical Services	459	1%	4%
55	Management of Companies and Enterprises	1	0%	0%
56	Administrative and Support and Waste Management and Remediation Services	6,615	8%	8%
61	Educational Services (Private)	619	1%	2%
62	Health Care and Social Assistance	4,679	5%	7%
71	Arts, Entertainment, and Recreation	734	1%	2%
72	Accommodation and Food Services	4,289	5%	9%
81	Other Services (except Public Administration)	2,981	3%	4%
90	Government	3,577	4%	7%
99	No Previous Work Experience/Unspecified	15,312	18%	15%

Source: EMSI Total Unemployment (5/2014)

& Hunting. The second highest number of unemployed is in a non-industry labeled as “No Previous Work Experience/Unspecified.” This is simply a catch-all category for which reliable unemployment data are unavailable. The Retail Trade sector has the third highest number of unemployed. It is common for industries like Retail Trade and Administrative & Support & Waste Management & Remediation Services to have a high percentage of low-skill jobs that require little to no education and training, thus making them more vulnerable to worker turnover. Another sector that is generally affected by high turnover is Accommodation & Food Services. For industry sectors such as Construction, seasonal jobs or jobs of short duration may also lead to high numbers of unemployed workers.

Only two industry sectors in the CCC Economic Region exceed the national concentration of unemployed workers. In the CCC Economic Region, Agriculture, Forestry, Fishing, & Hunting and No Previous Work Experience/Unspecified have a much higher proportion of unemployed workers

than at the national level. On the other hand, Accommodation & Food Services and Construction actually have a lower proportion of unemployed workers than at the national level in the CCC Economic Region.

Table 1.7 and Figure 1.8 on the next page provide a breakdown of unemployment in the CCC Economic Region by major occupation group. As shown, occupational groups that contain the highest number of unemployed workers are farming, fishing, & forestry occupations (16,866 unemployed workers), sales & related occupations (15,608 unemployed workers), no previous work experience/unspecified occupations (10,988 unemployed workers). Though some of these occupations groups have a relatively high number of annual openings (see Figure 1.3), high turnover still leads to a high number of unemployed.

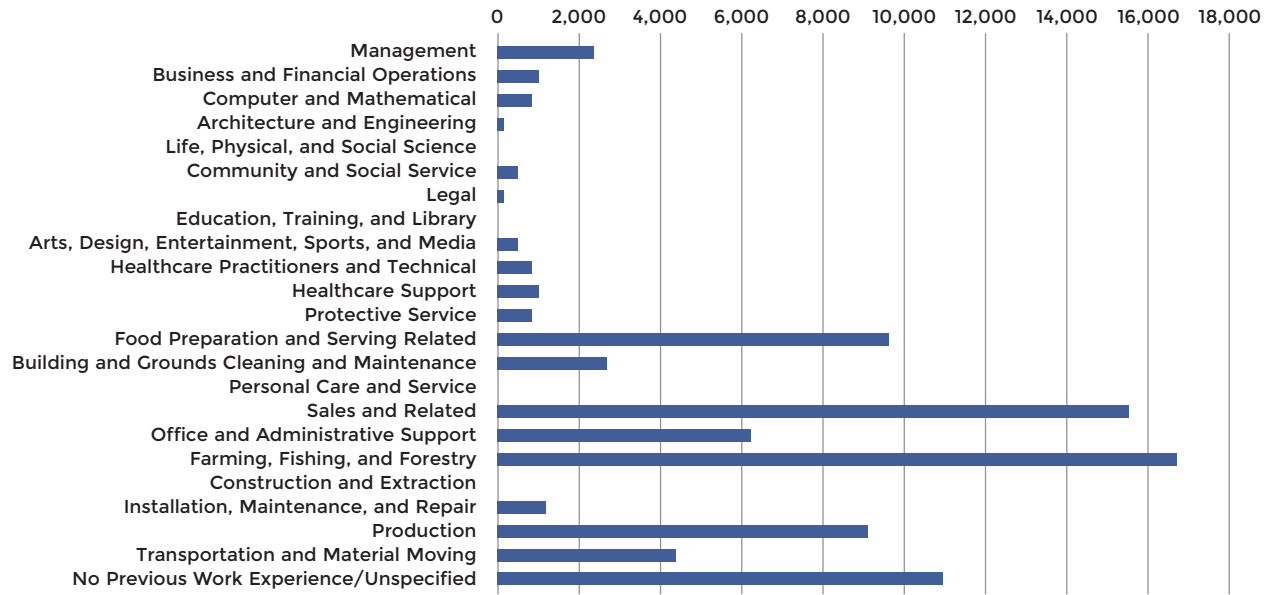
Most of the occupation groups have a concentration of unemployed workers that is either at or below the national average, including construction & extraction occupations, office & administrative support occupations, and transpor-

TABLE 1.7: NUMBER OF UNEMPLOYED WORKERS BY OCCUPATION GROUP IN CCC ECONOMIC REGION

SOC CODE	DESCRIPTION	NO. OF UNEMPLOYED	% OF UNEMPLOYED	NATIONAL % OF UNEMPLOYED
11-0000	Management	2,401	3%	5%
13-0000	Business and Financial Operations	1,039	1%	3%
15-0000	Computer and Mathematical	766	1%	1%
17-0000	Architecture and Engineering	233	0%	1%
19-0000	Life, Physical, and Social Science	4	0%	0%
21-0000	Community and Social Service	571	1%	1%
23-0000	Legal	200	0%	1%
25-0000	Education, Training, and Library	19	0%	2%
27-0000	Arts, Design, Entertainment, Sports, and Media	499	1%	2%
29-0000	Healthcare Practitioners and Technical	872	1%	2%
31-0000	Healthcare Support	1,067	1%	2%
33-0000	Protective Service	776	1%	1%
35-0000	Food Preparation and Serving Related	9,607	11%	8%
37-0000	Building and Grounds Cleaning and Maintenance	2,666	3%	5%
39-0000	Personal Care and Service	24	0%	3%
41-0000	Sales and Related	15,608	18%	11%
43-0000	Office and Administrative Support	6,373	7%	14%
45-0000	Farming, Fishing, and Forestry	16,866	20%	1%
47-0000	Construction and Extraction	53	0%	8%
49-0000	Installation, Maintenance, and Repair	1,150	1%	2%
51-0000	Production	9,194	11%	6%
53-0000	Transportation and Material Moving	4,439	5%	8%
99-0000	No Previous Work Experience/Unspecified	10,988	13%	11%

Source: EMSI Total Unemployment (5/2014)

FIGURE 1.8: NUMBER OF UNEMPLOYED WORKERS BY OCCUPATION GROUP IN CCC ECONOMIC REGION



Source: EMSI Total Unemployment (5/2014)

tation & material moving occupations. Farming, fishing, & forestry occupations and food preparation & serving related occupations have a much higher concentration of unemployed than at the national level.

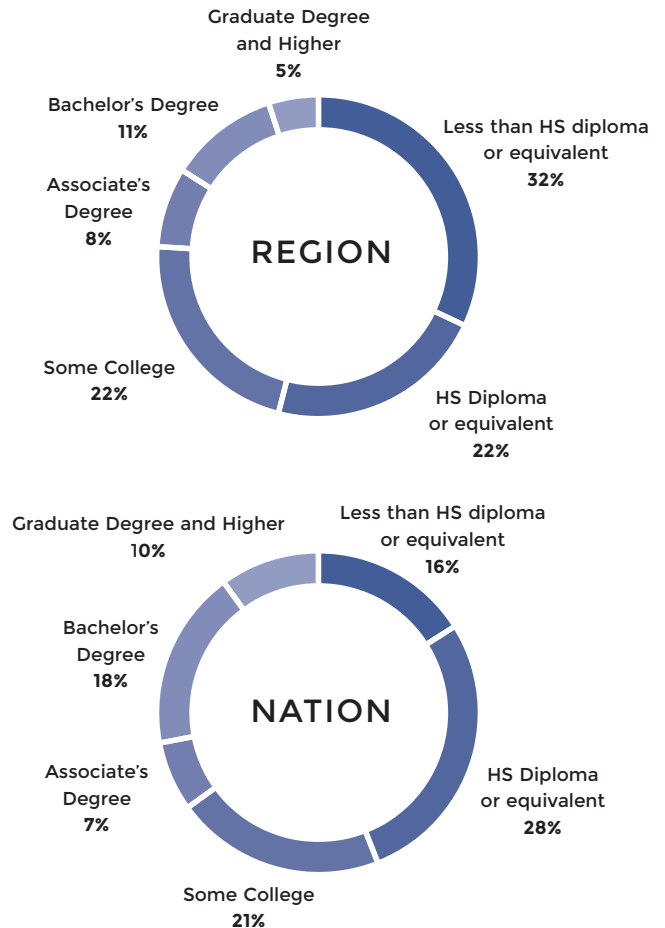
EDUCATIONAL ATTAINMENT

This section describes the educational attainment of the population in the CCC Economic Region for adults aged 25 years and older. This information is useful for educators targeting specific population groups that have low education levels. Educational attainment data in this section are presented by gender and by ethnicity and are broken out according to the following categories: 1) less than a high school degree, 2) high school degree, 3) some college,⁴ 4) associate’s degree, 5) bachelor’s degree, and 6) graduate degree and higher.

Overall Educational Attainment

Table 1.8 on the next page and Figure 1.9 display the educational attainment of the overall adult population in the CCC Economic Region, without reference to gender and ethnicity. In the CCC Economic Region, the percentage of

FIGURE 1.9: EDUCATIONAL ATTAINMENT OF ADULT POPULATION IN THE CCC ECONOMIC REGION



4 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’s or bachelor’s degree.

TABLE 1.8: BREAKDOWN OF ADULT POPULATION IN THE CCC ECONOMIC REGION BY EDUCATIONAL ATTAINMENT, 2009 AND 2014

EDUCATION LEVEL	2009 POPULATION	2009 % DISTRIBUTION	2014 POPULATION	2014 % DISTRIBUTION	POPULATION CHANGE	% DISTRIBUTION CHANGE
Less than HS diploma or equivalent	281,261	29%	332,098	32%	50,837	2.7%
High school diploma or equivalent	226,864	23%	231,538	22%	4,674	(1.3%)
Some college	220,989	23%	231,684	22%	10,695	(0.6%)
Associate's degree	75,152	8%	79,500	8%	4,347	(0.2%)
Bachelor's degree	112,473	12%	116,805	11%	4,332	(0.4%)
Graduate degree or higher	52,108	5%	53,581	5%	1,473	(0.3%)

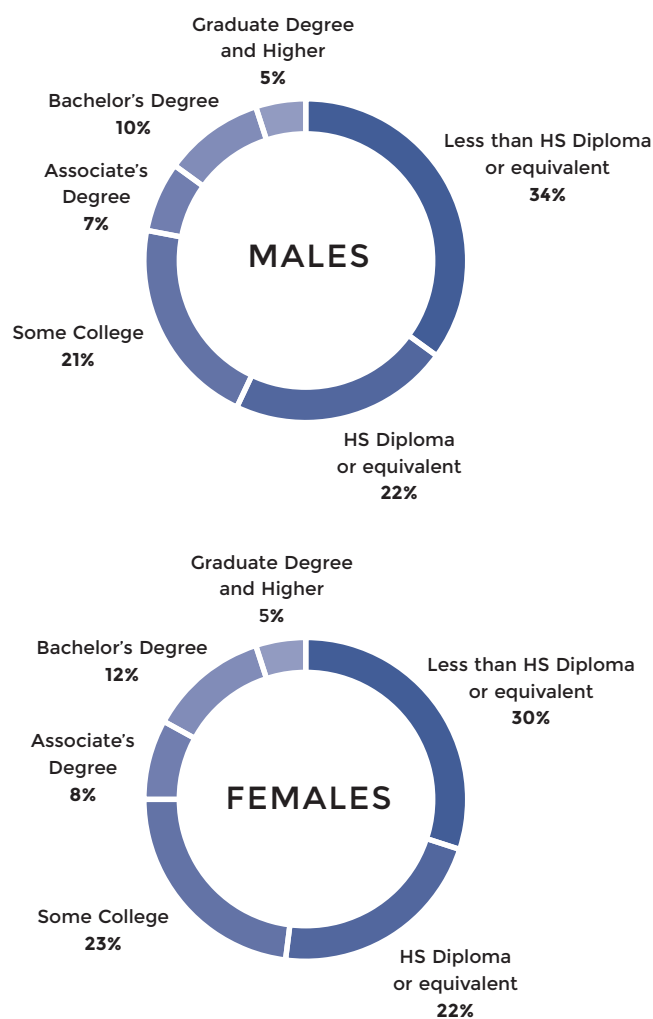
Source: EMSI Complete Data 2014.3

the adult population with a high school diploma or less is 54%, which is higher than the national average of 44%. These data suggest there is still an opportunity for educators in the CCC Economic Region to boost the percentage of adults with an associate’s degree or higher (currently this percentage sits at 24% for the region overall). Out of all the education categories in Table 1.8, the people that are most likely to seek education and training from CCC are those in the “Less than high school diploma,” “High school diploma,” and “Some college” categories. Together these categories total 795,321 people, or 76% of the entire adult population in the region. Between 2009 and 2014, the proportion of the overall adult population with “Less than a high school diploma” increased by 2.7 percentage points and the proportion of adults with a “High school diploma” decreased by 1.3 percentage points.⁵ Meanwhile, the proportion of adults with “Some college,” “Associate’s degree,” “Bachelor’s degree,” or a “Graduate degree and higher” decreased slightly (0.6 percentage points, 0.2 percentage points, 0.4 percentage points, and 0.3 percentage points, respectively).

Educational Attainment by Gender

The distribution of educational attainment by gender is fairly even in the CCC Economic Region. Males are slightly more likely to have “Less than high school diploma” level of education while females are more likely to have “Some

FIGURE 1.10: EDUCATIONAL ATTAINMENT OF ADULT POPULATION IN THE CCC ECONOMIC REGION BY GENDER



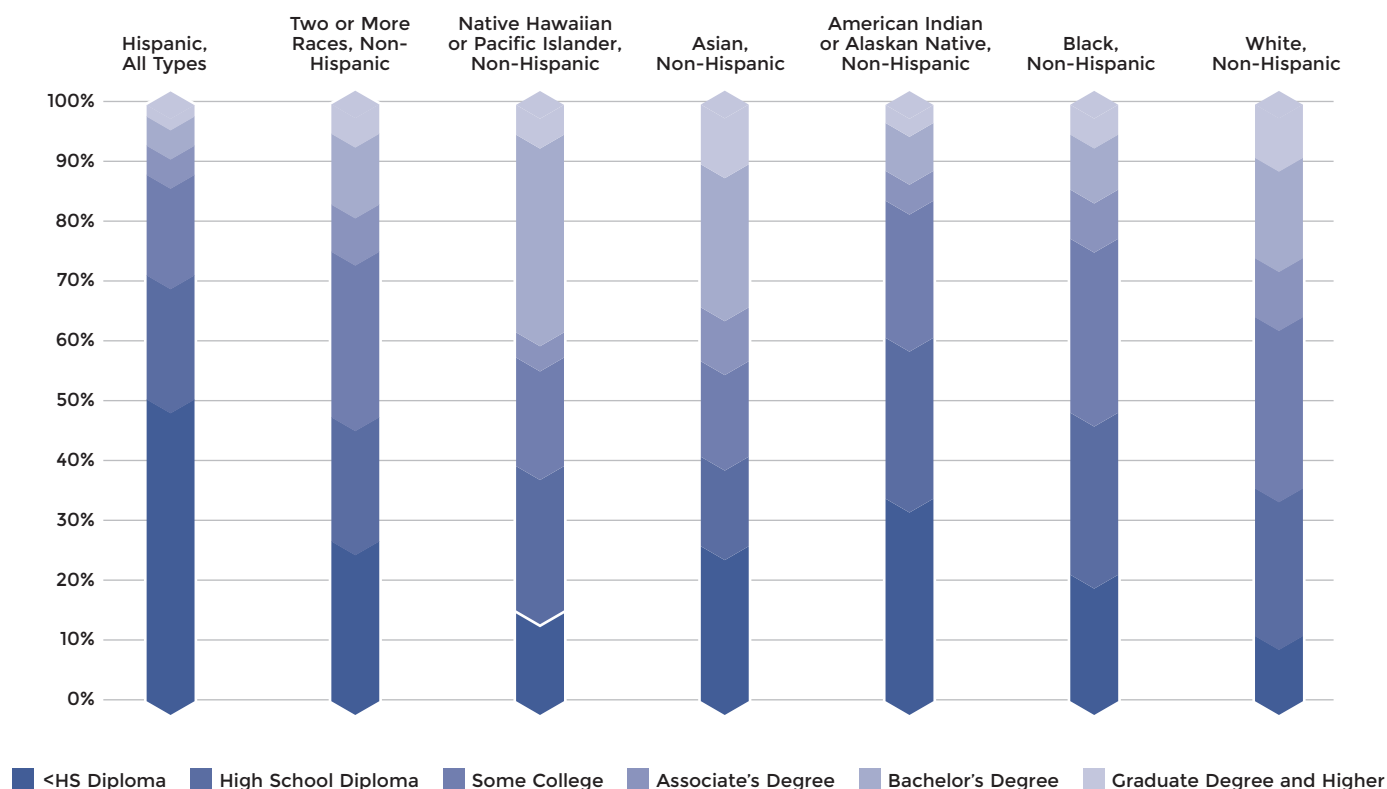
5 The column labeled “% Change” in Table 1.8 refers to the proportional change, not to the percent change between 2009 and 2014. For example, if a category comprised 20% of the total adult population in 2009 and 25% of the total adult population in 2014, the proportional change is equal to the difference between the two values (in this example, 5%).

TABLE 1.9: BREAKDOWN OF ADULT POPULATION IN THE CCC ECONOMIC REGION BY EDUCATIONAL ATTAINMENT AND GENDER

EDUCATION LEVEL	MALES	PROPORTION	FEMALES	PROPORTION
Less than high school diploma or equivalent	176,163	34%	155,935	30%
High school diploma or equivalent	114,302	22%	117,236	22%
Some college	111,471	21%	120,213	23%
Associate's degree	36,944	7%	42,555	8%
Bachelor's degree	53,698	10%	63,106	12%
Graduate degree and higher	27,557	5%	26,024	5%

Source: EMSI Complete Data 2014.3

FIGURE 1.11: EDUCATIONAL ATTAINMENT OF ADULT POPULATION IN THE CCC ECONOMIC REGION BY ETHNICITY



college,” “Associate’s degree,” or “Bachelor’s degree” levels. This information appears in Table 1.9 and Figure 1.10 on the previous page.

Educational Attainment by Ethnicity

Figure 1.11 and Table 1.10 on the next page display the educational attainment of the adult population by ethnicity. The “Asian, Non-Hispanics” ethnicity category has the highest percentage of adults with post-secondary degrees

(43%). “Native Hawaiian or Pacific Islander, Non-Hispanic” category follows with 42%. The “Hispanic, All Types” category has the lowest levels of education attainment. For this group, only 12% of the adult population has a post-secondary degree and 71% has a high school diploma or less. While the region is largely “Hispanic, All Types”, there are many opportunities to increase educational attainment in other ethnic groups.

TABLE 1.10: BREAKDOWN OF ADULT POPULATION IN THE CCC ECONOMIC REGION BY EDUCATIONAL ATTAINMENT AND ETHNICITY

		< HS DIPLOMA	HIGH SCHOOL DIPLOMA	SOME COLLEGE	ASSOCIATE'S DEGREE	BACHELOR'S DEGREE	GRADUATE DEGREE AND HIGHER
White, Non-Hispanic	COUNT	44,083	99,625	116,559	41,235	68,323	35,211
	PERCENT	11%	25%	29%	10%	17%	9%
Black, Non-Hispanic	COUNT	8,929	11,607	12,114	3,572	3,981	2,039
	PERCENT	21%	27%	29%	8%	9%	5%
American Indian or Alaskan Native, Non-Hispanic	COUNT	2,728	2,187	1,892	401	655	225
	PERCENT	34%	27%	23%	5%	8%	3%
Asian, Non-Hispanic	COUNT	18,651	10,662	11,842	6,791	17,574	7,287
	PERCENT	26%	15%	16%	9%	24%	10%
Native Hawaiian or Pacific Islander, Non-Hispanic	COUNT	190	313	231	55	423	68
	PERCENT	15%	24%	18%	4%	33%	5%
Two or More Races, Non-Hispanic	COUNT	3,564	2,793	3,638	1,057	1,546	631
	PERCENT	27%	21%	28%	8%	12%	5%
Hispanic, All Types	COUNT	253,953	104,352	85,409	26,389	24,303	8,122
	PERCENT	51%	21%	17%	5%	5%	2%

Source: EMSI Complete Data 2014.3

CHAPTER 2:

PROGRAM GAP ANALYSIS

The results that appear in this chapter present a focused view of the program groups projected to have a regional gap or surplus. Programs are analyzed at two different levels: postsecondary vocational certifications and associate's degrees, according to the training level offered at CCC.

Each table includes the TOP code and title,⁶ the average annual openings associated with that program (which have been de-duplicated using the process outlined in Appendix 3), the average annual completers between 2011 and 2013,⁷ and finally the gap or surplus figure. If the numbers are positive, there is a shortage or “gap” of completers—i.e., there are more job openings in those occupations than there are graduates or completers. If the numbers are negative, then there are fewer annual job openings compared to the “surplus” of completers for those program groups. The median hourly wage rate for related occupations is included. Due to data limitations, the wages are aggregated for all education levels.

INTERPRETING GAP/SURPLUS ANALYSIS RESULTS

The gap analysis is intended to serve as a point of departure for CCC as the College discusses regional workforce needs. A surplus or deficit of workers in a particular category does not necessarily indicate a problem for the region, and it is important that each occupation group be evaluated on a case-by-case basis. Evaluation of the program supply (surplus and gaps) will provide an understanding of the role skilled occupations play in economic sustainability and growth.

6 TOP codes are not as detailed as CIP codes (which this type of analysis typically uses), and the translation from CIP to TOP codes was on the back-end of the analysis. Therefore, there are some duplicate TOP codes and titles in each of the tables. The CIP codes were included next to the TOP titles in order to differentiate the programs. For the complete list of CIP codes and TOP codes, refer to Appendix 2 Table A2.2.

7 Data for CCC has been reviewed for accuracy by CCC and updated to reflect 2012-2014 completions.

Other information should also be considered when evaluating these surpluses and gaps. For example, only the education supply pipeline is considered in this analysis because these numbers can be tracked at the county and school level. However, other sources of supply exist as well—unemployed workers, industry trained pipelines, in-migrators, and job changers from other occupational categories can also be a source of skilled occupations. These types of considerations are useful when evaluating specific types of occupations. Unfortunately, secondary data sources (e.g., regional, state, and federal data) do not account for this, and primary data collection methods (i.e., interviews and surveys) are among the only ways to obtain information on this type of supply pipeline.

Lastly, it is important to keep in mind that the labor market is not so simple or efficient that one could expect supply and demand to be at perfect equilibrium for any extended period of time. As such, as a general rule of thumb, only programs with considerable gaps or surpluses should be considered long-term strategic issues worthy of closer examination. Given the size and characteristics of the CCC Economic Region, any gap or surplus within 20 jobs either above or below zero should be considered within the normal range of labor market fluctuations.

Once evaluated internally within the College, specific implications should be considered for programs with substantial surpluses or gaps. These implications include:

- **Surplus:** Oversupply of specific education completers may lead to higher attrition rates (i.e., brain drain). In other words, the region is educating a workforce that is leaving after program completion because of a lack of jobs. Note: In the analysis of the CCC Economic Region where the neighboring population density is high in neighboring areas, a surplus of completers may indicate the need for Economic Region residents to commute outside of the Economic Region to find job opportunities. The commuting pattern flows described in Chapter 1 suggest that this is possible.

- **Gap:** Undersupply of specific program completers may lead to missed opportunities for economic growth and put stress on local businesses to find necessary human capital elsewhere. In other words, the region’s education institutions are not providing the necessary workforce for the region, thereby shifting the burden on the industries to find workers in other economies to fill the needed occupations. This translates into higher human resources costs and decreased efficiencies in the economic system. This also provides an opportunity for institutions to develop new programs. Note: Given population density in the areas bordering the Economic Region, a completion gap may be filled

by other institutions near the Economic Region. This potential scenario will need to be taken into consideration from the leadership.

POSTSECONDARY CERTIFICATE LEVEL GAP ANALYSIS

Figure 2.1 provides an illustration that summarizes the top gaps for CCC postsecondary certificate level programs. There were a total of five gaps identified at this education level.

Table 2.1 lists supply and demand for all certificate

FIGURE 2.1: SUPPLY AND DEMAND FOR CCC POSTSECONDARY CERTIFICATE LEVEL PROGRAMS

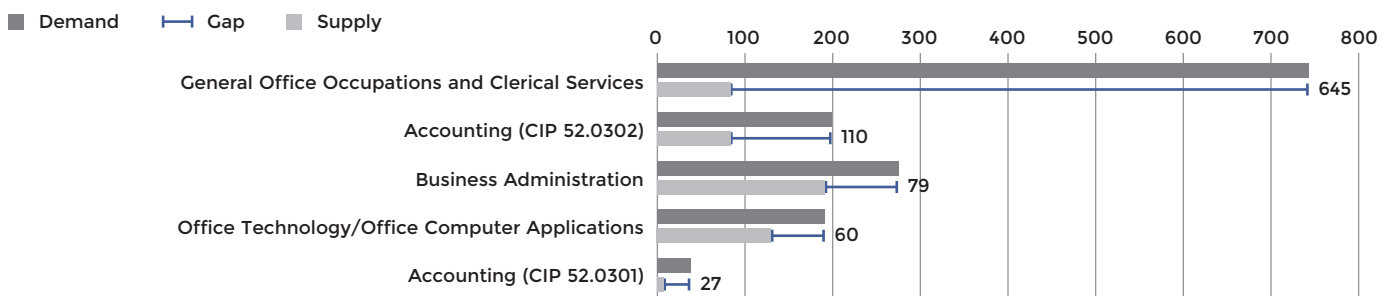


TABLE 2.1: SUPPLY AND DEMAND FOR CCC CERTIFICATE LEVEL PROGRAMS

TOP CODE	TOP TITLE	AVERAGE ANNUAL OPENINGS	AVERAGE ANNUAL COMPLETERS	AVERAGE ANNUAL CCC COMPLETERS	TOTAL GAP OR SURPLUS	MEDIAN HOURLY WAGE
???	General Office Occupations and Clerical Services	725	80	0	645	\$13.89
502.00	Accounting (CIP 52.0302)	196	86	2	110	\$16.67
505.00	Business Administration	270	191	2	79	\$34.71
514.00	Office Technology/Office Computer Applications	185	125	0	60	\$16.00
502.00	Accounting (CIP 52.0301)	36	9	2	27	\$26.45
958.00	Water and Wastewater Technology	19	3	2	16	\$22.48
835.00	Physical Education	3	3	1	0	\$29.11
501.00	Business and Commerce, General	4	6	0	(2)	\$36.61
115.00	Natural Resources	1	4	1	(3)	\$16.24
956.50	Welding Technology	35	43	1	(8)	\$15.57
1030.00	Graphic Arts and Design	5	13	0	(8)	\$17.41
1230.00	Nursing	19	30	0	(12)	\$37.13
956.30	Machining and Machine Tools	44	58	0	(14)	\$15.81
114.00	Forestry (CIP 3.0501)	10	32	1	(22)	\$16.24
950.20	Aviation Powerplant Mechanics	8	31	0	(23)	\$24.09
956.00	Manufacturing and Industrial Technology	4	34	0	(30)	\$33.90
708.20	Computer Support	5	37	17	(32)	\$23.08
???	Health Aide	25	81	1	(56)	\$11.55
2105.00	Administration of Justice (CIP 43.0107)	70	131	1	(61)	\$32.10
1305.00	Child Development/Early Care and Education (CIP 19.0709)	165	279	11	(114)	\$8.05
1230.20	Licensed Vocational Nursing	37	220	2	(182)	\$22.84

Source: EMSI Gap Analysis Model. Numbers may not sum due to rounding.

program types for which CCC offers a training program. While other program groups in the region may face larger surpluses, CCC did not offer any of the programs. Table 2.3 addresses programs that are not currently being offered but which would address considerable regional workforce gaps. At the certificate level, CCC is only one of many institutions offering programs and as such, their completers comprise 1% of total regional supply.

As shown in Table 2.1, General Office Occupations & Clerical Services has the largest gap. There are 725 annual openings but only 80 average annual completers (none from CCC). Accounting (gap of 110; median hourly wage \$16.67) and Business Administration (gap of 79; median hourly wage \$34.71) are the second and third largest gaps. It is important to keep wages in mind when reviewing the gap analysis. In the instance of the General Office Occupations & Clerical Services, there may be a large gap, but because the wages of occupations associated with this program are relatively low, the returns to education may not be justified, and by extension, expanding the program may not be warranted.

There are often some programs preparing students for

fields where they may compete with many other graduates. There are eight programs at CCC that are training for occupations with a significant surplus of workers. Licensed Vocational Nursing has the top surplus of 182. Although CCC produces only two completers a year for the 37 annual openings, other regional institutions add another 218 completers a year, resulting in the large surplus. Child Development/Early Care & Education has the second largest surplus of 114 completers; followed by Administration of Justice (surplus of 61). It is likely that the additional annual openings in areas outside of the CCC Economic Region are being filled by CCC completers. A review of placement rates could provide additional information.

ASSOCIATE'S LEVEL GAP ANALYSIS

Figure 2.2 on the next page provides an illustration of the top gaps for CCC associate's degree level programs. CCC had a total of two gaps greater than 20 at this education level.

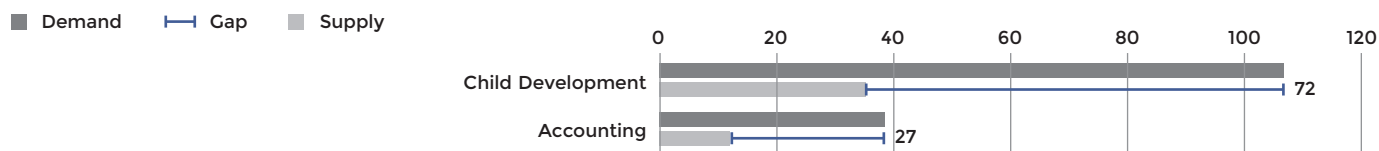
Similar to the previous table, Table 2.2 displays supply

TABLE 2.2: SUPPLY AND DEMAND FOR CCC ASSOCIATE'S LEVEL PROGRAMS

TOP CODE	TOP TITLE	AVERAGE ANNUAL OPENINGS	AVERAGE ANNUAL COMPLETERS	AVERAGE ANNUAL CCC COMPLETERS	TOTAL GAP OR SURPLUS	MEDIAN HOURLY WAGE
1305.00	Child Development (CIP 19.0706)	107	35	5	72	\$9.90
502.00	Accounting (CIP 52.0301)	39	12	3	27	\$26.45
1199.00	Other Foreign Languages	0	1	0	(1)	\$17.29
506.40	Small Business and Entrepreneurship	0	2	0	(2)	\$29.33
1002.20	Sculpture	0	3	0	(3)	\$8.12
1901.00	Physical Sciences, General	0	3	1	(3)	\$48.95
1502.00	Language Arts	0	4	1	(4)	\$28.92
1902.00	Physics, General	0	6	2	(6)	\$48.89
114.00	Forest Technology (CIP 3.0511)	0	11	1	(10)	\$14.25
1002.00	Art - Two Dimensional	0	14	3	(14)	\$14.62
514.20	Medical Office Technology	8	25	0	(17)	\$14.95
1506.00	Speech Communication	1	35	2	(34)	\$20.74
505.00	Business Administration	130	173	14	(43)	\$34.71
1701.00	Mathematics, General	0	61	15	(61)	\$40.64
2105.00	Criminology - Law Enforcement (CIP 43.0103)	5	121	1	(116)	\$72.95
2001.00	Psychology, General	0	117	19	(117)	\$41.21
401.00	Biology, General	0	163	31	(163)	\$32.45
2105.00	Administration of Justice (CIP 43.0107)	24	200	0	(176)	\$32.10
2201.00	Social Sciences, General	1	246	28	(244)	\$25.96
1230.00	Nursing	110	621	0	(511)	\$37.13

Source: EMSI Gap Analysis Model. Numbers may not sum due to rounding.

FIGURE 2.2: SUPPLY AND DEMAND FOR CCC ASSOCIATE'S DEGREE LEVEL PROGRAMS



and demand for all associate's level programs for which CCC provides training. Again, the table only includes program groups available at CCC. Other program groups in the region may face larger gaps, but CCC does not offer the program. Table 2.3 addresses programs that are not currently being offered but which would address considerable regional workforce gaps. CCC is once again only one of the many institutions offering associate's degree level programs in the region, and as such, their completers comprise 3% of total regional supply.

One of the programs that was training for undersupplied occupations at the certificate level is still undersupplied at the associate's degree level. Child Development is the largest gap (gap of 72; median hourly earnings \$9.90). The other gap at the associate's degree level is Accounting (gap of 27; median hourly earnings \$26.45).

For the CCC Economic Region, there are nine fields with a significant surplus. The largest reported surplus is in Nursing. There are 110 annual openings compared to 621 regional completers (none from CCC). General Social Sciences is associated with the second largest surplus (surplus of 244). Administration of Justice is the third largest surplus (surplus of 176). As alluded to earlier, it is highly likely that CCC completers are finding jobs outside the CCC Economic Region. A review of placement rates could provide additional information. Additionally, for some programs, completers may be intending to continue their education at a four year institution instead of immediately entering the workforce.

TRANSFER TRACK (LIBERAL ARTS) STUDENTS

A number of students attend CCC with the intention of transferring to a four-year school to receive a bachelor's degree. Though these students study any number of topics, a large number of them receive associate of arts degrees in liberal arts. Over the past three years, an average of 52 students have completed liberal arts, computer science,

childhood development/early care & education, or administration of justice degrees at the associate's degree level, which composes 23% of the college's annual production of certificates and degrees. Some of these programs may have had a gap or surplus in the region, but due to the programs being associated with the transfer track, they are included here.

Once these students leave CCC, their educational and career track is difficult to predict. They could attend a four-year college in the region or outside the region, and they could study any number of different programs that will ultimately determine their future career. 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 2014 and 2024, 4,968 jobs will require a bachelor's degree and 24,090 will require a bachelor's degree or less, availing these students of 92% of all regional job openings.

POTENTIAL NEW PROGRAMS

In addition to knowing how well CCC's current educational programs are serving the local labor market, it is helpful to know the fields of opportunity where the College could create new program offerings. Table 2.3 on the following page contains a list of 31 programmatic areas of opportunity that could fill gaps in the labor market by postsecondary vocational certificates and associate's degrees. These selected occupations present unmet annual openings by completions 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 programs with relatively small gaps are included. The median hourly earnings for workers in the Economic Region are included in the Table 2.3. The education level at which the analysis was performed is listed for each occupation.

There are 26 postsecondary certificate level areas of opportunity listed in Table 2.3. Blue collar occupations like heavy & tractor-trailer truck drivers, general maintenance & repair workers, and industrial machinery mechanics appear to be undersupplied in the CCC Economic Region. Skilled trades like electricians; plumbers, pipefitters, & steamfitters; and carpenters are other areas of opportunity. Wage rates are in a range between \$12.63 for light truck or

delivery services drivers to a high of \$44.23 for correctional officers & jailers.

The other five areas of opportunity are at the associate's degree level. Medical & clinical laboratory technicians have the largest gap (gap of 10) but also pay only \$16.93 an hour. Another healthcare related occupation, diagnostic medical sonographers, has a small gap but high wages (gap of 8; median hourly earnings \$41.15). Medical equipment

TABLE 2.3: PROGRAMMATIC AREAS OF OPPORTUNITY

SOC	SOC TITLE	AVERAGE ANNUAL OPENINGS	AVERAGE ANNUAL COMPLETERS	GAP	MEDIAN HOURLY EARNINGS	EDUCATION LEVEL
53-3032	Heavy and Tractor-Trailer Truck Drivers	318	113	205	\$17.41	Certificate
49-9071	Maintenance and Repair Workers, General	159	0	159	\$17.06	Certificate
33-3012	Correctional Officers and Jailers	138	2	136	\$44.23	Certificate
25-9041	Teacher Assistants	158	32	126	\$13.49	Certificate
47-2111	Electricians	65	0	65	\$21.74	Certificate
49-9041	Industrial Machinery Mechanics	77	13	64	\$22.40	Certificate
47-2152	Plumbers, Pipefitters, and Steamfitters	52	0	52	\$23.01	Certificate
47-2031	Carpenters	46	0	46	\$17.72	Certificate
53-3033	Light Truck or Delivery Services Drivers	92	50	42	\$12.63	Certificate
33-9099	Protective Service Workers, All Other	40	0	40	\$13.07	Certificate
51-1011	First-Line Supervisors of Production and Operating Workers	40	0	40	\$24.61	Certificate
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	39	0	39	\$20.59	Certificate
49-9051	Electrical Power-Line Installers and Repairers	32	0	32	\$39.62	Certificate
47-2073	Operating Engineers and Other Construction Equipment Operators	31	2	30	\$27.83	Certificate
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	23	0	23	\$28.54	Certificate
49-9052	Telecommunications Line Installers & Repairers	22	0	22	\$31.83	Certificate
25-4031	Library Technicians	26	6	21	\$17.29	Certificate
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	20	0	20	\$20.46	Certificate
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	24	6	18	\$23.51	Certificate
49-3041	Farm Equipment Mechanics & Service Technicians	18	1	17	\$18.52	Certificate
47-2021	Brickmasons and Blockmasons	16	0	16	\$25.56	Certificate
31-9097	Phlebotomists	14	0	14	\$14.93	Certificate
49-9043	Maintenance Workers, Machinery	15	2	13	\$14.79	Certificate
53-3022	Bus Drivers, School or Special Client	37	25	13	\$14.49	Certificate
47-2211	Sheet Metal Workers	13	0	13	\$21.88	Certificate
29-2081	Opticians, Dispensing	12	1	11	\$16.91	Certificate
29-2012	Medical and Clinical Laboratory Technicians	13	3	10	\$16.93	Associate
29-2032	Diagnostic Medical Sonographers	9	1	8	\$41.15	Associate
49-9062	Medical Equipment Repairers	8	0	8	\$21.00	Associate
19-4031	Chemical Technicians	7	0	7	\$14.27	Associate
19-4011	Agricultural and Food Science Technicians	7	1	6	\$17.02	Associate

Source: EMSI Gap Analysis Model.

repairers, chemical technicians, and agricultural & food science technicians are the three other potential areas of opportunity at the associate's degree level.

CONCLUSION

Between both postsecondary certificate level and associate's degree level at CCC, there are a total of seven programs associated with significant workforce gaps. Five were at the certificate level and the remaining two were at the associate's degree level. Only one program experienced a gap at both education levels. There were 17 programs associated with significant workforce surpluses.

General Office Occupations & Clerical Services has the largest certificate level gap (gap of 645), but compensation from related occupations is relatively low (median hourly earnings \$13.89). Accounting has the second largest gap (gap of 110; median hourly wage \$16.67). Business Administration, the third largest certificate level gap, has a significant gap and is mapped to high paying occupations (gap of 79; median hourly earnings \$34.71). The two associate's degree level gaps are: Child Development (gap of 72; median hourly earnings \$9.90), and Accounting (gap of 27; median hourly earnings \$26.45).

Licensed Vocational Nursing (surplus 182), Child Development/Early Care & Education (surplus 114), and Administration of Justice (surplus of 61) are the three programs

associated with the largest surpluses of completers at the certificate level. Nursing (surplus of 511), General Social Sciences (surplus of 244), and Administration of Justice (surplus of 176) are top three associate's degree level surpluses. For some of the programs, CCC is producing a moderate number of new completers, but additional supply from other regional institutions, leads to the surplus. It is possible that some of the completers are seeking employment outside the CCC Economic Region.

There are 26 postsecondary certificate level areas of opportunity identified. The largest gaps in the programmatic areas of opportunity were for blue collar occupations like heavy & tractor-trailer truck drivers, general maintenance & repair workers, and industrial machinery mechanics. Some skilled trades are also among the top areas of opportunity: electricians; plumbers, pipefitters, & steamfitters; and carpenters. Wage rates are in a range between \$12.63 for light truck or delivery services drivers to a high of \$44.23 for correctional officers & jailers. An additional five areas of opportunity are at the associate's degree level. Medical & clinical laboratory technicians have the largest gap (gap of 10), but also pay only \$16.93 an hour. Other healthcare related occupations, diagnostic medical sonographers and medical equipment repairers, have small gaps but high wages (gap of 8 each; median hourly earnings over \$20 an hour). Chemical technicians and agricultural & food science technicians are the other potential areas of opportunity at the associate's degree level.

APPENDIX 1: ABOUT EMSI DATA

As stated in Chapter 2, EMSI data were used to calculate the projected number of annual job openings from 2014 to 2024. These projections take into account openings due to job growth and openings due to replacement needs.

In order to capture a complete picture of industry employment, EMSI gathers and integrates economic, labor market, demographic, and education data from over 90 government and private-sector sources, creating a comprehensive and current database that includes both published data and detailed estimates with full coverage of the United States.

More specifically, EMSI combines covered employment data from Quarterly Census of Employment and Wages (QCEW-produced by the Department of Labor) with total employment data in Regional Economic Information Sys-

tem (REIS-published by the Bureau of Economic Analysis or BEA). This is augmented with County Business Patterns (CBP) and Non-Employer Statistics (NES) published by the US Census Bureau. 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.

Through this combination of data sources, EMSI is able to fill gaps in individual sources (such as suppressions and missing proprietors). This yields 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.

APPENDIX 2: PROGRAM-TO-OCCUPATION MAPPING

Table A2.1 displays the crosswalk between educational programs (CIP codes) and occupations (SOC codes) that EMSI used to complete the gap analysis. Also listed are the adjustment factors which were applied to the annual openings figures for each occupation within each program. The methodology for these factors is described in Appendix 3, with the program based weight figure recounted under “De-duplication of Annual Openings” and the educational level adjustments recounted under “Education Level Adjustments.”

TABLE A2.1: PROGRAM TO OCCUPATION MAPPING WITH EMPLOYMENT ADJUSTMENT FACTORS

CIP	PROGRAM	SOC	OCCUPATION	PROGRAM BASED WEIGHT	PERCENT OF WORKFORCE WITH GIVEN EDUCATION LEVEL	
					PSV AWARD OR SOME COLLEGE	ASSOCIATE'S DEGREE
3.0101	Natural Resources/Conservation, General	19-1031	Conservation Scientists	0.12	9	13
		19-1032	Foresters	0.12	9	13
		19-4093	Forest and Conservation Technicians	0.09	42	54
		45-4011	Forest and Conservation Workers	0.12	73	83
3.0501	Forestry, General	19-1031	Conservation Scientists	0.88	9	13
		19-1032	Foresters	0.88	9	13
		19-4093	Forest and Conservation Technicians	0.63	42	54
		45-4011	Forest and Conservation Workers	0.88	73	83
3.0511	Forestry and Conservation Technicians	19-4093	Forest and Conservation Technicians	0.28	42	54
9.0101	Speech Communication and Rhetoric	27-3012	Public Address System and Other Announcers	1.00	54	61
		27-3031	Public Relations Specialists	0.99	16	20
		27-3043	Writers and Authors	0.94	12	15
11.0701	Computer Science	11-3021	Computer and Information Systems Managers	0.46	19	27
		15-1111	Computer and Information Research Scientists	0.42	6	9
		15-1122	Information Security Analysts	0.08	29	43
		15-1131	Computer Programmers	0.77	19	28
		15-1132	Software Developers, Applications	0.47	11	16
		15-1133	Software Developers, Systems Software	0.47	11	16
		15-1134	Web Developers	0.08	23	31

CIP	PROGRAM	SOC	OCCUPATION	PROGRAM BASED WEIGHT	PERCENT OF WORKFORCE WITH GIVEN EDUCATION LEVEL	
					PSV AWARD OR SOME COLLEGE	ASSOCIATE'S DEGREE
		15-1143	Computer Network Architects	0.08	27	41
		15-1151	Computer User Support Specialists	0.09	40	57
		15-1152	Computer Network Support Specialists	0.09	40	57
		15-1199	Computer Occupations, All Other	0.54	34	49
11.0801	Web Page, Digital/Multimedia and Information Resources Design	15-1122	Information Security Analysts	0.17	29	43
		15-1134	Web Developers	0.17	23	31
		15-1143	Computer Network Architects	0.17	27	41
		27-1014	Multimedia Artists and Animators	0.52	34	43
		27-1024	Graphic Designers	0.55	31	44
11.1006	Computer Support Specialist	15-1151	Computer User Support Specialists	0.20	40	57
		15-1152	Computer Network Support Specialists	0.20	40	57
13.121	Early Childhood Education and Teaching	25-2011	Preschool Teachers, Except Special Education	0.35	39	53
		25-2012	Kindergarten Teachers, Except Special Education	0.55	39	53
13.1314	Physical Education Teaching and Coaching	25-2022	Middle School Teachers, Except Special and Career/Technical Education	0.14	3	5
		25-2031	Secondary School Teachers, Except Special and Career/Technical Education	0.12	3	4
		27-2022	Coaches and Scouts	0.11	32	40
		27-2023	Umpires, Referees, and Other Sports Officials	0.39	32	40
		39-9031	Fitness Trainers and Aerobics Instructors	0.11	45	55
15.0506	Water Quality and Wastewater Treatment Management and Recycling Technology/Technician	51-8031	Water and Wastewater Treatment Plant and System Operators	1.00	79	91
15.0613	Manufacturing Engineering Technology/Technician	17-2112	Industrial Engineers	1.00	19	28
		17-3026	Industrial Engineering Technicians	0.52	60	83
		27-1021	Commercial and Industrial Designers	0.74	31	44
16.9999	Foreign Languages, Literatures, and Linguistics, Other	27-3091	Interpreters and Translators	0.00	37	50
19.0706	Child Development	21-1093	Social and Human Service Assistants	0.47	50	60
		25-2011	Preschool Teachers, Except Special Education	0.36	39	53
		39-9011	Childcare Workers	0.25	75	84
19.0709	Child Care Provider/Assistant	39-9011	Childcare Workers	0.75	75	84
23.9999	English Language and Literature/Letters, Other	25-1099	Postsecondary Teachers	0.00	3	5

CIP	PROGRAM	SOC	OCCUPATION	PROGRAM BASED WEIGHT	PERCENT OF WORKFORCE WITH GIVEN EDUCATION LEVEL	
					PSV AWARD OR SOME COLLEGE	ASSOCIATE'S DEGREE
		51-4032	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	1.00	88	98
		51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	1.00	92	97
		51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	1.00	89	95
		51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	1.00	91	96
		51-4041	Machinists	1.00	86	97
		51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	1.00	91	96
		51-4191	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic	1.00	90	94
		51-4192	Layout Workers, Metal and Plastic	1.00	91	96
		51-4193	Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic	1.00	87	94
		51-4199	Metal Workers and Plastic Workers, All Other	1.00	91	96
48.0508	Welding Technology/Welder	51-4121	Welders, Cutters, Solderers, and Brazers	1.00	92	98
		51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	1.00	92	98
50.0409	Graphic Design	27-1011	Art Directors	1.00	34	43
		27-1014	Multimedia Artists and Animators	0.30	34	43
		27-1019	Artists and Related Workers, All Other	0.96	34	43
		27-1024	Graphic Designers	0.32	31	44
		51-9123	Painting, Coating, and Decorating Workers	1.00	93	97
50.0708	Painting	27-1012	Craft Artists	0.10	34	43
		27-1013	Fine Artists, Including Painters, Sculptors, and Illustrators	0.10	34	43
		27-1014	Multimedia Artists and Animators	0.13	34	43
50.0709	Sculpture	27-1012	Craft Artists	0.02	34	43
		27-1013	Fine Artists, Including Painters, Sculptors, and Illustrators	0.02	34	43
51.0716	Medical Administrative/Executive Assistant and Medical Secretary	31-9092	Medical Assistants	0.05	69	91
		43-6011	Executive Secretaries and Executive Administrative Assistants	0.47	67	81
		43-6013	Medical Secretaries	0.25	67	81

CIP	PROGRAM	SOC	OCCUPATION	PROGRAM BASED WEIGHT	PERCENT OF WORKFORCE WITH GIVEN EDUCATION LEVEL			
					PSV AWARD OR SOME COLLEGE	ASSOCIATE'S DEGREE		
51.2601	Health Aide	31-1013	Psychiatric Aides	0.11	83	91		
		31-1014	Nursing Assistants	0.13	83	91		
51.3801	Registered Nursing/Registered Nurse	29-1141	Registered Nurses	0.61	6	45		
51.3901	Licensed Practical/Vocational Nurse Training	29-2061	Licensed Practical and Licensed Vocational Nurses	0.34	78	95		
52.0101	Business/Commerce, General	11-1011	Chief Executives	0.02	27	33		
		11-1021	General and Operations Managers	0.02	42	51		
		11-2022	Sales Managers	0.02	27	33		
		11-3011	Administrative Services Managers	0.02	48	59		
		11-3051	Industrial Production Managers	0.02	47	56		
		11-3071	Transportation, Storage, and Distribution Managers	0.02	63	71		
		11-9021	Construction Managers	0.01	59	66		
		11-9151	Social and Community Service Managers	0.01	25	31		
		11-9199	Managers, All Other	0.01	38	46		
		13-1051	Cost Estimators	0.01	55	67		
		13-1111	Management Analysts	0.02	18	23		
		52.0201	Business Administration and Management, General	11-1011	Chief Executives	0.96	27	33
				11-1021	General and Operations Managers	0.95	42	51
11-2022	Sales Managers			0.98	27	33		
11-3011	Administrative Services Managers			0.96	48	59		
11-3051	Industrial Production Managers			0.98	47	56		
11-3071	Transportation, Storage, and Distribution Managers			0.96	63	71		
11-9021	Construction Managers			0.92	59	66		
11-9151	Social and Community Service Managers			0.86	25	31		
11-9199	Managers, All Other			0.89	38	46		
13-1051	Cost Estimators			0.92	55	67		
13-1111	Management Analysts			0.96	18	23		
37-1011	First-Line Supervisors of House-keeping and Janitorial Workers			0.95	83	89		
39-1011	Gaming Supervisors			0.95	58	68		
39-1021	First-Line Supervisors of Personal Service Workers	0.95	64	74				
52.0301	Accounting	13-2011	Accountants and Auditors	0.34	12	22		
		13-2031	Budget Analysts	0.95	23	32		
		13-2041	Credit Analysts	0.95	29	37		
		13-2061	Financial Examiners	1.00	17	20		
		13-2081	Tax Examiners and Collectors, and Revenue Agents	1.00	42	52		
52.0302	Accounting Technology/Technician and Bookkeeping	13-2082	Tax Preparers	1.00	41	50		

CIP	PROGRAM	SOC	OCCUPATION	PROGRAM BASED WEIGHT	PERCENT OF WORKFORCE WITH GIVEN EDUCATION LEVEL	
					PSV AWARD OR SOME COLLEGE	ASSOCIATE'S DEGREE
		43-3021	Billing and Posting Clerks	1.00	70	83
		43-3031	Bookkeeping, Accounting, and Auditing Clerks	0.91	72	83
		43-3041	Gaming Cage Workers	1.00	82	89
		43-3051	Payroll and Timekeeping Clerks	1.00	68	81
		43-4011	Brokerage Clerks	1.00	50	59
		43-9111	Statistical Assistants	1.00	56	67
52.0401	Administrative Assistant and Secretarial Science, General	43-6011	Executive Secretaries and Executive Administrative Assistants	0.53	67	81
		43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	1.00	67	81
52.0408	General Office Occupations and Clerical Services	43-3061	Procurement Clerks	1.00	60	71
		43-4021	Correspondence Clerks	1.00	73	83
		43-4031	Court, Municipal, and License Clerks	1.00	65	81
		43-4071	File Clerks	1.00	66	78
		43-4151	Order Clerks	1.00	73	83
		43-4161	Human Resources Assistants, Except Payroll and Timekeeping	1.00	57	71
		43-4171	Receptionists and Information Clerks	1.00	74	85
		43-4199	Information and Record Clerks, All Other	1.00	60	77
		43-5011	Cargo and Freight Agents	1.00	71	83
		43-5051	Postal Service Clerks	1.00	74	83
		43-5052	Postal Service Mail Carriers	1.00	76	86
		43-5053	Postal Service Mail Sorters, Processors, and Processing Machine Operators	1.00	76	85
		43-5071	Shipping, Receiving, and Traffic Clerks	1.00	86	92
		43-5111	Weighers, Measurers, Checkers, and Samplers, Recordkeeping	1.00	81	88
		43-9022	Word Processors and Typists	1.00	68	81
		43-9041	Insurance Claims and Policy Processing Clerks	1.00	65	77
		43-9051	Mail Clerks and Mail Machine Operators, Except Postal Service	1.00	80	89
		43-9061	Office Clerks, General	1.00	68	80
		43-9071	Office Machine Operators, Except Computer	1.00	76	86
		43-9199	Office and Administrative Support Workers, All Other	0.99	57	68
52.0703	Small Business Administration/ Management	11-9199	Managers, All Other	0.01	38	46

Completion data gathered for this analysis listed programs and program codes by CIP. In order to identify programs by the Taxonomy of Programs (TOP) as used by the California Community College a CIP to TOP crosswalk was used. Table A2.2 displays the entire CIP to TOP crosswalk as used in this analysis. Note: Due to the fact that TOP codes are not as detailed as CIP codes, there are several different programs that have the same TOP codes and titles. In order to differentiate the programs with the same TOP codes and titles, refer to the CIP titles for further description of the programs.

TABLE A2.2: CIP TO TOP PROGRAM MAPPING

CIP	CIP TITLE	TOP	TOP TITLE
3.0101	Natural Resources/Conservation, General	115.00	Natural Resources
3.0501	Forestry, General	114.00	Forestry
3.0511	Forestry and Conservation Technicians	114.00	Forest Technology
9.0101	Speech Communication and Rhetoric	1506.00	Speech Communication
11.0701	Computer Science	706.00	Computer Science for Transfer
11.1006	Computer Support Specialist	708.20	Computer Support
13.121	Early Childhood Education and Teaching	1305.00	Early Childhood Education for Transfer
13.1314	Physical Education Teaching and Coaching	835.00	Physical Education
15.0506	Water Quality and Wastewater Treatment Management and Recycling Technology/Technician	958.00	Water and Wastewater Technology
15.0613	Manufacturing Engineering Technology/Technician	956.00	Manufacturing and Industrial Technology
16.9999	Foreign Languages, Literatures, and Linguistics, Other	1199.00	Other Foreign Languages
19.0706	Child Development	1305.00	Child Development
19.0709	Child Care Provider/Assistant	1305.00	Child Development/Early Care & Education
23.9999	English Language and Literature/Letters, Other	1502.00	Language Arts
26.0101	Biology/Biological Sciences, General	401.00	Biology, General
27.0101	Mathematics, General	1701.00	Mathematics, General
40.0101	Physical Sciences	1901.00	Physical Sciences, General
40.0801	Physics, General	1902.00	Physics, General
42.0101	Psychology, General	2001.00	Psychology, General
43.0103	Criminal Justice/Law Enforcement Administration	2105.00	Criminology - Law Enforcement
43.0104	Criminal Justice/Safety Studies	2105.00	Administration of Justice for Transfer
43.0107	Criminal Justice/Police Science	2105.00	Administration of Justice
45.0101	Social Sciences, General	2201.00	Social Sciences, General
47.0608	Aircraft Powerplant Technology/Technician	950.20	Aviation Powerplant Mechanics
48.0501	Machine Tool Technology/Machinist	956.30	Machining and Machine Tools
48.0508	Welding Technology/Welder	956.50	Welding Technology
50.0409	Graphic Design	1030.00	Graphic Arts and Design
50.0708	Painting	1002.00	Art - Two Dimensional
50.0709	Sculpture	1002.20	Sculpture
51.0716	Medical Admin./Executive Assistant and Medical Secretary	514.20	Medical Office Technology
51.2601	Health Aide	???	Health Aide
51.3801	Registered Nursing/Registered Nurse	1230.00	Nursing
51.3901	Licensed Practical/Vocational Nurse Training	1230.20	Licensed Vocational Nursing
52.0101	Business/Commerce, General	501.00	Business and Commerce, General
52.0201	Business Administration and Management, General	505.00	Business Administration
52.0301	Accounting	502.00	Accounting
52.0302	Accounting Technology/Technician and Bookkeeping	502.00	Accounting
52.0401	Administrative Assistant and Secretarial Science, General	514.00	Office Technology/Office Computer Applications
52.0408	General Office Occupations and Clerical Services	???	Gen. Office Occupations & Clerical Services
52.0703	Small Business Administration/Management	506.40	Small Business and Entrepreneurship

APPENDIX 3: PROGRAM GAP ANALYSIS METHODOLOGY

This appendix focuses on describing and understanding the methodology used in the program 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 regional workforce needs.

SUPPLY AND DEMAND MODEL

EMSI builds a model using demand-side data (average annual 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 average annual openings for an occupation and the number of people completing postsecondary degrees for that occupation, whether at CCC or at another training provider within one of the regions. This makes it possible to identify whether there may be talent shortages or surpluses within the Economic Region.

The first step involves mapping the linkage between annual openings for a SOC code and the number of completions for an education program 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 education 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 therapists assistants). This

provides an easy comparison of annual 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 is not always the case. More often than not an educational program maps to multiple occupations and an occupation maps to multiple educational programs. For this reason, EMSI has pioneered a method of de-duplicating completers, such that the potential sources of supply are not double-counted 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 (i.e., employment covered by unemployment insurance as well as proprietor employment). The employment data reflects jobs for the third quarter of 2014. Within this dataset, EMSI calculates the number of regional annual job openings for the occupations that require two different levels of postsecondary training.⁸ The BLS also provides educational attainment data of current workers for each SOC code, broken out by their highest level of education attained. The data is presented as the percentage of workers in the SOC code with educational attainment ranging from less than a high school degree to an associate’s degree. Using these data, EMSI adjusted the annual opening estimates for each SOC code to only incorporate the percentage of workers for three different educational levels that correspond with CCC’s program offerings.

For example, as shown in Table A3.1, there are three occupations trained for by Corrections (CIP code 43.0102).

⁸ See Appendix 1 for a description of the sources and processes of EMSI data.

TABLE A3.1: EDUCATIONAL LEVEL ADJUSTMENTS

CIP CODE	CIP TITLE	SOC	TITLE	"SOME COLLEGE, NO DEGREE" OR POST-SECONDARY AWARD OR LOWER	ASSOCIATE'S DEGREE OR LOWER
43.0102	Corrections	33-3012	Correctional Officers and Jailers	75%	88%
		33-1012	First-Line Supervisors of Police and Detectives	46%	62%
		33-1011	First-Line Supervisors of Correctional Officers	61%	75%
Weighted Average				68%	85%

Within that cluster are an assortment of career fields, including correctional officers and jailers, first-line supervisors of police and detectives, and first-line supervisors of correctional officers. Among correctional officers, the majority of job openings (75%) are available to somebody with “some college” or a postsecondary vocational award. Alternatively, for first-line supervisors of police and detectives, only 46% of job openings are accessible to a person without a college degree. The weighted average of job openings is calculated for each program at each program/degree level where CCC has produced completers over the past three years. Not taking into account the educational attainment dynamics in this way would bias the result by over-counting potential job opportunities for completers.⁹

De-duplication of Annual Openings

Most educational programs are designed to train people for multiple occupational types, many of which are simultaneously linked with other educational programs, presenting a complexity when comparing supply and demand for any particular educational program. For instance, the Computer Systems Networking & Telecommunications program is mapped to three different occupations: computer support specialists, information security analysts, and computer systems analysts. If we focus on just one of the occupations for this list—computer support specialists—it is also mapped to 10 different educational programs, spanning program titles such as Computer Systems Analysis and Medical Office Computer Specialist.

To ensure that no double-counting occurs, it is necessary to either realign the program groupings to eliminate the mapping of occupations to multiple programs, or to determine what proportion of demand should be compared with supply numbers from each program. EMSI takes the second approach in this analysis, which has the

⁹ 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.

advantage of maintaining the program titles and descriptions in roughly the same format that completer data were originally delivered to EMSI. EMSI uses a formula that favors program types with the largest number of completers, attributing a greater proportion of demand to these than the programs which produce a smaller number of completers. This method utilizes the assumption that the higher output educational programs are likely feeding a higher degree of demand within the Economic Region.¹⁰ Appendix 2 contains the detailed mapping of each CIP code to all relevant occupations.

One possible criticism of this methodology is that it assumes, all else being equal, students from higher-output programs are more likely to obtain a job than students from lower-output programs, whereas in reality students are judged more by their skills and merits than their educational program of study. The intention of the analysis is not to rate students’ capability of competing for jobs, but rather to capture the unique dynamics of the local labor market. For example, in a region where a unique program such as Commercial and Advertising Art is more prevalent than Graphic Design, it can safely be assumed that the graduates of the Commercial and Advertising Art program will be offered a larger number of local openings than are students from the Graphic Design program. If such were not the case, it would be unlikely for the Commercial and Advertising Art program to remain the producer of local talent in the long-term, as the program would yield students to a program with a more successful job placement rate.

Recognizing that some smaller programs produce students who are more capable of obtaining local jobs than students from larger programs, EMSI also provides an

¹⁰ 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 a number of smaller educational providers provided that the aggregate output of the smaller schools is near the output of the single larger school.

alternative gap analysis, which does not reduce the number of annual openings based on the size of each educational program. Rather the total number of annual openings available for students at each educational level is provided without further modification. Due to this modification, these numbers have not been de-duplicated, unlike the annual openings figures shown in Chapter 2. These figures are provided in Appendix 4: Alternative Supply and Demand Calculations.

EDUCATION OUTPUT

There are several educational institutions in the Economic Region, some of which have programs similar to those offered at CCC. Hence completers at CCC will be competing for some jobs with completers from other regional institutions. EMSI determined education output by Classification of Instructional Program (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 education institutions in the Economic Region, EMSI used data from the Integrated Postsecondary Educational System (IPEDS).¹¹ These data are publicly available through the National Center for Educational Statistics. Completions data were averaged for a three-year period, 2011 through 2013, to smooth out any bumps in enrollment that may be unique to a particular academic year. Data gathered directly from CCC was used to replace IPEDS data for CCC and includes 2014 completions.

Tables A3.2 and A3.3 display the completion breakdown by institution and award type. CCC is one of many institutions this region, granting 46 certificates and 178 associate's degrees, which is 2% of both totals.

11 These data come with inherent weaknesses. First, 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 account for the fact that some people may receive multiple degrees or certifications, so when the number of degrees awarded exceeds the number of people receiving the degrees, the number of completers can be overstated. Nevertheless, this system is the best source for collecting data regarding a broad range of educational institutions.

TABLE A3.2: SUMMARY OF POSTSECONDARY CERTIFICATE LEVEL REGIONAL COMPLETIONS BY INSTITUTION

INSTITUTION	3-YEAR AVERAGE	PERCENT OF TOTAL
Advanced Career Institute	245	3%
Clovis Adult Education	151	2%
Clovis Community College	46	1%
College of the Sequoias	461	6%
Estes Institute of Cosmetology Arts and Science	78	1%
Fresno City College	1,331	17%
Galen College of Medical and Dental Assistants	57	1%
Heald College-Fresno	19	0%
Institute of Technology Inc	1,901	24%
Kaplan College-Fresno	316	4%
Lyles Fresno College of Beauty	37	0%
Madera Beauty College	38	0%
Manchester Beauty College	42	1%
Milan Institute of Cosmetology-Visalia	135	2%
Milan Institute-Clovis	256	3%
Milan Institute-Visalia	271	3%
Paul Mitchell the School-Fresno	84	1%
Porterville College	109	1%
Proteus	31	0%
Reedley College	853	11%
San Joaquin Valley College-Fresno	88	1%
San Joaquin Valley College-Online	116	1%
San Joaquin Valley College-Visalia	343	4%
Sierra Valley College of Court Reporting	8	0%
Tulare Beauty College	23	0%
UEI College-Fresno	564	7%
University of Phoenix-Central Valley Campus	0	0%
West Hills College-Coalinga	167	2%
West Hills College-Lemoore	39	0%
Grand Total	7,807	100%

Source: IPEDS, CCC

TABLE A3.3: SUMMARY OF ASSOCIATE'S DEGREE REGIONAL COMPLETIONS BY INSTITUTION

INSTITUTION	3-YEAR AVERAGE	PERCENT OF TOTAL
California Christian College	1	0%
Clovis Community College	178	3%
College of the Sequoias	962	16%
Fresno City College	1,172	19%
Herald College-Fresno	530	9%
Institute of Technology Inc	401	7%
ITT Technical Institute-Clovis	153	3%
Kaplan College-Fresno	60	1%
Porterville College	263	4%
Reedley College	504	8%
San Joaquin Valley College-Fresno	429	7%
San Joaquin Valley College-Fresno Aviation	45	1%
San Joaquin Valley College-Online	31	1%
San Joaquin Valley College-Visalia	748	12%
West Hills College-Coalinga	217	4%
West Hills College-Lemoore	322	5%
Grand Total	7,807	100%

Source: IPEDS, CCC

APPENDIX 4: ALTERNATIVE GAP ANALYSIS CALCULATIONS

EMSI de-duplicated the annual openings shown in Chapter 2 to account for the magnitude of output from different educational programs in the region. The process is explained in detail in Appendix 3 under “De-duplication of Annual Openings.” This procedure is designed to reflect the unique supply and demand dynamics of each regional economy. However, EMSI also recognizes that in some cases a student from a less predominant educational program is a more likely candidate to be offered a local job. These alternative supply and demand calculations give equal weight to every job opportunity within students’ field of study, regardless of whether that program is a big or small player in talent development for the region. Therefore, these estimates should be considered as less conservative measures than those from Chapter 2.

ALTERNATIVE GAP ANALYSIS TABLES

TABLE A4.1: ALTERNATIVE SUPPLY AND DEMAND FOR CCC’S POSTSECONDARY CERTIFICATE PROGRAMS

TOP	PROGRAM	AVERAGE ANNUAL OPENINGS	AVERAGE ANNUAL COMPLETERS	CCC COMPLETERS	TOTAL GAP OR SURPLUS
???	General Office Occupations and Clerical Services	726	80	0	646
501.00	Business and Commerce, General	241	6	0	236
502.00	Accounting	206	86	2	120
???	Health Aide	193	81	1	112
505.00	Business Administration	287	191	2	95
514.00	Office Technology/Office Computer Applications	196	125	0	70
502.00	Accounting	49	9	2	40
835.00	Physical Education	26	3	1	23
958.00	Water and Wastewater Technology	19	3	2	16
115.00	Natural Resources	13	4	1	9
1230.00	Nursing	30	30	0	0
950.20	Aviation Powerplant Mechanics	29	31	0	(2)
1030.00	Graphic Arts and Design	10	13	0	(3)
956.50	Welding Technology	35	43	1	(8)
708.20	Computer Support	24	37	17	(13)
956.30	Machining and Machine Tools	44	58	0	(14)
114.00	Forestry	13	32	1	(18)
956.00	Manufacturing and Industrial Technology	4	34	0	(30)
1305.00	Child Development/Early Care and Education	220	279	11	(59)
2105.00	Administration of Justice	70	131	1	(61)
1230.20	Licensed Vocational Nursing	110	220	2	(109)

TABLE A4.2: ALTERNATIVE SUPPLY AND DEMAND FOR CCC'S ASSOCIATE'S DEGREE PROGRAMS

TOP	PROGRAM	AVERAGE ANNUAL OPENINGS	AVERAGE ANNUAL COMPLETERS	CCC COMPLETERS	TOTAL GAP OR SURPLUS
1305.00	Child Development	362	35	5	327
514.20	Medical Office Technology	178	25	0	153
502.00	Accounting	62	12	3	50
506.40	Small Business and Entrepreneurship	15	2	0	13
1199.00	Other Foreign Languages	8	1	0	8
1502.00	Language Arts	9	4	1	5
1002.20	Sculpture	1	3	0	(2)
1901.00	Physical Sciences, General	0	3	1	(3)
1902.00	Physics, General	0	6	2	(6)
114.00	Forest Technology	4	11	1	(6)
1002.00	Art - Two Dimensional	3	14	3	(11)
505.00	Business Administration	150	173	14	(24)
1506.00	Speech Communication	1	35	2	(34)
1701.00	Mathematics, General	0	61	15	(60)
2105.00	Criminology - Law Enforcement	10	121	1	(111)
2001.00	Psychology, General	0	117	19	(117)
401.00	Biology, General	1	163	31	(162)
2105.00	Administration of Justice	24	200	0	(176)
2201.00	Social Sciences, General	1	246	28	(244)
1230.00	Nursing	181	621	0	(441)

APPENDIX 5: DETAILED EMPLOYMENT PROJECTIONS

Table A5.1 displays the occupations that align with one or more of CCC's educational programs. The programs with which they align can be found in Table A2.1. Table A5.2 displays the occupations that align with one or more of the programs discussed in the analysis of potential new programs (Tables 2.3). Note that if an occupation appears in Table A5.1 it is usually not included in Table A5.2.

TABLE A5.1: DETAILED EMPLOYMENT PROJECTIONS RELATED TO EXISTING PROGRAMS

SOC	OCCUPATION	2014 JOBS	2019 JOBS	CHANGE	PERCENT CHANGE	PROJECTED ANNUAL OPENINGS
11-1011	Chief Executives	1,008	1,039	31	3%	30
11-1021	General and Operations Managers	7,708	8,225	517	7%	255
11-2022	Sales Managers	1,544	1,610	66	4%	47
11-3011	Administrative Services Managers	1,045	1,118	73	7%	32
11-3021	Computer and Information Systems Managers	434	473	39	9%	14
11-3051	Industrial Production Managers	805	817	12	1%	19
11-3071	Transportation, Storage, and Distribution Managers	477	505	28	6%	17
11-9021	Construction Managers	1,139	1,063	(76)	(7%)	24
11-9121	Natural Sciences Managers	133	138	5	4%	4
11-9151	Social and Community Service Managers	795	921	126	16%	44
11-9199	Managers, All Other	1,977	2,008	31	2%	53
13-1051	Cost Estimators	992	1,029	37	4%	41
13-1111	Management Analysts	1,536	1,679	143	9%	54
13-2011	Accountants and Auditors	3,688	3,924	236	6%	161
13-2031	Budget Analysts	216	225	9	4%	11
13-2041	Credit Analysts	154	152	(2)	(1%)	4
13-2061	Financial Examiners	40	42	2	5%	0
13-2081	Tax Examiners and Collectors, and Revenue Agents	1,757	1,743	(14)	(1%)	61
13-2082	Tax Preparers	214	234	20	9%	9
15-1111	Computer and Information Research Scientists	42	45	3	7%	1
15-1122	Information Security Analysts	131	148	17	13%	6
15-1131	Computer Programmers	375	391	16	4%	14
15-1132	Software Developers, Applications	564	624	60	11%	20
15-1133	Software Developers, Systems Software	253	288	35	14%	11
15-1134	Web Developers	225	248	23	10%	9

SOC	OCCUPATION	2014 JOBS	2019 JOBS	CHANGE	PERCENT CHANGE	PROJECTED ANNUAL OPENINGS
15-1143	Computer Network Architects	120	136	16	13%	6
15-1151	Computer User Support Specialists	1,320	1,461	141	11%	51
15-1152	Computer Network Support Specialists	341	361	20	6%	10
15-1199	Computer Occupations, All Other	371	384	13	4%	9
15-2021	Mathematicians	<10	<10	--	--	0
15-2041	Statisticians	34	40	6	18%	2
15-2099	Mathematical Science Occupations, All Other	<10	<10	--	--	0
17-2112	Industrial Engineers	275	296	21	8%	13
17-3026	Industrial Engineering Technicians	59	62	3	5%	2
19-1029	Biological Scientists, All Other	154	155	1	1%	5
19-1031	Conservation Scientists	108	114	6	6%	5
19-1032	Foresters	51	56	5	10%	3
19-1099	Life Scientists, All Other	19	21	2	11%	1
19-2012	Physicists	28	30	2	7%	0
19-3031	Clinical, Counseling, and School Psychologists	1,241	1,316	75	6%	50
19-3032	Industrial-Organizational Psychologists	<10	<10	--	--	0
19-3039	Psychologists, All Other	67	71	4	6%	3
19-3099	Social Scientists and Related Workers, All Other	71	77	6	8%	2
19-4061	Social Science Research Assistants	25	31	6	24%	2
19-4093	Forest and Conservation Technicians	363	361	(2)	(1%)	15
21-1093	Social and Human Service Assistants	2,230	2,476	246	11%	112
25-1099	Postsecondary Teachers	4,570	5,080	510	11%	176
25-2011	Preschool Teachers, Except Special Education	2,278	2,420	142	6%	96
25-2012	Kindergarten Teachers, Except Special Education	1,310	1,420	110	8%	61
25-2022	Middle School Teachers, Except Special and Career/ Technical Education	2,818	3,070	252	9%	116
25-2031	Secondary School Teachers, Except Special and Career/ Technical Education	5,516	5,801	285	5%	213
27-1011	Art Directors	137	138	1	1%	4
27-1012	Craft Artists	81	79	(2)	(2%)	2
27-1013	Fine Artists, Including Painters, Sculptors, and Illustrators	66	65	(1)	(2%)	0
27-1014	Multimedia Artists and Animators	157	158	1	1%	5
27-1019	Artists and Related Workers, All Other	55	54	(1)	(2%)	1
27-1021	Commercial and Industrial Designers	62	64	2	3%	2
27-1024	Graphic Designers	605	606	1	0%	19
27-2022	Coaches and Scouts	662	719	57	9%	32
27-2023	Umpires, Referees, and Other Sports Officials	69	73	4	6%	3
27-3012	Public Address System and Other Announcers	36	38	2	6%	1
27-3031	Public Relations Specialists	428	474	46	11%	16
27-3043	Writers and Authors	297	306	9	3%	9

SOC	OCCUPATION	2014 JOBS	2019 JOBS	CHANGE	PERCENT CHANGE	PROJECTED ANNUAL OPENINGS
27-3091	Interpreters and Translators	400	454	54	14%	17
29-1141	Registered Nurses	10,324	11,609	1,285	12%	474
29-2061	Licensed Practical and Licensed Vocational Nurses	2,627	2,985	358	14%	142
31-1013	Psychiatric Aides	133	144	11	8%	5
31-1014	Nursing Assistants	4,783	5,430	647	14%	229
31-9092	Medical Assistants	3,986	4,431	445	11%	172
33-1012	First-Line Supervisors of Police and Detectives	370	397	27	7%	17
33-3011	Bailiffs	<10	<10	--	--	0
33-3021	Detectives and Criminal Investigators	371	390	19	5%	12
33-3051	Police and Sheriff's Patrol Officers	2,855	3,023	168	6%	127
33-9021	Private Detectives and Investigators	118	135	17	14%	7
33-9031	Gaming Surveillance Officers and Gaming Investigators	26	27	1	4%	0
37-1011	First-Line Supervisors of Housekeeping and Janitorial Workers	733	795	62	8%	32
39-1011	Gaming Supervisors	107	108	1	1%	3
39-1021	First-Line Supervisors of Personal Service Workers	697	756	59	8%	27
39-9011	Childcare Workers	8,094	8,233	139	2%	295
39-9031	Fitness Trainers and Aerobics Instructors	702	698	(4)	(1%)	11
43-3021	Billing and Posting Clerks	2,559	2,772	213	8%	92
43-3031	Bookkeeping, Accounting, and Auditing Clerks	7,008	7,425	417	6%	152
43-3041	Gaming Cage Workers	103	104	1	1%	3
43-3051	Payroll and Timekeeping Clerks	1,066	1,125	59	6%	36
43-3061	Procurement Clerks	306	320	14	5%	14
43-4011	Brokerage Clerks	37	36	(1)	(3%)	1
43-4021	Correspondence Clerks	26	27	1	4%	1
43-4031	Court, Municipal, and License Clerks	700	752	52	7%	22
43-4071	File Clerks	1,077	1,081	4	0%	27
43-4151	Order Clerks	666	686	20	3%	22
43-4161	Human Resources Assistants, Except Payroll and Time-keeping	686	704	18	3%	21
43-4171	Receptionists and Information Clerks	4,009	4,302	293	7%	172
43-4199	Information and Record Clerks, All Other	1,280	1,266	(14)	(1%)	30
43-5011	Cargo and Freight Agents	146	163	17	12%	8
43-5051	Postal Service Clerks	207	183	(24)	(12%)	3
43-5052	Postal Service Mail Carriers	989	898	(91)	(9%)	33
43-5053	Postal Service Mail Sorters, Processors, and Processing Machine Operators	250	226	(24)	(10%)	1
43-5071	Shipping, Receiving, and Traffic Clerks	2,618	2,779	161	6%	104
43-5111	Weighers, Measurers, Checkers, and Samplers, Record-keeping	1,041	1,105	64	6%	37
43-6011	Executive Secretaries and Executive Administrative Assistants	2,134	2,169	35	2%	34

SOC	OCCUPATION	2014 JOBS	2019 JOBS	CHANGE	PERCENT CHANGE	PROJECTED ANNUAL OPENINGS
43-6013	Medical Secretaries	3,121	3,535	414	13%	124
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	8,759	9,475	716	8%	258
43-9022	Word Processors and Typists	945	854	(91)	(10%)	4
43-9041	Insurance Claims and Policy Processing Clerks	882	900	18	2%	28
43-9051	Mail Clerks and Mail Machine Operators, Except Postal Service	872	773	(99)	(11%)	19
43-9061	Office Clerks, General	11,172	11,795	623	6%	370
43-9071	Office Machine Operators, Except Computer	154	150	(4)	(3%)	4
43-9111	Statistical Assistants	17	19	2	12%	1
43-9199	Office and Administrative Support Workers, All Other	3,621	3,701	80	2%	120
45-4011	Forest and Conservation Workers	200	224	24	12%	9
49-3011	Aircraft Mechanics and Service Technicians	648	752	104	16%	41
51-2011	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	29	34	5	17%	1
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	246	257	11	4%	7
51-4022	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	20	21	1	5%	1
51-4023	Rolling Machine Setters, Operators, and Tenders, Metal and Plastic	22	25	3	14%	0
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	250	262	12	5%	5
51-4032	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	19	18	(1)	(5%)	1
51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	73	72	(1)	(1%)	0
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	50	49	(1)	(2%)	0
51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	61	59	(2)	(3%)	1
51-4041	Machinists	577	631	54	9%	26
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	226	221	(5)	(2%)	5
51-4121	Welders, Cutters, Solderers, and Brazers	1,123	1,128	5	0%	33
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	162	170	8	5%	6
51-4191	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic	15	17	2	13%	1
51-4192	Layout Workers, Metal and Plastic	26	24	(2)	(8%)	1
51-4193	Plating and Coating Machine Setters, Operators, and Tenders, Metal and Plastic	68	68	0	0%	2
51-4199	Metal Workers and Plastic Workers, All Other	46	52	6	13%	0
51-8031	Water and Wastewater Treatment Plant and System Operators	499	530	31	6%	24
51-9123	Painting, Coating, and Decorating Workers	98	91	(7)	(7%)	1

TABLE A5.2: DETAILED EMPLOYMENT PROJECTIONS RELATED TO POTENTIAL FUTURE PROGRAMS

SOC	TITLE	2014 JOBS	2019 JOBS	CHANGE	% CHANGE	PROJECTED ANNUAL OPENINGS
19-4011	Agricultural and Food Science Technicians	439	458	19	4%	20
19-4031	Chemical Technicians	167	195	28	17%	10
25-4031	Library Technicians	655	697	42	6%	46
25-9041	Teacher Assistants	7,033	7,471	438	6%	254
29-2012	Medical and Clinical Laboratory Technicians	510	600	90	18%	33
29-2032	Diagnostic Medical Sonographers	203	252	49	24%	13
29-2081	Opticians, Dispensing	266	315	49	18%	19
31-9097	Phlebotomists	366	419	53	14%	18
33-3012	Correctional Officers and Jailers	5,083	5,332	249	5%	190
33-9099	Protective Service Workers, All Other	782	819	37	5%	63
47-2021	Brickmasons and Blockmasons	227	281	54	24%	17
47-2031	Carpenters	3,348	3,194	(154)	(5%)	53
47-2073	Operating Engineers and Other Construction Equipment Operators	920	976	56	6%	34
47-2111	Electricians	1,906	2,111	205	11%	82
47-2152	Plumbers, Pipefitters, and Steamfitters	1,341	1,532	191	14%	59
47-2211	Sheet Metal Workers	316	350	34	11%	14
49-2022	Telecommunications Equipment Installers and Repairers, Except Line Installers	683	801	118	17%	34
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	1,285	1,364	79	6%	45
49-3041	Farm Equipment Mechanics and Service Technicians	676	674	(2)	(0%)	21
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	824	838	14	2%	28
49-9041	Industrial Machinery Mechanics	1,442	1,678	236	16%	94
49-9043	Maintenance Workers, Machinery	579	632	53	9%	18
49-9051	Electrical Power-Line Installers and Repairers	483	574	91	19%	38
49-9052	Telecommunications Line Installers and Repairers	510	583	73	14%	29
49-9062	Medical Equipment Repairers	122	152	30	25%	10
49-9071	Maintenance and Repair Workers, General	5,436	5,838	402	7%	191
51-1011	First-Line Supervisors of Production and Operating Workers	2,175	2,265	90	4%	52
51-9023	Mixing and Blending Machine Setters, Operators, and Tenders	528	554	26	5%	22
53-3022	Bus Drivers, School or Special Client	1,474	1,555	81	5%	44
53-3032	Heavy and Tractor-Trailer Truck Drivers	10,766	11,549	783	7%	353
53-3033	Light Truck or Delivery Services Drivers	3,844	4,027	183	5%	102