

VICTORIA COLLEGE

# ECONOMIC OVERVIEW & PROGRAM GAP ANALYSIS

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emsi

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# EXECUTIVE SUMMARY

Victoria College (VC) is located in Victoria, TX and serves the surrounding counties in the Gulf Coastal Plains region of Texas. This report outlines the economy of this eight-county region (Calhoun, Goliad, Gonzales, DeWitt, Jackson, Lavaca, Refugio, and Victoria) 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 OVERVIEW

- The economy of the region served by VC (“the VC Service Region”) is primarily driven by the Government; Retail Trade; and Agriculture, Forestry, Fishing, & Hunting industries. Health Care & Social Assistance and Mining, Quarrying, & Oil & Gas Extraction added the most new jobs between 2009 and 2014, and both are projected to grow through 2024. Agriculture, Forestry, Fishing, & Hunting faced declines and is projected to continue losing jobs over the next decade. Overall the regional job growth is expected to be 17% over the next decade.
- Some high-skill occupational categories are projected to see high job growth over the next ten years, including business & financial operations occupations (32% job growth), computer & mathematical occupations (28% job growth), architecture & engineering occupations (25% job growth), and healthcare practitioners & technical occupations (23% 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 sales & related occupations, management occupations, and office & administrative support occupations.
- More than 32,000 of the people who live in the VC Service Region commute outside the region for work.

Another 21,500 people live outside the VC Service Region but commute to the region for work. These statistics indicate that there are strong economic links between the VC Service Region and the surrounding communities for both in-commuters and out-commuters.

- The educational composition of the adult population in the VC Service Region (people age 24 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 2.6 percentage points while the proportion with some college decreased by 1.4 percentage points. Meanwhile, the proportion of adults with other education levels changed by less than a percentage point.

## PROGRAM GAP ANALYSIS

- Between both the postsecondary certificate level and associate’s degree, there are a total of six programs associated with demonstrable workforce gaps. General Business Administration & Management exhibits a gap at both education levels offered by VC. There were twelve programs associated with significant workforce surpluses. None of these programs had a surplus at both education levels.
- At the postsecondary certificate level there are significant gaps in General Business Administration & Management, Truck & Bus Driver/Commercial Vehicle Operator & Instructor, and Pipefitting/Pipefitter & Sprinkler Fitter. For the associate’s degree analysis, there are significant gaps in General Business Administration & Management, General Administrative Assistant & Secretarial Science, and Chemical Technology/Technician.
- At the postsecondary certificate level the largest significant surpluses were in Phlebotomy Technician/Phlebotomist, Licensed Practical/Vocational Nurse Training, and Welding Technology/Welder. For the associate’s

degree analysis, the two programs with the large surpluses are Registered Nursing/Registered Nurse and Electrical, Electronic & Communications Engineering Technology/Technician.

- Institutions either aren't training students or aren't training a sufficient number of students for the following healthcare related occupations: medical records & health information technicians, dental assistants, massage therapists, radiologic technologists, and dental hygienists. Skilled trades like carpenters and electricians are other areas of opportunity.
- VC listed three programs that were proposed for the new school year in the fall of 2015. Machinist related occupations are in demand and offer many occupations with median hourly earnings of \$15 or greater. Industrial Maintenance Mechanic is related to occupations that pay around \$20 and are also in high demand in the VC Service Region. Geological & petroleum technicians and petroleum pump system operators, refinery operators, & gaugers offer additional opportunities for petroleum related programs with median hourly earnings around \$24.

# INTRODUCTION

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Colleges face many challenges in their efforts to identify the training needs of their service 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, Victoria College (VC) partnered with Economic Modeling Specialists Intl. (EMSI) to conduct an economic overview of the college's service 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 VC 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 VC 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 Calhoun, Goliad, Gonzales, DeWitt, Jackson, Lavaca, Refugio, and Victoria Counties in Texas. This regional backdrop will be referred to as "the VC Service Region". VC is located in Victoria, TX. The VC Service Region includes the majority of the area between San Antonio, Houston, and Corpus Christi in the Gulf Coastal Plains.<sup>1</sup> See Figure 1.1 for a map of the region.

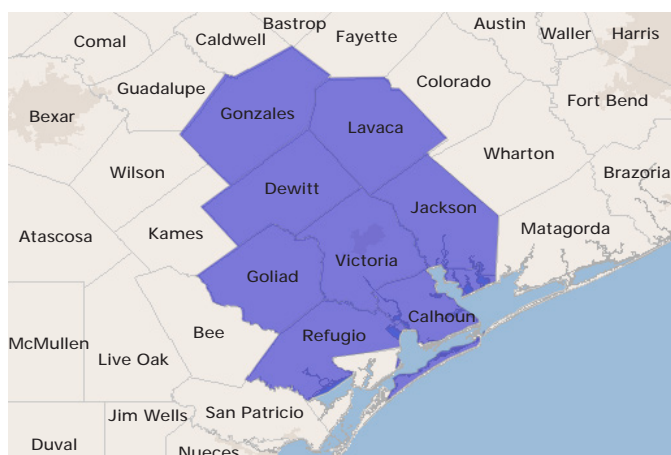
The report is broken into two chapters. Chapter 1 provides an overview of employment in the VC Service Region economy with high-level information about current and projected job trends, resident commuting patterns, and unemployment. Chapter 1 also provides further information specifically related to 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.

<sup>1</sup> 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

This chapter provides a high-level overview of employment and demographics in the economy of the VC Service Region, defined by Calhoun, Goliad, Gonzales, DeWitt, Jackson, Lavaca, Refugio, and Victoria Counties in Texas (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 VC Service Region according to the following five indicators: jobs by industry, jobs by occupation, commuting patterns, unemployment, and educational attainment.

**FIGURE 1.1: MAP OF VC SERVICE REGION**



**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	11,504	11,236	(268)	(2%)
21	Mining, Quarrying, and Oil and Gas Extraction	9,635	12,320	2,685	28%
22	Utilities	740	777	37	5%
23	Construction	9,804	11,860	2,056	21%
31	Manufacturing	10,998	11,898	900	8%
42	Wholesale Trade	3,899	4,750	851	22%
44	Retail Trade	12,539	13,996	1,457	12%
48	Transportation and Warehousing	2,696	3,262	566	21%
51	Information	830	854	24	3%
52	Finance and Insurance	5,260	6,890	1,630	31%
53	Real Estate and Rental and Leasing	4,808	6,365	1,557	32%
54	Professional, Scientific, and Technical Services	3,933	4,637	704	18%
55	Management of Companies and Enterprises	285	440	155	54%
56	Admin. & Support and Waste Mgmt. & Remediation Services	4,590	5,757	1,167	25%
61	Educational Services	821	963	142	17%
62	Health Care and Social Assistance	10,607	13,329	2,722	26%
71	Arts, Entertainment, and Recreation	1,286	1,612	326	25%
72	Accommodation and Food Services	7,711	9,117	1,406	18%
81	Other Services (except Public Administration)	5,920	6,093	173	3%
90	Government	15,555	18,082	2,527	16%
<b>Total</b>		<b>123,421</b>	<b>144,238</b>	<b>20,817</b>	<b>17%</b>

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 VC Service Region appears in Table 1.1 and Figure 1.2.

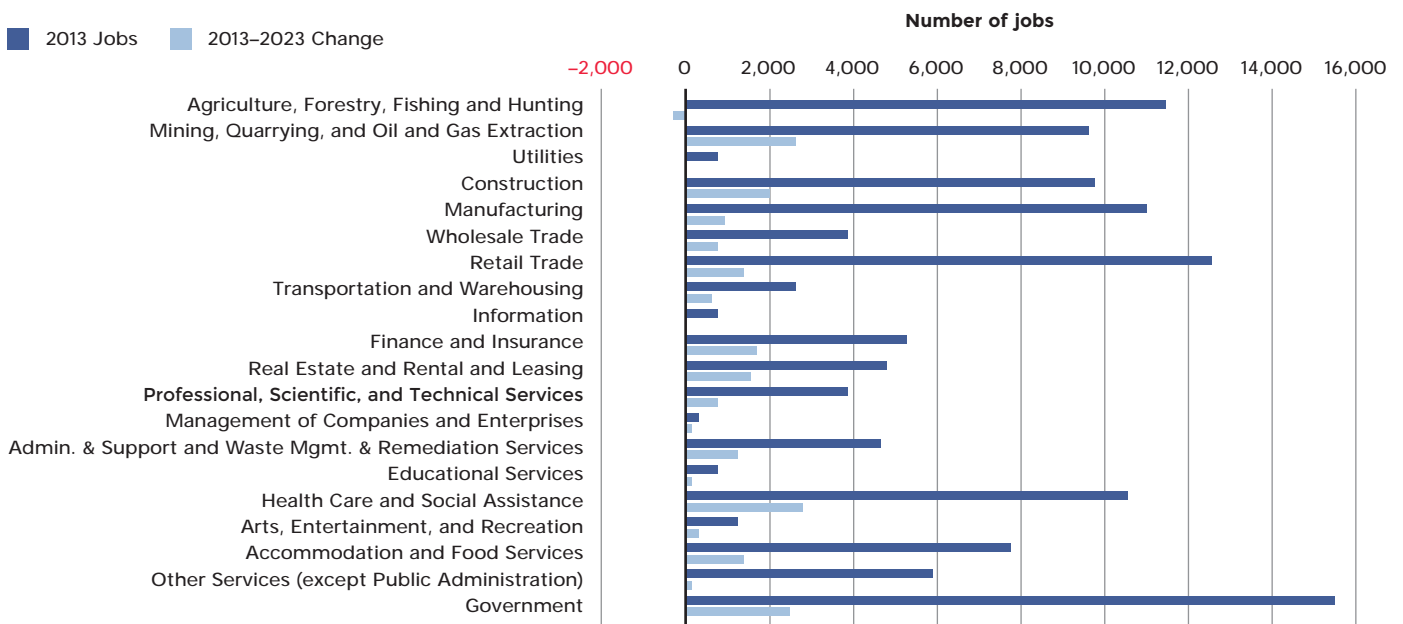
As shown, the three largest industry sectors in the VC Service Region are Government; Retail Trade; and Agriculture, Forestry, Fishing, & Hunting. Together these sectors made up 39,598 jobs or approximately 32% of total regional employment in 2014. Government and Retail Trade industry sectors are projected to grow between 2014 and 2024. Other industry sectors with notable projected growth are Health Care & Social Assistance (+2,722 jobs); Mining, Quarrying, & Oil & Gas Extraction (+2,685 jobs); and Construction (+2,056 jobs). The industry sector that is

expected to contract between 2014 and 2024 is Agriculture, Forestry, Fishing, & Hunting (-268 jobs). The Information and Utilities industry sectors are expected to experience very low growth (+24 jobs and +37 jobs, respectively).

Table 1.2 shows the employment concentration of the industry sectors in the VC Service 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 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

**FIGURE 1.2: JOBS AND JOB CHANGE BY INDUSTRY SECTOR IN VC SERVICE REGION, 2014 TO 2024**



Source: EMSI Complete Data 2014.3

**TABLE 1.2: EMPLOYMENT CONCENTRATION BY INDUSTRY SECTOR IN VC SERVICE REGION, 2014 & 2024**

NAICS CODE	DESCRIPTION	2014 LOCATION QUOTIENT	2024 LOCATION QUOTIENT
11	Agriculture, Forestry, Fishing and Hunting	4.93	4.65
21	Mining, Quarrying, and Oil and Gas Extraction	10.29	10.74
22	Utilities	1.96	2.02
23	Construction	1.58	1.64
31	Manufacturing	1.30	1.33
42	Wholesale Trade	0.90	0.95
44	Retail Trade	1.02	1.02
48	Transportation and Warehousing	0.67	0.69
51	Information	0.38	0.36
52	Finance and Insurance	0.75	0.77
53	Real Estate and Rental and Leasing	0.83	0.89
54	Professional, Scientific, and Technical Services	0.46	0.45
55	Management of Companies and Enterprises	0.19	0.25
56	Administrative and Support and Waste Management and Remediation Services	0.59	0.60
61	Educational Services	0.28	0.27
62	Health Care and Social Assistance	0.76	0.76
71	Arts, Entertainment, and Recreation	0.46	0.48
72	Accommodation and Food Services	0.86	0.87
81	Other Services (except Public Administration)	0.86	0.75
90	Government	0.98	1.05

Source: EMSI Complete Data 2014.3

larger conversations with other organizations about alignment program offerings with workforce needs.

The following three industry sectors have the highest location quotients in the VC Service Region: Mining, Quarrying, & Oil & Gas Extraction (10.29); Agriculture, Forestry, Fishing, & Hunting (4.93); and Utilities (1.96). These three industry sectors, as well as Construction and Manufacturing, are considered to have a comparative advantage. The relative concentrations are expected to undergo some changes over the next decade, but the same industry sectors are expected to remain above the 1.2 cutoff.<sup>2</sup>

## 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

<sup>2</sup> 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 VC Service Region by major group, with information on current and projected jobs, job change, average annual openings, and wage rates.

Management occupations comprise the largest occupation group in the VC Service Region at 15,772 jobs, followed by sales & related occupations at 14,828 jobs. Neither of these occupation groups ranks among the highest paid, however. Architecture & engineering occupations have

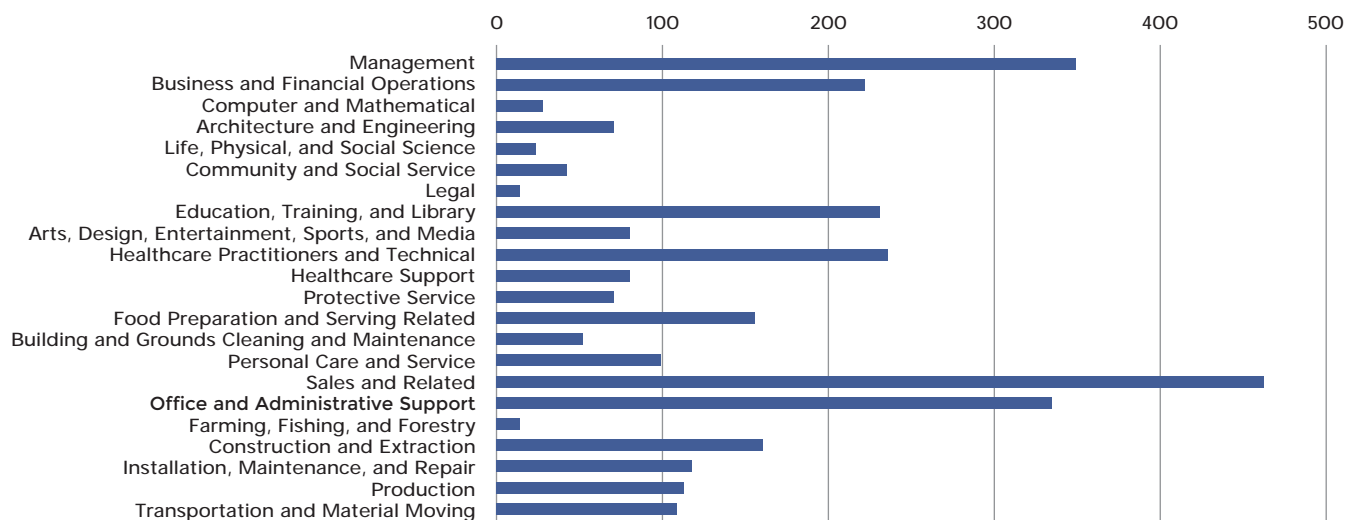


**TABLE 1.3: CURRENT AND PROJECTED JOBS, JOB CHANGE, AND MEDIAN HOURLY EARNINGS BY MAJOR OCCUPATION GROUP IN VC SERVICE REGION, 2014 TO 2024**

SOC CODE	DESCRIPTION	2014 JOBS	2024 JOBS	CHANGE	% CHANGE	MEDIAN HOURLY EARNINGS	AVERAGE ANNUAL OPENINGS
11-0000	Management	15,772	16,951	1,146	7%	\$17.74	351
13-0000	Business and Financial Operations	4,381	5,782	1,391	32%	\$24.58	225
15-0000	Computer and Mathematical	685	890	191	28%	\$24.71	30
17-0000	Architecture and Engineering	1,540	1,925	385	25%	\$33.39	72
19-0000	Life, Physical, and Social Science	583	684	78	13%	\$30.97	24
21-0000	Community and Social Service	1,185	1,407	222	19%	\$18.61	45
23-0000	Legal	432	519	87	20%	\$25.87	16
25-0000	Education, Training, and Library	5,612	6,789	1,165	21%	\$18.77	231
27-0000	Arts, Design, Entertainment, Sports, & Media	2,039	2,468	403	20%	\$15.37	79
29-0000	Healthcare Practitioners and Technical	5,625	7,001	1,298	23%	\$28.94	236
31-0000	Healthcare Support	3,039	3,729	690	23%	\$11.30	81
33-0000	Protective Service	2,057	2,406	349	17%	\$18.20	69
35-0000	Food Preparation and Serving Related	7,282	8,473	1,180	16%	\$9.35	155
37-0000	Building & Grounds Cleaning & Maintenance	4,267	5,000	722	17%	\$9.21	50
39-0000	Personal Care and Service	4,866	5,515	637	13%	\$9.95	101
41-0000	Sales and Related	14,828	17,463	2,625	18%	\$13.81	464
43-0000	Office and Administrative Support	13,794	15,823	2,040	15%	\$13.81	339
45-0000	Farming, Fishing, and Forestry	1,759	1,774	15	1%	\$11.04	14
47-0000	Construction and Extraction	10,699	13,356	2,657	25%	\$16.20	162
49-0000	Installation, Maintenance, and Repair	5,654	6,841	1,176	21%	\$17.18	121
51-0000	Production	8,061	8,935	906	11%	\$17.29	113
53-0000	Transportation and Material Moving	7,366	8,526	1,137	15%	\$14.48	110

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 VC SERVICE REGION**



Source: EMSI Complete Data 2014.3

median earnings of \$33.39 an hour, ranking the highest on the regional pay scale. Life, physical, & social science occupations – while one of the smallest occupation groups – have the second highest median earnings of \$30.97 an hour. Several of the higher-paying occupation groups are also projected to experience high job growth over the next ten years, such as computer & mathematical occupations (28%) and healthcare practitioners & technical services (23%).

Figure 1.3 on the previous page 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 work-

ers with some college or above occurs in sales & related occupations, management, and of ce & administrative support occupations.

## COMMUTING PATTERNS

The Longitudinal Employer-Household Dynamics (LEHD) program<sup>3</sup> at the U.S. Census Bureau provides information on the residential and employment locations of workers.

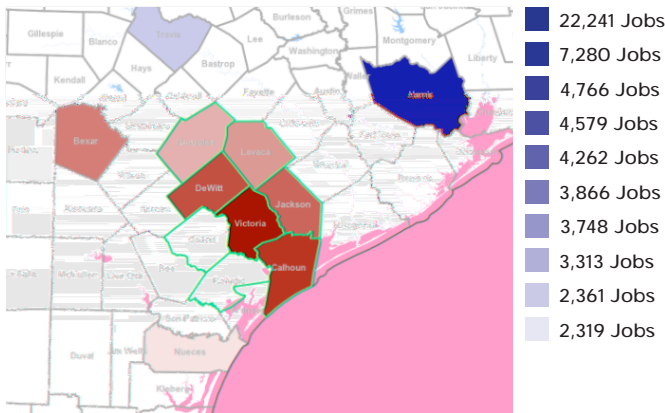
3 LEHD is an innovative program that uses modern statistical and computing techniques to combine federal and state administrative data on employers and employees with core Census Bureau censuses and surveys while protecting the confidentiality of people and firms that provide the data.

**TABLE 1.4: WHERE WORKERS ARE EMPLOYED WHO LIVE IN THE VC SERVICE REGION**

COUNTY	JOBS	PERCENTAGE
Victoria County, TX	22,241	28.9%
Harris County, TX	7,280	9.5%
Calhoun County, TX	4,766	6.2%
DeWitt County, TX	4,579	5.9%
Jackson County, TX	4,262	5.5%
Bexar County, TX	3,866	5.0%
Lavaca County, TX	3,748	4.9%
Gonzales County, TX	3,313	4.3%
Travis County, TX	2,361	3.1%
Nueces County, TX	2,319	3.0%
All Other Locations	18,270	23.7%
<b>Total Jobs for the Residents of the VC Service Region</b>	<b>77,005</b>	<b>100%</b>

Source: Census LEHD

**FIGURE 1.4: JOBS BY PLACE OF WORK**

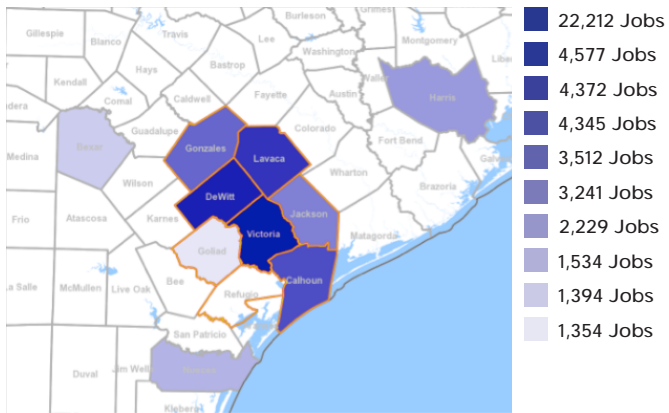


**TABLE 1.5: WHERE WORKERS LIVE WHO ARE EMPLOYED IN THE VC SERVICE REGION**

COUNTY	JOBS	PERCENTAGE
Victoria County, TX	22,212	33.6%
DeWitt County, TX	4,577	6.9%
Lavaca County, TX	4,372	6.6%
Calhoun County, TX	4,345	6.6%
Gonzales County, TX	3,512	5.3%
Jackson County, TX	3,241	4.9%
Harris County, TX	2,229	3.4%
Nueces County, TX	1,534	2.3%
Bexar County, TX	1,394	2.1%
Goliad County, TX	1,354	2.1%
All Other Locations	17,256	26.1%
<b>Total Jobs in the VC Service Region</b>	<b>66,026</b>	<b>100%</b>

Source: Census LEHD

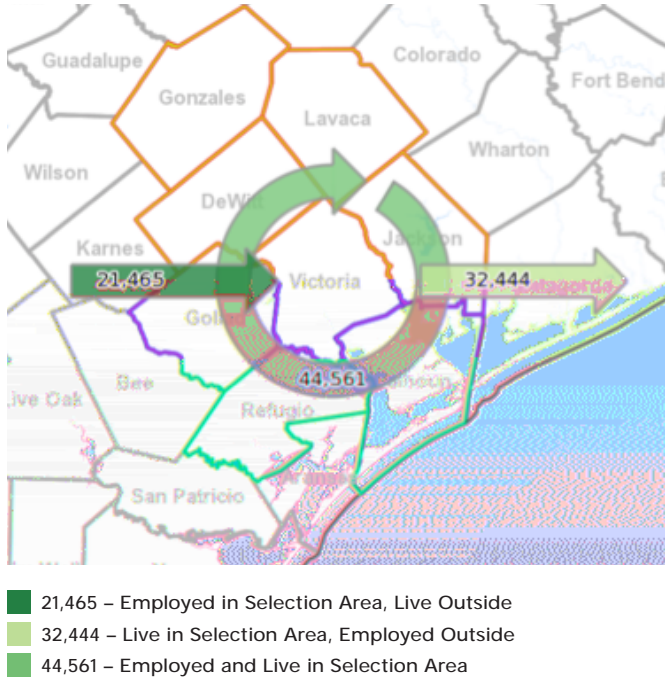
**FIGURE 1.5: JOBS BY PLACE OF RESIDENCE**



Data for the VC Service Region appears in Tables 1.4 and 1.5, with the same information displayed in Figures 1.4 and 1.5. Figure 1.6 provides a summary and additional view of the same data.

Approximately 42.1% (32,444) of residents of the VC Service Region commute outside the area for work, indicating that there are strong economic links between the county and surrounding communities. While more than a quarter the residents work in Victoria County (28.9%), a

**FIGURE 1.6: INFLOW/OUTFLOW JOB COUNTS**



significant portion of residents also work in Harris County (9.5%). Table 1.4 and Figure 1.4 display the top ten places of work for the VC Service 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 VC Service Region, 67.5% also live in the region. Victoria County, where VC is located, contributes 33.6% of the workers in the VC Service Region. Harris County supplies the most commuters from outside the area at 3.4%. Bexar County supplies the second most commuters from outside the area at 2.1%.

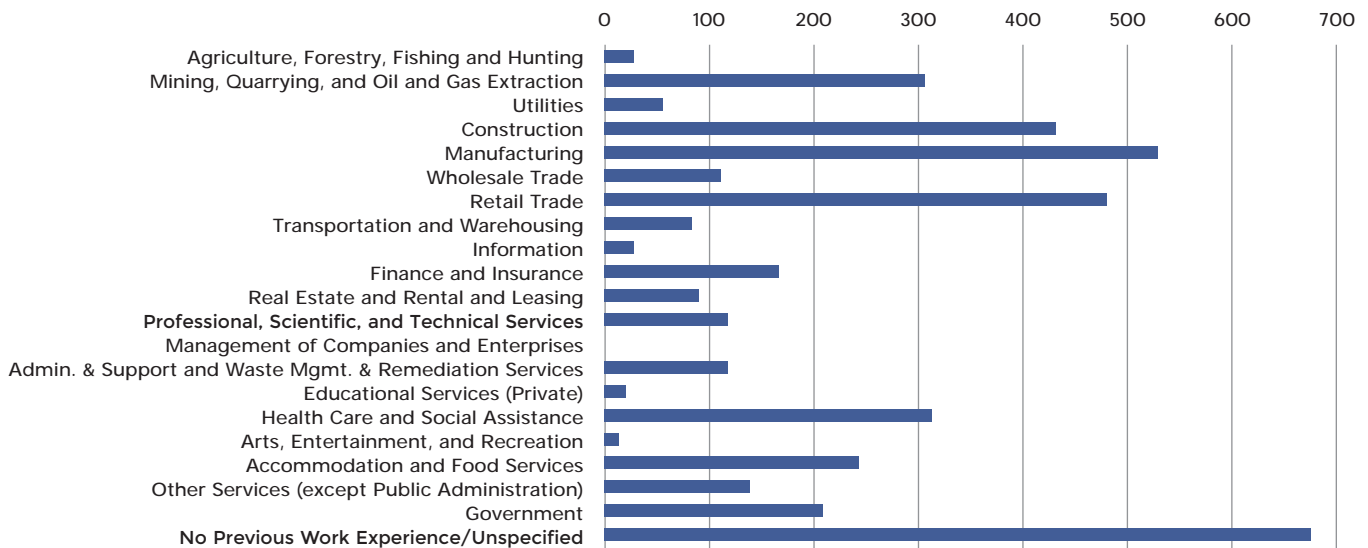
Figure 1.6 summarizes the inflow and outflow of jobs to and from the VC Service Region. There are 66,026 jobs in the region with 44,561 of these jobs filled by residents and 21,465 jobs going to people living outside the region. Additionally, 32,444 VC Service Region residents commute outside the region for work. The figure clearly illustrates the fact that about twice as many 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 on the next page and Figure 1.7 present the number of people unemployed by industry sector in the

**FIGURE 1.7: NUMBER OF UNEMPLOYED WORKERS BY INDUSTRY SECTOR IN VC SERVICE REGION**



Source: EMSI Total Unemployment (5/2014)

**TABLE 1.6: NUMBER OF UNEMPLOYED WORKERS BY INDUSTRY SECTOR IN VC SERVICE REGION**

NAICS CODE	DESCRIPTION	NO. OF UNEMPLOYED	% OF UNEMPLOYED	NATIONAL % OF UNEMPLOYED
11	Agriculture, Forestry, Fishing and Hunting	31	1%	1%
21	Mining, Quarrying, and Oil and Gas Extraction	308	7%	1%
22	Utilities	59	1%	0%
23	Construction	435	10%	8%
31	Manufacturing	533	13%	9%
42	Wholesale Trade	111	3%	2%
44	Retail Trade	484	12%	12%
48	Transportation and Warehousing	85	2%	3%
51	Information	30	1%	2%
52	Finance and Insurance	167	4%	3%
53	Real Estate and Rental and Leasing	88	2%	1%
54	Professional, Scientific, and Technical Services	116	3%	4%
55	Management of Companies and Enterprises	1	0%	0%
56	Administrative and Support and Waste Management and Remediation Services	116	3%	8%
61	Educational Services (Private)	24	1%	2%
62	Health Care and Social Assistance	318	8%	7%
71	Arts, Entertainment, and Recreation	16	0%	2%
72	Accommodation and Food Services	242	6%	9%
81	Other Services (except Public Administration)	140	3%	4%
90	Government	207	5%	7%
99	No Previous Work Experience/Unspecified	682	16%	15%

Source: EMSI Total Unemployment (5/2014)

VC Service 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.

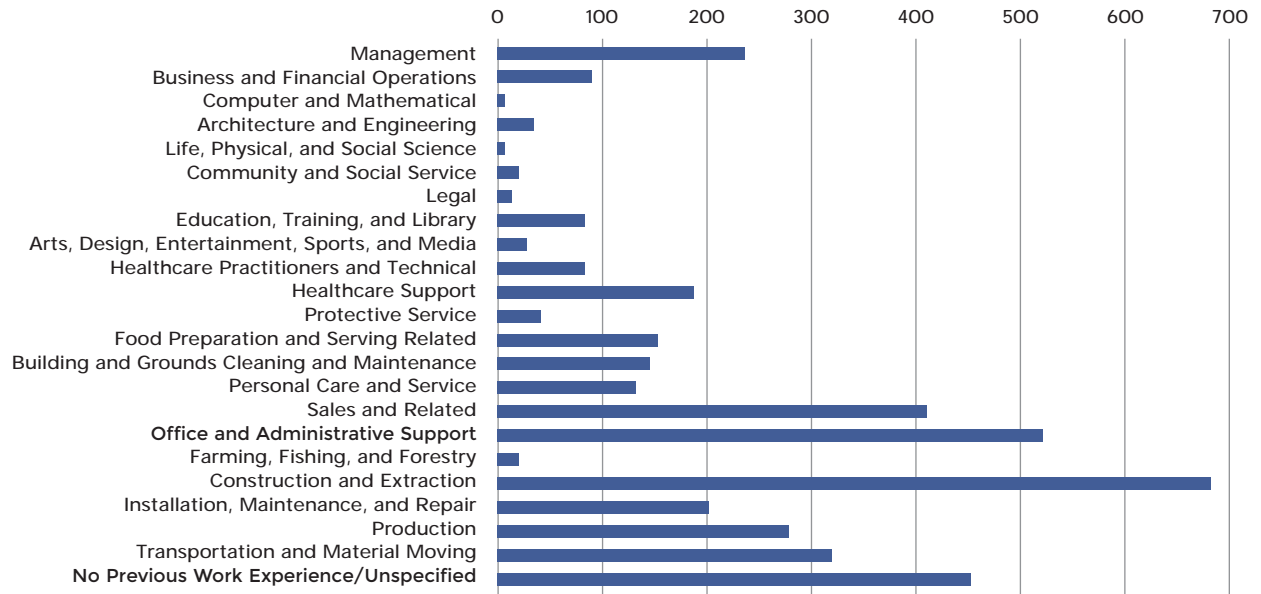
Nine industry sectors in the VC Service Region exceed the national concentration of unemployed workers. The other sectors in the region are either at or below national levels.

As shown in the table, the category with the 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 second highest number of unem-

ployed is Manufacturing. The Retail Trade sector has the third highest number of unemployed. It is common for an industry like Retail Trade or Accommodation & Food 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. For industry sectors such as Construction, seasonal jobs or jobs of short duration may also lead to high numbers of unemployed workers. Another sector that is generally affected by high turnover is Administrative & Support & Waste Management & Remediation Services. In the VC Service Region, Mining, Quarrying, & Oil & Gas Extraction; Manufacturing; and Construction have significantly higher percentages of unemployment than at the national level.

Table 1.7 and Figure 1.8 on the following page provide a breakdown of unemployment in the VC Service Region by major occupation group. As shown, the occupation groups that contain the highest number of unemployed workers are construction & extraction (687 unemployed

**FIGURE 1.8: NUMBER OF UNEMPLOYED WORKERS BY OCCUPATION GROUP IN VC SERVICE REGION**



Source: EMSI Total Unemployment (5/2014)

**TABLE 1.7: NUMBER OF UNEMPLOYED WORKERS BY OCCUPATION GROUP IN VC SERVICE REGION**

SOC CODE	DESCRIPTION	NO. OF UNEMPLOYED	% OF UNEMPLOYED	NATIONAL % OF UNEMPLOYED
11-0000	Management	241	6%	5%
13-0000	Business and Financial Operations	92	2%	3%
15-0000	Computer and Mathematical	9	0%	1%
17-0000	Architecture and Engineering	33	1%	1%
19-0000	Life, Physical, and Social Science	5	0%	0%
21-0000	Community and Social Service	24	1%	1%
23-0000	Legal	13	0%	1%
25-0000	Education, Training, and Library	85	2%	2%
27-0000	Arts, Design, Entertainment, Sports, and Media	31	1%	2%
29-0000	Healthcare Practitioners and Technical	84	2%	2%
31-0000	Healthcare Support	189	5%	2%
33-0000	Protective Service	43	1%	1%
35-0000	Food Preparation and Serving Related	157	4%	8%
37-0000	Building and Grounds Cleaning and Maintenance	148	4%	5%
39-0000	Personal Care and Service	132	3%	3%
41-0000	Sales and Related	415	10%	11%
43-0000	Office and Administrative Support	524	12%	14%
45-0000	Farming, Fishing, and Forestry	21	1%	1%
47-0000	Construction and Extraction	687	16%	8%
49-0000	Installation, Maintenance, and Repair	206	5%	2%
51-0000	Production	283	7%	6%
53-0000	Transportation and Material Moving	319	8%	8%
99-0000	No Previous Work Experience/Unspecified	455	11%	11%

Source: EMSI Total Unemployment (5/2014)

workers), of ce & administrative support occupations (524 unemployed workers), and no previous work experience/ unspecified occupations (455 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.

Eight occupation groups have a concentration of unemployed workers that are below the national average. Food preparation & serving related occupations and of ce & administrative support occupations are well below the average. Construction & extraction occupations and health-care support occupations both have a much higher concentration of unemployed than at the national level.

## EDUCATIONAL ATTAINMENT

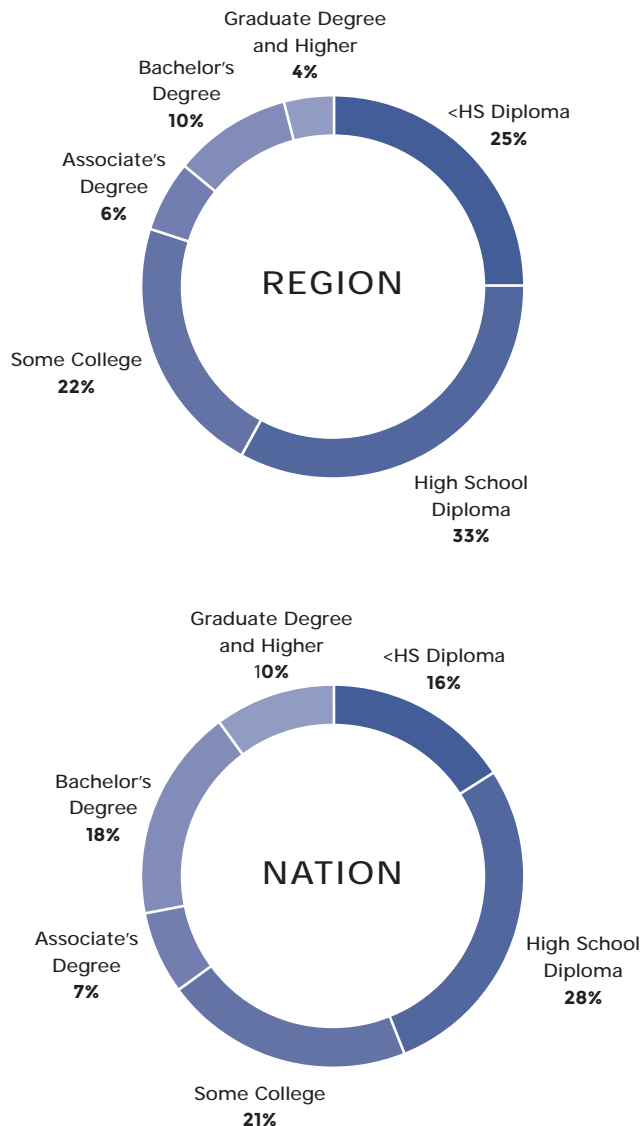
This section describes the educational attainment of the population in the VC Service Region for adults aged 25 years and older. This information is useful for educators targeting specific population groups that have low education levels. Educational attainment data in this section is presented by gender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

### Overall Educational Attainment

Table 1.8 and Figure 1.9 display the educational attainment of the overall adult population in the VC Service 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.

**FIGURE 1.9: EDUCATIONAL ATTAINMENT OF ADULT POPULATION IN THE VC SERVICE REGION**



**TABLE 1.8: BREAKDOWN OF ADULT POPULATION IN VC SERVICE 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	28,078	22%	32,490	25%	4,412	2.6%
High school diploma	42,501	33%	43,420	33%	919	(0.5%)
Some college	29,592	23%	28,800	22%	(792)	(1.4%)
Associate’s degree	7,802	6%	8,411	6%	609	0.2%
Bachelor’s degree	13,895	11%	13,272	10%	(623)	(0.8%)
Graduate degree or higher	5,709	4%	5,760	4%	51	(0.1%)

Source: EMSI Complete Data 2014.3

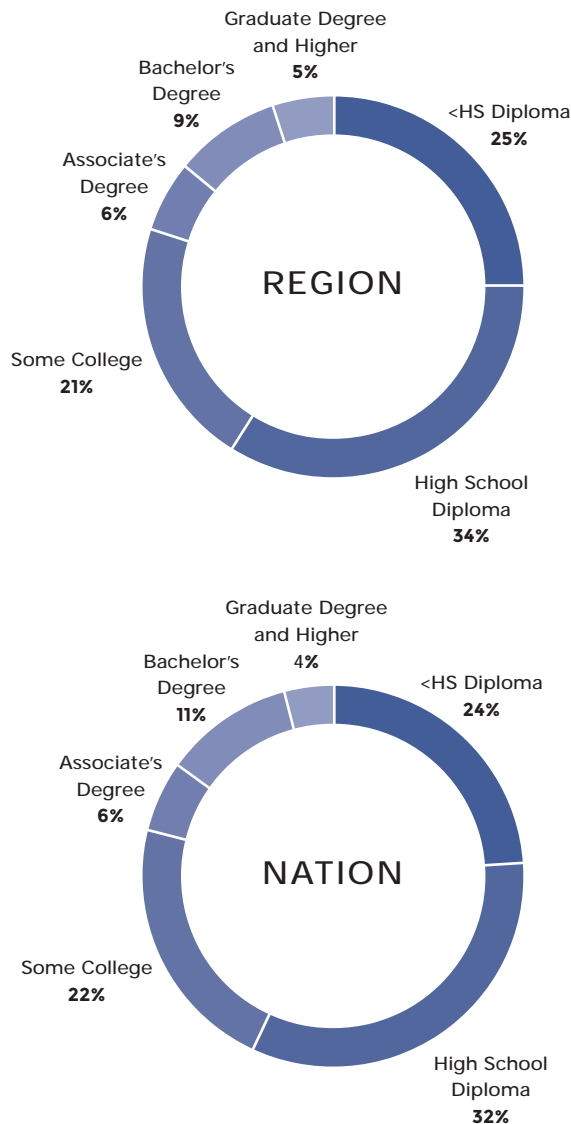
without reference to gender and ethnicity. In the VC Service Region, the percentage of the adult population with a high school diploma or less is 57%, considerably higher than the national average of 44%. These data suggest there is a strong opportunity for educators in the VC Service Region to boost the percentage of adults with an associate's degree or higher (currently this percentage sits at 21% 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 VC are those in the "Less than high school diploma," "High school diploma," and "Some college" categories. Together these categories make up 104,710 people, or 79% 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 2.6 percentage points.<sup>5</sup> Meanwhile, the proportion of the adult population with a "Some college" decreased by 1.4 percentage points. All other education levels decreased slightly except those with an "Associate's degree."

### Educational Attainment by Gender

The distribution of educational attainment by gender is fairly even in the VC Service Region. Females are more likely to have attained "Bachelor's degree," or "Some college" level of education while males are more likely to have "Less than high school diploma," "High school diploma," or "Graduate degree and higher" levels. The genders are equally likely to have an "Associate's degree." This information appears in Table 1.9 and Figure 1.10.

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%).

**FIGURE 1.10: EDUCATIONAL ATTAINMENT OF ADULT POPULATION IN THE VC SERVICE REGION BY GENDER**



**TABLE 1.9: BREAKDOWN OF ADULT POPULATION IN VC SERVICE REGION BY EDUCATIONAL ATTAINMENT AND GENDER**

EDUCATION LEVEL	MALES	PROPORTION	FEMALES	PROPORTION
Less than high school diploma	16,352	25%	16,138	24%
High school diploma	21,722	34%	21,698	32%
Some college	13,781	21%	15,019	22%
Associate's degree	4,154	6%	4,257	6%
Bachelor's degree	5,721	9%	7,551	11%
Graduate degree and higher	3,067	5%	2,693	4%

Source: EMSI Complete Data 2014.3

### Educational Attainment by Ethnicity

Figure 1.10 and Table 1.11 display the educational attainment of the adult population by ethnicity. The “Asian, Non-Hispanic” ethnicity category has the highest percentage of adults with post-secondary degrees (62%). “White, Non-Hispanic” follows with the second highest percentage but with a much lower 29%. The “Hispanic, All Types” cat-

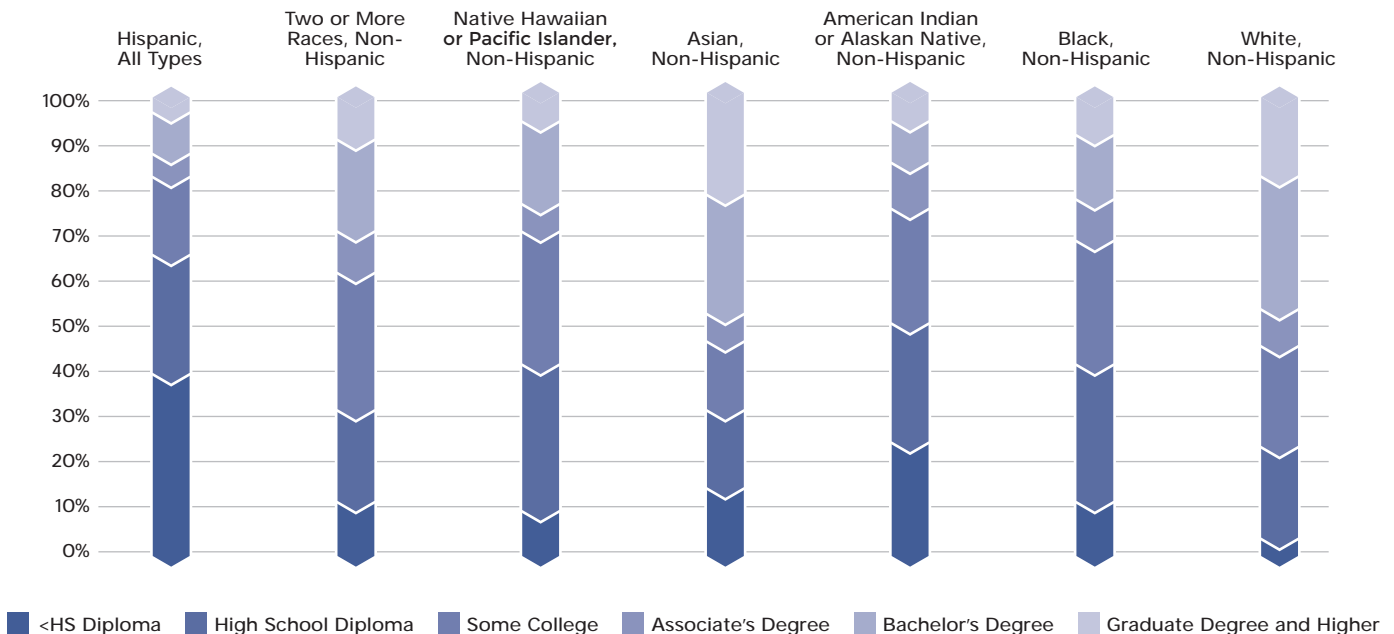
egory has the lowest levels of education attainment. For this group, only 8% of the adult population has a post-secondary degree and 77% has a high school diploma or less. While the region is primarily “White, Non-Hispanic” there are many opportunities to increase educational attainment in other ethnic groups.

**TABLE 1.10: BREAKDOWN OF ADULT POPULATION IN VC SERVICE 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	9,100	25,663	19,467	6,442	10,867	4,660
	PERCENT	12%	34%	26%	8%	14%	6%
Black, Non-Hispanic	COUNT	2,350	2,918	1,722	242	371	178
	PERCENT	30%	37%	22%	3%	5%	2%
American Indian or Alaskan Native, Non-Hispanic	COUNT	163	72	44	24	15	14
	PERCENT	49%	22%	13%	7%	5%	4%
Asian, Non-Hispanic	COUNT	107	283	196	71	612	293
	PERCENT	7%	18%	13%	5%	39%	19%
Native Hawaiian or Pacific Islander, Non-Hispanic	COUNT	15	6	5	3	4	3
	PERCENT	42%	17%	15%	7%	10%	9%
Two or More Races, Non-Hispanic	COUNT	178	165	194	19	37	57
	PERCENT	27%	25%	30%	3%	6%	9%
Hispanic, All Types	COUNT	20,578	14,313	7,171	1,611	1,367	555
	PERCENT	45%	31%	16%	4%	3%	1%

Source: EMSI Complete Data 2014.3

**FIGURE 1.11: EDUCATIONAL ATTAINMENT OF ADULT POPULATION IN THE VC SERVICE REGION BY ETHNICITY**





## 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 VC.

Each table includes the CIP code and title, 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, 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.

### INTERPRETING GAP/SURPLUS ANALYSIS RESULTS

The gap analysis is intended to serve as a point of departure for VC 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.

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 VC Service Region, any gap or surplus within 10 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 VC Service Region where the neighboring population density is very high, a surplus of completers may indicate the need for service region residents to commute outside of the service region to find job opportunities. The commuting patterns 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 and thereby shift 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 opportu-

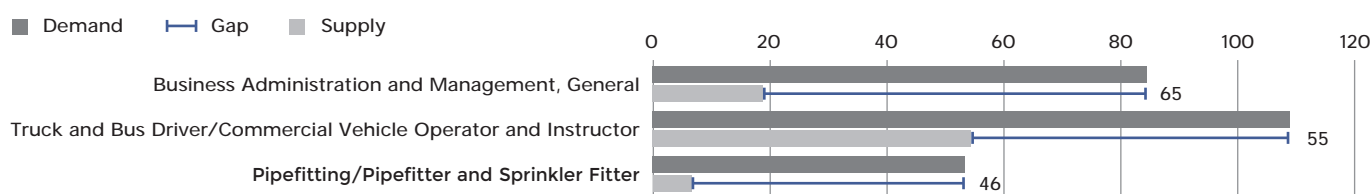
nity for institutions to develop new programs. Note: Given high population density in the region adjacent to the service region, a completion gap may be filled by other institutions near the service region. This potential scenario will need to be taken into consideration from the leadership.

## POSTSECONDARY CERTIFICATE LEVEL GAP ANALYSIS

Figure 2.1 provides an illustration that summarizes the top gaps for VC postsecondary certificate level programs.

Table 2.1 lists supply and demand for all certificate program types for which VC offers a training program.

**FIGURE 2.1: SUPPLY AND DEMAND FOR VC POSTSECONDARY CERTIFICATE LEVEL PROGRAMS**



**TABLE 2.1: SUPPLY AND DEMAND FOR VC CERTIFICATE LEVEL PROGRAMS**

CIP CODE	CIP TITLE	AVERAGE ANNUAL OPENINGS	AVERAGE ANNUAL COMPLETERS	AVERAGE ANNUAL VC COMPLETERS	TOTAL GAP OR SURPLUS	MEDIAN HOURLY WAGE
52.0201	Business Administration and Management, General	84	19	19	65	\$28.09
49.0205	Truck and Bus Driver/Commercial Vehicle Operator and Instructor	108	54	54	55	\$15.17
46.0502	Pipe fitting/Pipe fitter and Sprinkler Fitter	53	7	7	46	\$21.27
43.0203	Fire Science/Fire- fighting	5	2	2	2	\$16.71
46.0301	Electrical and Power Transmission Installation/ Installer, General	24	26	26	(2)	\$25.83
15.0303	Electrical, Electronic and Communications Engineering Technology/Technician	2	5	5	(3)	\$26.54
15.0501	Heating, Ventilation, Air Conditioning and Refrigeration Engineering Technology/Technician	11	16	16	(5)	\$18.90
30.1101	Gerontology	0	6	6	(6)	\$16.31
52.0407	Business/Office Automation/Technology/Data Entry	1	8	3	(7)	\$15.38
11.0101	Computer and Information Sciences, General	5	13	13	(8)	\$26.20
51.0805	Pharmacy Technician/Assistant	6	17	17	(12)	\$14.68
48.0501	Machine Tool Technology/Machinist	1	16	16	(15)	\$17.94
51.0904	Emergency Medical Technology/Technician (EMT Paramedic)	7	23	23	(16)	\$11.14
51.0801	Medical/Clinical Assistant	7	31	31	(24)	\$11.75
43.0107	Criminal Justice/Police Science	17	49	49	(32)	\$20.32
51.2603	Medication Aide	1	40	40	(39)	\$16.20
51.3902	Nursing Assistant/Aide and Patient Care Assistant/Aide	49	96	96	(48)	\$10.20
48.0508	Welding Technology/Welder	23	84	29	(61)	\$18.08
51.3901	Licensed Practical/Vocational Nurse Training	42	117	117	(75)	\$17.69
51.1009	Phlebotomy Technician/Phlebotomist	3	112	112	(109)	\$11.47

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

While other program groups in the region may face larger surpluses, VC 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, almost all of the completers in the region will be from VC.

As shown in Table 2.1, General Business Administration & Management faces the largest gap: there are 84 annual openings, compared to 19 annual average completions from VC. A similar situation is also occurring with Truck & Bus Driver/Commercial Vehicle Operator & Instructor, with only a total of 54 annual completers to fill 108 projected job openings. The third program with a gap is Piping/Pipefitter and Sprinkler Fitter (gap of 46). All of the programs with gaps are associated with occupations that pay median hourly wages of at least \$15.

There are 10 programs at VC that are training for occupations with a surplus of workers. Phlebotomy Technician/Phlebotomist has a surplus of 109. Licensed Practical/Vocational Nurse Training has a supply of 117 average annual

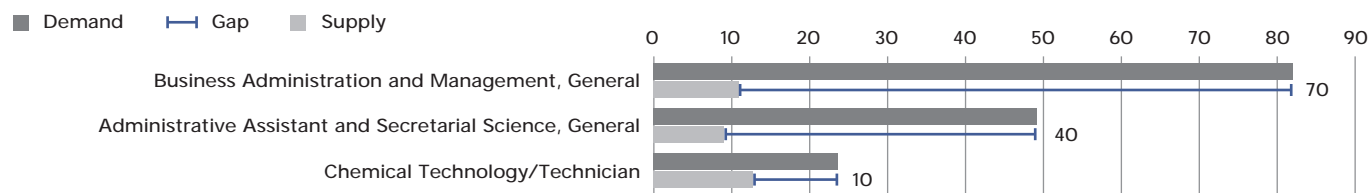
completers for 42 annual jobs. For Welding Technology/Welder, there are 23 job openings a year and 84 regional completers. If only VC were producing completions, then, their supply of 29 completers a year would be in equilibrium. However, there are an additional 55 completers from other institutions in the region. Many of the surpluses are a result of the large numbers of continuing education completions from VC. It is also likely that the additional annual openings in areas outside of the VC Service Region are being filled by VC completers. A review of placement rates could provide additional information.

## ASSOCIATE'S LEVEL GAP ANALYSIS

Figure 2.2 below provides a graphical illustration of the top gaps for VC associate's degree level programs.

Similar to the previous table, Table 2.2 displays supply and demand for all associate's level programs for which VC provides training. Again, the table only includes program

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



**TABLE 2.2: SUPPLY AND DEMAND FOR VC ASSOCIATE'S LEVEL PROGRAMS\***

CIP CODE	CIP TITLE	AVERAGE ANNUAL OPENINGS	AVERAGE ANNUAL COMPLETERS	AVERAGE ANNUAL VC COMPLETERS	TOTAL GAP OR SURPLUS	MEDIAN HOURLY WAGE
52.0201	Business Administration and Management, General	81	11	11	70	\$28.09
52.0401	Admin. Assistant and Secretarial Science, General	49	9	9	40	\$14.41
41.0301	Chemical Technology/Technician	23	13	13	10	\$30.21
43.0203	Fire Science/Fire-fighting	4	2	2	2	\$16.71
51.0908	Respiratory Care Therapy/Therapist	4	9	9	(5)	\$23.32
51.0904	Emergency Medical Technology/Technician (EMT Paramedic)	2	7	7	(5)	\$11.14
51.1004	Clinical/Medical Laboratory Technician	2	8	8	(6)	\$14.26
51.0806	Physical Therapy Technician/Assistant	7	15	15	(8)	\$23.20
15.0303	Electrical, Electronic and Communications Engineering Technology/Technician	1	27	27	(27)	\$26.54
51.3801	Registered Nursing/Registered Nurse	39	98	98	(59)	\$27.31

\* The General Studies Associate's degree offered by VC was not mapped to specific occupations. Source: EMSI Gap Analysis Model. Numbers may not sum due to rounding.

groups available at VC. Other program groups in the region may face larger gaps, but VC does not offer the program. VC is the only institution offering associate's degree level programs in the region, and as such, their completers comprise 100% of total regional supply.

General Business Administration & Management has the largest associate's degree level program gap (70). There are 81 average annual openings in the region, compared to 11 average completers from VC. General Administrative Assistant & Secretarial Science (gap of 40) and Chemical Technology/Technician (gap of 10) have the other two gaps in the region.

There are often some programs preparing students for fields where they will compete with many other potential workers. For the VC Service Region, there are only two fields with a surplus. The largest reported surplus is in Registered Nursing/Registered Nurse. There are only 39 annual openings for 98 regional completers. Electrical, Electronic & Communications Engineering Technology/Technician is associated with the other large surplus (27). Again, it is highly likely that VC completers are finding jobs outside the VC Service Region. A review of placement rates could provide additional information.

## TRANSFER TRACK (LIBERAL ARTS) STUDENTS

A number of students attend VC 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 122 students have completed general studies degrees at the associate's degree level, which composes 12% of the college's annual production of certificates and degrees.

Once these students leave VC, 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, 1,478 jobs will require a bachelor's degree and 5,186 will require a bachelor's degree or less, availing these students of 91% of all regional job openings.

## POTENTIAL NEW PROGRAMS

In addition to knowing how well VC'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 contains a short list of six 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 service region are included in the table. Finally, the education level each occupation was examined at is listed in the table.

Institutions either aren't training students or aren't training a sufficient number of students for the following healthcare related occupations: medical records & health information technicians, dental assistants, massage therapists, radiologic technologists, and dental hygienists. Skilled trades like carpenters and electricians present other areas of opportunity. VC listed three programs that were proposed for the new school year in the fall of 2015. The occupations related to each of these programs are listed in Table 2.3. Machinist related occupations are in demand and offer many occupations with median hourly earnings of \$15 or greater. Industrial Maintenance Mechanic is related to occupations that pay around \$20 and are also in high demand in the VC Service Region.

## CONCLUSION

Between both postsecondary certificate level and associate's degree, there are a total of six programs associated with demonstrable workforce gaps. General Business Administration & Management exhibits a gap at both education levels offered by VC. There were twelve programs associated with significant workforce surpluses. None of these programs had a surplus at both education levels.

At the postsecondary certificate level there are significant gaps in General Business Administration & Management, Truck & Bus Driver/Commercial Vehicle Operator

**TABLE 2.3: PROGRAMMATIC AREAS OF OPPORTUNITY**

SOC	SOC TITLE	AVERAGE ANNUAL OPENINGS	AVERAGE ANNUAL COMPLETERS	GAP	MEDIAN HOURLY EARNINGS	EDUCATION LEVEL
47-2031	Carpenters	29	0	29	\$20.17	Certificate
49-3023	Automotive Service Technicians and Mechanics	25	0	25	\$21.17	Certificate
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	22	0	22	\$22.17	Certificate
47-2111	Electricians	16	0	16	\$23.17	Certificate
51-8093	Petroleum Pump System Operators, Refinery Operators, and Gaugers	10	0	10	\$24.17	Certificate
49-3031	Bus and Truck Mechanics & Diesel Engine Specialists	10	0	10	\$25.17	Certificate
47-2031	Carpenters	29	0	29	\$20.17	Certificate
29-2071	Medical Records and Health Information Technicians	5	0	5	\$12.83	Certificate
31-9091	Dental Assistants	4	0	4	\$16.13	Certificate
31-9011	Massage Therapists	3	0	3	\$11.93	Certificate
15-1151	Computer User Support Specialists	3	0	3	\$17.49	Certificate
29-2034	Radiologic Technologists	5	0	5	\$23.06	Associate
29-2021	Dental Hygienists	3	0	3	\$29.29	Associate
<b>Petroleum Technology (Proposed Fall 2015)</b>						
19-4041	Geological and Petroleum Technicians	3	0	3	\$24.64	Associate
<b>Industrial Maintenance Mechanic (Proposed Fall 2015)</b>						
49-9041	Industrial Machinery Mechanics	39	0	39	\$20.38	Certificate
49-9043	Maintenance Workers, Machinery	6	0	6	\$18.56	Certificate
<b>Machinist (Proposed Fall 2015)</b>						
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	4	0	4	\$15.25	Associate
51-4022	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	1	0	1	\$13.74	Associate
51-4023	Rolling Machine Setters, Operators, and Tenders, Metal and Plastic	1	0	1	\$16.59	Associate
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	0	0	0	\$10.31	Associate
51-4032	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	1	0	1	--	Associate
51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	0	0	0	\$15.07	Associate
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	0	0	0	\$16.43	Associate
51-4041	Machinists	10	0	10	\$16.83	Associate
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	0	0	0	\$15.63	Associate
51-4191	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic	1	0	1	\$16.09	Associate
51-4192	Layout Workers, Metal and Plastic	1	0	1	\$19.86	Associate
51-4199	Metal Workers and Plastic Workers, All Other	1	0	1	\$20.17	Associate

Source: EMSI Gap Analysis Model

& Instructor, and Pipe fitting/Pipe fitter & Sprinkler Fitter. For the associate's degree analysis, there are significant gaps in General Business Administration & Management, General Administrative Assistant & Secretarial Science, and Chemical Technology/Technician.

At the postsecondary certificate level the largest significant surpluses were in Phlebotomy Technician/Phlebotomist, Licensed Practical/Vocational Nurse Training, and Welding Technology/Welder. For the associate's degree analysis, the two programs with surpluses are Registered Nursing/Registered Nurse and Electrical, Electronic & Communications Engineering Technology/Technician.

It is important to consider wages when considering programs to bolster or add. Nursing Assistant/Aide & Patient Care Assistant/Aide is related to occupations with lower wages (around \$10 an hour). On the other hand, General Business Administration & Management related occupations make a median wage of excess of \$28 an hour in the region. Several of the areas of opportunity have median hourly earnings in excess of \$20 an hour. Occupations with lower wages below \$10 were removed from consideration. The largest gaps in Table 2.3 were associated with industrial machinery mechanics and carpenters.

# APPENDIX 1: ABOUT EMSI DATA

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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 develops this data by combining 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 System (REIS-published by the

Bureau of Economic Analysis or BEA). This is augmented with County Business Patterns (CBP) and Nonemployer 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 statewide (and sub-state area industry projections published by individual state agencies--where available), 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 opening 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 WORK- FORCE WITH GIVEN EDUCATION LEVEL	
					PSV AWARD OR SOME COLLEGE	ASSOCIATE'S DEGREE
11.0101	Computer and Information Sciences, General	11-3021	Computer and Information Systems Managers	0.41	19	27
		15-1111	Computer and Information Research Scientists	0.41	6	9
		15-1121	Computer Systems Analysts	1.00	20	28
		15-1122	Information Security Analysts	1.00	29	43
		15-1134	Web Developers	1.00	23	31
		15-1141	Database Administrators	1.00	22	32
		15-1142	Network and Computer Systems Administrators	1.00	34	49
		15-1143	Computer Network Architects	1.00	27	41
		15-1199	Computer Occupations, All Other	0.41	34	49
15.0303	Electrical, Electronic and Communications Engineering Technology/Technician	17-3023	Electrical and Electronics Engineering Technicians	1.00	60	83
15.0501	Heating, Ventilation, Air Conditioning and Refrigeration Engineering Technology/Technician.	17-3029	Engineering Technicians, Except Drafters, All Other	1.00	60	83
		49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	1.00	83	96
30.1101	Gerontology.	19-1042	Medical Scientists, Except Epidemiologists	1.00	1	2
		19-3099	Social Scientists and Related Workers, All Other	1.00	6	10
41.0301	Chemical Technology/Technician	19-4031	Chemical Technicians	1.00	54	66
		51-8091	Chemical Plant & System Operators	1.00	80	91



PERCENT OF WORK-FORCE WITH GIVEN EDUCATION LEVEL

CIP	PROGRAM	SOC	OCCUPATION	PROGRAM BASED WEIGHT	PSV AWARD OR SOME COLLEGE	ASSOCIATE'S DEGREE
		51-8092	Gas Plant Operators	1.00	80	91
		51-9011	Chemical Equipment Operators and Tenders	1.00	70	81
43.0107	Criminal Justice/Police Science	33-3011	Bailiffs	1.00	73	86
		33-3021	Detectives and Criminal Investigators	1.00	33	46
		33-3051	Police and Sheriff's Patrol Officers	1.00	49	66
		33-9021	Private Detectives and Investigators	1.00	38	50
		33-9031	Gaming Surveillance Officers and Gaming Investigators	1.00	74	84
43.0203	Fire Science/Fire-fighting	33-2011	Firefighters	1.00	59	79
		33-2021	Fire Inspectors and Investigators	1.00	53	71
		33-2022	Forest Fire Inspectors and Prevention Specialists	1.00	53	71
46.0301	Electrical and Power Transmission Installation/Installer, General.	49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	1.00	74	86
		49-9051	Electrical Power-Line Installers and Repairers	1.00	83	94
46.0502	Pipefitting/Pipefitter and Sprinkler Fitter.	47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	1.00	82	89
		47-2152	Plumbers, Pipefitters, and Steamfitters	1.00	89	96
48.0501	Machine Tool Technology/Machinist.	51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	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
49.0205	Truck and Bus Driver/Commercial Vehicle Operator and Instructor.	53-3021	Bus Drivers, Transit and Intercity	1.00	85	92
		53-3022	Bus Drivers, School or Special Client	1.00	85	92
		53-3032	Heavy and Tractor-Trailer Truck Drivers	1.00	90	95
		53-3033	Light Truck or Delivery Services Drivers	1.00	90	95
51.0801	Medical/Clinical Assistant.	31-9092	Medical Assistants	0.61	69	91
51.0805	Pharmacy Technician/Assistant.	29-2052	Pharmacy Technicians	1.00	62	82
51.0806	Physical Therapy Technician/Assistant	31-2021	Physical Therapist Assistants	1.00	28	80
		31-2022	Physical Therapist Aides	1.00	28	80
51.0904	Emergency Medical Technology/Technician (EMT Paramedic)	29-2041	Emergency Medical Technicians and Paramedics	1.00	65	85
		53-3011	Ambulance Drivers and Attendants, Except Emergency Medical Technicians	1.00	81	89

PERCENT OF WORK-FORCE WITH GIVEN EDUCATION LEVEL

CIP	PROGRAM	SOC	OCCUPATION	PROGRAM BASED WEIGHT	PSV AWARD OR SOME COLLEGE	ASSOCIATE'S DEGREE
51.0908	Respiratory Care Therapy/ Therapist	29-1126	Respiratory Therapists	1.00	16	71
		29-2054	Respiratory Therapy Technicians	1.00	62	82
51.1004	Clinical/Medical Laboratory Technician	29-2012	Medical and Clinical Laboratory Technicians	1.00	31	48
51.1009	Phlebotomy Technician/Phle- botomist.	31-9097	Phlebotomists	1.00	77	90
51.2603	Medication Aide.	31-9099	Healthcare Support Workers, All Other	1.00	77	87
51.3801	Registered Nursing/Registered Nurse	29-1141	Registered Nurses	1.00	6	45
51.3901	Licensed Practical/Vocational Nurse Training	29-2061	Licensed Practical and Licensed Vocational Nurses	1.00	78	95
51.3902	Nursing Assistant/Aide and Patient Care Assistant/Aide.	31-1014	Nursing Assistants	1.00	83	91
52.0201	Business Administration and Management, General	11-1011	Chief Executives	0.86	27	33
		11-1021	General and Operations Managers	0.86	42	51
		11-2022	Sales Managers	0.85	27	33
		11-3011	Administrative Services Managers	0.90	48	59
		11-3051	Industrial Production Managers	0.90	47	56
		11-3071	Transportation, Storage, and Distri- bution Managers	0.90	63	71
		11-9021	Construction Managers	0.90	59	66
		11-9151	Social and Community Service Managers	0.86	25	31
		11-9199	Managers, All Other	0.86	38	46
		13-1051	Cost Estimators	0.90	55	67
		13-1111	Management Analysts	0.90	18	23
		37-1011	First-Line Supervisors of Housekeep- ing and Janitorial Workers	1.00	83	89
		39-1011	Gaming Supervisors	1.00	58	68
		39-1021	First-Line Supervisors of Personal Service Workers	1.00	64	74
52.0401	Administrative Assistant and Secretarial Science, General	43-6011	Executive Secretaries and Executive Administrative Assistants	0.44	67	81
		43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	1.00	67	81
52.0407	Business/Of ce Automation/ Technology/Data Entry	43-9021	Data Entry Keyers	1.00	68	81

# APPENDIX 3: PROGRAM GAP ANALYSIS METHODOLOGY

The chapter 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

Using demand-side data (average annual openings) and supply-side data (postsecondary education output), EMSI builds a model 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 VC or at another training provider within one of the regions. This made it possible to identify whether there may be talent shortages or surpluses within the service 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.<sup>6</sup> 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 VC’s program offerings.

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

<sup>6</sup> 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 POSTSECONDARY 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%
<b>Weighted Average</b>				<b>68%</b>	<b>85%</b>

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 VC 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.<sup>7</sup>

### 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

<sup>7</sup> 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 that 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 service region.<sup>8</sup> 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

<sup>8</sup> 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 service region, some of which have programs similar to those offered at VC. Hence completers at VC 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 service region, EMSI used data from the Integrated Postsecondary Educational System (IPEDS).<sup>9</sup> 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 VC was used to replace IPEDS data for VC.

Table A3.2 displays the breakdown by institution for

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

INSTITUTION	3-YEAR AVERAGE	PERCENT OF TOTAL
Manuel and Theresa's School of Hair Design-Victoria	13	2%
Texas Vocational Schools Inc	89	11%
Victoria Beauty College Inc	52	6%
Victoria College	681	82%
<b>Grand Total</b>	<b>835</b>	<b>100%</b>

Source: VC

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

INSTITUTION	3-YEAR AVERAGE	PERCENT OF TOTAL
Victoria College	323	100%
<b>Grand Total</b>	<b>323</b>	<b>100%</b>

Source: VC

postsecondary certificate level completions. At this education level, there were 835 annual completers, of which VC produced 681 or 82%. Table A3.3 displays these data at the associate's degree level. Only VC was offering associate's degrees in the region, producing an average of 323 graduates per year.

9 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.

# APPENDIX 4: ALTERNATIVE GAP ANALYSIS CALCULATIONS

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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.

## HIGHLIGHTS OF ALTERNATIVE GAP ANALYSIS

Most programs have an identical gap/surplus amount, as the previous calculations show in Tables 2.1 through 2.2, but there are a few changes. Among certificate level programs, the General Business Administration & Management gap increased (now a gap of 76). Medical/Clinical Assistant is now training for a smaller surplus than before. At the associate’s degree level, the only changes the increased gaps for General Business Administration & Management and General Administrative Assistant & Secretarial Science.

## ALTERNATIVE GAP ANALYSIS TABLES

**TABLE A4.1: ALTERNATIVE SUPPLY AND DEMAND FOR VC'S POSTSECONDARY CERTIFICATE PROGRAMS**

CIP	PROGRAM	AVERAGE ANNUAL OPENINGS	AVERAGE ANNUAL COMPLETERS	VC COMPLETERS	TOTAL GAP OR SURPLUS
52.0201	Business Administration and Management, General	95	19	19	76
49.0205	Truck and Bus Driver/Commercial Vehicle Operator and Instructor	108	54	54	55
46.0502	Pipe fitting/Pipe fitter and Sprinkler Fitter	53	7	7	46
43.0203	Fire Science/Fire-fighting	5	2	2	2
46.0301	Electrical and Power Transmission Installation/Installer, General	24	26	26	(2)
15.0303	Electrical, Electronic and Communications Engineering Technology/Technician	2	5	5	(3)
15.0501	Heating, Ventilation, Air Conditioning and Refrigeration Engineering Technology/Technician	11	16	16	(5)
30.1101	Gerontology	0	6	6	(6)
52.0407	Business/Office Automation/Technology/Data Entry	1	8	3	(7)
11.0101	Computer and Information Sciences, General	5	13	13	(7)
51.0805	Pharmacy Technician/Assistant	6	17	17	(12)
48.0501	Machine Tool Technology/Machinist	1	16	16	(15)
51.0904	Emergency Medical Technology/Technician (EMT Paramedic)	7	23	23	(16)
51.0801	Medical/Clinical Assistant	12	31	31	(20)
43.0107	Criminal Justice/Police Science	17	49	49	(32)
51.2603	Medication Aide	1	40	40	(39)
51.3902	Nursing Assistant/Aide and Patient Care Assistant/Aide	49	96	96	(48)
48.0508	Welding Technology/Welder	23	84	29	(61)
51.3901	Licensed Practical/Vocational Nurse Training	42	117	117	(75)
51.1009	Phlebotomy Technician/Phlebotomist	3	112	112	(109)

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

CIP	PROGRAM	AVERAGE ANNUAL OPENINGS	AVERAGE ANNUAL COMPLETERS	VC COMPLETERS	TOTAL GAP OR SURPLUS
52.0201	Business Administration and Management, General	93	11	11	82
52.0401	Administrative Assistant and Secretarial Science, General	55	9	9	46
41.0301	Chemical Technology/Technician	23	13	13	10
43.0203	Fire Science/Fire-fighting	4	2	2	2
51.0908	Respiratory Care Therapy/Therapist	4	9	9	(5)
51.0904	Emergency Medical Technology/Technician (EMT Paramedic)	2	7	7	(5)
51.1004	Clinical/Medical Laboratory Technician	2	8	8	(6)
51.0806	Physical Therapy Technician/Assistant	7	15	15	(8)
15.0303	Electrical, Electronic and Communications Engineering Technology/Technician	1	27	27	(27)
51.3801	Registered Nursing/Registered Nurse	39	98	98	(59)

# APPENDIX 5: DETAILED EMPLOYMENT PROJECTIONS

Table A5.1 displays the occupations that align with one or more of VC'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 not included in Table A5.2.

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

SOC	OCCUPATION	2014 JOBS	2018 JOBS	CHANGE	PERCENT CHANGE	PROJECTED ANNUAL OPENINGS
11-2022	Sales Managers	163	190	27	17%	9
11-3011	Administrative Services Managers	159	175	16	10%	6
11-3021	Computer and Information Systems Managers	60	68	8	13%	3
11-3051	Industrial Production Managers	192	198	6	3%	5
11-3071	Transportation, Storage, and Distribution Managers	158	172	14	9%	7
11-9021	Construction Managers	561	568	7	1%	15
11-9151	Social and Community Service Managers	41	47	6	15%	2
11-9199	Managers, All Other	1,288	1,443	155	12%	62
11-1011	Chief Executives	258	304	46	18%	15
11-1021	General and Operations Managers	1,696	1,799	103	6%	60
13-1051	Cost Estimators	140	167	27	19%	10
13-1111	Management Analysts	403	459	56	14%	19
15-1111	Computer and Information Research Scientists	<10	<10	--	--	1
15-1121	Computer Systems Analysts	122	146	24	20%	7
15-1122	Information Security Analysts	<10	12	--	--	1
15-1134	Web Developers	45	55	10	22%	3
15-1141	Database Administrators	24	28	4	17%	1
15-1142	Network and Computer Systems Administrators	95	105	10	11%	4
15-1143	Computer Network Architects	15	16	1	7%	1
15-1199	Computer Occupations, All Other	30	33	3	10%	1
17-3023	Electrical and Electronics Engineering Technicians	59	66	7	12%	3
17-3029	Engineering Technicians, Except Drafters, All Other	42	45	3	7%	1
19-1042	Medical Scientists, Except Epidemiologists	17	20	3	18%	1
19-3099	Social Scientists and Related Workers, All Other	<10	<10	--	--	1
19-4031	Chemical Technicians	63	68	5	8%	3
29-1126	Respiratory Therapists	116	131	15	13%	5
29-1141	Registered Nurses	1,849	2,094	245	13%	88
29-2012	Medical and Clinical Laboratory Technicians	60	71	11	18%	4
29-2041	Emergency Medical Technicians and Paramedics	136	161	25	18%	9



SOC	OCCUPATION	2014 JOBS	2018 JOBS	CHANGE	PERCENT CHANGE	PROJECTED ANNUAL OPENINGS
29-2052	Pharmacy Technicians	283	314	31	11%	9
29-2054	Respiratory Therapy Technicians	13	14	1	8%	1
29-2061	Licensed Practical and Licensed Vocational Nurses	1,076	1,183	107	10%	54
31-1014	Nursing Assistants	1,303	1,424	121	9%	59
31-2021	Physical Therapist Assistants	58	73	15	26%	5
31-2022	Physical Therapist Aides	48	59	11	23%	4
31-9092	Medical Assistants	403	443	40	10%	17
31-9097	Phlebotomists	80	90	10	13%	4
31-9099	Healthcare Support Workers, All Other	28	32	4	14%	1
33-2011	Fire fighters	147	162	15	10%	7
33-2021	Fire Inspectors and Investigators	<10	<10	--	--	1
33-2022	Forest Fire Inspectors and Prevention Specialists	<10	<10	--	--	0
33-3011	Bailiffs	<10	<10	--	--	1
33-3021	Detectives and Criminal Investigators	137	146	9	7%	5
33-3051	Police and Sheriff's Patrol Officers	400	436	36	9%	21
33-9021	Private Detectives and Investigators	72	98	26	36%	8
33-9031	Gaming Surveillance Officers and Gaming Investigators	<10	<10	--	--	1
37-1011	First-Line Supervisors of Housekeeping and Janitorial Workers	185	209	24	13%	10
39-1011	Gaming Supervisors	15	18	3	20%	1
39-1021	First-Line Supervisors of Personal Service Workers	129	137	8	6%	4
43-6011	Executive Secretaries and Executive Administrative Assistants	525	555	30	6%	13
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	1,904	2,098	194	10%	63
43-9021	Data Entry Keyers	135	127	(8)	(6%)	2
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	1,338	1,521	183	14%	54
47-2152	Plumbers, Pipe fitters, and Steam fitters	372	398	26	7%	10
49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers	443	497	54	12%	24
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	276	296	20	7%	12
49-9051	Electrical Power-Line Installers and Repairers	119	136	17	14%	8
51-4035	Milling and Planing Machine Setters, Operators, and Tenders, Metal and Plastic	15	15	0	0%	1
51-4121	Welders, Cutters, Solderers, and Brazers	490	528	38	8%	24
51-4122	Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders	26	30	4	15%	1
51-8091	Chemical Plant and System Operators	295	297	2	1%	12
51-8092	Gas Plant Operators	41	45	4	10%	2
51-9011	Chemical Equipment Operators and Tenders	243	249	6	2%	10
53-3011	Ambulance Drivers and Attendants, Except Emergency Medical Technicians	<10	<10	--	--	1
53-3021	Bus Drivers, Transit and Intercity	53	57	4	8%	2
53-3022	Bus Drivers, School or Special Client	243	263	20	8%	9
53-3032	Heavy and Tractor-Trailer Truck Drivers	2,217	2,422	205	9%	85
53-3033	Light Truck or Delivery Services Drivers	655	722	67	10%	25

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

SOC	TITLE	2014 JOBS	2018 JOBS	CHANGE	% CHANGE	PROJECTED ANNUAL OPENINGS
15-1151	Computer User Support Specialists	174	194	20	11%	7
19-4041	Geological and Petroleum Technicians	61	71	10	16%	5
29-2021	Dental Hygienists	80	90	10	13%	4
29-2034	Radiologic Technologists	171	192	21	12%	7
29-2071	Medical Records and Health Information Technicians	130	146	16	12%	7
31-9011	Massage Therapists	112	135	23	21%	6
31-9091	Dental Assistants	156	167	11	7%	6
47-2031	Carpenters	886	983	97	11%	33
47-2111	Electricians	372	434	62	17%	20
49-3023	Automotive Service Technicians and Mechanics	669	711	42	6%	29
49-3031	Bus and Truck Mechanics and Diesel Engine Specialists	272	297	25	9%	11
49-3042	Mobile Heavy Equipment Mechanics, Except Engines	252	337	85	34%	26
49-9041	Industrial Machinery Mechanics	687	808	121	18%	47
49-9043	Maintenance Workers, Machinery	229	247	18	8%	7
51-4021	Extruding and Drawing Machine Setters, Operators, and Tenders, Metal and Plastic	231	203	(28)	(12%)	5
51-4022	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	15	14	(1)	(7%)	1
51-4023	Rolling Machine Setters, Operators, and Tenders, Metal and Plastic	39	29	(10)	(26%)	1
51-4031	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic	164	144	(20)	(12%)	1
51-4032	Drilling and Boring Machine Tool Setters, Operators, and Tenders, Metal and Plastic	<10	<10	--	--	1
51-4033	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic	30	28	(2)	(7%)	1
51-4034	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	34	32	(2)	(6%)	1
51-4041	Machinists	334	387	53	16%	21
51-4081	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic	48	47	(1)	(2%)	1
51-4191	Heat Treating Equipment Setters, Operators, and Tenders, Metal and Plastic	16	11	(5)	(31%)	1
51-4192	Layout Workers, Metal and Plastic	12	12	0	0%	1
51-4199	Metal Workers and Plastic Workers, All Other	30	26	(4)	(13%)	1
51-8093	Petroleum Pump System Operators, Refinery Operators, and Gaugers	174	201	27	16%	13