

October 2020

Labor Market Analysis

Drone Technology and Media



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 drone technology and media. Four occupations related to drone technology and media were identified for Merced College:

- 15-1299, Computer Occupations, All Other
- 27-4021, Photographers
- 17-3031, Surveying and Mapping Technicians
- 27-4031, Camera Operators, Television, Video, and Film

Key findings:

- **Occupational demand** — Nearly 1,620 workers were employed in jobs related to drone technology in 2019 in the North Central Valley/Northern Mother Lode (NCV/NML) subregion. The largest occupation is computer occupations, all other with 1,103 workers in 2019, a projected growth rate of 1% over the next five years, and 93 annual openings.
- **Wages** — Computer occupations (all other) earn the highest entry-level wages, \$23.20/hour in the subregion and \$24.40/hour in the region.
- **Employers** — Employers with the most job postings in the subregion are Anthem Blue Cross, Amazon, and Save Mart Supermarkets.
- **Occupational titles** — The most common occupational title in job postings in the subregion is Information Technology Project Managers. The most common job title is It Support Engineer I.
- **Skills and certifications** — The top baseline skill is communication, the top specialized skill is SQL, and the top software skill is SQL. The most in-demand certification is a driver's license.
- **Education** — A bachelor's degree is typically required for two of the four occupations. A high school diploma is typically required for surveying and mapping technicians, and camera operators, television, video, and film.
- **Supply** — Analysis of postsecondary completions in the region shows that on average 44 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 139 trained workers in the subregion and 396 workers in the region. The Center of Excellence recommends that Merced College work with the regional director, the college's advisory board, and local industry in the development of programs to address the shortage of drone technology workers in the region.

Introduction

The Central Valley/Mother Lode Center of Excellence was asked by Merced College to provide labor market information for drone technology and media using Taxonomy of Programs (TOP) code – title 0799 – Other Information Technology. Review of the given occupations resulted in two additional programs being identified as appropriate for inclusion in this analysis:

- 060400 - Radio and Television
- 101200 - Applied Photography

The geographical focus for this report is the North Central Valley/Northern Mother Lode (NCV/NML) 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 North Central Valley/Northern Mother Lode (NCV/NML) subregion is \$10.27/hour.¹ Analysis of the program and occupational data related to drone technology resulted in the identification of applicable occupations. The Standard Occupational Classification (SOC) System codes and titles used in this report are:

- 15-1299, Computer Occupations, All Other
- 27-4021, Photographers
- 17-3031, Surveying and Mapping Technicians
- 27-4031, Camera Operators, Television, Video, and Film

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. O*NET data was not available for Computer Occupations, All Other; and Surveying and Mapping Technicians.

Photographers

Job Description: Photograph people, landscapes, merchandise, or other subjects, using digital or film cameras and equipment. May develop negatives or use computer software to produce finished images and prints. Includes scientific photographers, aerial photographers, and photojournalists.

Knowledge: Customer and Personal Service, Sales and Marketing, Computers and Electronics, Fine Arts, English Language

Skills: Active Listening, Speaking, Service Orientation, Social Perceptiveness, Active Learning

Camera Operators, Television, Video, and Film

Job Description: Operate television, video, or motion picture camera to record images or scenes for various purposes, such as TV broadcasts, advertising, video production, or motion pictures.

Knowledge: English Language, Computers and Electronics, Communications and Media, Telecommunications

Skills: Active Listening, Coordination, Judgment and Decision Making, Reading Comprehension, Speaking

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://insightccd.org/tools-metrics/self-sufficiency-standard-tool-for-california/>.

Occupational Demand

The North Central Valley/Northern Mother Lode subregion employed 1,618 workers in drone technology occupations in 2019 (Exhibit 1). The largest occupation is computer occupations, all other, with 1,103 workers in 2019. This occupation is projected to grow by 1% over the next five years and has the greatest number of projected annual openings, 93.

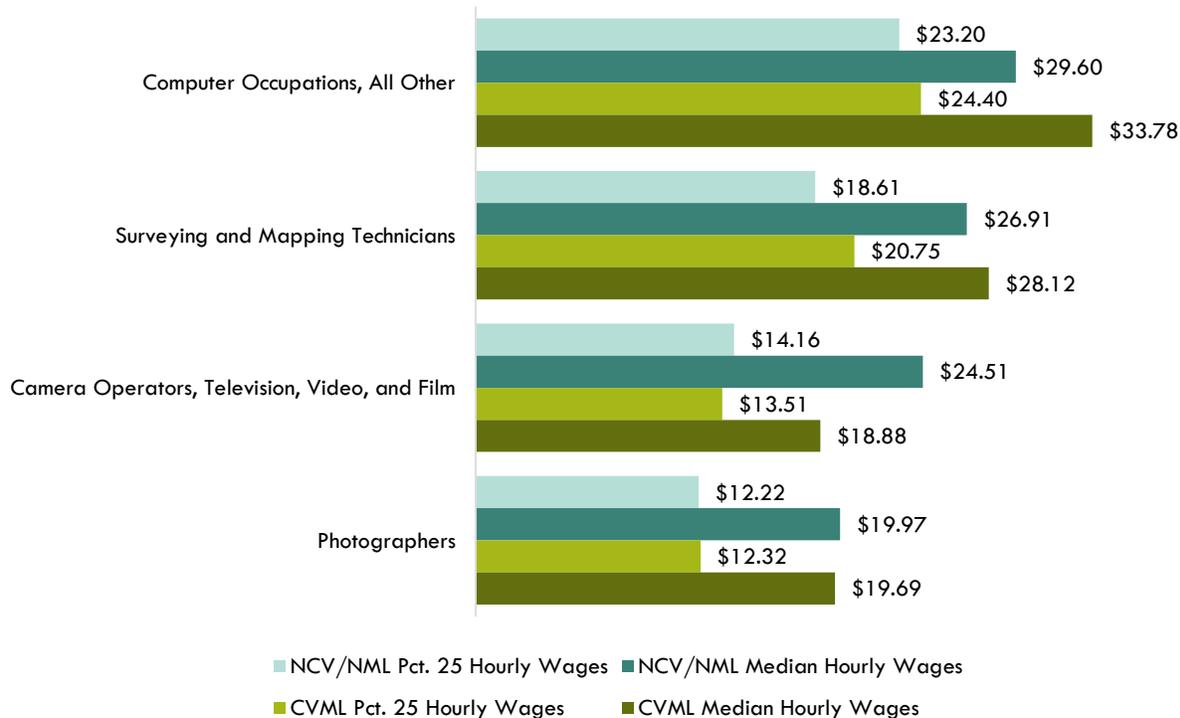
Exhibit 1. Drone technology and media employment and occupational projections in the NCV/NML subregion

Occupation	2019 Jobs	2024 Jobs	5-Year Change	5-Year % Change	Annual Openings
Computer Occupations, All Other	1,103	1,117	14	1%	93
Photographers	354	346	(8)	(2%)	38
Surveying and Mapping Technicians	135	138	3	2%	17
Camera Operators, Television, Video, and Film	26	28	2	8%	3
Total	1,618	1,628	10	1%	152

Wages

Exhibit 2 compares the entry-level and experienced wages of the drone technology and media occupations. Computer occupations (all other) earn the highest entry-level wages, \$23.20/hour in the subregion and \$24.40/hour in the region.

Exhibit 2. Entry-level and experienced wage comparison in the NCV/NML subregion and region



Job Postings

There were 494 job postings for the four occupations in the NCV/NML subregion from April 2020 to September 2020.² The employers with the most job postings are listed in Exhibit 3.

Exhibit 3. Top employers of drone technology and media by number of job postings

Employer	Job Postings	% Job Postings
Anthem Blue Cross	63	16%
Amazon	27	7%
Save Mart Supermarkets	19	5%
American Consumer Panels	13	3%
The Save Mart Companies	13	3%
Kalo	8	2%
Ej Gallo	7	2%
Moss Adams Llp	7	2%
Sutter Health	7	2%
Sutter Medical Center	7	2%

Exhibit 4 shows how job postings for the targeted occupations in the NCV/NML subregion are distributed across 10 O*NET OnLine occupations. The occupational title Information Technology Project Managers is listed in 114 job postings. Note how a higher proportion of job postings are for this occupational title, and for business intelligence analysts. Common job titles in postings include IT Support Engineer I in 18 job postings, data analyst in 12 job postings, and in-home usage tester in 10 job postings.

Exhibit 4. Top occupational titles in job postings for drone technology and media

Occupational Title	Job Postings	% of Job Postings
Information Technology Project Managers	114	23%
Business Intelligence Analysts	100	20%
Computer Systems Engineers/Architects	94	19%
Document Management Specialists	38	8%
Software Quality Assurance Engineers and Testers	37	7%
Photographers	36	7%
Database Architects	23	5%
Camera Operators, Television, Video, and Motion Picture	10	2%
Data Warehousing Specialists	10	2%
Mapping Technicians	8	2%

² 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 drone technology occupations that are calculated by Burning Glass which uses a machine learning model built off of millions of job postings every year, and accounts for adjustments based on locations, industry, skills, experience, education requirements, among other variables.

Exhibit 5. Salaries for drone technology and media

Market Salary Percentile	Salary Amount
10th Percentile	\$34,538
25th Percentile	\$46,160
50th Percentile	\$69,375
75th Percentile	\$93,678
90th Percentile	\$115,119

Education

Of the 494 job postings, 317 listed an education level preferred for the positions being filled. Among those, 73% requested a bachelor’s degree, 38% requested high school or vocational training, and 18% requested a master’s degree, and (Exhibit 6). A job posting can indicate more than one education level; hence, the percentages shown in the chart below total more than 100%.

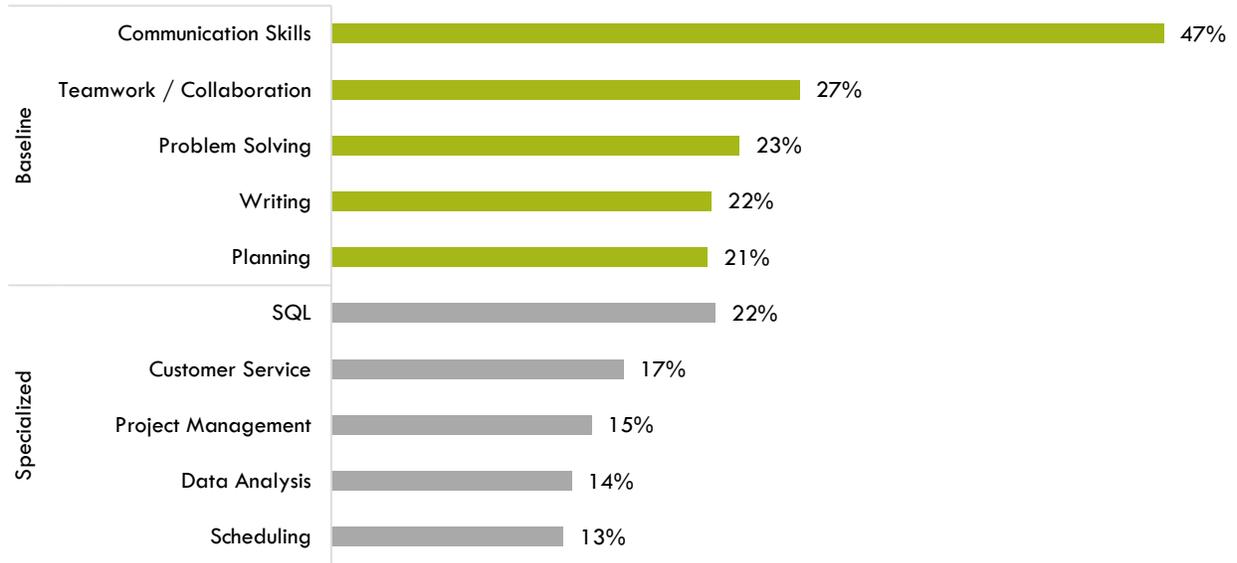
Exhibit 6. Education levels requested in job postings for drone technology and media

Education Level	Job Postings	% of Job Postings
Bachelor's degree	232	73%
High school or vocational training	119	38%
Master's degree	56	18%
Associate degree	38	12%
Doctoral degree	20	6%

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, 47% of job postings, teamwork/collaboration, 27%, and problem solving, 23%. The top three specialized skills are SQL, 22% of job postings, customer service, 17%, and project management, 15%.

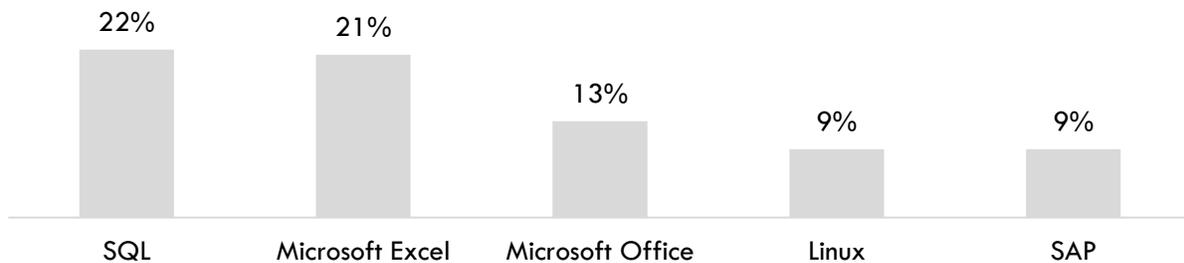
Exhibit 7. In-demand drone technology and media baseline and specialized skills



Software Skills

Analysis also included the software skills most in demand by employers. SQL and Microsoft Excel were the top two software skills identified in job postings (Exhibit 8).

Exhibit 8. In-demand drone technology and media software skills



Certifications

Of the 494 job postings, 96 contained certification data. Among those, 42% indicated a need for a driver's license. The next top certifications are Microsoft Certified Solutions Expert and Cisco Certified Entry Networking Technician (Exhibit 9). (Due to the low number of job postings with certifications listed, the chart below may not be representative of the full sample.)

Exhibit 9. Top drone technology and media certifications requested in job postings



Education, Work Experience & Training

A bachelor's degree is typically required for two of the four occupations (Exhibit 10). A high school diploma or the equivalent is typically required for surveying and mapping technicians, and camera operators, television, video, and film.

Exhibit 10. Education, work experience, training, and Current Population Survey results for drone technology and media occupations³

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Computer Occupations, All Other	Bachelor's degree	None	Moderate-term	34.7%
Surveying and Mapping Technicians	High school diploma or equivalent	None	Moderate-term	59.0%
Photographers	High school diploma or equivalent	None	Moderate-term	34.2%
Camera Operators, Television, Video, and Film	Bachelor's degree	None	None	25.4%

Supply

Analysis of program data from the California Community Colleges Chancellor's Office Data Mart included the TOP codes: 060400 - Radio and Television and 101200 - Applied Photography. Analysis of the last three years of TOP code data shows that, on average, 44 awards were conferred in the Central Valley/Mother Lode region each year (Exhibit 11). There are currently zero completions in the Central Valley/Mother Lode for TOP code-title 079900-Other Information Technology.

Exhibit 11. Postsecondary supply for drone technology occupations in the region

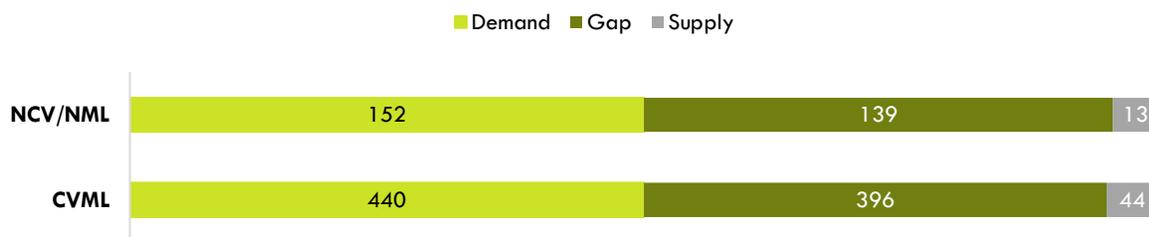
TOP Code - Title	Colleges	Associate Degree	Certificate 12 < 18 units	Certificate 18 < 30 units	Certificate 30 < 60 units	Subtotal
060400 - Radio and Television	San Joaquin Delta	11				11
	Bakersfield				8	8
101200 - Applied Photography	Fresno City	4	14		4	23
	Merced			1		1
	San Joaquin Delta			1		1
TOTAL		16	14	2	12	44

Gap Analysis

There is an undersupply of 139 drone technology and media workers in the NCV/NML subregion and 396 workers in the region (Exhibit 12).

³ "Labor Force Statistics from the Current Population Survey," Bureau of Labor Statistics, <https://www.bls.gov/cps/>.

Exhibit 12. Drone technology and media workforce annual demand and supply in the NCV/NML subregion and region



Student Outcomes

Exhibit 13 summarizes employment and wage outcomes from the California Community College Chancellor’s Cal-PASS Plus LaunchBoard for the TOP codes related to drone technology. Among applied photography students, 26 received a degree, certificate, or attained an apprenticeship, and 116 transferred. A higher percentage of radio and television students attained a median change in earnings and a living wage.

Exhibit 13. Regional metrics for the TOP codes related to drone technology

Metric	Radio and Television 060400	Applied Photography 101200
Students Who Got a Degree or Certificate or Attained Apprenticeship Journey Status	15	26
Number of Students Who Transferred	11	116
Job Closely Related to Field of Study	*	55%
Median Change in Earnings	150%	34%
Attained a Living Wage	63%	44%
* denotes data not available.		

Conclusion

The entry-level wages of the four occupations exceed the NCV/NML subregion’s average living wage. There were 494 job postings in the past six months for occupations related to drone technology in the subregion. Analysis of skills and certification requirements in job postings indicates:

- The top baseline skill is communication, and the top specialized skill is SQL.
- The top software skill is SQL.
- The top certification is a driver’s license.

There is an undersupply of trained workers, a shortage of 139 in the NCV/NML subregion and 396 in the region.

Recommendation

Based on these findings, it is recommended that Merced College work with the regional director, the college’s advisory board, and local industry in the development of programs to address the shortage of drone technology 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.