

## 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 <b>1,965 annual job openings</b> throughout Los Angeles and Orange counties for these drone entrepreneurship occupations, which is <b>more than the 700 awards conferred by educational institutions.</b>	
Living Wage: (Entry-Level, 25 <sup>th</sup> )	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
	<i>Comments:</i> <b>the majority (54%) of annual job openings</b> for these drone entrepreneurship occupations <b>have entry-level hourly wages significantly below the OC living wage of \$20.63.</b> 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 drone entrepreneurship occupations typically require a high school diploma, <b>more than one-third of workers in the field have completed some college or an associate degree as their highest level of education.</b>	

### 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. <sup>1</sup> 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 determine whether there is a supply gap in the Los Angeles/Orange County regional labor market related to three middle-skill occupations:

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

These three occupations commonly utilize drones and have a significant percentage of workers that are considered self-employed, which is used as a proxy for small business and entrepreneurship. Collectively,

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

58% of workers in these occupations are considered self-employed, which is significantly higher than the 9% of self-employed workers across all occupations. Community colleges should consider aligning drone entrepreneurship programs with existing drone technology focus areas such as surveying and mapping, photography, and building inspection.

Based on the available data there appears to be a supply gap for these drone entrepreneurship occupations and typical education requirements for these occupations align with a community college education. However, the majority of annual job openings 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 <sup>th</sup> Percentile)	Typical Entry-Level Education	Community College Educational Attainment	% of Self-Employed Workers
Surveying and Mapping Technicians (17-3031)	LA: 103	LA: 33		High school diploma or equivalent	56%	21%
	OC: 33	OC: 51	OC: \$27.93			
	<i>TTL: 156</i>	<i>TTL: 84</i>				
Photographers (27-4021)	LA: 958	LA: 389		High school diploma or equivalent	34%	80%
	OC: 290	OC: 168	OC: \$14.96			
	<i>TTL: 1,228</i>	<i>TTL: 557</i>				
Construction and Building Inspectors (47-4011)	LA: 401	LA: 18		High school diploma or equivalent	43%	17%
	OC: 68	OC: 41	OC: \$27.47			
	<i>TTL: 580</i>	<i>TTL: 59</i>				
<b>Total</b>	<b>1,965</b>	<b>700</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>

### Demand:

- The number of jobs related to these drone entrepreneurship occupations are projected to increase 9% through 2027, equating to 1,965 annual job openings.
- Hourly entry-level wages for these drone entrepreneurship occupations range from \$14.96 to \$27.93 in Orange County; 54% of annual job openings have entry-level wages significantly below the living wage.
- There were 1,671 online job postings related to 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 drone entrepreneurship occupations is a high school diploma or equivalent.
- Between 34% and 56% of workers in the field have completed some college or an associate degree as their highest level of educational attainment.

## Supply:

- There was an average of 700 awards conferred by 24 community colleges in Los Angeles and Orange Counties from 2019 to 2022.
  - It is important to note that none of the programs offered at these 24 colleges had a specific emphasis on drone entrepreneurship.
- Non-community college institutions conferred an average of 84 awards from 2019 to 2021. None of these programs had a specific emphasis on drone entrepreneurship.
- Orange County community college students that exited small business and entrepreneurship programs in the 2020-21 academic year had a median annual wage of \$35,454 after exiting the program and 38% attained the regional living wage.
- Throughout Orange County, 65% of small business and entrepreneurship students that exited their program in 2019-20 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 these drone entrepreneurship occupations from 2017 through 2027. Though there was a 7% decline across all occupations from 2019 to 2020 due to the COVID-19 pandemic, employment in these drone entrepreneurship occupations increased each year from 6% in Orange County during the same period but declined 5% in 2021. These drone entrepreneurship occupations are projected to grow at a similar rate for all occupations through 2027.

**Exhibit 2: Annual Percent Change in Jobs for Drone Entrepreneurship Occupations, 2017-2027**

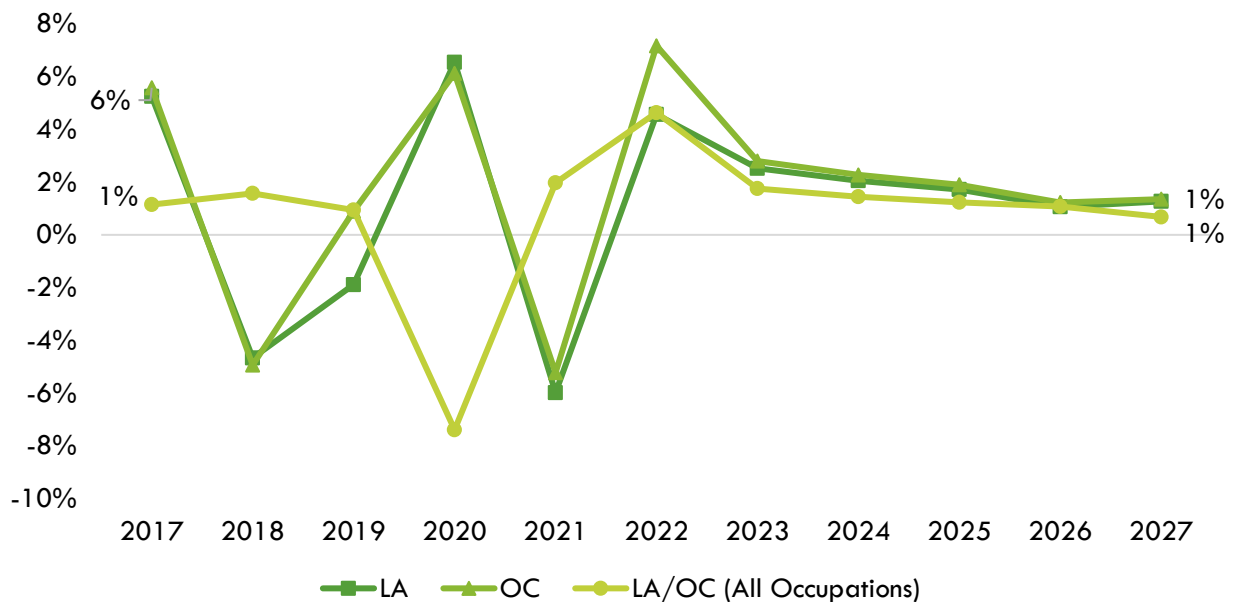


Exhibit 3 shows the five-year occupational demand projections for these drone entrepreneurship occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to increase by 9% through 2027. There is projected to be 1,965 jobs available annually.

### Exhibit 3: Occupational Demand in Los Angeles and Orange Counties<sup>2</sup>

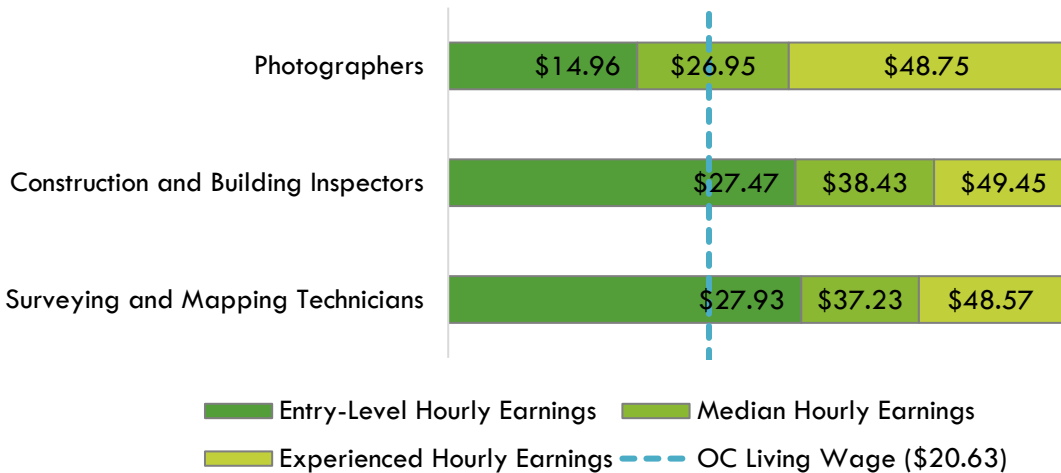
Geography	2022 Jobs	2027 Jobs	2022-2027 Change	2022-2027 % Change	Annual Openings
Los Angeles	12,102	13,182	1,080	9%	1,463
Orange	3,941	4,332	391	10%	502
<b>Total</b>	<b>16,042</b>	<b>17,514</b>	<b>1,471</b>	<b>9%</b>	<b>1,965</b>

### Wages:

The labor market endorsement in this report considers the entry-level hourly wages for these drone entrepreneurship occupations in Orange County as they relate to the county's living wage. Los Angeles County wages are included below in order to provide a complete analysis of the LA/OC region.

The majority (54%) of annual openings for these drone entrepreneurship occupations have entry-level wages significantly below the living wage for one adult (\$20.63 in Orange County). Typical entry-level hourly wages range between \$14.96 and \$27.93. Orange County's average wages (\$44.18) are above the average statewide wage of \$43.60 for these occupations. Exhibit 4 shows the wage range for each of these drone entrepreneurship occupations in Orange County and how they compare to the regional living wage, sorted from lowest to highest entry-level wage.

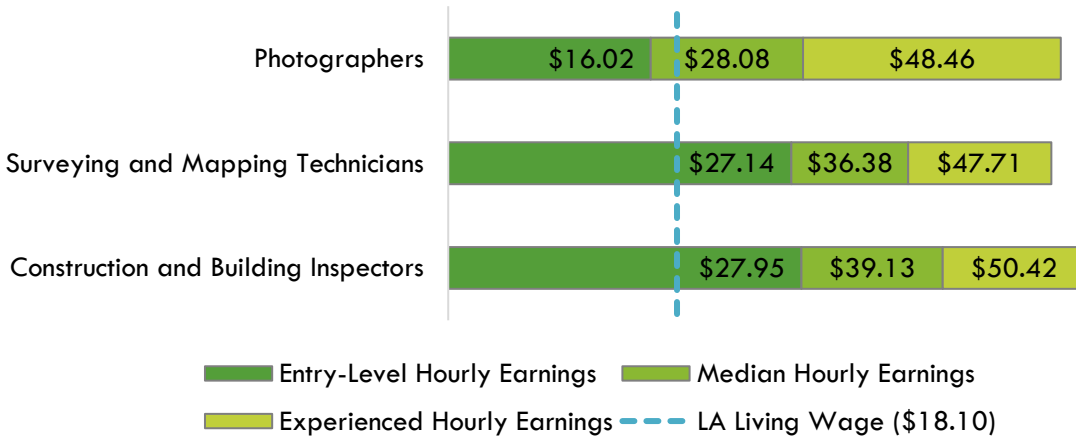
### Exhibit 4: Wages by Occupation in Orange County



The majority (65%) of annual openings for these drone entrepreneurship occupations have entry-level wages significantly below the living wage for one adult (\$18.10 in Los Angeles County). Typical entry-level hourly wages are in a range between \$16.02 and \$27.95. Los Angeles County's average wages (\$44.71) are above the average statewide wage of \$43.60 for these occupations. Exhibit 5 shows the wage range for each of these drone entrepreneurship occupations in Los Angeles County and how they compare to the regional living wage, sorted from lowest to highest entry-level wage.

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

## Exhibit 5: 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 of phrases; determining differences in words that can be used as nouns, verbs, and/or adjectives; and misspellings or grammatical errors.<sup>3</sup> 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. It is important to note that online job postings data includes postings from employers typically hiring for full-time or part-time employees and does not capture self-employment data. However, the data throughout this section shows how drone skills can be applied to numerous occupations.

There were 1,671 online job postings related to drone technology listed in the past 12 months. Exhibit 6 shows the top occupations, by number of job postings, that requested drone skills.

### Exhibit 6: 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%

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

Occupation	Job Postings	Percentage of Job Postings
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 7.

#### Exhibit 7: 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 8.

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

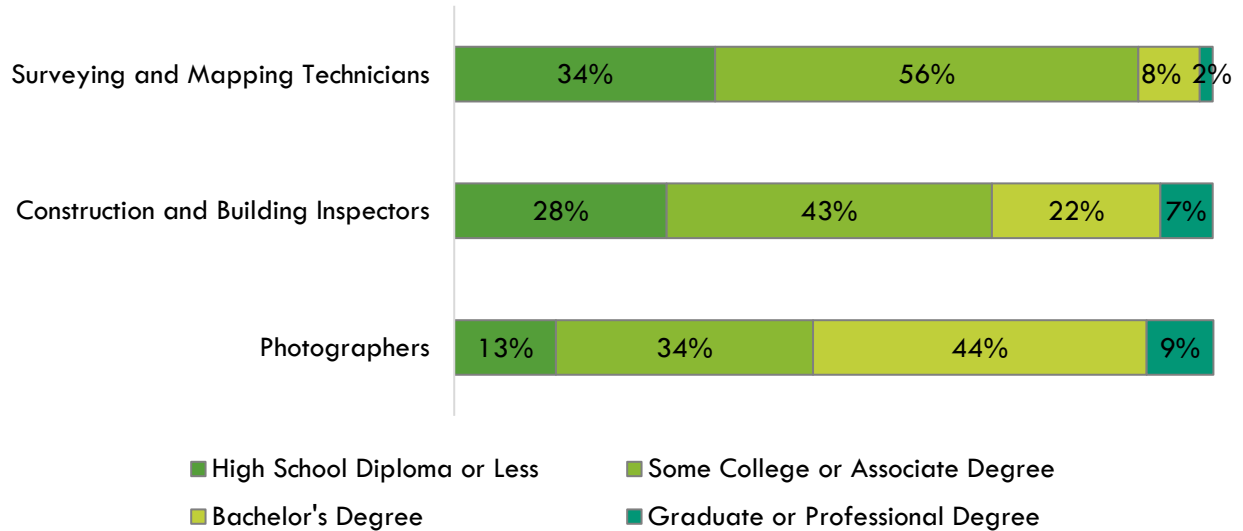
Top Specialized Skills	Top Soft Skills	Top Computer Skills
Project Management (244)	Communications (732)	Microsoft Excel (268)
Marketing (194)	Management (506)	Microsoft Office (193)
Computer Science (143)	Operations (480)	Microsoft PowerPoint (149)
Python (Programming Language) (140)	Leadership (337)	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 these three drone entrepreneurship occupations. However, the national-level educational attainment data indicates between 34% and 56% of workers in the field have completed some college or an associate degree as their highest level of education. Exhibit 9 shows the educational attainment for each occupation, sorted by highest community college 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 degree and 40% (423) requested a high school diploma or an associate degree.

Exhibit 9: National-level Educational Attainment for Occupations



# Educational Supply

## Community College Supply:

Exhibit 10 shows the three-year average number of awards conferred by community colleges in the related TOP codes: Small Business and Entrepreneurship (0506.40), Construction Inspection (0957.20), Surveying (0957.30), Applied Photography (1012.00), and Geographic Information Systems (2206.10). The colleges with the most completions in the region are Irvine Valley, Pasadena, and Santiago Canyon. Over the past 12 months, there were three other entrepreneurship-related program recommendation requests and two other drone-related requests from regional community colleges.

**Exhibit 10: Regional Community College Awards (Certificates and Degrees), 2019-2022**

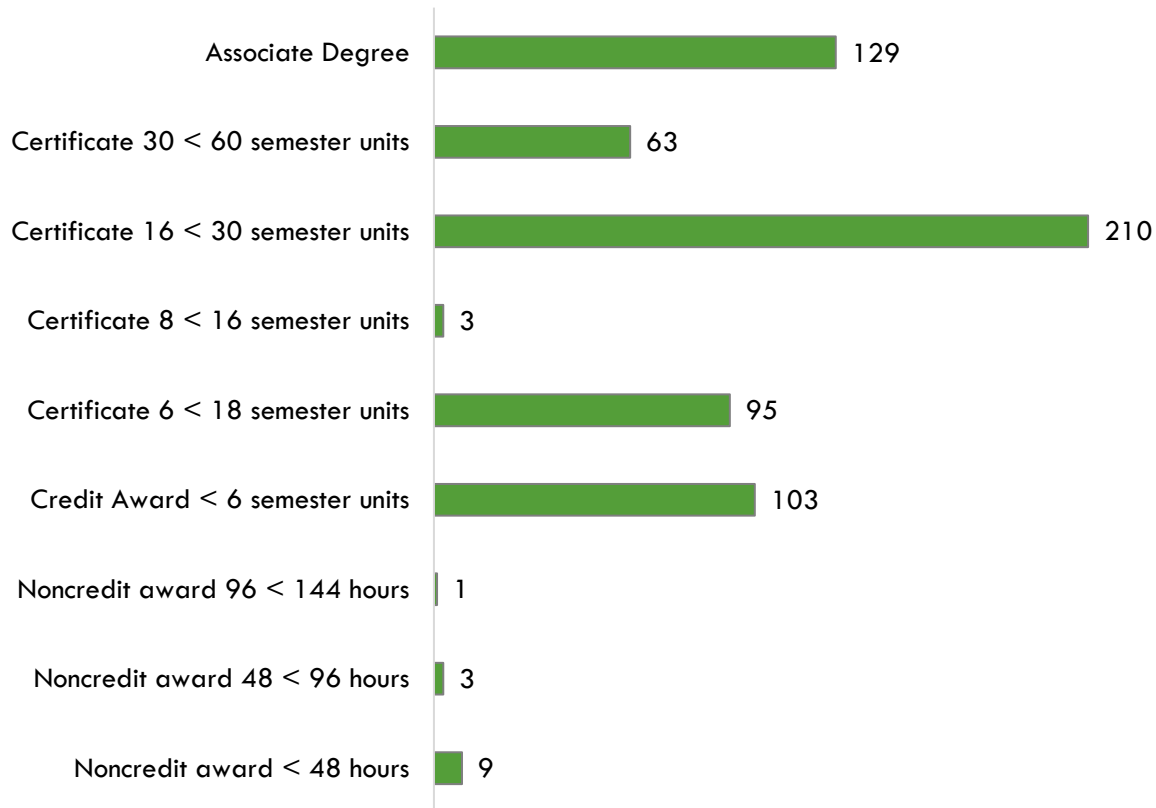
TOP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average		
0506.40	Small Business and Entrepreneurship	Cerritos	38	18	15	23		
		Citrus	0	0	1	0		
		East LA	4	1	36	13		
		Glendale	1	1	0	1		
		LA City	5	4	7	6		
		LA Pierce	4	6	5	5		
		LA Trade	6	9	3	6		
		LA Valley	0	0	99	33		
		Long Beach	0	2	0	1		
		Mt San Antonio	26	19	36	27		
		Pasadena	9	22	186	73		
		Rio Hondo	6	4	6	5		
		Santa Monica	19	22	28	23		
		West LA	4	1	5	3		
		<b>LA Subtotal</b>		<b>122</b>	<b>109</b>	<b>427</b>	<b>219</b>	
		Coastline	4	16	4	8		
		Cypress	7	4	0	3		
		Fullerton	3	6	5	5		
		Golden West	13	2	3	6		
		Irvine	56	11	233	100		
		Orange Coast	0	0	8	3		
		Saddleback	14	8	10	11		
		Santa Ana	5	6	1	4		
		Santiago Canyon	0	0	1	0		
		<b>OC Subtotal</b>		<b>102</b>	<b>53</b>	<b>265</b>	<b>140</b>	
		<b>Supply Subtotal/Average</b>			<b>224</b>	<b>162</b>	<b>692</b>	<b>359</b>



TOP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average
0957.20	Construction Inspection	Pasadena	21	20	14	18
		<b>LA Subtotal</b>	<b>21</b>	<b>20</b>	<b>14</b>	<b>18</b>
		Coastline	11	12	14	13
		Fullerton	4	5	10	6
		Saddleback	15	8	1	8
		Santiago Canyon	15	17	11	14
		<b>OC Subtotal</b>	<b>45</b>	<b>42</b>	<b>36</b>	<b>41</b>
<b>Supply Subtotal/Average</b>			<b>66</b>	<b>62</b>	<b>50</b>	<b>59</b>
0957.30	Surveying	East LA	0	3	6	3
		<b>LA Subtotal</b>	<b>0</b>	<b>3</b>	<b>6</b>	<b>3</b>
		Santiago Canyon	44	59	25	43
		<b>OC Subtotal</b>	<b>44</b>	<b>59</b>	<b>25</b>	<b>43</b>
<b>Supply Subtotal/Average</b>			<b>44</b>	<b>62</b>	<b>31</b>	<b>46</b>
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
		<b>LA Subtotal</b>	<b>134</b>	<b>65</b>	<b>102</b>	<b>100</b>
		Cypress	5	2	2	3
		Fullerton	11	4	5	7
		Orange Coast	18	21	10	16
		<b>OC Subtotal</b>	<b>34</b>	<b>27</b>	<b>17</b>	<b>26</b>
<b>Supply Subtotal/Average</b>			<b>168</b>	<b>92</b>	<b>119</b>	<b>126</b>
2206.1	Geographic Information Systems	LA Pierce	2	0	5	3
		Pasadena	0	0	4	1
		Rio Hondo	15	16	19	16
		<b>LA Subtotal</b>	<b>17</b>	<b>16</b>	<b>28</b>	<b>20</b>
		Cypress	4	9	5	6
		<b>OC Subtotal</b>	<b>4</b>	<b>9</b>	<b>5</b>	<b>6</b>
<b>Supply Subtotal/Average</b>			<b>21</b>	<b>25</b>	<b>33</b>	<b>26</b>
<b>Supply Total/Average</b>			<b>523</b>	<b>403</b>	<b>925</b>	<b>616</b>

Exhibit 11 shows the annual average community college awards by type from 2019-20 to 2021-22. The plurality of the awards are for certificates between 16 and less than 30 semester units (210), followed by associate degrees (129).

### Exhibit 11: Annual Average Community College Awards by Type, 2019-2022



### Community College Student Outcomes:

Exhibit 12, on the following page, shows the Strong Workforce Program (SWP) metrics for small business and entrepreneurship programs in North Orange County Community College District (NOCCCD), the Orange County Region, and California. Of the 1,480 small business and entrepreneurship students in the 2019-20 academic year, 17% (255) attended a NOCCCD college.

Additionally, NOCCCD students that exited small business and entrepreneurship programs in the 2020-21 academic year had slightly higher median annual earnings (\$36,120) compared to all small business and entrepreneurship students in Orange County (\$35,454) and the state (\$35,736). A slightly higher percentage of NOCCCD small business and entrepreneurship students attained the living wage (42%) when compared to all small business and entrepreneurship students in Orange County (38%).

## Exhibit 12: Small Business and Entrepreneurship (0506.40) Strong Workforce Program Metrics, 2020-21<sup>4</sup>

SWP Metric	NOCCCD	OC Region	California
SWP Students	255	1,480	9,509
SWP Students Who Earned 9 or More Career Education Units in the District in a Single Year	36%	33%	32%
SWP Students Who Completed a Noncredit CTE or Workforce Preparation Course	Insufficient Data	Insufficient Data	77%
SWP Students Who Earned a Degree or Certificate or Attained Apprenticeship Journey Status	Insufficient Data	27	526
SWP Students Who Transferred to a Four-Year Postsecondary Institution (2019-20)	19	82	425
SWP Students with a Job Closely Related to Their Field of Study (2019-20)	Insufficient Data	65%	64%
Median Annual Earnings for SWP Exiting Students	\$36,120 (\$17.37)	\$35,454 (\$17.05)	\$35,736 (\$17.18)
Median Change in Earnings for SWP Exiting Students	25%	31%	22%
SWP Exiting Students Who Attained the Living Wage	42%	38%	47%

### Non-Community College Supply:

For a comprehensive regional supply analysis, it is also important to consider the supply from other institutions in the region that provide training programs for these drone entrepreneurship occupations. Exhibit 13 shows the annual and two-year average number of awards conferred by these institutions in the related Classification of Instructional Programs (CIP) Codes: Geographic Information Science and Cartography (45.0702), Commercial Photography (50.0406), and Entrepreneurship/Entrepreneurial Studies (52.0701). Due to different data collection periods, the most recent two-year period of available data is from 2019 to 2021. Between 2019 and 2021, non-community college institutions in the region conferred an average of 84 awards annually in related training programs.

### Exhibit 13: Regional Non-Community College Awards, 2019-2021

CIP Code	Program	College	2019-2020 Awards	2020-2021 Awards	3-Year Award Average
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
<b>Supply Subtotal/Average</b>			<b>15</b>	<b>10</b>	<b>12</b>
50.0406	Commercial Photography	Mount Saint Mary's University	0	0	0
		<b>Supply Subtotal/Average</b>	<b>6</b>	<b>0</b>	<b>2</b>

<sup>4</sup> All SWP metrics are for 2020-21 unless otherwise noted.

CIP Code	Program	College	2019-2020 Awards	2020-2021 Awards	3-Year Award Average
52.0701	Entrepreneurship/ Entrepreneurial Studies	Azusa Pacific University	4	3	4
		California Intercontinental University	1	2	2
		Hussian College-Los Angeles	1	0	0
		Loyola Marymount University	70	62	66
		Mount Saint Mary's University	0	1	0
<b>Supply Subtotal/Average</b>			<b>76</b>	<b>68</b>	<b>72</b>
<b>Supply Total/Average</b>			<b>91</b>	<b>78</b>	<b>84</b>

# Regional Demographics

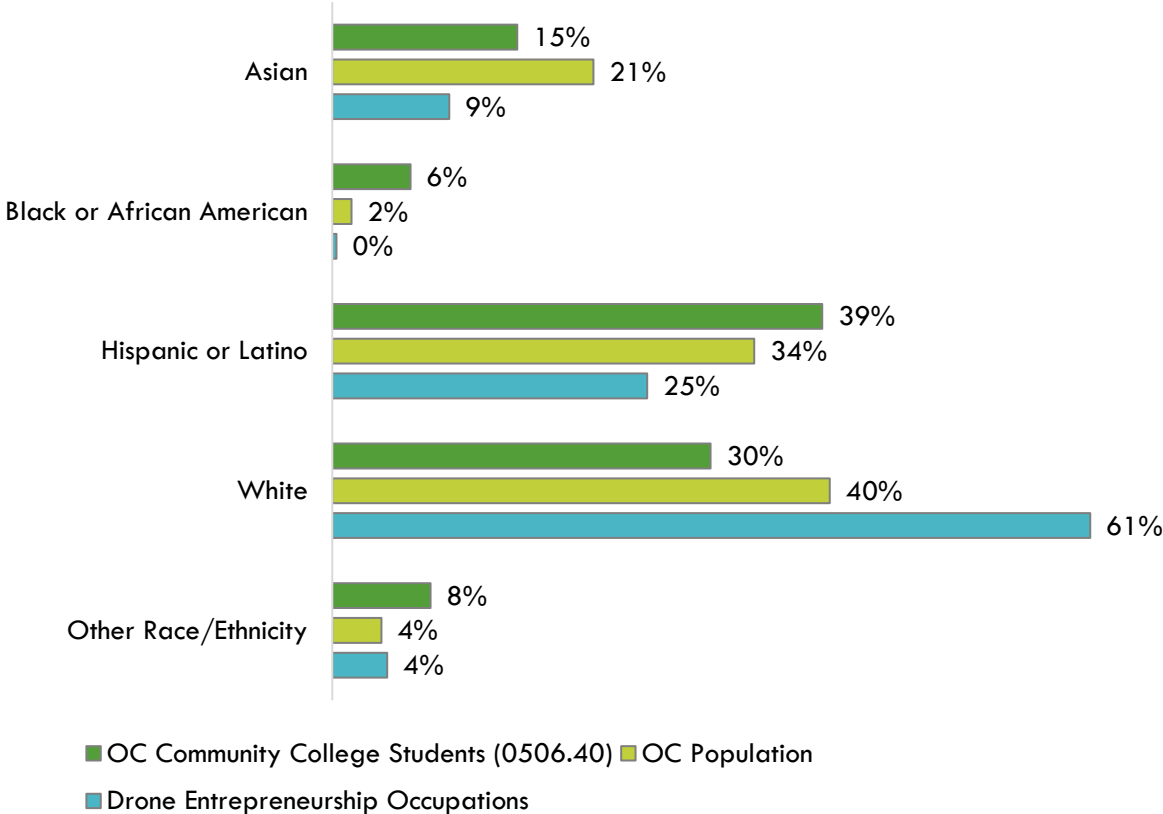
This section analyzes demographic data for Orange County community college students enrolled in small business and entrepreneurship programs compared to the OC population, as well occupational data, for the purpose of identifying potential diversity and equity issues that can be addressed by community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

## Ethnicity:

Exhibit 14 shows the ethnicity of Orange County community college students enrolled in small business and entrepreneurship programs compared to the overall Orange County population, as well as the three drone entrepreneurship occupations included in this report. Notably, 61% of workers employed in these drone entrepreneurship occupations are white, which is significantly higher than the population (40%) and community college small business and entrepreneurship students (30%). Conversely, 39% of small business and entrepreneurship students are Hispanic or Latino, which is slightly higher than the population (34%) but significantly higher than these drone entrepreneurship occupations.

Examining disaggregated data for each occupation (not shown), the two occupations with the highest percentage of white workers are *surveying and mapping technicians* (83%) and *construction and building inspectors* (67%). These two occupations also have entry-level wages significantly above the living wage. Conversely, *photographers* has the highest percentage of Hispanic or Latino workers (27%) but has entry-level wages significantly below the living wage.

Exhibit 14: Program and County Demographics by Ethnicity

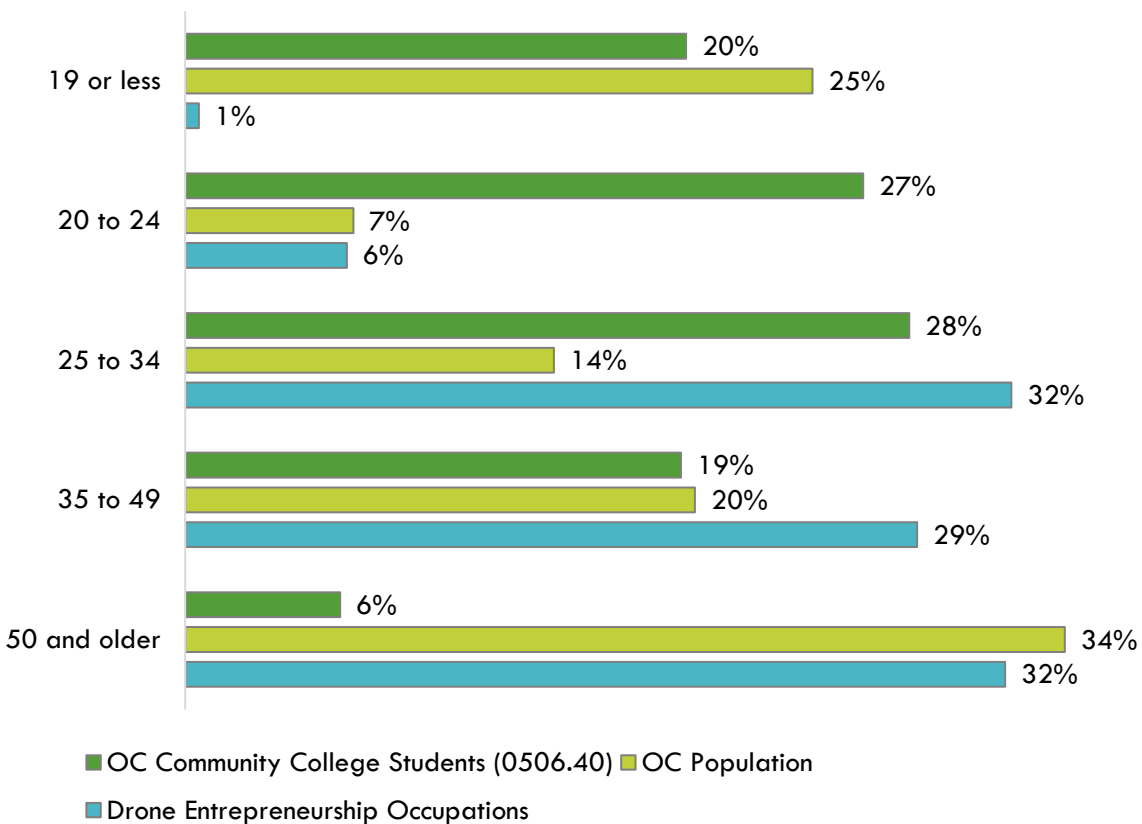


## Age:

Exhibit 15 shows the age of Orange County community college students enrolled in small business and entrepreneurship programs compared to the overall Orange County population, as well as the three drone entrepreneurship occupations included in this report. Approximately 75% of small business and entrepreneurship students are 34 or less, which is significantly higher than the population (46%) and more than double these drone entrepreneurship occupations (39%).

Examining disaggregated data for each occupation (not shown), over 50% of *surveying and mapping technicians* and *construction and building inspectors* are 40 and older. These occupations also have entry-level wages significantly above the living wage. Conversely, 45% of *photographers* are 34 or less. This occupation also has entry-level wages significantly below the living wage.

Exhibit 15: Program and County Demographics by Age

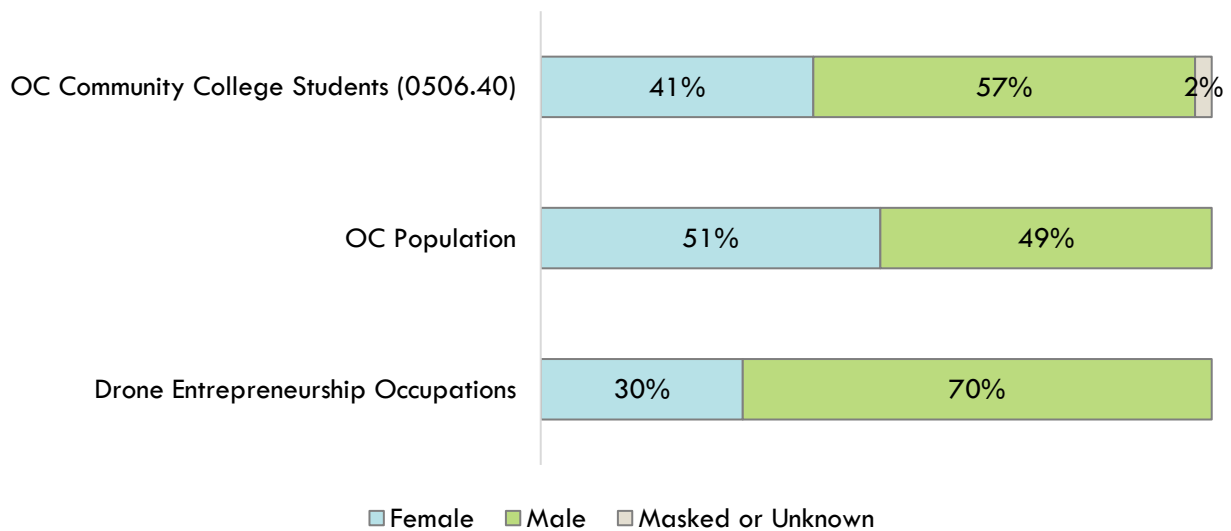


## Sex:

Exhibit 16 shows the sex of Orange County community college students enrolled in small business and entrepreneurship programs compared to the overall Orange County population as well as these drone entrepreneurship occupations.

Though the population is split nearly evenly, the majority of workers in these drone entrepreneurship programs (70%) and community college small business and entrepreneurship students (57%) are men. Examining disaggregated data for each occupation (not shown), over 85% of *surveying and mapping technicians* and *construction and building inspectors* are men. These occupations also have entry-level wages significantly above the living wage. Conversely, 43% of *photographers* are women. This occupation also has entry-level wages significantly below the living wage.

Exhibit 16: 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](http://datamart.cccco.edu)) and CIP code data comes from the Integrated Postsecondary Education Data System ([nces.ed.gov/ipeds/use-the-data](http://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 represent 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 <a href="https://lightcast.io/">https://lightcast.io/</a></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, child care, health care, transportation, and taxes. For more information, see: <a href="https://insightccd.org/family-needs-calculator/">https://insightccd.org/family-needs-calculator/</a></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 <a href="https://www.bls.gov/emp/documentation/education/tech.htm">https://www.bls.gov/emp/documentation/education/tech.htm</a></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 <a href="https://www.onetonline.org/help/online/">https://www.onetonline.org/help/online/</a></p>
Educational Supply	<p>The CCCCCO Data Mart provides information about students, courses, student services, outcomes and faculty and staff. For more information, see: <a href="https://datamart.cccco.edu">https://datamart.cccco.edu</a></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 <a href="https://nces.ed.gov/ipeds/use-the-data/survey-components/7/completions">https://nces.ed.gov/ipeds/use-the-data/survey-components/7/completions</a></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: <a href="https://www.calpassplus.org/LaunchBoard/Home.aspx">https://www.calpassplus.org/LaunchBoard/Home.aspx</a></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: <a href="https://www.census.gov/programs-surveys/acs">https://www.census.gov/programs-surveys/acs</a></p> <p>Data is sourced from IPUMS USA, a database providing access to ACS and other Census Bureau data products. For more information, see: <a href="https://usa.ipums.org/usa/about.shtml">https://usa.ipums.org/usa/about.shtml</a></p>

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