Labor Market Analysis for Program Recommendation: 2206.10/Geographic Information Systems
CIP: 45.0702 Geographic Information Science and Cartography *(Geographic Information Systems Certificate)*

Orange County Center of Excellence, October 2025

⚠ Endorsed: Caution Advised			
Program LMI Endorsement Criteria			
	Met ☐	Partially Met ☑	Not Met ☐
Supply Gap:	There are projected to be **141 annual job openings** throughout Los Angeles and Orange counties for *surveying and mapping technicians*, which **is more than the 221 awards conferred by educational institutions**. However, these educational programs also prepare students for **7 other related occupations, which account for 5,776 additional annual job openings**. Because these programs train for a variety of occupations with high demand, there is most likely an undersupply of labor for *surveying and mapping technicians*.		
	Met ☑	Partially Met ☐	Not Met ☐
Self-Sufficiency Standard Living Wage[1]:	The typical entry-level wage for *surveying and mapping technicians* is **$27.94**, which is **above the OC living wage of $27.13**.		
	Met ☑	Partially Met ☐	Not Met ☐
Education:	Although *surveying and mapping technicians* typically require a high school diploma, and **55% of workers in the field have completed some college or an associate degree as their highest level of education.**		

Summary

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 and Orange counties regional labor market related to one middle-skill occupation:

- *Surveying and Mapping Technicians (17-3031)*

Although the number of awards exceeds demand for *surveying and mapping technicians*, supply is likely overstated because related educational programs train for an additional seven occupations. When considering the strong demand across this occupation, it is likely the region is experiencing a supply gap. Additionally, typical education requirements for this occupation align with a community college education, and annual job openings have entry-

[1] The living wage endorsement criteria in this report uses the University of Washington's Center for Women's Welfare Self-Sufficiency Standard, which the COE refers to as a living wage; Orange County's living wage of $27.13, was last updated in March 2024.

level wages above the Self-Sufficiency Standard 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, and educational attainment for the middle-skill occupation included in this report.

Exhibit 1: Labor Market Endorsement Summary

Occupation (SOC)	Demand (Annual Openings)	Supply (CC and Non-CC)	Entry-Level Hourly Earnings (25th Percentile)	Typical Entry-Level Education	Community College Educational Attainment
Surveying and Mapping Technicians (17-3031)	LA: 93 OC: 48	LA: 160 OC: 61	OC: $27.94	High school diploma or equivalent	55%
Total	**141**	**221**	**N/A**	**N/A**	**N/A**

Demand

- In Los Angeles and Orange counties, the number of jobs related to *surveying and mapping technicians* is projected to increase 2% through 2029, equating to 141 annual job openings.
- Hourly entry-level wages for *surveying and mapping technicians* are $27.94 in Orange County, which is above the Self-Sufficiency Standard living wage.
- There were 83 online job postings for *surveying and mapping technicians* over the past 12 months. The highest number of postings were for survey technicians, directors of surveying, and land surveyors.
- The typical entry-level education for *surveying and mapping technicians* is a high school diploma or equivalent.
- Approximately 55% of workers in the field have completed some college or an associate degree as their highest level of educational attainment.

Supply

- Between 2021 to 2024, an average of 104 awards conferred by 9 community colleges for this middle-skill occupation in Los Angeles and Orange counties.
- From 2020 to 2023, non-community college institutions conferred an average of 117 awards for this middle-skill occupation.
- In the 2022-23 academic year, Orange County community college students that exited geographic information systems programs had a median annual wage of $63,054 ($30.31 per hour) post-exit.
- Due to a low number of students, there is no outcome data available for students employed in jobs closely related to their field of study and attaining a living wage.

Demand

Occupational Projections

Exhibit 2 shows the annual percentage change in jobs for *surveying and mapping technicians* from 2019 through 2029. Between 2019 and 2020, employment levels across Los Angeles and Orange counties declined sharply due to the broader economic impacts of the COVID-19 pandemic. From 2021 to 2023, Orange County experienced a decline in *surveying and mapping technicians,* which rebounded in 2024. Beginning in 2025, job levels are projected to grow at a higher rate in Orange County compared to all occupations through 2029.

Exhibit 2: Annual Percentage Change in Jobs for *Surveying and Mapping Technicians*, 2019-2029

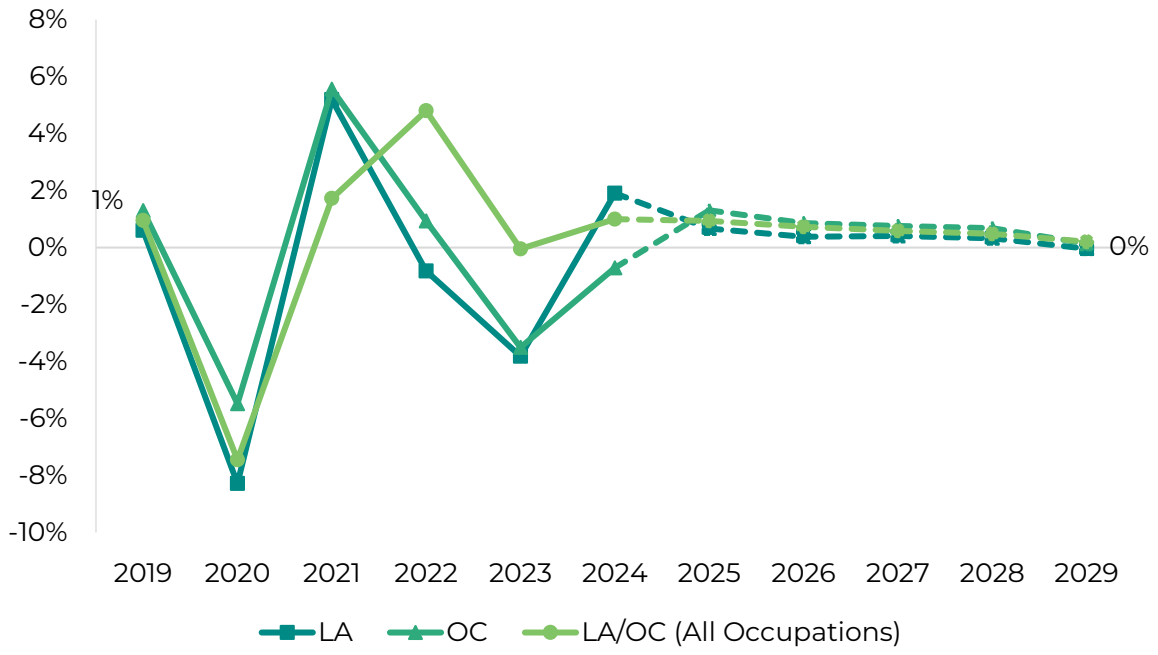


Exhibit 3 shows the five-year occupational demand projections for the middle-skill occupation *surveying and mapping technicians*. In Los Angeles and Orange counties, the number of jobs related to this occupation is projected to increase 2% through 2029. There is projected to be 141 available annually.

Exhibit 3: Middle-Skill Occupational Demand in Los Angeles and Orange Counties[2]

Geography	2024 Jobs	2029 Jobs	2024-2029 Change	2024-2029 % Change	Annual Openings
Los Angeles	714	727	13	2%	93
Orange	351	364	13	4%	48
Total	**1,065**	**1,091**	**26**	**2%**	**141**

[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.

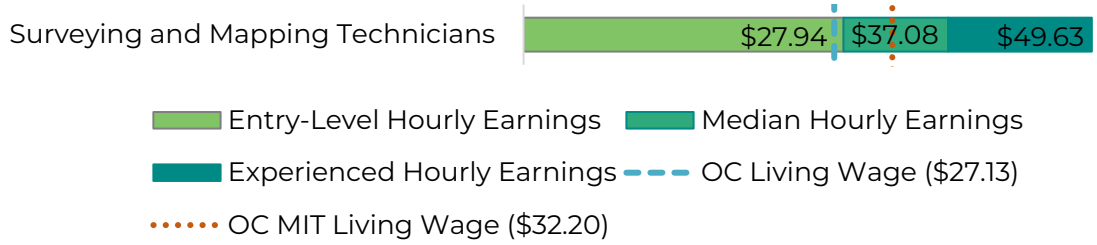
Wages

The labor market endorsement in this report considers the entry-level hourly wages for *surveying and mapping technicians* 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 LA/OC region.

In addition to the Self Sufficiency Standard living wage, data for the MIT Living Wage (updated on February 10, 2025) is provided as a reference. Currently, the MIT Living Wage in Orange County is $32.20. Both figures account for geographic-specific costs of necessities such as housing, food, health care, and transportation to assess the cost of living, and are notated in the exhibits below.

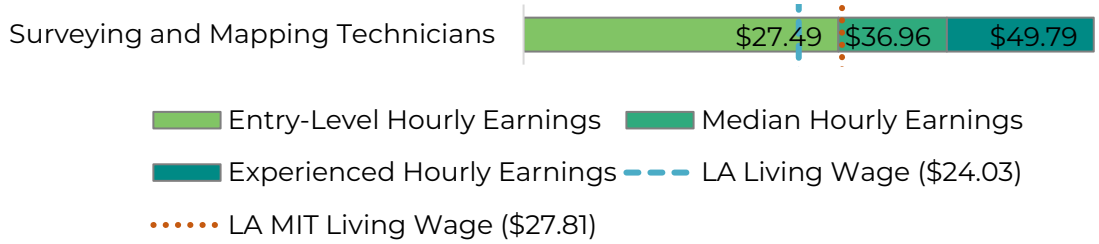
In Orange County, the typical entry-level wage for *surveying and mapping technicians* is $27.94, which is above the Self-Sufficiency living wage of $27.13 for a single adult. Exhibit 4 shows the wage range for *surveying and mapping technicians* in Orange County and how it compares to the regional living wage.

Exhibit 4: Wages by Occupation in Orange County



In Los Angeles County, the typical entry-level wage for *surveying and mapping technicians* is $27.49, which is above the Self-Sufficiency living wage of $24.03 for a single adult. Exhibit 5 shows the wage range for *surveying and mapping technicians* in Los Angeles County and how it compares to the regional living wage.

Exhibit 5: Wages by Occupation in Los Angeles County



Resilient Jobs and U.S. News & World Report Best Jobs

Exhibit 6 shows if each occupation is considered an Orange County Great Recession-Resilient, COVID-19 Pandemic Recession-Resilient Job, or a 2025 U.S. News & World Report (USN&WR) Best Job[3]. *Surveying and mapping technicians* did not meet the criteria to be designated as a Pandemic Recession-Resilient Job, Great Recession-Resilient Job, or USN&WR Best Job.

Exhibit 6: Resilient Jobs and USN&WR Best Jobs Designations

Occupation	Great Recession-Resilient Job	COVID-19 Pandemic Recession-Resilient Job	2025 USN&WR Best Job
Surveying and Mapping Technicians	☐	☐	☐

Job Postings

Important Job Postings Data Note: *There are limitations when analyzing job postings. A single job posting may not represent a single job opening for a variety of reasons.*

There were 83 online job postings related to *surveying and mapping technicians* listed in the past 12 months. Exhibit 7 shows the number of job postings by occupation.

Exhibit 7: Number of Job Postings by Occupation (n=83)

Occupation	Job Postings	Percentage of Job Postings
Surveying and Mapping Technicians	83	100%
Total Postings	**463**	**100%**

Job Postings for Middle Skill Occupation

The top job titles for *surveying and mapping technicians* in the region, by number of job postings, are shown in Exhibit 8.

Exhibit 8: Top Job Titles by Number of Job Postings for the Middle-Skill Occupation (n=83)

Job Titles	Job Postings	Percentage
Survey Technicians	21	25%
Directors of Surveying	8	10%
Land Surveyors	5	6%
Survey Field Technicians	4	5%
Field Surveyors	3	4%
Mapping Technicians	3	4%
Survey Project Managers	3	4%
Surveyors	3	4%
Land Survey Technicians	2	2%
Survey CAD Technicians	2	2%

[3] "100 Best Jobs," U.S. News & World Report, accessed January 28, 2025, https://money.usnews.com/careers/best-jobs/rankings/the-100-best-jobs.

The top employers for *surveying and mapping technicians* in the region, by number of job postings, are shown in Exhibit 9.

Exhibit 9: Top Employers by Number of Job Postings for the Middle-Skill Occupation (n=83)

Employer	Job Postings	Percentage of Job Postings
Becker & Miyamoto	4	5%
GPAC	3	4%
Greater Los Angeles Agency On Deafness, Inc. (Glad)	3	4%
Surveying And Drafting Services	3	4%
Blew & Associates P.A	2	2%
California Solar Electric	2	2%
David Evans And Associates	2	2%
Express Employment Professionals - Costa Mesa	2	2%
Michael Baker International	2	2%
N&M	2	2%

The top specialized, soft, and computer skills for the middle-skill occupation *surveying and mapping technicians* 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 for the Middle-Skill Occupation (n=83)

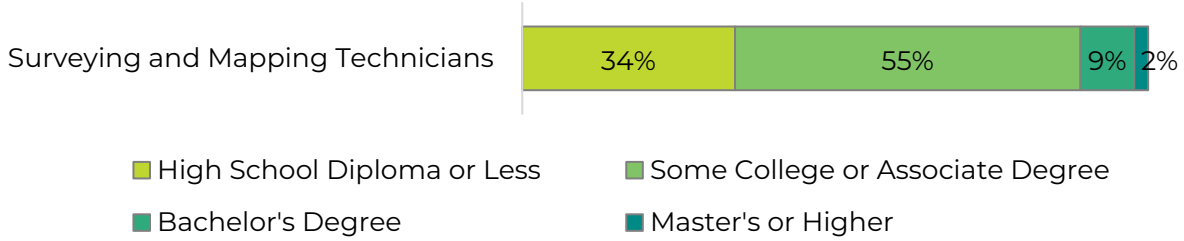
Top Specialized Skills	Top Soft Skills	Top Computer Skills
Surveying (36)	Communication (27)	AutoCAD Civil 3D (13)
Topography (16)	Detail Oriented (23)	AutoCAD (10)
Field Surveys (15)	Research (18)	Microsoft Office (7)
AutoCAD Civil 3D (13)	Writing (11)	MicroStation (CAD Design Software) (6)
Project Management (12)	Coordinating (10)	Software Systems (4)
AutoCAD (10)	Good Driving Record (10)	Geographic Information Systems (3)
Legal Land Description (10)	Mathematics (9)	Microsoft Excel (3)
Topographic Surveying (10)	Verbal Communication Skills (9)	Geospatial Information Technology (GIT) (2)
Surveys (9)	Customer Service (8)	Microsoft Outlook (2)
Global Positioning Systems (8)	English Language (8)	Microsoft Word (2)

Educational Attainment

The Bureau of Labor Statistics (BLS) lists high school diploma or equivalent for *surveying and mapping technicians*.

The national-level educational attainment data indicates 55% of workers in the field have completed some college or an associate degree as their highest level of education. Exhibit 11 shows the educational attainment for this occupation.

Exhibit 11: National-level Educational Attainment for Occupations



Requested Minimum Education Requirement

In Los Angeles and Orange Counties, 40% (33) of job postings for *surveying and mapping technicians* included a stated minimum education requirement:

- 73% (24) requested a high school diploma or associate degree.
- 21% (7) requested a bachelor's degree.

Educational Supply

The following supply tables display the total supply for *surveying and mapping technicians* that align with these TOP and CIP codes and program needs.

Community College Supply

Exhibit 12 shows the three-year average number of awards conferred by community colleges in the related TOP code:

- Surveying (0957.30)
- Geographic Information Systems (2206.10)

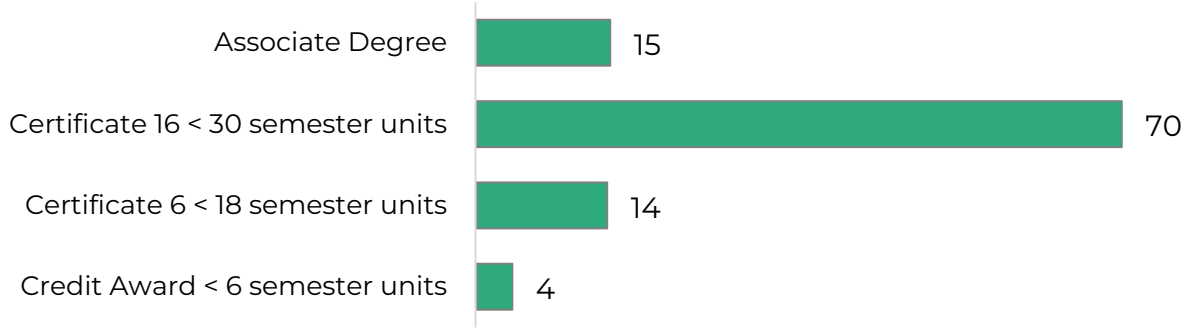
The colleges with the most completions in the region are Santiago Canyon (54), followed by Rio Hondo (16), and Pasadena (15). Over the past 12 months, there were no other related program recommendation requests from regional community colleges.

Exhibit 12: Regional Community College Awards (Certificates and Degrees), 2021-2024

TOP Code	Program	College	2021-2022 Awards	2022-2023 Awards	2023-2024 Awards	3-Year Award Average
0957.30	Surveying	East LA	6	3	4	4
		LA Mission	0	1	4	2
		LA Subtotal	**6**	**4**	**8**	**6**
		Santiago Canyon	25	99	38	54
		OC Subtotal	**25**	**99**	**38**	**54**
Supply Subtotal/Average			**31**	**103**	**46**	**60**
2206.10	Geographic Information Systems	LA Pierce	5	5	4	5
		Mt San Antonio	0	0	4	1
		Pasadena	4	15	27	15
		Rio Hondo	19	17	11	16
		Santa Monica	0	1	3	1
		LA Subtotal	**28**	**38**	**49**	**38**
		Cypress	5	6	6	6
		OC Subtotal	**5**	**6**	**6**	**6**
Supply Subtotal/Average			**33**	**44**	**55**	**44**
Supply Total/Average			**64**	**147**	**101**	**104**

Exhibit 13 shows the annual average community college awards by type from 2021-22 to 2023-24. The plurality of the awards are for certificate 16 less than 30 semester units, followed by associate degree and certificate 6 less than 18 semester units.

Exhibit 13: Annual Average Community College Awards by Type, 2021-2024



Community College Student Outcomes

Exhibit 14 shows the Strong Workforce Program (SWP) metrics for geographic information systems programs in the Rancho Santiago Community College District (RSCCD), the Orange County Region, and California. Due to low student enrollment, student outcomes data is available only at statewide and regional levels.

Exhibit 14: Geographic Information Systems (2206.10) Strong Workforce Program Metrics, 2021-24[4]

SWP Metric	RSCCD	OC Region	California
SWP Students	21	77	2,605
SWP Students Who Earned 9 or More Career Education Units in the District in a Single Year	Insufficient Data	27%	25%
SWP Students Who Completed a Noncredit CTE or Workforce Preparation Course	Insufficient Data	Insufficient Data	29%
SWP Students Who Earned a Degree or Certificate or Attained Apprenticeship Journey Status	Insufficient Data	Insufficient Data	117
SWP Students Who Transferred to a Four-Year Postsecondary Institution (2022-23)	Insufficient Data	Insufficient Data	203
SWP Students with a Job Closely Related to Their Field of Study (2021-22)	Insufficient Data	Insufficient Data	79%
Median Annual Earnings for SWP Exiting Students (2022-23)	Insufficient Data	$63,054 ($30.31)	$57,812 ($27.79)
Median Change in Earnings for SWP Exiting Students (2022-23)	Insufficient Data	79%	31%
SWP Exiting Students Who Attained the Living Wage (2022-23)	Insufficient Data	Insufficient Data	60%

[4] All SWP metrics are for 2023-24 unless otherwise noted.

Non-Community College Supply

To comprehensively analyze the regional supply, it is crucial to include data from other institutions offering geographic information systems programs. Exhibit 15 displays the annual and three-year average awards granted by these institutions under the related Classification of Instructional Programs (CIP) code: Geographic Information Science and Cartography (45.0702). No awards were conferred under the related CIP code: Surveying Technology/Surveying (15.1102).

The available data covers 2020 to 2023. During this period, non-community college institutions in the region conferred an average of 117 awards annually in related program.

Exhibit 15: Regional Non-Community College Awards, 2020-2023

CIP Code	Program	College	2020-2021 Awards	2021-2022 Awards	2022-2023 Awards	3-Year Award Average
45.0702	Geographic Information Science and Cartography	Antioch University-Los Angeles	0	0	0	0
		California State University-Long Beach	23	20	21	21
		California State University-Northridge	1	9	4	5
		Mount Saint Mary's University	0	0	0	0
		University of California-Los Angeles	0	10	5	5
		University of Massachusetts Global	2	1	0	1
		University of Southern California	63	87	105	85
Supply Total/Average			**89**	**127**	**135**	**117**

Regional Demographics

The following section presents occupational, community college program, and population demographic data for Orange County. This comparison can help identify possible equity gaps between the local workforce and the student pipeline who are preparing for this occupation. These insights can inform program development, outreach, and support strategies to better align community college programs with current labor market needs.

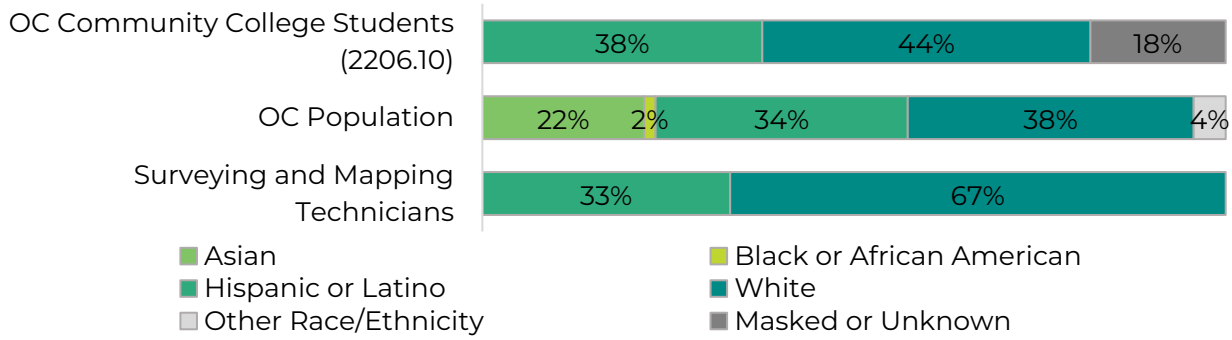
Ethnicity

Exhibit 16 compares the ethnicity of Orange County community college students enrolled in geographic information systems programs, the overall Orange County population, and occupation-specific data for *surveying and mapping technicians* included in this report.

White workers are overrepresented in the field, comprising 67% of *surveying and mapping technicians* compared to 44% of geographic information systems students. In contrast, Hispanic or Latino individuals make up 33% of the workforce but account for over 38% of program enrollment. There is no representation for Asian or Black or African American individuals.

These trends suggest there may be broader inequities in access to education and resources or awareness of *surveying and mapping technicians.* However, 18% of geographic information systems students are masked or unknown, limiting the ability to fully assess race and ethnic demographic representation in these programs.

Exhibit 16: Program and County Demographics by Ethnicity

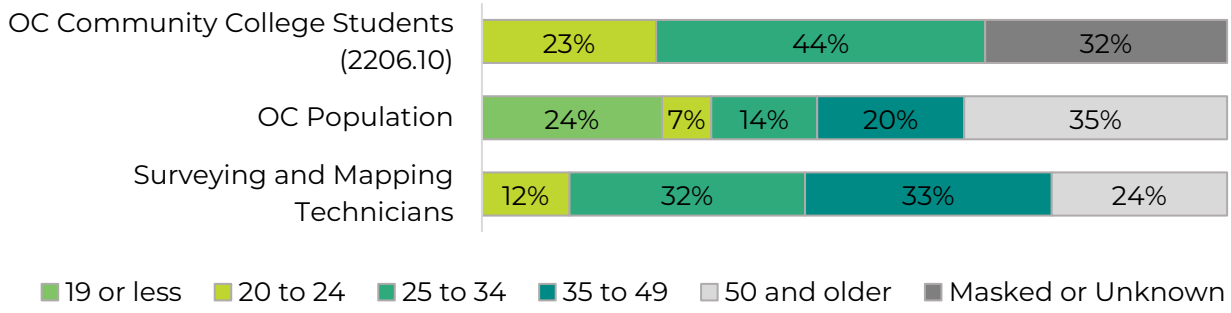


Age

Exhibit 17 compares the age of Orange County community college students enrolled in Geographic information systems programs, the overall Orange County population, and occupation-specific data for *surveying and mapping technicians*.

The majority (65%) of *surveying and mapping technicians* are aged 25 to 49, whereas in geographic information systems, most individuals (67%) are aged 20 to 24. There is no representation of individuals aged 19 or younger in either the programs or the workforce. This suggests *surveying and mapping technicians* are more commonly pursued by individuals in their mid or later career stages, potentially indicating delayed entry into the field or strong retention among experienced professionals. However, 32% of geographic information systems students are masked or unknown, limiting the ability to fully assess age demographic representation in these programs.

Exhibit 17: Program and County Demographics by Age

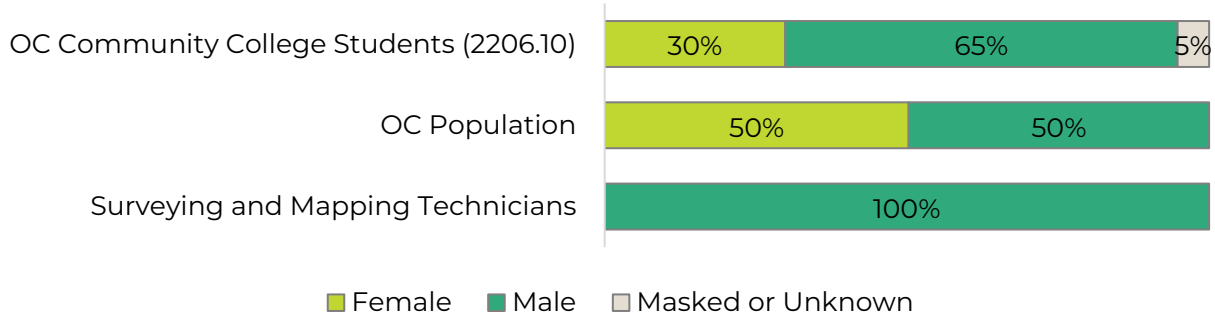


Sex

Exhibit 18 compares the sex of Orange County community college students enrolled in geographic information systems programs, the overall Orange County population, and occupation-specific data for *surveying and mapping technicians*.

Although the gender distribution in the general population is relatively balanced, the workforce is overwhelmingly male and has no female representation. This imbalance is mirrored in geographic information systems programs, where men make up the majority (65%).

Exhibit 18: Program and County Demographics by Sex



Appendix A: Methodology

OC COE prepared this report by analyzing occupational and educational program data. Occupational data comes from Lightcast, a labor market analytics firm which compiles information from the California Employment Development Department (EDD), U.S. Bureau of Labor Statistics (BLS), and other agencies. Analysis of emerging occupations is predicated on online job postings data combined with Occupational Information Network (O*NET) profile descriptions. Program supply data was sourced from the California Community Colleges Chancellor's Office Data Mart (MIS Data Mart) (datamart.cccco.edu) and the Integrated Postsecondary Education Data System (nces.ed.gov/ipeds/use-the-data), also known as IPEDS, which was integrated into the COE's Supply Table. (IPEDS).

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 have 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 each occupation (SOC code) by analyzing the number of 3-year average program completers or awards in related TOP and CIP codes. TOP code data comes from MIS Data Mart and CIP code data comes from the IPEDS. The 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 throughout the United States and Canada. The California Community Colleges are the only system that use TOP codes.

The analysis reflects labor market demand for occupations closely related to the proposed program as expressed by the requesting college in consultation with the OC COE. assess current and projected employment based on data trends for detailed occupations, as well as annual average awards granted by regional postsecondary educational institutions. Real-time labor market information (online job postings) assesses employer preferences but cannot be used to measure the quantity of open positions, number of jobs, or annual openings.

All findings are based on the most current available data and a combination of primary and secondary sources. While care was taken to ensure accuracy, the OC COE, its host district, and the California Community Colleges Chancellor's Office are not responsible for individual decisions made based on this report.

Appendix B: Data Sources

Data Type	Source
Occupational Projections, Wages, and Job Postings	Traditional and real-time labor market information are captured using data from Lightcast (v.2025.3), a labor market analytics firm.
Living Wage	Per the CCCCCO's this report's endorsement criteria uses the University of Washington's Center for Women's Welfare Self-Sufficiency Standard last updated in March 2024, which is $27.13 per hour ($57,294 annually) in Orange County. The MIT Living Wage, updated on February 10, 2025, is a nationally recognized living wage metric and is provided for reference. The current MIT Living Wage in Orange County is $32.20.
Typical Education and Training Requirements, and Educational Attainment	The Bureau of Labor Statistics (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.
Emerging Occupation Descriptions, Additional Education Requirements, and Employer Preferences	The O*NET database includes information on skills, abilities, knowledges, work activities, and interests associated with occupations.
Educational Supply	The CCCCO Data Mart provides information about students, courses, student services, outcomes and faculty and staff. The National Center for Education Statistics (NCES) Integrated Postsecondary Integrated Data System (IPEDS) collects data on the number of postsecondary awards earned (completions).
Student Metrics and Demographics	Data Vista (v.2.0), a statewide data system supported by the California Community Colleges Chancellor's Office provides data on progress, success, employment, and earnings outcomes for California community college students.
Population and Occupation Demographics	The Census Bureau's American Community Survey (ACS) is the premier source for detailed population and housing information. Data is sourced from IPUMS USA, a database providing access to ACS and other Census Bureau data products.

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