Unmet Workforce Demand for Avionics Jobs in LA County

Labor Market Supply and Demand Analysis for Bachelor of Science in Aviation Maintenance Technology - Avionics at West LA College

Prepared by: Los Angeles Center of Excellence for Labor Market Research
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Key Findings

Demand:

- Employment for aerospace engineers has declined by 42% over the last 20 years in LA County.
- Over the next five years, jobs for aerospace engineers are projected to grow by 27%, resulting in more than 500 jobs available annually in Los Angeles County.
- Average hourly wages for aerospace engineers are $26.80 higher than the average across all occupations at the 10th percentile, $28.89 higher at the 25th percentile, $37.60 higher at the median, $53.26 higher at the 75th percentile, and $65.93 more per hour at the 90th percentile.
- The majority of employers hiring aerospace engineers in the past 12 months in Los Angeles County preferred a candidate with a bachelor's degree (88%).
- Los Angeles County employers seeking candidates with a bachelor's degree for aerospace engineers are advertising annual salaries that are nearly $62,000 per year higher ($132,864) than those seeking candidates with a high school diploma or associate degree ($70,912). This is an 87% difference.

Supply:

- Between 2020 and 2022, educational providers in the region conferred an average of 307 bachelor's degrees from programs related to aerospace engineering.

Gap Analysis:

- With 307 average annual bachelor's degrees issued in the county and 521 job postings for aerospace engineers from prospective employers requiring a bachelor's degree for entry, the potential supply gap at this level of education is 214 unfilled jobs in LA County.

Introduction

Catalog Description/Program Description

The Bachelor of Science in Aviation Maintenance Technology: Avionics is designed to meet a critical demand for highly skilled technicians capable of troubleshooting complex aircraft, spacecraft and satellite systems, as well as possessing a high degree of critical and analytical skills coupled with an ability to communicate and organize sophisticated ideas in order to improve safety and maintenance reliability and lead programs and personnel.

Graduates will be certified Airframe and Power Plant mechanics by the Federal Aviation Administration (FAA), and licensed avionics technicians by the Federal Communication Commission (FCC) and National Center for Aerospace & Transportation Technologies (NCATT) in order to perform the necessary repairs and operational tests on all general and commercial airplanes. As holders of a baccalaureate degree, graduates will also possess the critical thinking, communication and leadership skills to become managers, reliability engineers, business owners, and other mid-level professionals.

- ***Aerospace Engineers* (47-1011)** Perform engineering duties in designing, constructing, and testing aircraft, missiles, and spacecraft. May conduct basic and applied research to evaluate adaptability of materials and equipment to aircraft design and manufacture. May recommend improvements in testing equipment and techniques.[1]

The purpose of this study is to determine whether there is demand in the statewide and regional labor market for aerospace engineers that is not being met by the supply from relevant training programs. More specifically, this report addresses the labor market components of Assembly Bill 927, which require evidence of unmet workforce needs related to West LA College's proposed Bachelor of Science in Aviation Maintenance Technology - Avionics.[2]

[1] Aerospace Engineers (bls.gov)
[2] AB-927 Public postsecondary education: community colleges: statewide baccalaureate degree program

Key Avionics Occupation

The key avionics occupation analyzed in this report was selected from the 2018 Standard Occupational Classification (SOC) system. Aerospace engineers are classified under the architecture and engineering occupations major group (17-0000).

Exhibit 1: Key avionics occupation

SOC Code	Description	Typical Entry-Level Education	Work Experience Required
17-2011	Aerospace Engineers	Bachelor's Degree	None

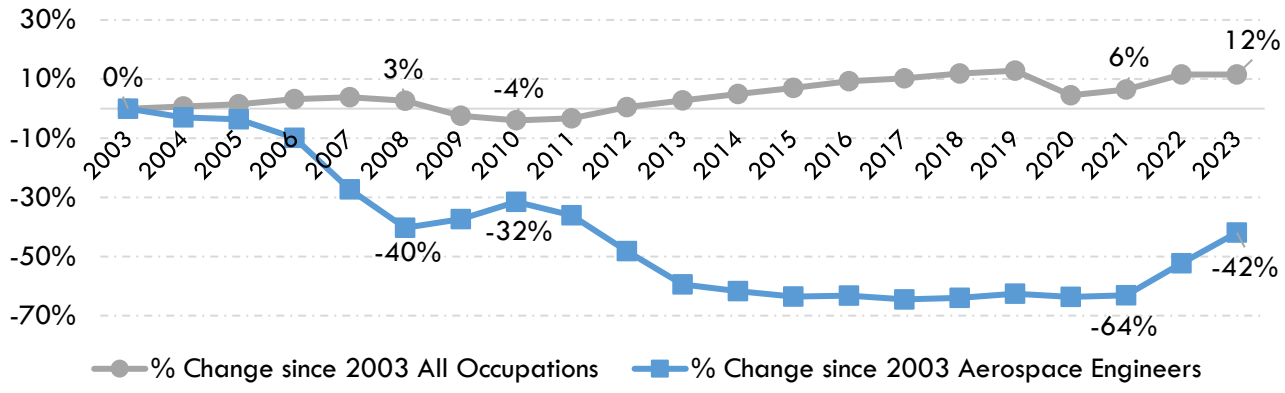
Source: 2018 Standard Occupational Classification (SOC) system

Labor Market Demand for Avionics Jobs

Historical employment in LA County

Exhibit 2 demonstrates that since 2003, employment for aerospace engineers has declined by 42% while employment across all occupations has grown by 12%. Aerospace engineers have experienced periods of growth and decline over the past 20 years, showing a less favorable percentage change in the number of jobs since 2003 as compared to all jobs in Los Angeles County. The first major dip in the number of jobs coincided with the Great Recession (2007-2009). While jobs appeared to have slightly rebounded between 2009 and 2010, counts continued to fall from 2011-2021, when there were 64% fewer aerospace engineer jobs as compared to 2003. These jobs have steadily increased from 2021-2023, growing by 10% each year; however, the number of aerospace engineer jobs in LA County in 2023 is still 42% fewer than the number of aerospace engineer jobs in 2003. Since 2003, the number of jobs in Los Angeles County have increased by 12%, only dipping below the number of 2003 jobs during the Great Recession (2007-2009).

Exhibit 2: Percent change in employment since 2003



Source: Lightcast, Datarun 2024.2

Projected annual job openings, 2022-2027

Exhibit 3 displays detailed 2022 job counts, projected employment figures through 2027, five-year percentage change in employment, and projected annual job openings for aerospace engineers. In Los Angeles County, there will be more than 500 annual job openings through 2027. Aerospace engineers are projected to grow by 27% by 2027 in LA County. In California, more than 1,000 job openings are projected to be available annually, signaling that more than half of aerospace engineer jobs in California are located in LA County. This occupation is expected to grow by 12% throughout the state, nearing 12,400 jobs by 2027.

Exhibit 3: Occupational demand in Los Angeles County and California

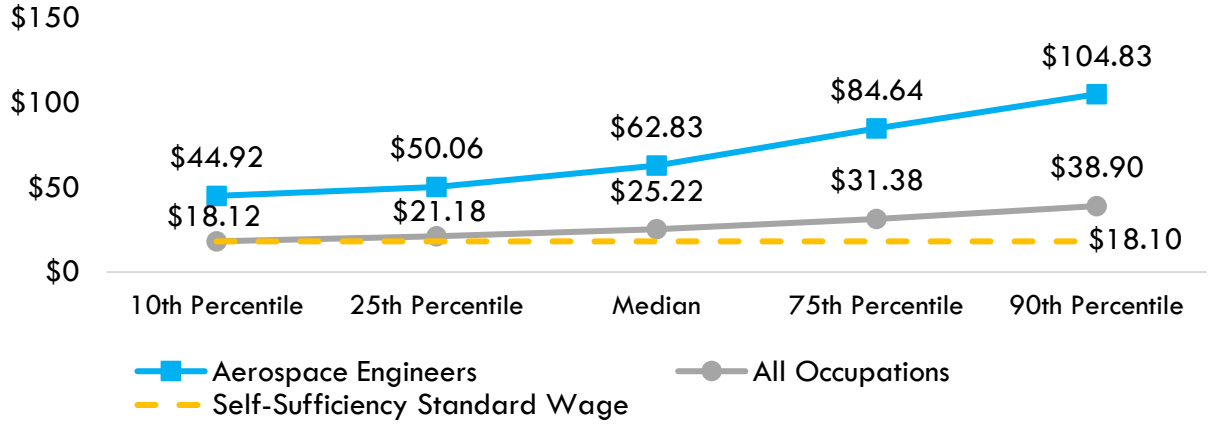
SOC	Occupation	Region	2022 Jobs	2027 Jobs	5-Year % Change	Annual Openings
17-2011	Aerospace Engineers	Los Angeles	4,513	5,723	27%	521
		California	11,084	12,370	12%	1,034

Source: Lightcast, Datarun 2024.2

Average hourly wages for aerospace engineers

The average hourly wage for aerospace engineers in Los Angeles County at the 10th, 25th, median, 75th, and 90th percentile is displayed in Exhibit 4. At the lowest percentile available (i.e., the 10th), workers employed as aerospace engineers earn $26.80 per hour more than the regional average across all occupations. This is welcome news by itself; however, the lifelong benefit of being employed as an aerospace engineer in Los Angeles County is that this gap widens among higher earners in a mostly linear fashion. Progressing to the 25th percentile, aerospace engineers earn $28.89 per hour more than the average worker in the region, $37.60 more at the median level, $53.26 more at the 75th percentile, and $65.93 more per hour at the 90th percentile, on average. While earnings may vary depending on employer, industry, and city of employment, these represent average wages across Los Angeles County.

Exhibit 4: Hourly wage range for aerospace engineers



Source: Lightcast, Datarun 2024.2 and the Self-Sufficiency Standard for California

Detailed median hourly and annual wages are displayed in Exhibit 5 for aerospace engineers in Los Angeles County.

Exhibit 5: Median hourly and annual wages for aerospace engineers

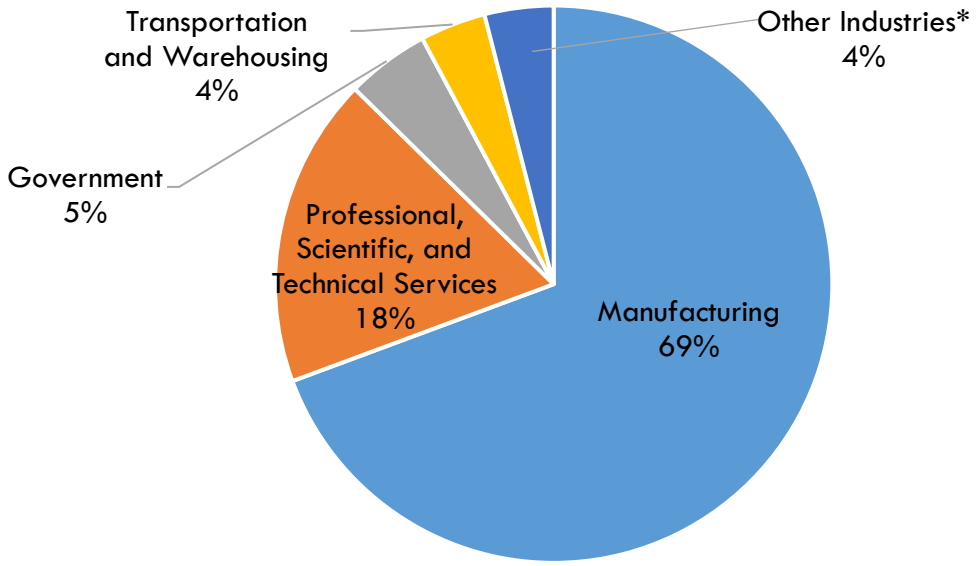
SOC Code	Description	Median Hourly Earnings	Median Annual Earnings
17-2011	Aerospace Engineers	$62.83	$130,678

Source: Lightcast, Datarun 2024.2

Industry employment of aerospace engineers

Exhibit 6 displays the portion of aerospace engineers working within each industry sector. Unsurprisingly, the industry sector with the largest share of aerospace engineers is manufacturing (69%). Combined with professional, scientific, and technical services (18%) these two industry sectors account for more than 87% of the employment for aerospace engineers in Los Angeles County. Within the manufacturing sector, the largest share of employment for aerospace engineers is within the aerospace product and parts manufacturing industry at 61% (NAICS 3364), followed by navigational, measuring, electromedical, and control instruments manufacturing at 7% (NAICS 3345).

Exhibit 6: Industry concentration of aerospace engineer jobs in 2022



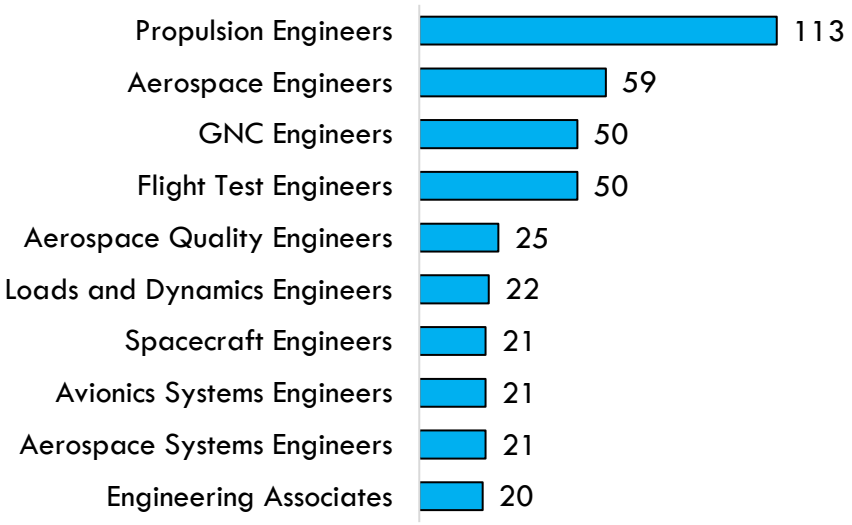
**Other Industries include: Management of Companies and Enterprises (1.4%), Administrative and Support and Waste Management and Remediation Services (1.0%), Information (0.6%), Construction (0.4%), Educational Services (0.3%), Wholesale Trade (0.1%), Arts, Entertainment, and Recreation (0.1%), and Other Services, except Public Administration (0.1%).*

Source: Lightcast, Datarun 2024.2

Job postings for aerospace engineers

Over the last 12 months (June 2023 through May 2024), there were 1,079 unique online job postings for aerospace engineers in Los Angeles County. The number of job postings by job title appear in Exhibit 7. The most common job titles from job postings were propulsion engineers, aerospace engineers, flight test engineers, and GNC engineers. The employers posting the most job ads during this timeframe were Boeing, Northrop Grumman, SpaceX, Supernal, Rocket Lab USA, and The Aerospace Corporation. The skills sought most frequently in these job ads were related to systems engineering, physics, aerospace engineering, spacecraft, export control, avionics, computer science, propulsion, flight testing, and simulations. Many of these job postings also require security clearance, presumably due to defense work for government contracts.

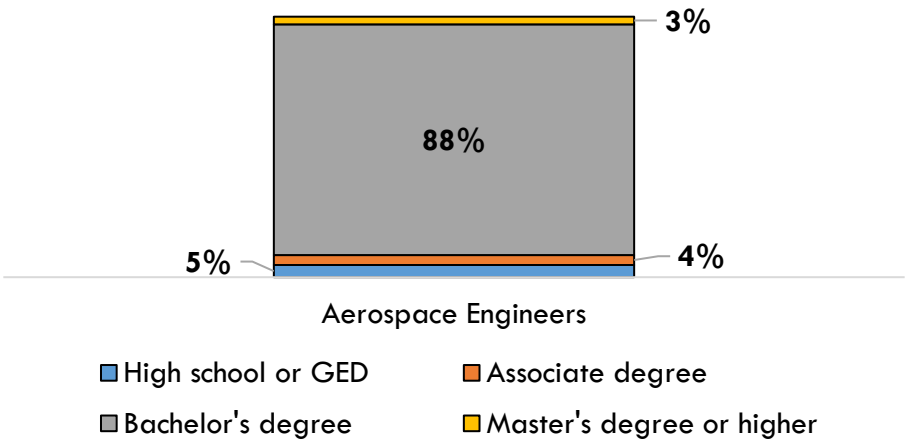
Exhibit 7: Job postings by job title in Los Angeles County (June 2023 – May 2024)



Source: Lightcast job posting data

Of all the job postings that listed a minimum educational requirement, the vast majority of employers sought candidates with a bachelor's degree (88% of total). Exhibit 8 shows a breakdown of education levels listed in job postings for aerospace engineers. There were 9% of job postings that desired a candidate holding less than a bachelor's degree: 4% of job postings desired a candidate with an associate degree, while 5% requested candidates with a high school diploma or GED. Only 3% of the job postings desired a candidate with a master's degree or more education. In Los Angeles County, there were 812 job postings that required a bachelor's degree for entry for aerospace engineers.

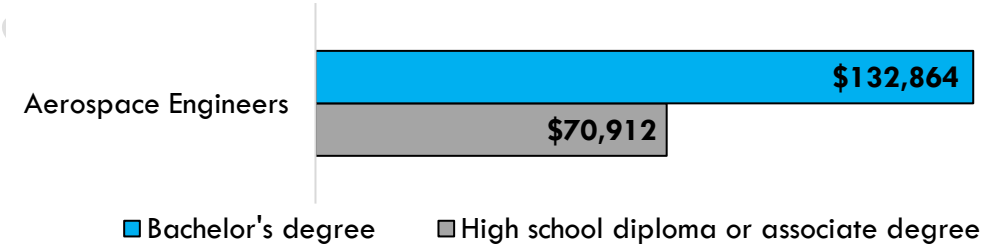
Exhibit 8: Education breakdown in job postings in Los Angeles County



Source: Lightcast job posting data

Taking a closer look at job postings that listed a bachelor's degree as the required level of education versus postings that listed a high school diploma or associate degree, employers seeking candidates with a bachelor's degree for aerospace engineers are advertising annual salaries that are nearly $62,000 per year higher than those seeking candidates with a high school diploma or associate degree. Exhibit 9 demonstrates that regional employers posting job ads for aerospace engineers are willing to pay 87% more for candidates with a bachelor's degree than for candidates with a high school diploma or associate degree.

Exhibit 9: Annual median advertised salary by education level in Los Angeles County



Source: Lightcast job postings data

Educational Supply: Training Programs for Aerospace Engineers

Bachelor's degrees related to aerospace engineering

In Los Angeles County, awards related to aerospace engineering have been conferred at four 4-year colleges (see Exhibit 10 below for summary data and Appendix for details). Between 2020 and 2022, there was an annual average of 307 bachelor's degrees awarded. Currently, there are no programs in Los Angeles County that are coded under the following related CIP codes:

Aeronautical/Aerospace Engineering Technology/Technician (15.0801) or Avionics Maintenance Technology/Technician (47.0609).

Exhibit 10: LA County bachelor's degrees, 2020-2022

Program (CIP)	2019-20	2020-21	2021-22	3-Year Average
Aerospace, Aeronautical, and Astronautical/Space Engineering, General (14.0201)	275	274	372	307

Source: National Center for Education Statistics' Integrated Postsecondary Education Data System

In California, bachelor's degrees related to aerospace engineering have been issued at 12 colleges: Eleven 4-year colleges, and one 2-year community college (see Exhibit 11). Between 2021 and 2023, there was an average of 15 bachelor's degrees awarded annually at one community college (Antelope Valley). Due to different data collection periods, data for 4-year colleges throughout the state is available from 2020 to 2022. Between 2020 and 2022, there was an average of 783 bachelor's degrees awarded annually at 11 different 4-year colleges. More than one-third of aerospace engineering-related awards conferred in California were at 4-year colleges in Los Angeles County (307 of 798 awards). Currently, there are no programs in California that are coded under the following related CIP codes: Aeronautical/Aerospace Engineering Technology/Technician (15.0801) or Avionics Maintenance Technology/Technician (47.0609).

Exhibit 11: California bachelor's degrees, 2019-2023

Program (TOP)	2020-21	2021-22	2022-23	3-Year Average
Aeronautical and Aviation Technology (0950.00)	15	13	16	15
Program (CIP)	**2019-20**	**2020-21**	**2021-22**	**3-Year Average**
Aerospace, Aeronautical, and Astronautical/Space Engineering, General (14.0201)	733	772	844	783

Source: National Center for Education Statistics' Integrated Postsecondary Education Data System

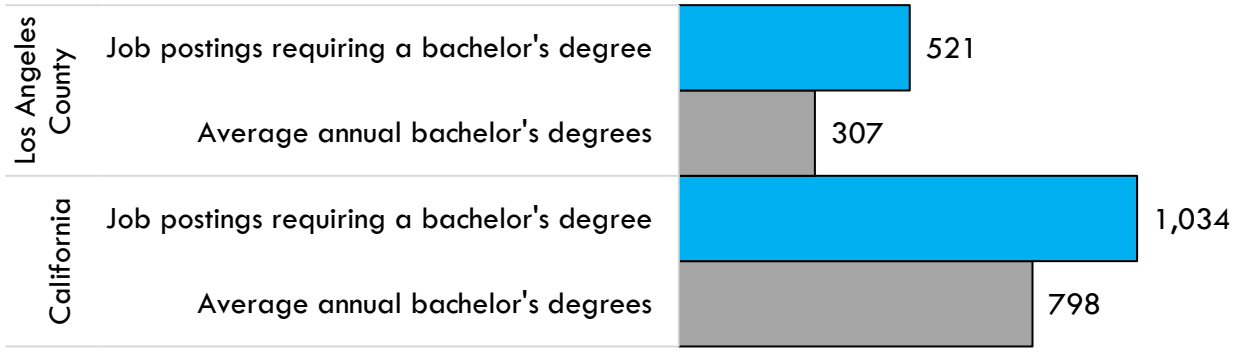
Gap Analysis

Breaking down the educational supply and occupational demand for aerospace engineer jobs in Los Angeles County yields a clear pattern (see Exhibit 12). With 307 average annual bachelor's degrees issued in the county and 521 job openings for aerospace engineers requiring a bachelor's degree for entry, the potential supply gap at the baccalaureate level is 214 unfilled jobs. It is worth noting that there were also 812 unique job postings in Los Angeles County over the last year seeking aerospace engineers with a bachelor's degree. This projected workforce

shortage facing Los Angeles County requires the attention of all regional education and training providers.

In California as a whole, there is also a gap between the number of job openings requiring a bachelor's degree and the number of annual bachelor's degrees awarded. While there were 1,034 aerospace engineer job openings requiring a bachelor's degree in California in the past year, there were 798 bachelor's awards conferred in key related programs. Therefore, a statewide projected workforce shortage of 236 unfilled annual job openings for aerospace engineers with baccalaureate degrees is certainly a cause for conversation and planning among education and training providers. It is worth noting that there were also 1,961 unique job postings in California over the last year seeking aerospace engineers with a bachelor's degree.

Exhibit 12: Supply and demand gap analysis for aerospace engineers



Source: Lightcast job postings data; California Community Colleges Chancellor's Office Management Information Systems Data Mart; National Center for Education Statistics' Integrated Postsecondary Education Data System

Recommendations & Discussion

This report demonstrates that the demand for projected jobs related to aerospace engineers is unmet by the talent supply from related education and training programs over the next five years, both in Los Angeles County and California as a whole. While this is a great starting point to engage in meaningful discussion about the prospects of a community college baccalaureate program helping to bridge the gap between talent supply and occupational demand in the labor market, it is not sufficient based on legislation.

Therefore, this report can be used as a launch board to validate these findings from traditional labor market information and job postings with regional employers and training providers in an effort to validate the following (sub-bullets summarize key points of support from this report):

- **Evidence that employers are having difficulty filling positions that require a baccalaureate degree.**
    - With nearly 1,079 job postings for aerospace engineers in Los Angeles County over the last year, there is strong evidence that regional employers are actively seeking qualified individuals for these jobs. 88% of these are seeking candidates with a bachelor's degree.
- **Evidence that employers are willing to pay baccalaureate degree holders more than those with a related associate degree or no postsecondary degree.**
    - Regional employers seeking candidates with a bachelor's degree for aerospace engineer jobs are advertising annual salaries that are 87% higher, or nearly $62,000 higher, per year than those seeking candidates with a high school diploma or associate degree.
- **Evidence that employers prefer candidates with the proposed baccalaureate degree.**
    - The majority of regional employers were seeking candidates with a bachelor's degree (88% of total), demonstrating that employers postings job ads prefer candidates with a bachelor's degree for these jobs.
- **Evidence of job placement and/or promotion opportunities for candidates with a baccalaureate degree.**
    - Evidence of this criterion requires additional information from regional employers.
- **Evidence that the occupation/field the proposed baccalaureate degree is in will provide for higher-wage job opportunities.**
    - Average hourly wages for aerospace engineers are $26.80 higher than the average across all occupations at the 10th percentile, $28 higher at the 25th percentile, $37 higher at the median, $53 higher at the 75th percentile, and $65 more per hour at the 90th percentile.

Methodology

This report has three primary objectives:

1. Assess and quantify the labor market demand for aerospace engineers in Los Angeles County and California that typically require a bachelor's degree for entry.
2. Assess and quantify the educational supply for such jobs.
3. Calculate the potential unmet workforce demand for these jobs.

For the first objective, the most recent datarun (2024.2) from Lightcast was analyzed using 2022 as a base year and a five-year projection period through 2027. This five-year period approximates the time it takes for a typical community college training program to be developed, approved, and for the first cohort of students to enroll, complete the program, and enter the workforce. The average annual job openings for aerospace engineers that typically require a bachelor's degree for entry was the primary metric analyzed for this objective.

The second objective was calculated using the National Center for Education Statistics' Integrated Postsecondary Education Data System (IPEDS). This dataset was queried for the number of bachelor's degrees issued from educational institutions in Los Angeles County and California during the most recent three academic years available (2021-23 for TOP programs and 2020-22 for CIP programs). Reporting in IPEDS is organized by Classification of Instructional Programs (CIP). The California Community Colleges Chancellor's Office Management Information Systems Data Mart was queried for sub-baccalaureate awards. Reporting in this system is organized by the Taxonomy of Programs (TOP).

The third objective was achieved by calculating the difference between the sum of job openings requiring a bachelor's degree related to aerospace engineers and the number of baccalaureate awards issued from related bachelor's-level programs. This calculation determines whether there is demand in the labor market for bachelor's level candidates that is not being met by the bachelor's supply from educational programs that align with the relevant occupation.

Appendix

Table A: Los Angeles County bachelor's degrees issued for aerospace engineering

CIP - Program	Institution	2019-20 Awards	2020-21 Awards	2021-22 Awards	3-Year Average
14.0201 – Aerospace, Aeronautical, and Astronautical/Space Engineering, General	California State Polytechnic University-Pomona	103	101	163	122
	California State University-Long Beach	73	63	97	78
	University of California-Los Angeles	56	58	63	59
	University of Southern California	43	52	49	48
Grand Total/Average		**275**	**274**	**372**	**307**

Table B: California bachelor's degrees issued for aerospace engineering

TOP - Program	Institution	2020-21 Awards	2021-22 Awards	2022-23 Awards	3-Year Average
0950.00 – Aeronautical and Aviation Technology	Antelope Valley	15	13	16	15
CIP - Program	**Institution**	**2019-20 Awards**	**2020-21 Awards**	**2021-22 Awards**	**3-Year Average**
14.0201 – Aerospace, Aeronautical, and Astronautical/ Space Engineering, General	California State Polytechnic University-Pomona	103	101	163	122
	California Polytechnic State University-San Luis Obispo	113	93	106	104
	University of California-San Diego	75	126	83	95
	California State University-Long Beach	73	63	97	78
	San Diego State University	61	80	70	70
	San Jose State University	82	55	74	70
	University of California-Irvine	59	72	78	70
	University of California-Davis	60	67	55	61
	University of California-Los Angeles	56	58	63	59
	University of Southern California	43	52	49	48
	Stanford University	8	5	6	6
	Grand Total	**748**	**785**	**860**	**798**

About the Centers of Excellence for Labor Market Research

The Centers of Excellence (COE) is a statewide initiative supported by the California Community Colleges' Economic and Workforce Development program. The COE research team represents expertise in labor market analysis with a focus on research design, educational and training program mapping, and identifying skill sets for emerging occupations as well as geospatial analysis. The COE maintains strategic alliances with research organizations whose relationships and technical expertise enhance COE research efforts and with industry associations that assist in validating research findings, ensuring that the most recent industry and labor market conditions are captured. COE studies are used to inform policy discussions, industry-wide legislative efforts, and regional workforce and economic development strategies, as well as guide program and resource development efforts by the California Community Colleges. These reports can be accessed at **www.coeccc.net**.