May 2023

Labor Market Analysis

Drone Technology

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 Modesto Junior 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 *Drone Technology*, which includes:

- Airline Pilots, Copilots, and Flight Engineers (SOC 53-2011)
- Commercial Pilots (SOC 53-2012)

Key Findings

- **Occupational Demand —** *Drone Technology* related occupations have a labor market demand of 45 annual job openings in the North Central Valley/Northern Mother Lode (NCV/NML) subregion. Between 2021 and 2026, commercial pilots are projected to have the most demand with 32 annual job openings and are projected to depreciate by five percent.

- **Wages** — Average entry-level earnings of $55.28/hour for *Drone Technology occupations* are higher than the living wage in the NCV/NML subregion, which is $12.65/hour for a single adult.[1] Airline pilots, copilots, and flight engineers earn the highest entry-level wage, $58.33/hour.

- **Employers and Occupational Titles —** Employers in the NCV/NML subregion include Reach Air Medical Services, Sierra West Airlines, and Phi Air Medical. The most common occupational title in job postings in the subregion is commercial pilots. The most common job title is rotor wing pilots.

- **Skills and Certifications —** The top baseline skill is record keeping, the top specialized skill is regulatory documents, and the top software skill is document object model. The most in-demand certification is a FAA Instrument Rating.

- **Education —** A high school diploma or equivalent is typically required for commercial pilots. A bachelor's degree is typically required for airline pilots, copilots, and flight engineers.

- **Supply and Demand Analysis —** Based on 45 annual openings (i.e., demand) and zero postsecondary degrees awarded (i.e., supply), an analysis of supply and demand suggests there is an undersupply of 45 workers in the NCV/NML subregion. In the CVML region, two awards were conferred suggesting an undersupply of 178 workers.

Recommendation

Based on a comparison of demand and supply, there is an undersupply of trained workers in the NCV/NML subregion and the CVML region. The Center of Excellence recommends that Modesto Junior College work with the regional directors, the college's advisory board, and local industry in the development of programs to address the shortage of Drone Technology workers.

[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/.

Introduction

The Central Valley/Mother Lode Center of Excellence developed this report to provide Modesto Junior College with labor market information for *Drone Technology*. 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. Analysis of the program and occupational data related to *Drone Technology* is included in the report. The Standard Occupational Classification (SOC) System code and occupational title used in this report from the Bureau of Labor Statistics and O*NET OnLine is shown below.

Airline Pilots, Copilots, and Flight Engineers (SOC 53-2011)

- **Job Description:** Pilot and navigate the flight of fixed-wing aircraft, usually on scheduled air carrier routes, for the transport of passengers and cargo. Requires Federal Air Transport certificate and rating for specific aircraft type used. Includes regional, national, and international airline pilots and flight instructors of airline pilots.
- **Knowledge:** Transportation, English Language, Geography, Mechanical, Public Safety and Security
- **Skills:** Operation and Control, Operations Monitoring, Active Listening, Critical Thinking, Monitoring

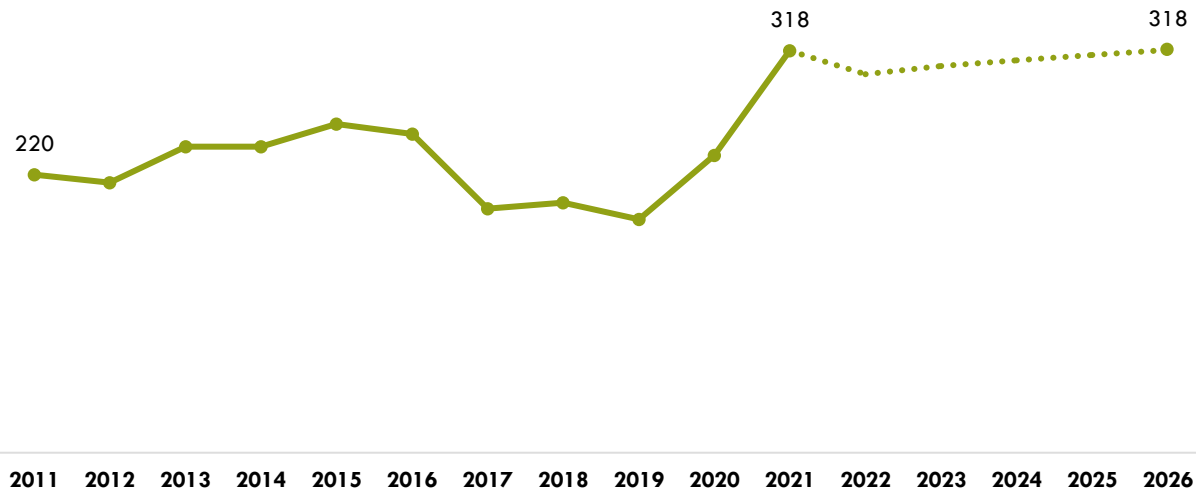
Commercial Pilots (SOC 53-2012)

- **Job Description:** Pilot and navigate the flight of fixed-wing aircraft on nonscheduled air carrier routes, or helicopters. Requires Commercial Pilot certificate. Includes charter pilots with similar certification, and air ambulance and air tour pilots. Excludes regional, national, and international airline pilots.
- **Knowledge:** Transportation, Customer and Personal Service, Geography, English Language, Public Safety and Security
- **Skills:** Operation and Control, Operations Monitoring, Critical Thinking, Monitoring, Active Listening

Employment

Exhibit 1a shows trends for *Drone Technology* in the NCV/NML subregion. Between 2021 to 2026, the number of jobs for *Drone Technology* is projected to remain the same, or grow by zero percent.

Exhibit 1a. Occupational projections for *Drone Technology* in the NCV/NML subregion



Between 2021 to 2026, *Drone Technology* in the NCV/NML subregion employed 318 workers in 2021 (Exhibit 1b). Commercial pilots are projected to decrease by five percent over the next five years and have projected annual openings of 32.

Exhibit 1b. Occupational projections for *Drone Technology* in the NCV/NML subregion

Occupation	2021 Jobs	2026 Jobs	5-Year Change	5-Year % Change	Annual Openings
Commercial Pilots	249	235	(14)	(5%)	32
Airline Pilots, Copilots, and Flight Engineers	69	83	14	21%	13
TOTAL	**318**	**318**	**0**	**0%**	**45**

Wages

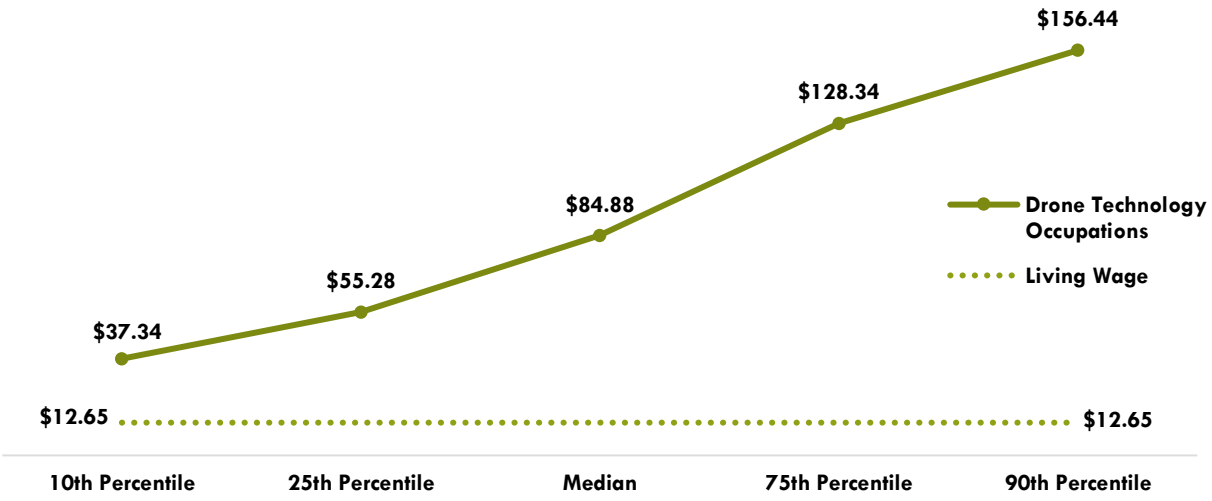
The average living wage for a single adult in the NCV/NML subregion is $12.65/hour.[2] Exhibit 2a shows the entry-hourly wages for airline pilots, copilots, and flight engineers related to *Drone Technology*, which are $58.33/hour.[3] Please note 10th and 25th percentiles are considered entry-level wages while 75th and 90th are considered experienced wages, either gained by long-term employment, extra training, etc.

Exhibit 2a. Hourly wages for *Drone Technology* in the NCV/NML subregion

Occupation	Pct. 25 Hourly Earnings	Median Hourly Earnings	Pct. 75 Hourly Earnings
Airline Pilots, Copilots, and Flight Engineers	$58.33	$103.08	$185.54
Commercial Pilots	$52.24	$66.68	$71.14

Exhibit 2b shows the average hourly wages for *Drone Technology Occupations*; the average entry-level wage is more than the average entry-level living wage for the SCV/SML subregion.

Exhibit 2b. *Drone Technology Occupations* average hourly wages in the SCV/SML subregion



[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 70 job postings for *Drone Technology* in the NCV/NML 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 Reach Air Medical Services, Sierra West Airlines, and Phi Air Medical.

Exhibit 3. Top employers of *Drone Technology* by number of job postings

Employer
Reach Air Medical Services
Sierra West Airlines
Phi Air Medical
Northeast Healthcare Recruitment
Phi Health
Helius
Belcan
Aviation Search Group
Global Medical Response
Courtney Aviation

Top Occupational Titles

Exhibit 4 shows the O*NET OnLine occupational titles for *Drone Technology* in the NCV/NML subregion. Common job titles in postings include: Rotor Wing Pilots, Helicopter Pilots, and Emergency Medical Services Helicopter Pilots.

Exhibit 4. Top occupational titles in job postings for *Drone Technology*

Occupational Title
Commercial Pilots
Airline Pilots, Copilots, and Flight Engineers

[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.

Education

Of the 70 job postings, zero listed a preferred or minimum educational requirement for the position being filled.

Baseline, Specialized, and Software Skills

Exhibit 5 depicts the top baseline, specialized, and software skills in job postings. The three most important baseline skills are record keeping, cleanliness, and customer service. The top three specialized skills are regulatory documents, federal aviation administration, and rotorcraft. The top software is document object model.

Exhibit 5. In-demand baseline, specialized, and software skills for *Drone Technology*

Baseline Skills	Specialized Skills	Software Skills
Record Keeping	Regulatory Documents	Document Object Model
Cleanliness	Federal Aviation Administration	Inventory Control Systems
Customer Service	Rotorcraft	Inventory Management System
Communications	Multi-Engine Land	Software Systems
Loading and Unloading	Community Outreach	

Certifications

Of the 70 job postings, there were 77 certifications listed. Among those, 44% indicated a need for a FAA Instrument Rating. The next top certification is a FAA Second Class Medical Certificate (Exhibit 6). In accordence with the Federal Aviation Administration (FAA) regulations, "in order to fly your drone under the FAA's Small UAS Rule (Part 107), you must obtain a Remote Pilot Certificate from the FAA. This certificate demonstrates that you understand the regulations, operating requirements, and procedures for safely flying drones."[5]

Exhibit 6. Top *Drone Technology* certifications requested in job postings

Certifications	% of Job Postings
FAA Instrument Rating	44%
FAA Second Class Medical Certificate	31%
Security Identification Display Area (SIDA) Badge	6%
Airline Transport Pilot License	6%
Commercial Pilot License	6%

[5] Federal Aviation Administration: faa.gov/uas/commercial_operators/become_a_drone_pilot - :~:text=In order to fly your,procedures for safely flying drones..

Education, Work Experience, & Training

A high school diploma or equivalent is typically required for commercial pilots. A bachelor's degree is typically required for airline pilots, copilots, and flight engineers (Exhibit 7).

Exhibit 7. Education, work experience, training, and Current Population Survey results for *Drone Technology*[6]

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Commercial Pilots	High school diploma or equivalent	None	Moderate-term	22.0%
Airline Pilots, Copilots, and Flight Engineers	Bachelor's degree	Less than 5 years	Moderate-term	22.0%

Supply

An analysis of program data from the Integrated Postsecondary Education Data System (IPEDS) for the last three program years shows that, on average, zero awards were conferred in the NCV/NML subregion (Exhibits 8 and 9). Also, please note there was no supply data available for 079900 - Other Information Technology.

Exhibit 8. TOP and CIP codes for *Drone Technology*

TOP Titles	CIP Titles
302020 - Piloting	49.0102 - Airline/Commercial/Professional Pilot and Flight Crew
079900 - Other Information Technology	11.0899 - Computer Software and Media Applications, Other 11.9999 - Computer and Information Sciences and Support Services, Other

Exhibit 9. Postsecondary supply for *Drone Technology*

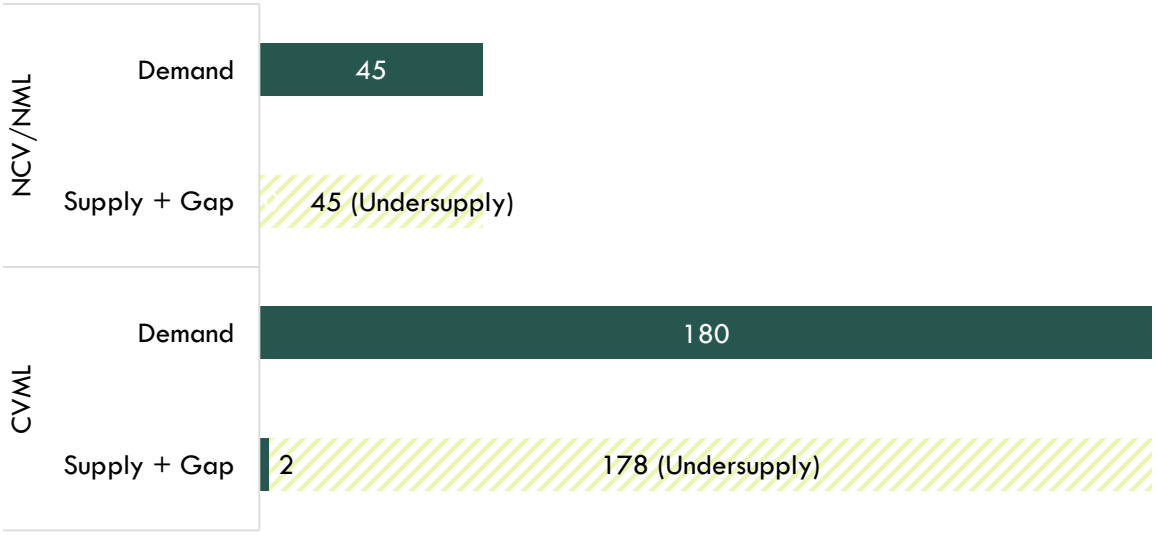
TOP/CIP Code- Title	College	Associate Degree	Total
302020 - Piloting	Reedley College	2	2
NCV/NML TOTAL		0	0
CVML TOTAL		**2**	**2**

*NCV/NML awards

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

There is an undersupply of 45 *Drone Technology* workers in the NCV/NML subregion and an undersupply of 178 workers in the region (Exhibit 10).

Exhibit 10. *Drone Technology* workforce demand (annual job openings), postsecondary awards (supply), and additional students needed to fill gap in the NCV/NML subregion and region



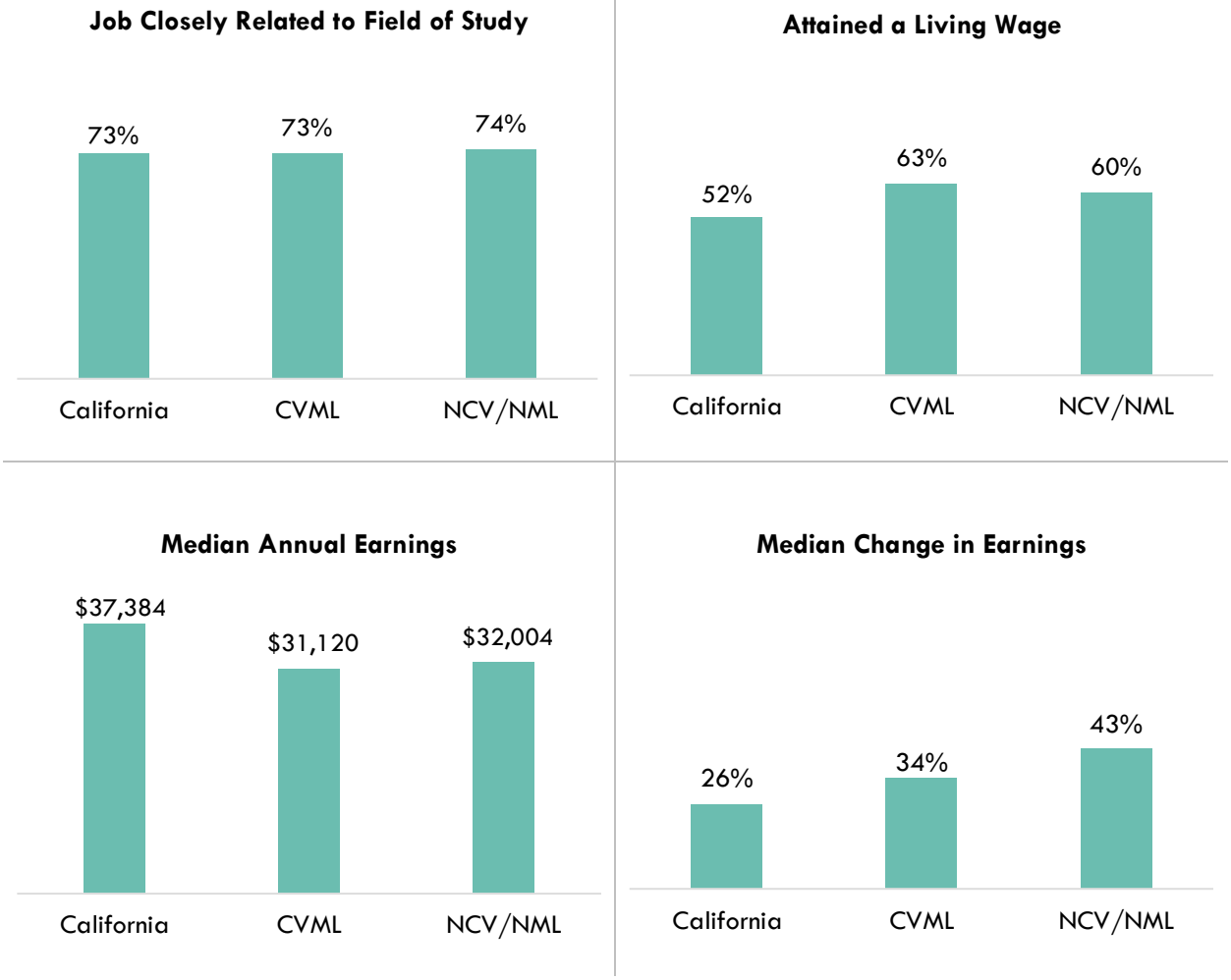
Student Outcomes

Exhibits 11a- 11b summarize outcomes from California Community College Chancellor's LaunchBoard for TOP codes related to *Drone Technology*. Notably, 74% of students obtained a job closely related to their field of study in the subregion and 60% attained a living wage in the subregion.

Exhibit 11a. Metrics for TOP 302020 - Piloting

Metric	
Students Who Got a Degree or Certificate or Attained Apprenticeship Journey Status	2,700
Number of Students Who Transferred	2,388
*denotes data not available in table and charts	

Exhibit 11. Metrics for TOP 302020 - Piloting



Recommendation

This report suggests there is a shortage of 45 workers in the NCV/NML subregion and a shortage of 178 workers in the CVML region for *Drone Technology*. Based on these findings, it is recommended that Modesto Junior College work with the regional directors, the college's advisory board, and local industry in the development of programs to address the shortage of *Drone Technology* 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	Burning Glass: burning-glass.com/.
Additional Education Requirements/ Employer Preferences	The O*NET Job Zone database includes over 900 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.