June 2023

Labor Market Analysis

Business Information systems

Prepared by Central Valley/Mother Lode Center of Excellence

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COVID-19 Statement: This report includes employment projection data by Lightcast. Lightcast's projections are modeled on recorded (historical) employment figures and incorporate several underlying assumptions, including the assumption that the economy during the projection period will be at approximately full employment or potential output. To the extent that a recession or labor shock, such as the economic effects of COVID-19, can cause long-term structural change, they may impact the projections. At this time, it is not possible to quantify the impact of COVID-19 on projections of industry and occupational employment. Other measures such as unemployment rates and monthly industry employment estimates will reflect the most recent information on employment and jobs in the state and, in combination with input from local employers, may help validate current and future employment needs as depicted here.

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Summary

The Central Valley/Mother Lode Center of Excellence developed this report for Porterville College to determine whether there is demand in the local labor market that is not being met by the supply from community college programs. This report summarizes labor market demand, wages, skills, and postsecondary supply for *Business Information systems occupations*, which include:

- Computer Network Support Specialists (SOC 15-1231)
- Computer User Support Specialists (SOC 15-1232)
- Computer Network Architects (SOC 15-1241)
- Network and Computer Systems Administrators (SOC 15-1244)

Key Findings

- **Occupational Demand —** *Business Information systems occupations* have a labor market demand of 400 annual job openings in the South Central Valley/Southern Mother Lode (SCV/SML) subregion. Between 2021 and 2026, computer user support specialists are projected to have the most demand with 215 annual job openings and a projected growth rate of 15 percent.

- **Wages —** Average entry-level earnings of $26.89/hour for *Business Information systems occupations* are higher than the living wage in the SCV/SML subregion, which is $11.91/hour for a single adult.[1] Network and computer systems administrators earn the highest entry-level wage, $31.66/hour.

- **Employers and Occupational Titles —** Employers in the SCV/SML subregion include GPAC, Creative Financial Staffing, and T-Mobile US. The most common occupational title in job postings in the subregion is Computer User Support Specialists. The most common job title is Systems Administrators.

- **Skills and Certifications —** The top baseline skill is communications, the top specialized skill is operating systems, and the top software skill is operating systems. The most in-demand certification is a Cisco Certified Network Associate.

- **Education —** Some college, no degree is typically required for computer user support specialists. An associate degree is typically required for computer network support specialists. A bachelor's degree is typically required for network and computer systems administrators and computer network architects.

- **Supply and Demand Analysis —** Based on 400 annual openings (i.e., demand), and 241 postsecondary degrees awarded (i.e., supply), an analysis of supply and demand suggests there is an undersupply of 159 workers in the SCV/SML subregion. In the CVML region, 294 awards were conferred suggesting an undersupply of 294 workers.

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[1] The term "living wage" in Center of Excellence reports is calculated by averaging the self-sufficiency wages from the Insight Center's California Family Needs Calculator for each county in the subregion: https://insightcced.org/tools-metrics/self-sufficiency-standard-tool-for-california/.

Recommendation

Based on a comparison of demand and supply, there is an undersupply of trained workers in the SCV/SML subregion and the CVML region. The Center of Excellence recommends that Porterville College work with the regional directors, the college's advisory board, and local industry in the expansion of programs to address the shortage of Business Information systems workers.

Introduction

The Central Valley/Mother Lode Center of Excellence developed this report to provide Porterville College with labor market information for Business Information systems. The geographical focus for this report is the South Central Valley/Southern Mother Lode (SCV/SML) subregion, but regional demand and supply data has been included for broader applicability and use. Analysis of the program and occupational data related to Business Information systems resulted in the identification of applicable occupations, known as *Business Information systems Occupations*. The Standard Occupational Classification (SOC) System code and occupational titles used in this report from the Bureau of Labor Statistics and O*NET OnLine are shown below.).

Computer Network Support Specialists (SOC 15-1231)
- **Job Description:** Analyze, test, troubleshoot, and evaluate existing network systems, such as local area networks (LAN), wide area networks (WAN), cloud networks, servers, and other data communications networks. Perform network maintenance to ensure networks operate correctly with minimal interruption.
- **Knowledge:** Computers and Electronics, Telecommunications, Customer and Personal Service, Engineering and Technology
- **Skills:** Critical Thinking, Active Listening, Judgment and Decision Making, Reading Comprehension, Active Learning

Computer User Support Specialists (SOC 15-1232)
- **Job Description:** Provide technical assistance to computer users. Answer questions or resolve computer problems for clients in person, via telephone, or electronically. May provide assistance concerning the use of computer hardware and software, including printing, installation, word processing, electronic mail, and operating systems.
- **Knowledge:** Computers and Electronics, Customer and Personal Service, English Language, Telecommunications, Engineering and Technology
- **Skills:** Active Listening, Reading Comprehension, Speaking Complex Problem Solving, Critical Thinking

Computer Network Architects (SOC 15-1241)

- **Job Description:** Design and implement computer and information networks, such as local area networks (LAN), wide area networks (WAN), intranets, extranets, and other data communications networks. Perform network modeling, analysis, and planning, including analysis of capacity needs for network infrastructures. May also design network and computer security measures. May research and recommend network and data communications hardware and software.
- **Knowledge:** Computers and Electronics, telecommunications, Engineering and Technology, English Language, Design
- **Skills:** Critical Thinking, Active Listening, Complex Problem Solving, Reading Comprehension, Judgment and Decision Making

Network and Computer Systems Administrators (SOC 15-1244)

- **Job Description:** Install, configure, and maintain an organization's local area network (LAN), wide area network (WAN), data communications network, operating systems, and physical and virtual servers. Perform system monitoring and verify the integrity and availability of hardware, network, and server resources and systems. Review system and application logs and verify completion of scheduled jobs, including system backups. Analyze network and server resource consumption and control user access. Install and upgrade software and maintain software licenses. May assist in network modeling, analysis, planning, and coordination between network and data communications hardware and software.
- **Knowledge:** Computers and Electronics, Engineering and Technology, English Language, Customer and Personal Service, Mathematics
- **Skills:** Critical Thinking, Judgment and Decision Making, Reading Comprehension, Systems Analysis, Active Listening

Employment

Exhibit 1a shows trends for *Business Information systems occupations* in the SCV/SML subregion. Between 2021 to 2026, the number of jobs for *Business Information systems workers* is projected to increase by 480 jobs, or 12 percent.

Exhibit 1a. Occupational projections for *Business Information systems* in the SCV/SML subregion
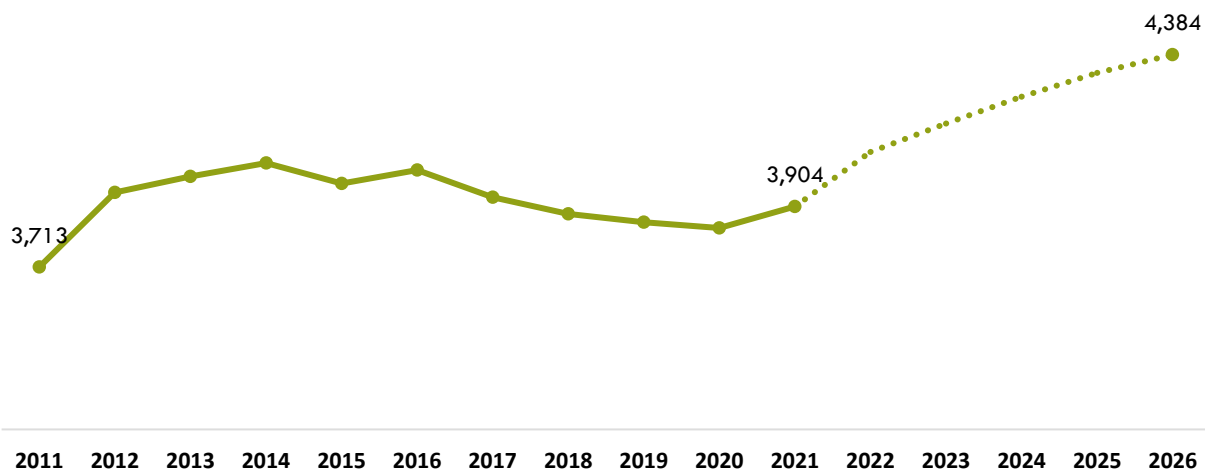
Between 2021 to 2026, demand for *Business Information systems* workers in the SCV/SML subregion is 400 annual openings (Exhibit 1b). Computer user support specialists are projected to have the most demand with 215 annual job openings and a projected growth rate of 15 percent.

Exhibit 1b. Occupational projections for *Business Information systems* in the SCV/SML subregion

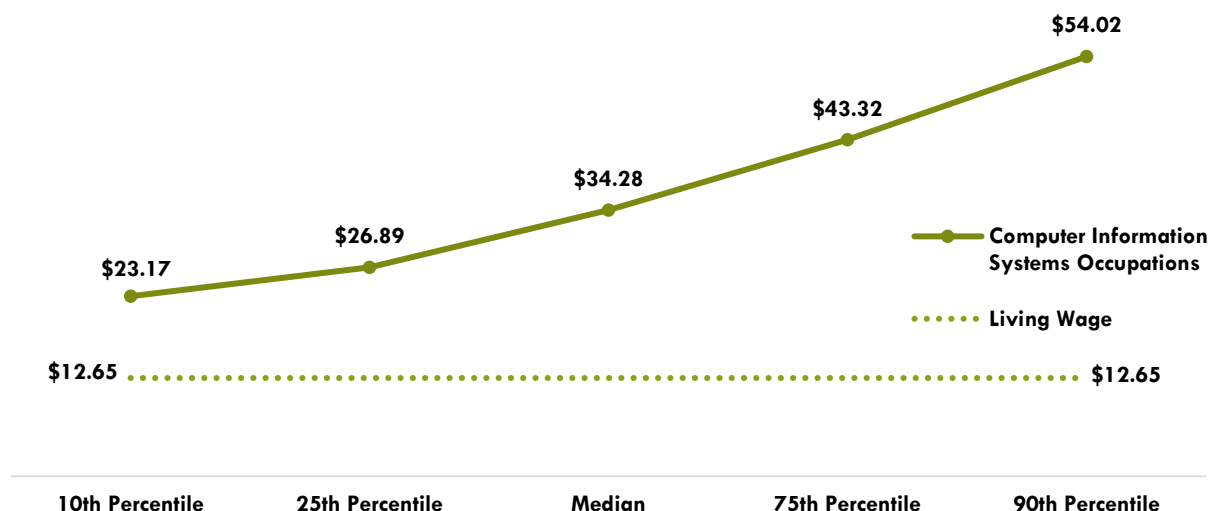| Occupation	2021 Jobs	2026 Jobs	5-Year Change	5-Year % Change	Annual Openings
Computer User Support Specialists	1,908	2,188	280	15%	215
Network and Computer Systems Administrators	999	1,102	103	10%	91
Computer Network Support Specialists	627	693	66	11%	64
Computer Network Architects	371	402	31	8%	31
TOTAL	**3,904**	**4,384**	**480**	**12%**	**400**

Wages

The average living wage for a single adult in the SCV/SML subregion is $11.91/hour.[2] Exhibit 2a shows the hourly wages of *Business Information systems* workers. Network and computer systems administrators earn the highest entry-level wage, $31.66/hour in the subregion.[3] Please note 10th and 25th percentiles are considered entry-level wages while 75th and 90th are considered experienced wages, either by gained by long-term employment, extra training, etc.

Exhibit 2a. *Business Information systems* **hourly wages in the SCV/SML subregion**

Occupation	Pct. 25 Hourly Earnings	Median Hourly Earnings	Pct. 75 Hourly Earnings
Network and Computer Systems Administrators	$31.66	$40.93	$47.89
Computer Network Architects	$30.76	$39.43	$54.05
Computer Network Support Specialists	$24.70	$29.72	$36.91
Computer User Support Specialists	$20.45	$27.03	$34.45

Exhibit 2b shows the average hourly wages for *Business Information systems* workers; the average entry-level wage is more than the average entry-level living wage for the SCV/SML subregion.

Exhibit 2b. *Business Information systems* **average hourly wages in the SCV/SML subregion**

$23.17 $26.89 $34.28 $43.32 $54.02

— Computer Information Systems Occupations

····· Living Wage

$12.65 ··········· $12.65

| 10th Percentile | 25th Percentile | Median | 75th Percentile | 90th Percentile |

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[2] The term "living wage" in Center of Excellence reports is calculated by averaging the self-sufficiency wages from the Insight Center's California Family Needs Calculator for each county in the subregion: https://insightcced.org/tools-metrics/self-sufficiency-standard-tool-for-california/.

[3] Entry-level wages are derived from the 25th percentile.

Job Postings

There were 1,253 job postings for *Business Information systems occupations* in the SCV/SML subregion from November 2022 to April 2023.[4]

Top Employers

The top employers with the most job postings are listed in Exhibit 3. The top employers in online job postings were GPAC, Creative Financial Staffing, and T-Mobile US.

Exhibit 3. Top employers of *Business Information systems* by number of job postings

Employer
GPAC
Creative Financial Staffing
T-Mobile US
Lockheed Martin
Internal Revenue Service
Naval Air Systems Command
CTG
Randstad
Verizon Communications
AppleOne

Top Occupational Titles

Exhibit 4 shows the O*NET OnLine occupational titles for *Business Information systems* in the SCV/SML subregion. Common job titles in postings include: Systems Administrators, Network Design Engineers, and IT Specialists.

Exhibit 4. Top occupational titles in job postings for *Business Information systems*

Occupational Title
Systems Administrators
Network Design Engineers
IT Specialists
IT Technicians
Outside Sales Representatives
IT Support Technicians
Help Desk Specialists
Network Engineers
Network Administrators
Help Desk Technicians

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[4] Other than occupation titles and job titles, the categories below can be counted one or multiple times per job posting, and across several areas in a single posting. For example, a skill can be counted in two different skill types, and an employer can indicate more than one education level.

Salaries

Exhibit 5 shows the "Market Salaries" for *Business Information systems* occupations. These are calculated by Lightcast using a machine learning model built from millions of job postings every year. This accounts for adjustments based on location, industry, skills, experience, education, among other variables.

Exhibit 5. Market salaries for *Business Information systems*

Market Salary	Job Postings
$49,000-$54,999	118
$85,000-$192,000	117
$55,000-$60,999	90
$43,000-$48,999	68
$37,000-$42,999	55

Education

Of the 1,253 job postings, 1,026 listed a preferred or minimum educational requirement for the position being filled. Among those, 46% requested a bachelor's degree, 27% requested a high school or GED, and 20% requested an associate degree (Exhibit 6).

Exhibit 6. Education levels requested in job postings for *Business Information systems*

Education Level	Job Postings	% of Job Postings
Bachelor's degree	474	46%
High school or GED	279	27%
Associate degree	205	20%
Master's degree	53	5%
Ph.D. or professional degree	15	1%

Baseline, Specialized, and Software Skills

Exhibit 7 depicts the top baseline, specialized, and software skills in job postings. The three most important baseline skills are communication, troubleshooting, and customer service. The top three specialized skills are operating systems, help desk support, and technical support. The top software skill is operating systems.

Exhibit 7. In-demand *Business Information systems* baseline, specialized, and software skills

Baseline Skills	Specialized Skills	Software Skills
Communications	Operating Systems	Operating Systems
Troubleshooting (Problem Solving)	Help Desk Support	Active Directory
Customer Service	Technical Support	Firewall
Management	Computer Science	Windows Servers
Problem Solving	Active Directory	AutoCAD

Certifications

Of the 1,253 job postings, 1,068 contained certification data. Among those, 9% indicated a need for a Cisco Certified Network Associate. The next top certification is a CompTIA Security+ (Exhibit 8).

Exhibit 8. Top *Business Information systems* **certifications requested in job postings**

Certifications	% of Job Postings
Cisco Certified Network Associate	9%
CompTIA Security+	9%
CompTIA A+	8%
IAT Level II Certification	4%
CompTIA Network+	3%

Education, Work Experience, & Training

Some college, no degree is typically required for computer user support specialists. An associate degree is typically required for computer network support specialists. A bachelor's degree is typically required for network and computer systems administrators and computer network architects (Exhibit 9).

Exhibit 9. Education, work experience, training, and Current Population Survey Results for *Business Information systems*[5]

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Computer User Support Specialists	Some college, no degree	None	None	39.2%
Network and Computer Systems Administrators	Bachelor's degree	None	None	39.2%
Computer Network Support Specialists	Associate's degree	None	None	20.4%
Computer Network Architects	Bachelor's degree	5 years or more	None	23.4%

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[5] "Labor Force Statistics from the Current Population Survey," Bureau of Labor Statistics, https://www.bls.gov/cps/.

Supply

An analysis of program data from the Integrated Postsecondary Education Data System (IPEDS) for the last three program years shows that, on average, 241 awards were conferred in the SCV/SML subregion (Exhibits 10 and 11).

Exhibit 10. TOP and CIP codes for *Business Information systems*

TOP Titles	CIP Titles
070200 - Computer Information systems	11.0103 - Information Technology
	15.1202 - Computer Technology/Computer Systems Technology
070800 - Computer Infrastructure and Support	11.1001 - Network and System Administration/Administrator
	11.1003 - Computer and Information Systems Security/Information Assurance
	11.0901 - Computer Systems Networking and Telecommunications
070810 - Computer Networking	11.1001 - Network and System Administration/Administrator
	11.1003 - Computer and Information Systems Security/Information Assurance
	11.1006 - Computer Support Specialist
070820 - Computer Support	11.1003 - Computer and Information Systems Security/Information Assurance
	11.1004 - Web/Multimedia Management and Webmaster
070900 - World Wide Web Administration	11.1003 - Computer and Information Systems Security/Information Assurance

**Exhibit 11. Postsecondary supply for *Business Information systems***

TOP/ CIP Code- Title	College	2019-2020	2020-2021	2021-2022	3-year Average
070200 - Computer Information systems	Bakersfield	-	1	-	0*
	Cerro Coso	56	68	72	65*
	Clovis	1	1	-	1*
	Fresno City	10	34	21	22*
	Merced	3	3	3	3*
	Porterville	8	8	2	6*
	Reedley College	45	6	3	18*
	San Joaquin Delta	12	16	19	16
	Sequoias	4	12	10	9*
070800 - Computer Infrastructure and Support	Bakersfield	8	7	7	7*
	Fresno City	3	1	-	1*
070810 - Computer Networking	Cerro Coso	34	27	44	35*
	Clovis	5	8	-	4*
	Fresno City	63	23	24	37*
	Modesto Junior	4	4	8	5
	Reedley College	29	8	4	14*
	San Joaquin Delta	24	33	42	33
	Sequoias	7	13	8	9*
	West Hills Lemoore	1	2	3	2*
070820 - Computer Support	Clovis	1	1	-	1*
	Reedley College	5	9	6	7*
070900 - World Wide Web Administration	Fresno City	3	3	4	3*
SCV/SML TOTAL		**283**	**232**	**208**	**241**
CVML TOTAL		**326**	**288**	**280**	**298[6]**

*SCV/SML awards

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[6] Average annual supply may not add up to the total displayed due to rounding error

There is an undersupply of 159 Business Information systems workers in the SCV/SML subregion and an undersupply of 294 workers in the region (Exhibit 12).

Exhibit 12. *Business Information systems* **workforce demand (annual job openings), postsecondary awards (supply), and additional students needed to fill gap in the SCV/SML subregion and region**
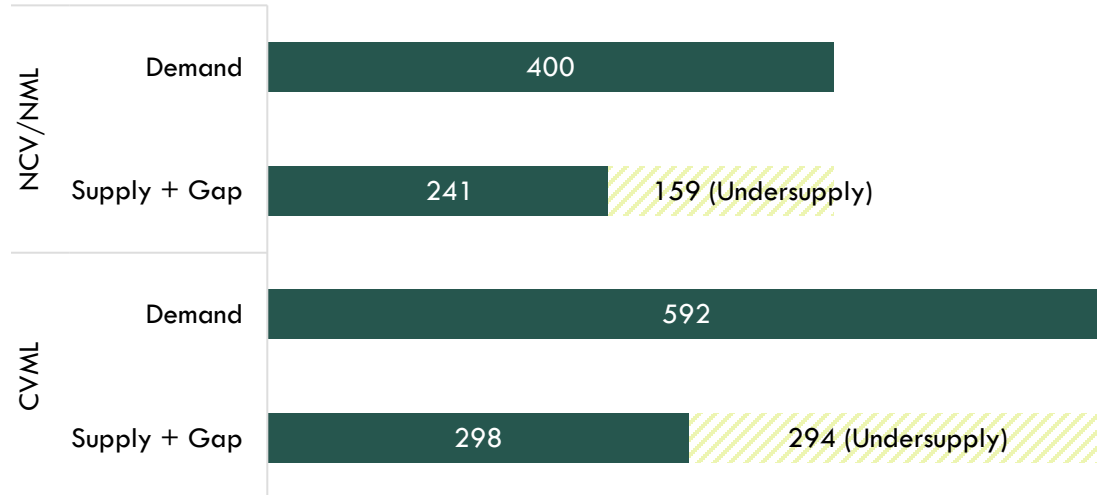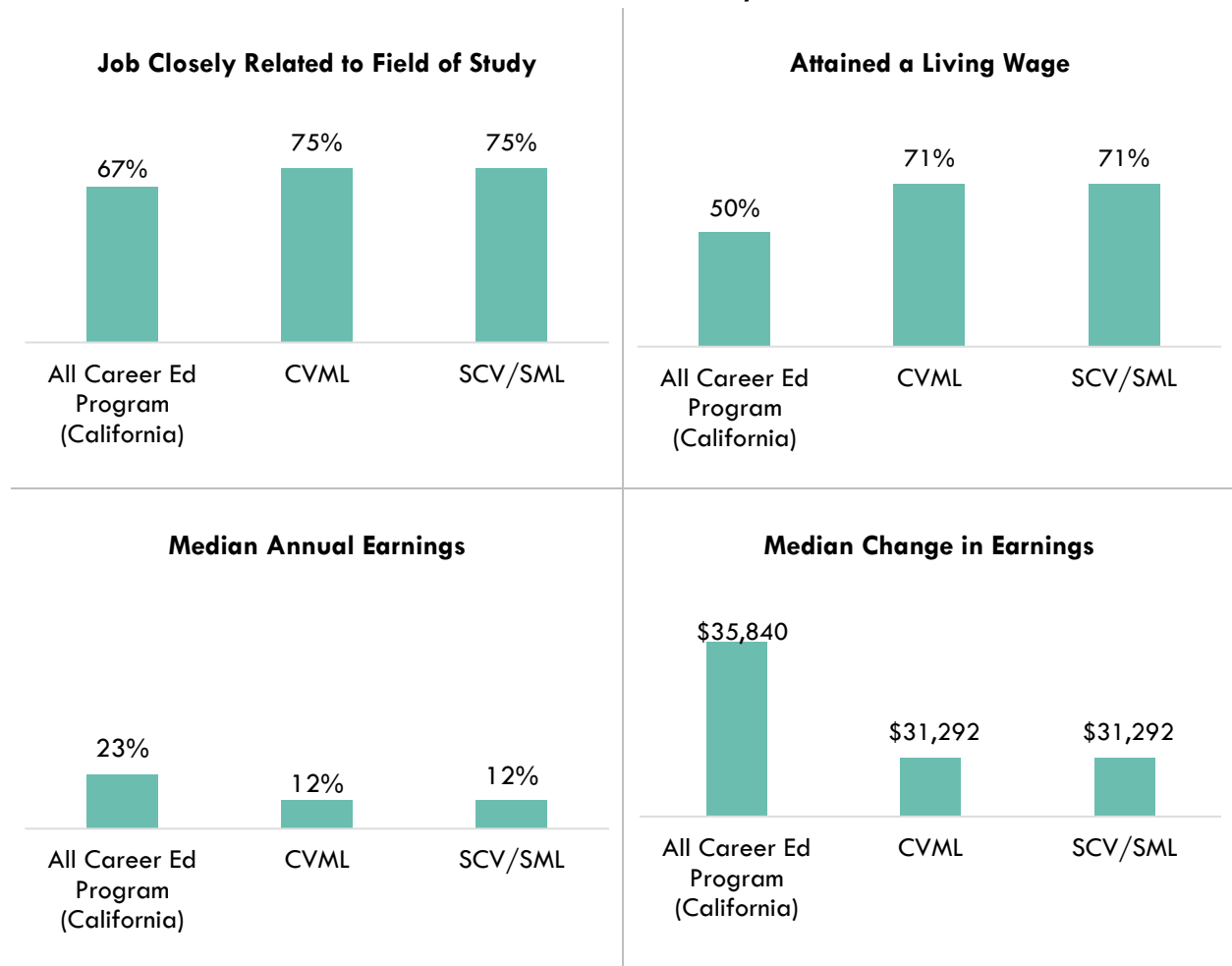

Student Outcomes

Exhibits 13a – 13b summarize outcomes from California Community College Chancellor's LaunchBoard for TOP codes related to *Business Information systems*. Notably, 75% of students obtained a job closely related to their field of study in the subregion and 71% attained a living wage in the subregion.

Exhibit 13a. Metrics for TOP 070200 - Business Information systems

Metric	
Students Who Got a Degree or Certificate or Attained Apprenticeship Journey Status	104
Number of Students Who Transferred	18
*denotes data not available in table and charts	

Exhibit 13b. Metrics for TOP 070200 - Business Information systems

Job Closely Related to Field of Study

All Career Ed Program (California)	CVML	SCV/SML
67%	75%	75%

Attained a Living Wage

All Career Ed Program (California)	CVML	SCV/SML
50%	71%	71%

Median Annual Earnings

All Career Ed Program (California)	CVML	SCV/SML
23%	12%	12%

Median Change in Earnings

All Career Ed Program (California)	CVML	SCV/SML
$35,840	$31,292	$31,292

Recommendation

This report suggests there is a shortage of 252 workers in the SCV/SML subregion and a shortage of 430 workers in the CVML region for *Business Information systems*. Based on these findings, it is recommended that Porterville College work with the regional directors, the college's advisory board, and local industry in the expansion of programs to address the shortage of Business Information systems workers in the region.

Appendix: Methodology & Data Sources

Data Sources

Labor market and educational supply data compiled in this report derive from a variety of sources. Data were drawn from external sources, including the Economic Modeling Specialists, Inc., the California Community Colleges Chancellor's Office Management Information Systems Data Mart and the National Center for Educational Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS). Below is the summary of the data sources found in this study.

Data Type	Source
Labor Market Information/Population Estimates and Projections/Educational Attainment	Economic Modeling Specialists, Intl. (Lightcast). Lightcast occupational employment data are based on final Lightcast industry data and final Lightcast staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors). Occupational wage estimates also affected by county-level Lightcast earnings by industry: economicmodeling.com.
Typical Education Level and On-the-job Training	Bureau of Labor Statistics (BLS) uses a system to assign categories for entry-level education and typical on-the-job training to each occupation for which BLS publishes projections data: https://www.bls.gov/emp/tables/educational-attainment.htm.
LaunchBoard	Chancellor's LaunchBoard. https://www.calpassplus.org/LaunchBoard/SWP.aspx
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division: labormarketinfo.edd.ca.gov.
Job Posting and Skills Data	Lightcast.
Additional Education Requirements/ Employer Preferences	The O*NET Job Zone database includes over 900 occupations as well as information on skills, abilities, knowledge, work activities and interests associated with specific occupations: onetonline.org.

Key Terms and Concepts

Annual Job Openings: Annual openings are calculated by dividing the number of years in the projection period by total job openings.

Education Attainment Level: The highest education attainment level of workers age 25 years or older.

Employment Estimate: The total number of workers currently employed.

Employment Projections: Projections of employment are calculated by a proprietary Economic Modeling Specialists, Intl. (LIGHTCAST) formula that includes historical employment and economic indicators along with national, state and local trends.

LaunchBoard (Attained the Living Wage): Among SWP students who exited college and did not transfer to any postsecondary institution, the proportion who attained the district county living wage for a single adult measured immediately following academic year of exit

LaunchBoard (Median Annual Earnings): Among SWP students who exited the community college system and who did not transfer to any postsecondary institution, median earnings following the academic year of exit.

LaunchBoard (Median Change in Earnings): Among SWP students who exited and who did not transfer to any postsecondary institution, median change in earnings between the second quarter prior to the beginning of the academic year of entry and the second quarter after the end of the academic year of exit from the last college attended.

LaunchBoard (Job Closely Related to Field of Study): Among SWP students who responded to the CTE Outcomes Survey and did not transfer to any postsecondary institution, the proportion who reported that they are working in a job very closely or closely related to their field of study.

Living Wage: The cost of living in a specific community or region for one adult and no children. The cost increases with the addition of children.

Occupation: An occupation is a grouping of job titles that have a similar set of activities or tasks that employees perform.

Percent Change: Rate of growth or decline in the occupation for the projected period; this does not factor in replacement openings.

Replacements: Estimate of job openings resulting from workers retiring or otherwise permanently leaving an occupation. Workers entering an occupation often need training. These replacement needs, added to job openings due to growth, may be used to assess the minimum number of workers who will need to be trained for an occupation.

Total Job Openings (New + Replacements): Sum of projected growth (new jobs) and replacement needs. When an occupation is expected to lose jobs, or retain the current employment level, number of openings will equal replacements.

Typical Education Requirement: represents the typical education level most workers need to enter an occupation.

Typical On-The-Job Training: indicates the typical on-the-job training needed to attain competency in the skills needed in the occupation.