

Summary

Program LMI Endorsement	Endorsed: All LMI Criteria Met <input type="checkbox"/>	Endorsed: Some LMI Criteria Met <input checked="" type="checkbox"/>	Not LMI Endorsed <input type="checkbox"/>
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Program LMI Endorsement Criteria

	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Supply Gap:	<i>Comments:</i> there is projected to be 1,956 annual job openings throughout Los Angeles and Orange counties for these middle-skill uncrewed systems applications occupations, which is more than the 576 awards conferred by educational institutions.	
Living Wage: (Entry-Level, 25 th)	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
	<i>Comments:</i> the majority (54%) of annual job openings for these middle-skill uncrewed systems occupations have entry-level hourly wages significantly below the OC living wage of \$20.63. However, the remaining 46% of annual job openings have entry-level hourly wages significantly above the living wage.	
Education:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
	<i>Comments:</i> Though these middle-skill uncrewed systems applications occupations typically require a high school diploma, more than one-third of workers in the field have completed some college or an associate degree as their highest level of education.	

Emerging Occupation(s)

Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<i>Comments:</i> Previous research from the OC COE has demonstrated that drone technology cuts across multiple occupational areas including construction, maintenance and repair, photography, public safety, software development, and more. ¹ Because knowledge of drone technology is a skill that can be applied to numerous occupations, there is no Standard Occupational Classification (SOC) code within the federal Bureau of Labor Statistics (BLS) coding system. This report includes an analysis of online job postings for drone-related skills to better understand real-time demand for drone workers.	

The Orange County Center of Excellence for Labor Market Research (OC COE) prepared this report to provide Los Angeles/Orange County labor market demand and supply data related to the following occupations:

- Middle-Skill
 - Surveying and Mapping Technicians (17-3031)
 - Photographers (27-4021)
 - Construction and Building Inspectors (47-4011)

¹ <https://coeccc.net/orange-county/2022/07/drone-technology/>

- Above Middle-Skill – denoted with an asterisk (*) throughout this report.
 - Cartographers and Photogrammetrists (17-1021)*
 - Camera Operators, Television, Video, and Film (27-4031)*

Previous research from the OC COE has demonstrated that uncrewed systems applications and drone technology cuts across multiple occupational areas including construction, maintenance and repair, photography, public safety, software development, and more. Because knowledge of drone technology is a skill that can be applied to numerous occupations, there is no Standard Occupational Classification (SOC) code within the federal Bureau of Labor Statistics (BLS) coding system. However, the five occupations analyzed in this report commonly utilize drones.

Additionally, though the occupations included in this report may utilize drones, not all jobs require drone skills. Therefore, traditional labor market demand data is overstated for drone technology. To better understand real-time demand for drone skills, this report includes an analysis of online job postings for drone-related jobs. Furthermore, the vast majority of the educational programs that prepare students for the five occupations analyzed in this report do not have a specific emphasis on drones and supply for drone workers is overstated.

Based on the available data there appears to be a supply gap for these middle-skill uncrewed systems applications occupations and typical education requirements for these middle-skill occupations align with a community college education. However, the majority of annual job openings for these middle-skill occupations have entry-level wages below the living wage. **Therefore, due to some of the regional labor market criteria being met, the COE endorses this proposed program.**

Exhibit 1 lists the occupational demand, supply, typical entry-level education, educational attainment, and percentage of self-employed workers for the occupations included in this report.

Exhibit 1: Labor Market Endorsement Summary

Occupation (SOC)	Demand (Annual Openings)	Supply (CC and Non-CC)	Entry-Level Hourly Earnings (25 th Percentile)	Typical Entry-Level Education	Community College Educational Attainment
Surveying and Mapping Technicians (17-3031)	LA: 103	LA: 241	OC: \$27.93	High school diploma or equivalent	56%
	OC: 179	OC: 87			
	TTL: 156	TTL: 328			
Photographers (27-4021)	LA: 958	LA: 163	OC: \$14.96	High school diploma or equivalent	34%
	OC: 270	OC: 26			
	TTL: 1,228	TTL: 189			
Construction and Building Inspectors (47-4011)	LA: 401	LA: 18	OC: \$27.47	High school diploma or equivalent	43%
	OC: 179	OC: 41			
	TTL: 580	TTL: 59			
Middle-Skill Subtotal	1,965	576	N/A	N/A	N/A
Cartographers and Photogrammetrists (17-1021)	LA: 19	LA: 2	OC: \$34.46	Bachelor's Degree	23%
	OC: 7	OC: 0			
	TTL: 26	TTL: 2			
Camera Operators, Television, Video, and Film (27-4031)	LA: 714	LA: 524	OC: \$18.16	Bachelor's Degree	26%
	OC: 37	OC: 158			
	TTL: 752	TTL: 682			
Above Middle-Skill Subtotal	778	684	N/A	N/A	N/A
Total	2,742	1,260	N/A	N/A	N/A

Los Angeles/Orange County Demand:

- The number of jobs related to these middle-skill uncrewed systems applications occupations is projected to increase 9% through 2027, equating to 1,965 annual job openings.
- Hourly entry-level wages for these middle-skill uncrewed systems applications occupations range from \$14.96 to \$27.93 in Orange County; 56% of annual job openings have entry-level wages below the living wage.
- There were 1,671 online job postings related to uncrewed systems applications/drone technology over the past 12 months. The highest number of postings were for software engineers, luxury sales consultants, and security operations specialists.
- The typical entry-level education for these middle-skill uncrewed systems applications occupations is a high school diploma.
- Between 34% and 56% of workers in these uncrewed systems applications occupations have completed a bachelor's degree as their highest level of education.

Los Angeles/Orange County Supply:

- There was an average of 908 awards conferred annually by community colleges in Los Angeles and Orange Counties from 2019 to 2022.
 - Throughout Los Angeles and Orange counties, there are currently 16 drone-related programs. Of those, only six programs are specifically related to the occupational areas included in this report – all six are related to drone photography or cinematography.
- Non-community college institutions conferred an average of 352 awards from 2019 to 2021.
 - All awards were conferred under programs that train for these occupations. However, it is important to note that not all of these programs specifically train for uncrewed systems applications/drone technology.
- Orange County community college students that exited aeronautical and aviation technology programs in the 2020-21 academic year had a median annual wage of \$48,608 after exiting the program and 55% attained the living wage.
- There was insufficient data to determine the percentage of aeronautical and aviation technology students that exited their program in 2019-20 and reported that they are working in a job closely related to their field of study.

Demand

Occupational Projections:

Exhibit 2 shows the annual percent change in jobs for the five uncrewed systems applications occupations researched in this report from 2017 through 2027. Despite a 7% decline across all occupations in Los Angeles and Orange counties from 2019 to 2020 due to the COVID-19 pandemic, employment in these uncrewed systems applications occupations increased 6% in Orange County during the same period. Following a decline in employment from 2020 to 2021, employment in these occupations is projected to slightly increase each year through 2027.

Exhibit 2: Annual Percent Change in Jobs for Uncrewed Systems Applications Occupations, 2017-2027

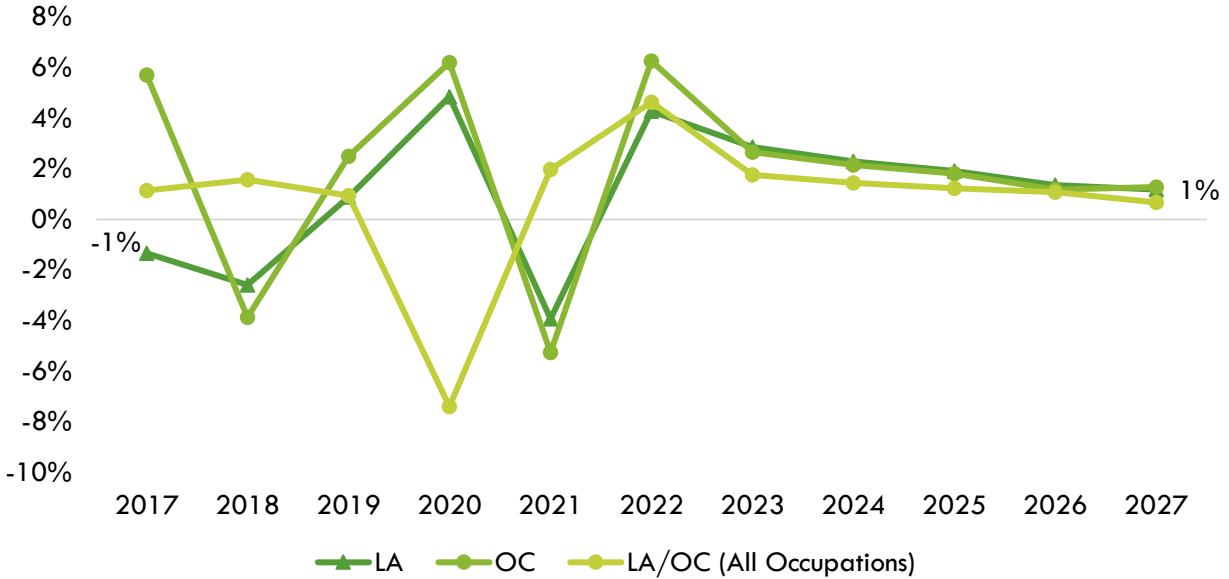


Exhibit 3 shows the five-year occupational demand projections for these middle-skill uncrewed systems applications occupations in Los Angeles/Orange County. The number of jobs related to these middle-skill occupations is projected to increase 9% through 2027. There is projected to be 1,965 jobs available annually.

Exhibit 3: Middle- Skill Occupational Demand in Los Angeles and Orange Counties²

Geography	2022 Jobs	2027 Jobs	2022-2027 Change	2022-2027 % Change	Annual Openings
Los Angeles	12,102	13,182	1,080	9%	1,463
Orange	3,941	4,332	391	10%	502
Total	16,042	17,514	1,471	9%	1,965

Exhibit 4 shows the five-year occupational demand projections for these above middle-skill uncrewed systems applications occupations in Los Angeles/Orange County. The number of jobs related to these above middle-skill occupations is projected to increase by 12% through 2027. There is projected to be 778 jobs available annually. Of those, 97% (733) are projected to be in Los Angeles County.

Exhibit 4: Above Middle-Skill Occupational Demand in Los Angeles and Orange Counties

Geography	2022 Jobs	2027 Jobs	2022-2027 Change	2022-2027 % Change	Annual Openings
Los Angeles	5,780	6,483	703	12%	733
Orange	422	443	20	5%	44
Total	6,203	6,925	723	12%	778

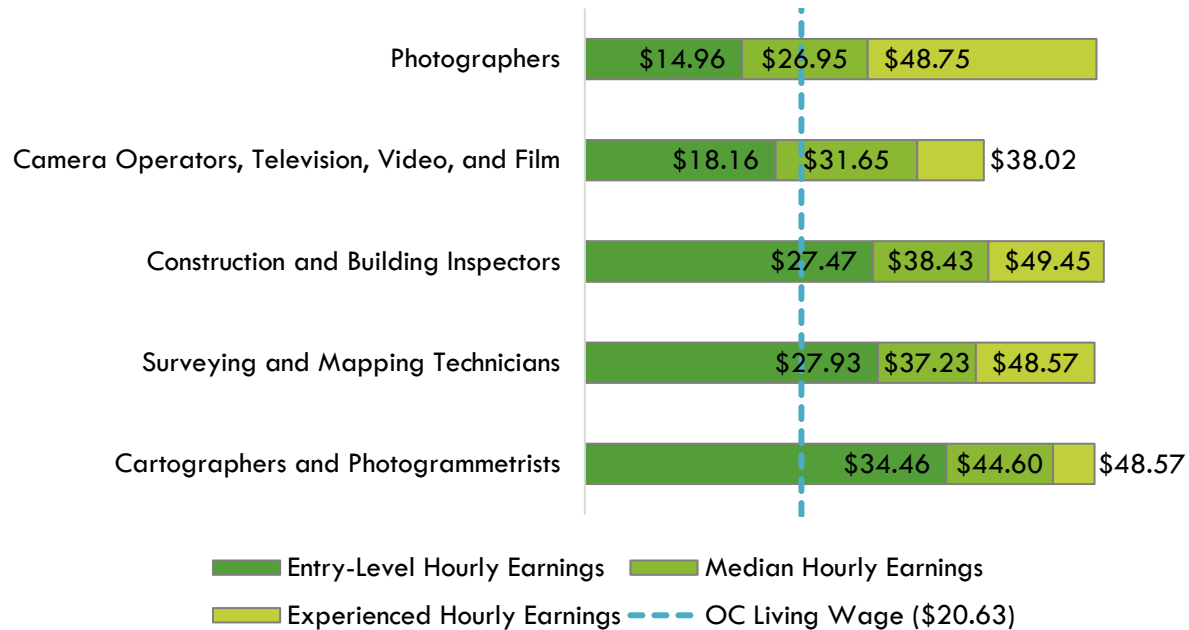
² Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

Wages:

The labor market analysis in this report considers the entry-level hourly wages for these uncrewed systems applications occupations in Orange County as they relate to the county's living wage. Los Angeles County wages are included below to provide a complete analysis of the region and state.

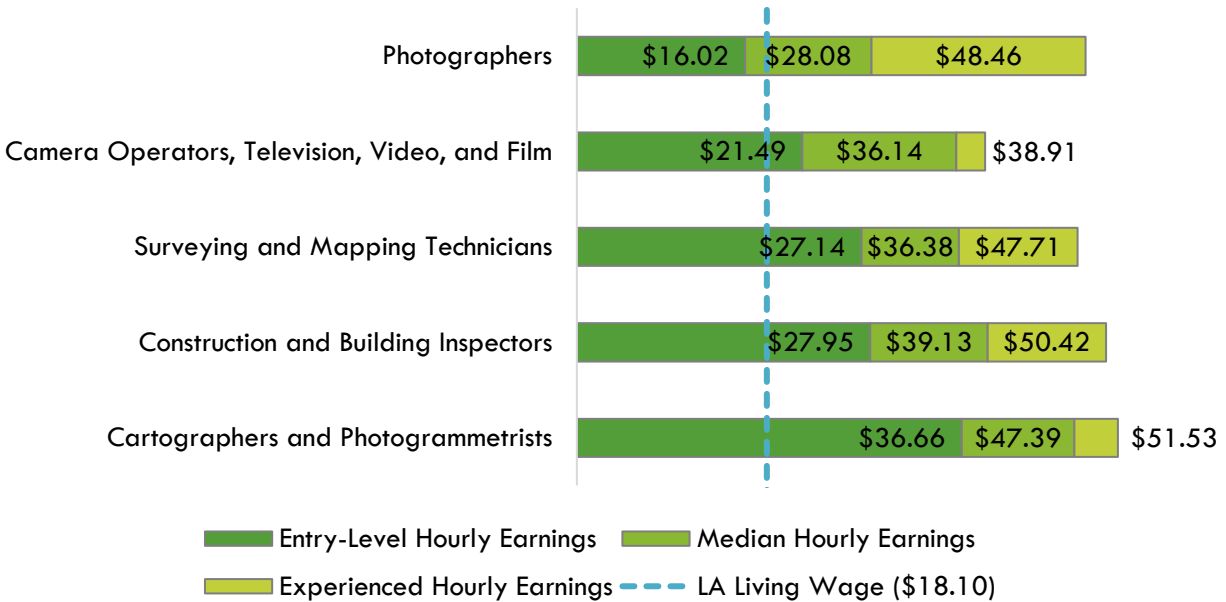
The majority (56%) of annual openings for these middle-skill uncrewed systems applications occupations have entry-level wages below the living wage for one adult (\$20.63 in Orange County). Typical entry-level hourly wages for these middle-skill occupations range from \$14.96 to \$27.47. Exhibit 5 shows the wage range for each of these uncrewed systems applications occupations in Orange County and how they compare to the regional living wage, sorted from lowest to highest entry-level wage.

Exhibit 5: Wages by Occupation in Orange County



The majority of annual openings (56%) for these middle-skill uncrewed systems applications occupations have entry-level wages above the living wage for one adult (\$18.10 in Los Angeles County). Typical entry-level hourly wages for these middle-skill occupations range from \$16.02 to \$27.95. Exhibit 6 shows the wage range for each of these uncrewed systems applications occupations in Los Angeles County how they compare to the regional living wage, sorted from lowest to highest entry-level wage.

Exhibit 6: Wages by Occupation in Los Angeles County



Job Postings:

Important Online Job Postings Data Note: Online job postings data is sourced from Lightcast, a labor market analytics firm that scrapes, collects, and organizes data from online job boards such as LinkedIn, Indeed, Glassdoor, Monster, GovernmentJobs.com, and thousands more. Lightcast uses natural language processing (NLP) to determine the related company, industry, occupation, and other information for each job posting. However, NLP has limitations that include understanding contextual words or phrases; determining differences in words that can be used as nouns, verbs, and/or adjectives; and misspellings or grammatical errors.³ For these reasons, job postings could be assigned to the wrong employer, industry, or occupation within Lightcast's database.

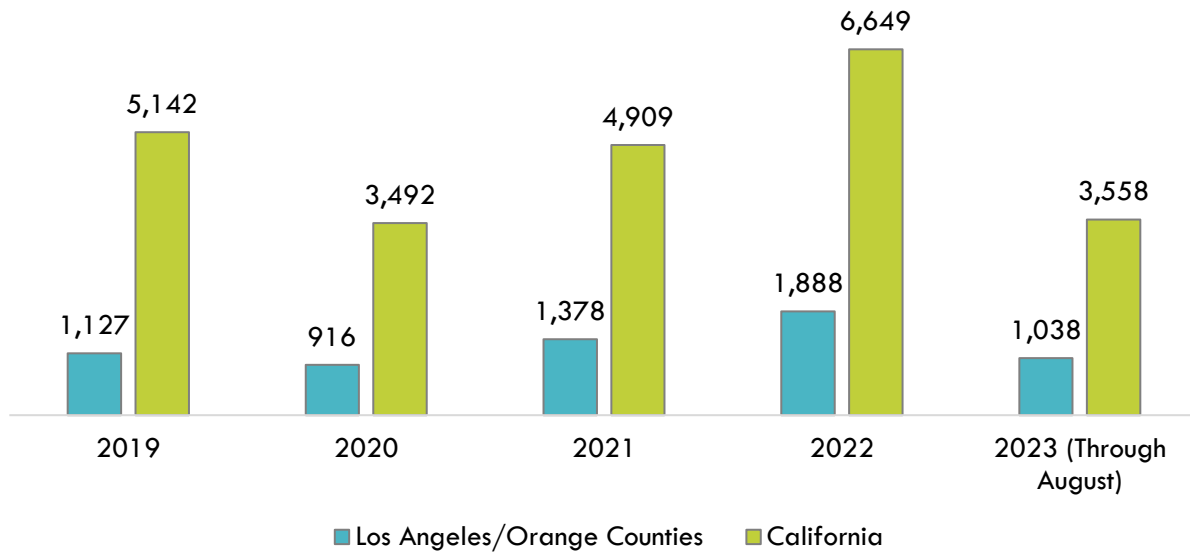
Additionally, there are several limitations when analyzing job postings. A single job posting may not represent a single job opening, as employers may be creating a pool of candidates for future openings or hiring for multiple positions with a single posting. Additionally, not all jobs are posted online, and jobs may be filled through other methods such as internal promotion, word-of-mouth advertising, physical job boards, or a variety of other channels.

To better understand the real-time demand for drone skills, this section analyzes online job postings that contained keywords related to drone technology. Because drone piloting and related skills can be applied to numerous occupations, this section includes data on all job postings related to drone technology, rather than only those related to the occupations analyzed in this report.

Exhibit 7 shows the number of online job postings related to drone technology from 2019 to 2023 in both Los Angeles/Orange counties and California. Currently, job postings data for 2023 is available only through August. Following a decline in job postings in 2020 due to the COVID-19 pandemic, the number of drone technology job postings increased in 2021 and again in 2022. In 2019, Los Angeles and Orange counties accounted for 22% of all drone technology postings throughout the state. As of 2022, Los Angeles and Orange counties accounted for 29% of all drone technology postings in California. Through August 2023, drone technology job postings are slightly lower than the same period in 2022.

³ K. R. Chowdhary, Fundamentals of Artificial Intelligence (Basingstoke: Springer Nature, 2020), <https://link.springer.com/book/10.1007/978-81-322-3972-7>.

Exhibit 7: Number of Drone Technology Job Postings in Los Angeles/Orange Counties and California, 2019-2023



Los Angeles and Orange County Job Postings

There were 1,671 online job postings related to drone technology listed in the past 12 months in Los Angeles/Orange County. Exhibit 8 shows the top occupations, by number of job postings, that requested drone skills.

Exhibit 8: Top Occupations by Number of Job Postings (n=1,671)

Occupation	Job Postings	Percentage of Job Postings
Software Developers	163	10%
Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	73	4%
Photographers	50	3%
Computer Occupations, All Other	46	3%
Security Guards	45	3%
Engineers, All Other	43	3%
Postsecondary Teachers	42	3%
Project Management Specialists	38	2%
Business Operations Specialists, All Other	33	2%
Surveyors	31	2%

The top employers in the region, by number of job postings, are shown in Exhibit 9.

Exhibit 9: Top Employers by Number of Job Postings (n=1,671)

Employer	Job Postings	Percentage of Job Postings
Anduril Industries	124	7%
Allied Universal	120	7%
Crown Castle	90	5%
UnitedHealth Group	51	3%
Acara Solutions	43	3%
Carlisle Interconnect Technologies	42	3%
Servexo	41	2%
Bluebeam	40	2%
Atreyu Productions	37	2%
The Aerospace Corporation	36	2%

The top specialized, soft, and computer skills listed by those most frequently mentioned in job postings (denoted in parentheses) are shown in Exhibit 10.

Exhibit 10: Top Skills by Number of Job Postings (n=1,671)

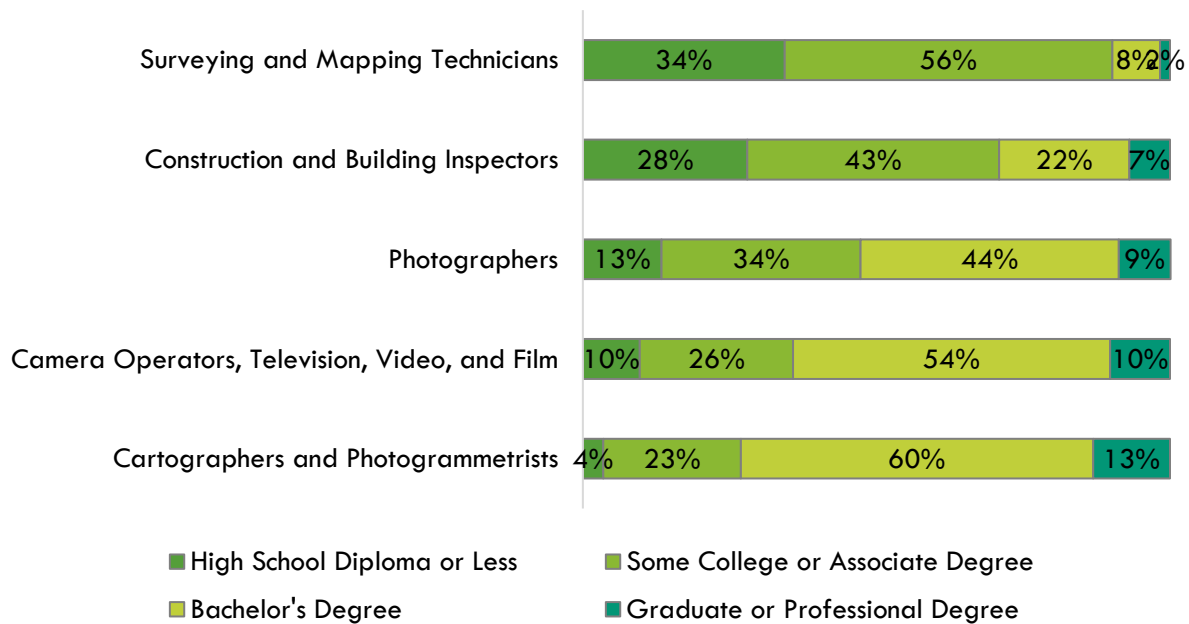
Top Specialized Skills	Top Soft Skills	Top Computer Skills
Project Management (244)	Communications (732)	Microsoft Excel (268)
Marketing (194)	Management (506)	Microsoft Office (193)
Computer Science (143)	Operations (480)	Microsoft PowerPoint (149)
Python (Programming Language) (140)	Leadership (337)	Python (Programming Language) (147)
Sensors (135)	Writing (318)	C++ (Programming Language) (136)
C++ (Programming Language) (133)	Sales (306)	Microsoft Outlook (113)
Robotics (130)	Customer Service (298)	React.js (Javascript Library) (99)
Software Engineering (117)	Detail Oriented (292)	Salesforce (94)
Business Development (108)	Problem Solving (292)	Microsoft Word (91)
Customer Relationship Management (105)	Microsoft Excel (268)	Exacq (Video Surveillance Software) (81)

Educational Attainment:

The Bureau of Labor Statistics (BLS) lists a high school diploma or equivalent as the typical entry-level education for *surveying and mapping technicians, photographers, and construction and building inspectors* and a bachelor's degree for *cartographers and photogrammetrists and camera operators, television, video, and film*. The national-level educational attainment data indicates between 34% and 56% of workers in the middle-skill occupations have completed some college or an associate degree as their highest level of education. Between 23% and 26% of workers in the above middle-skill occupations have completed some college or an associate degree. Exhibit 11 shows the educational attainment for each occupation, sorted by highest bachelor's degree educational attainment to lowest.

Of the 63% of the cumulative job postings for drone technology that listed a minimum education requirement in Los Angeles/Orange County, 60% (624) requested a bachelor's, master's, or doctoral degree and 40% (423) requested a high school diploma or an associate degree.

Exhibit 11: National-level Educational Attainment for Occupations



Educational Supply

The following sections analyze the supply from community college and non-community college institutions for these uncrewed systems applications occupations throughout the region. Because this report analyzes a variety of occupations related to drone technology, it is important to consider the educational programs that train for these occupations, as well as those that specifically provide training for drone technology skills.

The supply data throughout this section includes program awards data for programs that have historically trained for these occupations. However, there are at least 16 active community college programs related to drone technology in Los Angeles/Orange County. Exhibit 12 shows the 16 drone-related community college programs offered throughout the region. Of the 16 programs, only 6 programs are specifically related to the occupational areas included in this report.

More than half of these programs were approved in 2021 or later, so awards data is not yet available. The remainder of this section analyzes supply data for programs that have historically trained for these uncrewed systems applications occupations.

Exhibit 12: Drone Technology-Related Community College Programs in California

TOP Code/Title	College	Program Name	Award Type	CCCCO Approval Date
0602.00/Journalism	Fullerton	Drone Journalism	Certificate	7/23/2021
0604.20/Television (including combined TV/Film/Video)	Santa Ana	Drone Cinematography	Certificate	2/24/2022
		Introduction to Drone Pilot	Noncredit award	6/26/2023
0612.20/Film Production	Orange Coast	Drone Videography	Certificate	2/17/2021
0614.00/Digital Media	Orange Coast	Basic Drone Imaging Skills	Certificate	4/7/2021
0799.00/Other Information Technology	Santa Ana	Drone Technology	Certificate	1/27/2021
1012.00/Applied Photography	Cypress	UAV/UAS Drone Photography and Video	Certificate	1/17/2017
	Glendale	Drone Photography	Certificate	3/28/2022
	Mt. San Antonio	Drone Camera Operator	A.S. Degree	8/31/2018
	Orange Coast	Drone Photography	Certificate	2/17/2021
3020.00/Aviation and Airport Management and Services	Orange Coast	Unmanned Aircraft Systems	Certificate	6/21/2019
3020.20/Piloting	Cypress	UAS Drone Basic	Certificate	1/17/2017
		UAS Drone Advanced	Certificate	1/17/2017
		UAS Drone	A.S. Degree	1/29/2017
	Mt. San Antonio	Unmanned Aircraft System	A.S. Degree	3/10/2020
		Unmanned Aircraft Systems	Certificate	4/20/2020
3099.00/Other Commercial Services	Citrus	Drone Technology	Noncredit award	5/12/2022

Community College Supply:

Los Angeles and Orange Counties

Exhibit 13 shows the three-year average number of awards conferred by community colleges in the related TOP codes: Television (including combined TV/film/video) (0604.20), Film Production (0612.20), Construction Inspection (0957.20), Surveying (0957.30), Applied Photography (1012.00), and Geographic Information Systems (2206.10).

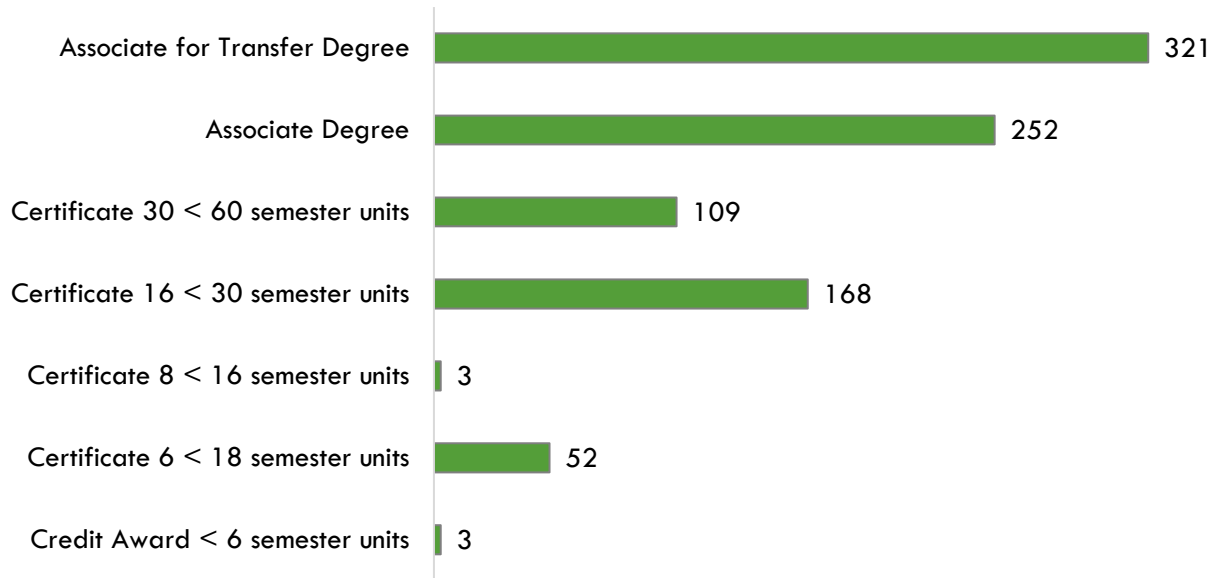
Exhibit 13: Regional Community College Awards (Certificates and Degrees), 2019-2022

TOP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average
0604.20	Television (including combined TV/film/video)	Cerritos	0	5	13	6
		El Camino	22	27	32	27
		Glendale	14	17	25	19
		LA City	34	45	35	38
		LA Pierce	26	29	31	29
		LA Valley	31	42	48	41
		Long Beach	35	42	49	42
		Mt San Antonio	54	34	50	46
		Pasadena	45	65	51	54
		LA Subtotal	261	306	334	302
		Cypress	15	16	20	17
		Fullerton	48	52	55	51
		Orange Coast	40	22	46	36
		Saddleback	2	0	15	6
		Santa Ana	17	6	13	12
		OC Subtotal	44	59	25	43
		Supply Subtotal/Average			44	62
0612.20	Film Production	Cerritos	8	11	22	14
		LA City	62	45	116	73
		LA Valley	31	35	54	40
		Santa Monica	59	41	45	49
		West LA	7	28	10	15
		LA Subtotal	167	160	247	191
		Orange Coast	48	26	32	35
		Saddleback	3	0	0	1
		OC Subtotal	51	26	32	36
Supply Subtotal/Average			218	186	279	227
0957.20	Construction Inspection	Pasadena	21	20	14	18
		LA Subtotal	21	20	14	18

TOP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average
		Coastline	11	12	14	13
		Fullerton	4	5	10	6
		Saddleback	15	8	1	8
		Santiago Canyon	15	17	11	14
		OC Subtotal	45	42	36	41
Supply Subtotal/Average			66	62	50	59
0957.30	Surveying	East LA	0	3	6	3
		LA Subtotal	0	3	6	3
		Santiago Canyon	44	59	25	43
		OC Subtotal	44	59	25	43
Supply Subtotal/Average			44	62	31	46
1012.00	Applied Photography	East LA	5	1	0	3
		El Camino	10	7	10	9
		Glendale	6	5	6	5
		LA City	38	5	8	17
		LA Pierce	2	3	2	2
		LA Valley	0	0	3	1
		Mt San Antonio	31	10	32	24
		Pasadena	5	1	10	6
		Santa Monica	37	33	31	33
		LA Subtotal	134	65	102	100
		Cypress	5	2	2	3
		Fullerton	11	4	5	7
		Orange Coast	18	21	10	16
		OC Subtotal	34	27	17	26
Supply Subtotal/Average			168	92	1198	126
2206.10	Geographic Information Systems	LA Pierce	2	0	5	3
		Pasadena	0	0	4	1
		Rio Hondo	15	16	19	16
		LA Subtotal	17	16	28	20
		Cypress	4	9	5	6
		OC Subtotal	4	9	5	6
Supply Subtotal/Average			21	25	33	26
Supply Subtotal/Average			900	829	995	908

Exhibit 14 shows the annual average community college awards by type from 2019-20 through 2021-22. The plurality of the awards are for associate for transfer degrees (321), followed by associate degrees (252).

Exhibit 14: Annual Average Community College Awards by Type in Los Angeles and Orange Counties, 2019-2022



Community College Student Outcomes:

Exhibit 15 shows the Strong Workforce Program (SWP) metrics for aeronautical and aviation technology programs in North Orange County Community College District (NOCCCD), the Orange County Region, and California. Currently, NOCCCD does not offer any programs under the aeronautical and aviation technology TOP code. Therefore, metrics for NOCCCD are not available

Orange County students that exited aeronautical and aviation technology programs in the 2020-21 academic year had had median annual earnings of \$48,608, which is higher than students throughout the state (\$44,488). However, students throughout the state had a higher median change in earnings (30%) than Orange County students (4%).

Exhibit 15: Aeronautical and Aviation Technology (0950.00) Strong Workforce Program Metrics, 2020-21⁴

SWP Metric	NOCCCD	OC Region	California
SWP Students	N/A	138	807
SWP Students Who Earned 9 or More Career Education Units in the District in a Single Year	N/A	62%	68%
SWP Students Who Completed a Noncredit CTE or Workforce Preparation Course	N/A	Insufficient Data	91%
SWP Students Who Earned a Degree or Certificate or Attained Apprenticeship Journey Status	N/A	21	170
SWP Students Who Transferred to a Four-Year Postsecondary Institution	N/A	Insufficient Data	10
SWP Students with a Job Closely Related to Their Field of Study (2019-20)	N/A	Insufficient Data	80%
Median Annual Earnings for SWP Exiting Students	N/A	\$48,608 (\$23.37)	\$44,488 (\$21.39)
Median Change in Earnings for SWP Exiting Students	N/A	4%	30%
SWP Exiting Students Who Attained the Living Wage	N/A	55%	64%

⁴ All SWP metrics are for 2020-21 unless otherwise noted.

Non-Community College Supply:

The following sections include supply data for non-community institutions that conferred awards in the related Classification of Instructional Programs (CIP) codes:

- Radio and Television Broadcasting Technology/Technician (10.0202)
- Audiovisual Communications Technologies/Technicians, Other (10.0299)
- Surveying Technology/Surveying (15.1102)
- Signal/Geospatial Intelligence (29.0203)
- Geospatial Intelligence (43.0407)
- Geography (45.0701)
- Geographic Information Science and Cartography (45.0702)
- Building/Home/Construction Inspection/Inspector (46.0403)
- Commercial Photography (50.0406)
- Photography (50.0605)
- Documentary Production (50.0607)

Los Angeles and Orange Counties

Exhibit 16 shows the annual and three-year average number of awards conferred by non-community college institutions in the related Classification of Instructional Programs (CIP) Codes in Los Angeles and Orange counties. Due to different data collection periods, the most recent period of available data is from 2019 to 2021. Between 2019 and 2021, non-community colleges and universities throughout the region conferred an average of 352 awards annually in related training programs.

Exhibit 16: Regional Non-Community College Awards, 2019-2021

CIP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2-Year Award Average
10.0202	Radio and Television Broadcasting Technology/Technician	Hollywood Cultural College	20	12	16
Supply Subtotal/Average			20	12	16
43.0407	Geospatial Intelligence	Mount Saint Mary's University	2	2	2
Supply Subtotal/Average			2	2	2
45.0701	Geography	California State Polytechnic University-Pomona	27	24	26
		California State University-Dominguez Hills	0	7	4
		California State University-Fullerton	37	36	36
		California State University-Long Beach	56	47	52
		California State University-Los Angeles	14	6	10

CIP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2-Year Award Average
		California State University-Northridge	33	41	37
		University of California-Los Angeles	87	71	79
		University of Southern California	0	0	0
Supply Subtotal/Average			254	232	244
45.0702	Geographic Information Science and Cartography	Mount Saint Mary's University	0	0	0
		University of Massachusetts Global	2	2	2
		University of Southern California	13	8	10
Supply Subtotal/Average			15	10	12
50.0406	Commercial Photography	Mount Saint Mary's University	0	0	0
Supply Subtotal/Average			0	0	0
50.0605	Photography	Art Center College of Design	30	19	24
		California Institute of the Arts	14	14	14
		Mount Saint Mary's University	0	0	0
		New York Film Academy	35	14	24
		University of La Verne	1	1	1
Supply Subtotal/Average			80	48	63
50.0607	Documentary Production	Mount Saint Mary's University	0	0	0
		New York Film Academy	15	15	15
Supply Subtotal/Average			15	15	15
Supply Subtotal/Average			386	319	352

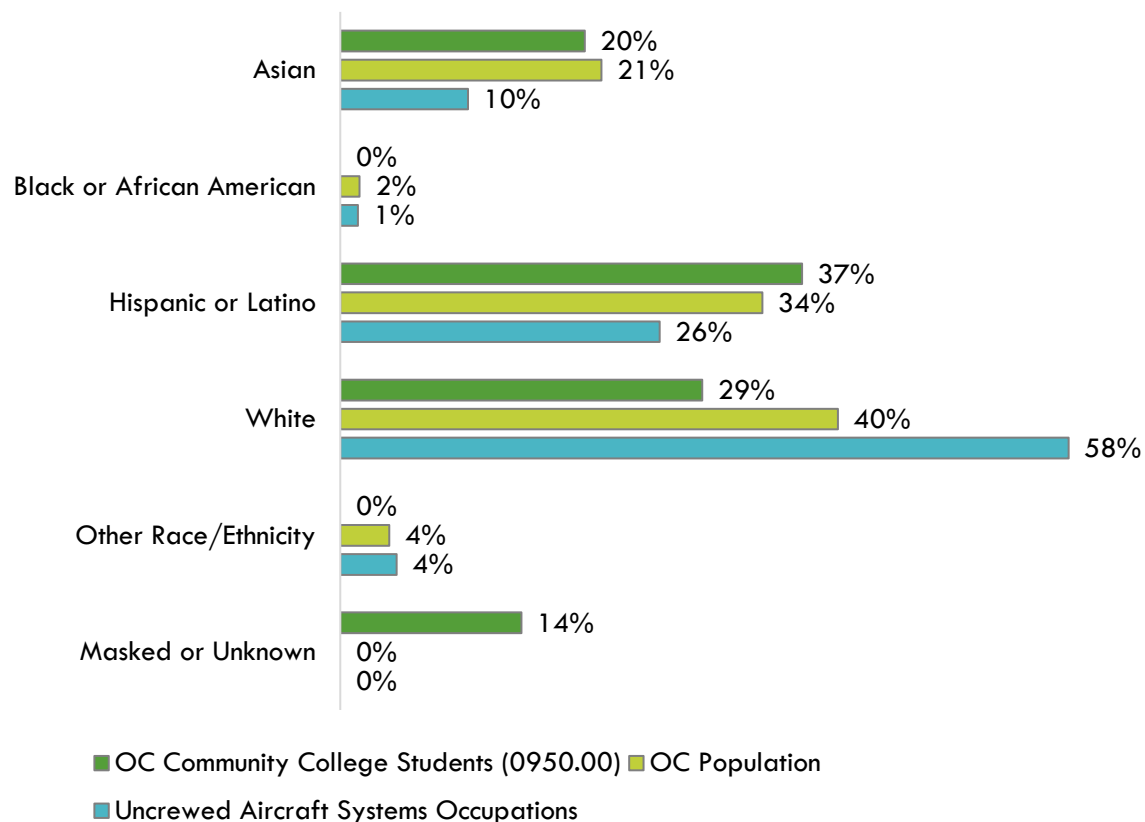
Regional Demographics

This section analyzes demographic data for Orange County community college students enrolled in aeronautical and aviation technology programs compared to the OC population, as well occupational data, for the purpose of identifying potential diversity and equity issues that can be addressed by community college programs.

Ethnicity:

Exhibit 17 shows the ethnicity of Orange County community college students enrolled in aeronautical and aviation technology programs compared to the overall Orange County population, as well as the five uncrewed systems applications occupations included in this report. Notably, 58% of workers employed in these uncrewed systems applications occupations are white, which is significantly higher than the population (40%) and community college aeronautical and aviation technology students (29%). Conversely, 31% of community college aeronautical and aviation technology students are Hispanic or Latino, which is higher than the Orange County population (34%) and significantly higher than workers in these uncrewed systems applications occupations (26%).

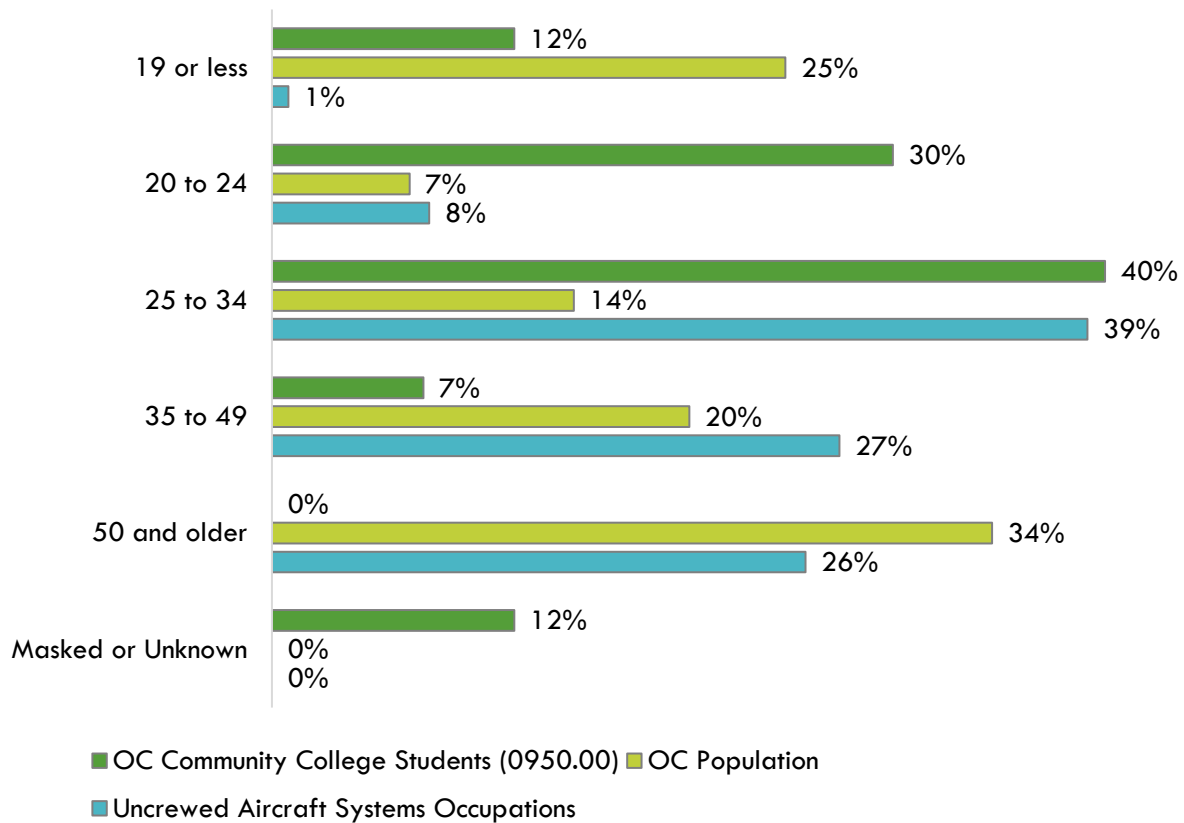
Exhibit 17: Regional Program and County Demographics by Ethnicity



Age:

Exhibit 18 shows the age of Orange County community college students enrolled in aeronautical and aviation technology programs compared to the overall Orange County population, as well as the five uncrewed systems applications occupations included in this report. The plurality of workers in these uncrewed systems applications occupations (39%) and aeronautical and aviation technology students (40%) are age 25 to 34. Notably, 42% of aeronautical and aviation technology students are 24 or less, which is significantly higher than the population (25%) and these uncrewed systems applications (9%).

Exhibit 18: Regional Program and County Demographics by Age

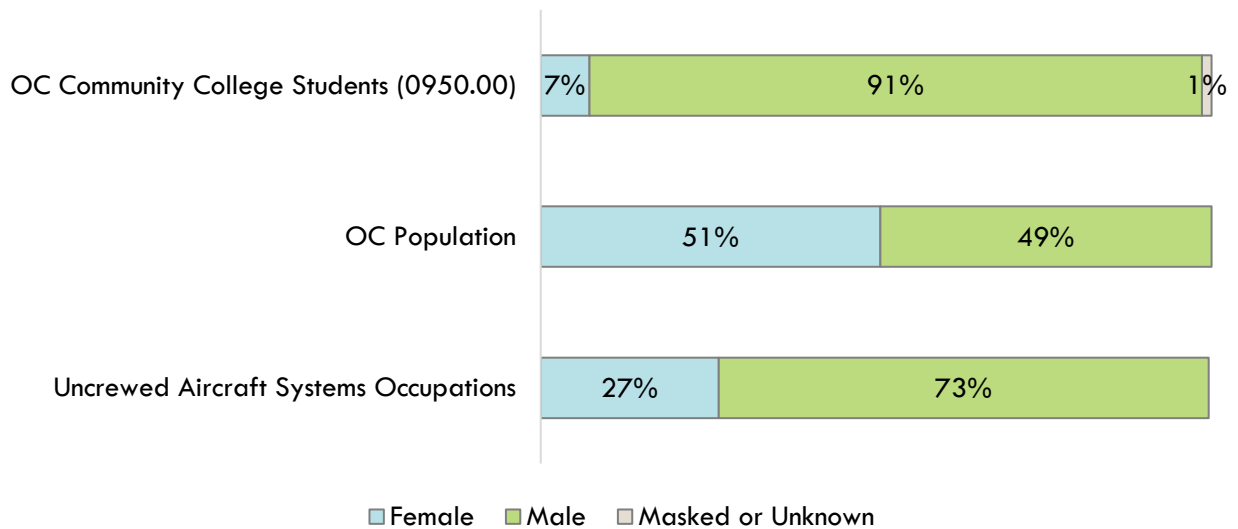


Sex:

Exhibit 19 shows the sex of Orange County community college students enrolled in aeronautical and aviation technology programs compared to the overall Orange County population as well as these uncrewed systems applications occupations.

Though the Orange County population is split nearly evenly between men and women, 91% of aeronautical and aviation technology students and 73% of workers in these uncrewed systems applications occupations are men.

Exhibit 19: Regional Program and County Demographics by Sex



Appendix A: Methodology

The OC COE prepared this report by analyzing data from occupations and education programs. Occupational data is derived from Lightcast, a labor market analytics firm that consolidates data from the California Employment Development Department (EDD), U.S. Bureau of Labor Statistics (BLS) and other government agencies. Program supply data is drawn from two systems: Taxonomy of Programs (TOP) and Classification of Instructional Programs (CIP).

Using a TOP-SOC crosswalk, the OC COE identified middle-skill jobs for which programs within these TOP codes train. Middle-skill jobs include:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor's degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or
- All occupations that require a high school diploma or equivalent or no formal education, but also require short- to long-term on-the-job training where multiple community colleges have existing programs.

The OC COE determined labor market supply for an occupation or SOC code by analyzing the number of program completers or awards in a related TOP or CIP code. The COE developed a “supply table” with this information, which is the source of the program supply data for this report. TOP code data comes from the California Community Colleges Chancellor's Office MIS Data Mart (datamart.cccco.edu) and CIP code data comes from the Integrated Postsecondary Education Data System (nces.ed.gov/ipeds/use-the-data), also known as IPEDS. TOP is a system of numerical codes used at the state level to collect and report information on California community college programs and courses throughout the state that have similar outcomes. CIP codes are a taxonomy of academic disciplines at institutions of higher education in the United States and Canada. Institutions outside of the California Community College system do not use TOP codes in their reporting systems.

Data included in this analysis represents the labor market demand for relevant positions most closely related to the proposed program as expressed by the requesting college in consultation with the OC COE. Traditional labor market information was used to show current and projected employment based on data trends, as well as annual average awards granted by regional community colleges. Real-time labor market information captures job post advertisements for occupations relevant to the field of study which can signal demand and show what employers are looking for in potential employees but is not a perfect measure of the quantity of open positions.

All representations have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. The most recent data available at the time of the analysis was examined; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor's Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.

Appendix B: Data Sources

Data Type	Source
Occupational Projections, Wages, and Job Postings	<p>Traditional labor market information data is sourced from Lightcast, a labor market analytics firm. Lightcast occupational employment data are based on final Lightcast industry data and final Lightcast staffing patterns. Wage estimates are based on Occupational Employment Statistics and the American Community Survey. For more information, see https://lightcast.io/</p>
Living Wage	<p>The living wage is derived from the Insight Center’s California Family Needs Calculator, which measures the income necessary for an individual of family to afford basic expenses. The data assesses the cost of housing, food, childcare, health care, transportation, and taxes. For more information, see: https://insightccd.org/family-needs-calculator/</p> <p>The living wage for one adult in Orange County is \$20.63 per hour (\$42,910.40 annually). This figure is used by the CCCCCO to calculate the percentage of students that attained the regional living wage.</p>
Typical Education and Training Requirements, and Educational Attainment	<p>The Bureau of Labor Statistics (BLS) provides information about education and training requirements for hundreds of occupations. BLS uses a system to assign categories for entry-level education, work experience in a related occupation, and typical on-the-job training to each occupation for which BLS publishes projections data. For more information, see https://www.bls.gov/emp/documentation/education/tech.htm</p>
Emerging Occupation Descriptions, Additional Education Requirements, and Employer Preferences	<p>The O*NET database includes information on skills, abilities, knowledge, work activities, and interests associated with occupations. For more information, see https://www.onetonline.org/help/online/</p>
Educational Supply	<p>The CCCCCO Data Mart provides information about students, courses, student services, outcomes and faculty and staff. For more information, see: https://datamart.cccco.edu</p> <p>The National Center for Education Statistics (NCES) Integrated Postsecondary Integrated Data System (IPEDS) collects data on the number of postsecondary awards earned (completions). For more information, see https://nces.ed.gov/ipeds/use-the-data/survey-components/7/completions</p>
Student Metrics and Demographics	<p>LaunchBoard, a statewide data system supported by the California Community Colleges Chancellor's Office and hosted by Cal-PASS Plus, provides data on progress, success, employment, and earnings outcomes for California community college students. For more information, see: https://www.calpassplus.org/LaunchBoard/Home.aspx</p>

Data Type	Source
Population and Occupation Demographics	<p>The Census Bureau's American Community Survey (ACS) is the premier source for detailed population and housing information. For more information, see: https://www.census.gov/programs-surveys/acs</p> <p>Data is sourced from IPUMS USA, a database providing access to ACS and other Census Bureau data products. For more information, see: https://usa.ipums.org/usa/about.shtml</p>

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