July 2022

Labor Market Analysis

GIS Exploration

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Prepared by the Central Valley/Mother Lode Center of Excellence

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COVID-19 Statement: This report includes employment projection data by Emsi. Emsi'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

Please note the COVID-19 statement on page 2 when considering this report's findings.

This study conducted by the Central Valley/Mother Lode Center of Excellence examines labor market demand, wages, skills, and postsecondary supply for GIS Exploration. Two occupations related to GIS Exploration were identified for Porterville College:

- 17-1022, Surveyors
- 17-3031, Surveying and Mapping Technicians

Key findings:

- **Occupational demand —** Nearly 440 workers were employed in jobs related to GIS Exploration in 2020 in the South Central Valley/Southern Mother Lode (SCV/SML) subregion. The largest occupation is surveying and mapping technicians with 177 workers, a projected growth rate of 16% over the next five years, and 31 annual openings.

- **Wages —** Surveyors earn the highest entry-level wage, $34.29/hour in the subregion.

- **Employers —** Employers with the most job postings in the subregion are the State of California, Local, and Blair.

- **Occupational titles —** The most common occupational title in job postings in the subregion is Surveyors. The most common job title is Solar Site Surveyor.

- **Skills and certifications —** The top baseline skill is communication skills, the top specialized skill is land survey, and the top software skill is AutoCAD. The most in-demand certification is a Licensed Professional Surveyor.

- **Education —** A high school diploma or equivalent is typically required for surveying and mapping technicians. A bachelor's degree is typically required for surveyors.

- **Supply —** Analysis of postsecondary completions shows that on average of 0 awards were conferred in the Central Valley/Mother Lode region each year.

Based on a comparison of occupational demand and supply, there is an undersupply of 56 trained workers in the subregion and 88 workers in the region. The Center of Excellence recommends that Porterville College work with the regional directors, the college's advisory board, and local industry in the development of programs to address the shortage of GIS Exploration workers in the region.

Introduction

The Central Valley/Mother Lode Center of Excellence was asked by Porterville College to provide labor market information for GIS Exploration. 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. The average living wage for a single adult in the SCV/SML subregion is $11.91/hour.[1] Analysis of the program and occupational data related to GIS Exploration resulted in the identification of applicable occupations. The Standard Occupational Classification (SOC) System codes and titles used in this report are:

- 17-1022, Surveyors
- 17-3031, Surveying and Mapping Technicians

The occupational titles, job descriptions, sample job titles, and knowledge and skills from the Bureau of Labor Statistics and O*NET OnLine are shown below.

Surveyors
Job Description: Make exact measurements and determine property boundaries. Provide data relevant to the shape, contour, gravitation, location, elevation, or dimension of land or land features on or near the earth's surface for engineering, mapmaking, mining, land evaluation, construction, and other purposes.
Knowledge: Mathematics, Engineering and Technology, Customer and Personal Service, English Language, Law and Government
Skills: Mathematics, Critical Thinking, Reading Comprehension, Speaking, Active Listening

Surveying and Mapping Technicians
Job Description: Perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist, to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.
Knowledge: Computers and Electronics, Geography, Mathematics, English Language, Engineering and Technology
Skills: Operations Monitoring, Active Listening, Critical Thinking, Operation and Control, Speaking

Occupational Demand

The SCV/SML subregion employed 431 workers in GIS Exploration occupations in 2020 (Exhibit 1). The largest occupation is surveying and mapping technicians with 177 workers in 2020. This occupation is projected to grow by 16% over the next five years and has the greatest number of projected annual openings, 31.

Exhibit 1. GIS Exploration employment and occupational projections in the SCV/SML subregion

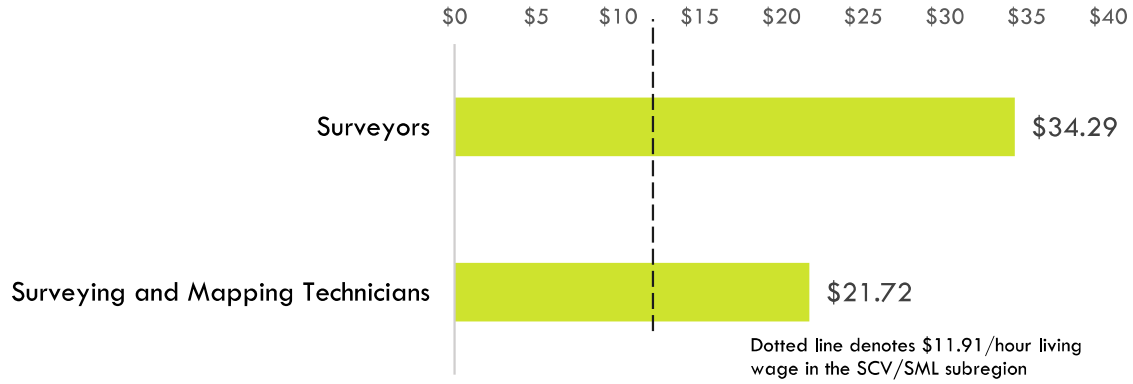
Occupation	2021 Jobs	2026 Jobs	5-Year Change	5-Year % Change	Annual Openings
Surveying and Mapping Technicians	177	204	28	16%	31
Surveyors	254	264	9	4%	25
TOTAL	**431**	**468**	**37**	**9%**	**56**

[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/.

Wages

Exhibit 2 shows the entry-level hourly wages of the GIS Exploration occupations. Surveyors earn the highest entry-level wage, $34.29/hour in the subregion[2].

Exhibit 2. GIS Exploration entry-level wages in the SCV/SML subregion



Job Postings

There were 140 job postings for the two occupations in the SCV/SML subregion from January 2022 to June 2022.[3] The employers with the most job postings are listed in Exhibit 3.

Exhibit 3. Top employers of GIS Exploration by number of job postings

Employer	Job Postings	% Job Postings
state of california	6	6%
Local	4	4%
Blair	3	3%
Highlands Trade Partners	3	3%
O& X27 Dell Engineering	3	3%
Odell Engineering	3	3%
Sunrun	3	3%
Vivint Solar	3	3%
Dale G Mell & Associates	2	2%
Denham Resources	2	2%

Exhibit 4 shows how job postings for the targeted occupations in the SCV/SML subregion are distributed across three O*NET OnLine occupations. The occupational title Surveyors is listed in 100 job postings. Note how this occupational title dominates the job posting results. Common job titles in postings include Solar Site Surveyor in 15 job postings, Professional Land Surveyor in nine job postings, and Site Surveyor in nine job postings.

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

[3] 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.

Exhibit 4. Top occupational titles in job postings for GIS Exploration

Occupational Title	Job Postings	% of Job Postings
Surveyors	100	71%
Surveying Technicians	22	16%
Mapping Technicians	18	13%

Salaries

Exhibit 5 shows the "Market Salaries" for GIS Exploration occupations. These are calculated by Burning Glass using a machine learning model built off of millions of job postings every year. This accounts for adjustments based on locations, industry, skills, experience, education requirements, among other variables.

Exhibit 5. Salaries for GIS Exploration occupations

Market Salary Percentile	Salary Amount
10th Percentile	$31,302
25th Percentile	$35,464
50th Percentile	$53,089
75th Percentile	$63,558
90th Percentile	$73,480

Education

Of the 140 job postings, 84 listed an education level preferred for the positions being filled. Among those, 58% requested high school or vocational training, 43% requested a bachelor's degree, and 15% requested an associate degree (Exhibit 6). A job posting can indicate more than one education level. Hence, the percentages shown in the chart below may total more than 100%.

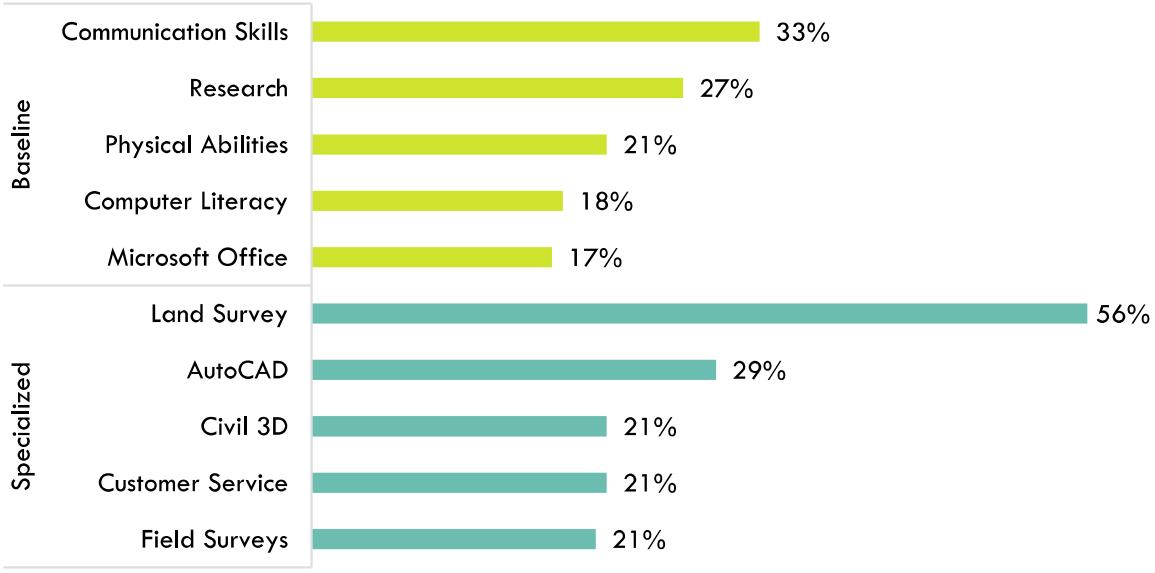
Exhibit 6. Education levels requested in job postings for GIS Exploration

Education Level	Job Postings	% of Job Postings
High school or vocational training	49	58%
Bachelor's degree	36	43%
Associate's degree	13	15%
Master's degree	1	1%

Baseline and Specialized Skills

Exhibit 7 depicts the top baseline and specialized skills for the targeted occupations. The three most important baseline skills are communication skills, 33% of job postings, research, 27%, and physical abilities, 21%. The top three specialized skills are land survey, 56% of job postings, AutoCAD, 59%, and Civil, 21%.

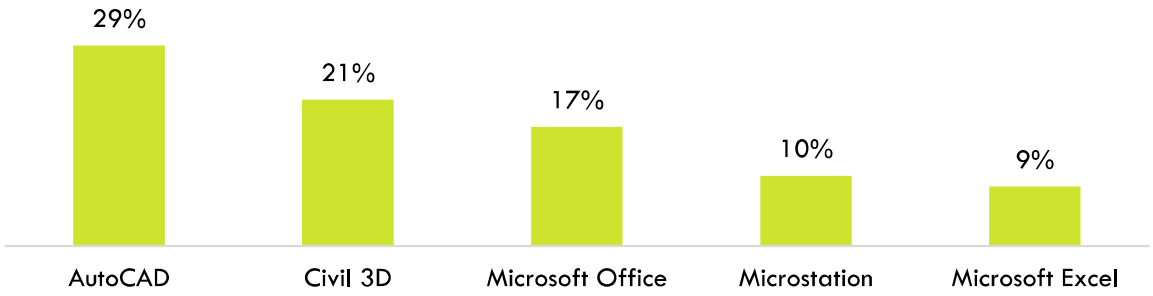
Exhibit 7. In-demand GIS Exploration baseline and specialized skills



Software Skills

Analysis also included the software skills most in demand by employers. AutoCAD and Civil 3D were the top two software skills identified in job postings (Exhibit 8).

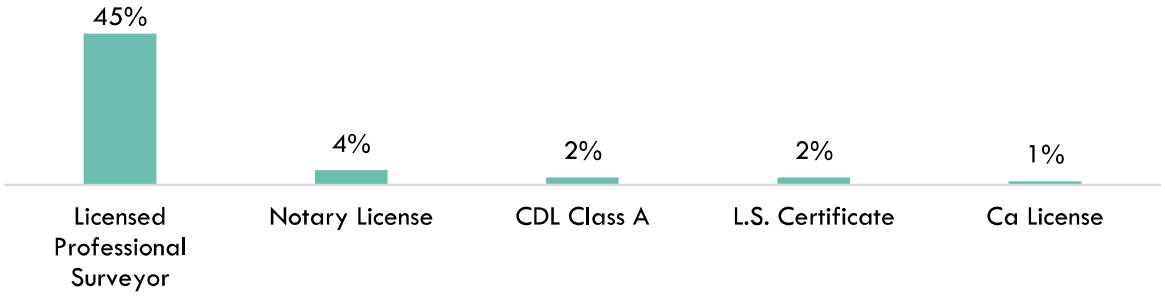
Exhibit 8. In-demand GIS Exploration software skills



Certifications

Of the 140 job postings, 94 contained certification data. Among those, 45% indicated a need for a Licensed Professional Surveyor. The next top certifications are a notary license and CDL Class A (Exhibit 9). Please note, 67% of the job posting indicated a need for a drivers license however it is not a certification.

Exhibit 9. Top GIS Exploration certifications requested in job postings



Education, Work Experience & Training

A high school diploma or equivalent is typically required for surveying and mapping technicians. A bachelor's degree is typically required for surveyors (Exhibit 10).

Exhibit 10. Education, work experience, training, and Current Population Survey results for GIS Exploration occupations[4]

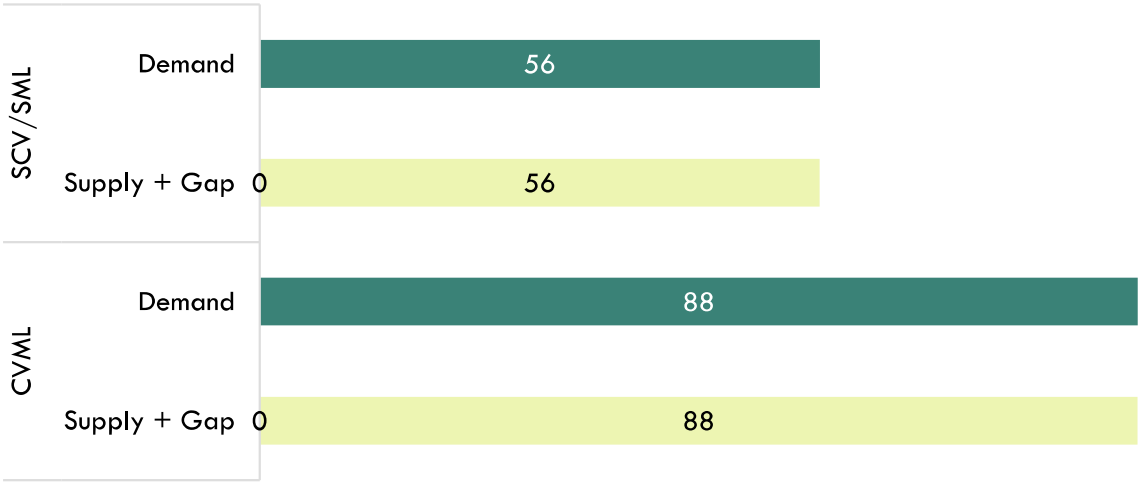
Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Surveying and Mapping Technicians	High school diploma or equivalent	None	Moderate-term	57.7%
Surveyors	Bachelor's degree	None	Internship/residency	22.6%

Supply

There was no supply data available for 0957.30- Surveying from the Integrated Postsecondary Education Data System (IPEDS).

There is an undersupply of 56 GIS Exploration workers in the SCV/SML subregion and 88 workers in the region (Exhibit 11).

Exhibit 11. GIS Exploration workforce demand (annual job openings), postsecondary supply of students (awards), and additional students needed to fill gap in the SCV/SML subregion and region



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

Student Outcomes

Exhibit 12 summarizes employment and wage outcomes from the California Community College Chancellor's Cal-PASS Plus LaunchBoard for the TOP code related to GIS Exploration. Of note, 11 surveying students transferred.

Exhibit 12. Regional metrics for the TOP code related to GIS Exploration

Metric	Surveying 095730
Students Who Got a Degree or Certificate or Attained Apprenticeship Journey Status	*
Number of Students Who Transferred	11
Job Closely Related to Field of Study	*
Median Change in Earnings	*
Attained a Living Wage	*
* denotes data not available.	

Conclusion

The entry-level wages of the two occupations exceed the SCV/SML subregion's average living wage. There were 140 job postings in the past six months for occupations related to GIS Exploration in the subregion. Analysis of skills and certification requirements in job postings indicates:

- The top baseline skill is communication skills, and the top specialized skill is land survey.
- The top software skill is AutoCAD.
- The top certification is a Licensed Professional Surveyor.

There is an undersupply of trained workers, a shortage of 56 in the SCV/SML subregion and 88 in the region.

Recommendation

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 development of programs to address the shortage of GIS Exploration workers in the region.

Appendix A: 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. (EMSI). EMSI occupational employment data are based on final EMSI industry data and final EMSI 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 EMSI 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.
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division: labormarketinfo.edd.ca.gov.
Job Posting and Skills Data	Burning Glass: burning-glass.com/.
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. (EMSI) formula that includes historical employment and economic indicators along with national, state and local trends.

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.