

Labor Market Analysis: 2206.10/Geographic Information Systems
Geographic Information Systems (Certificate requiring 8 to <16 semester units)
 Los Angeles Center of Excellence, October 2022

Summary

Program Endorsement:	Endorsed: All Criteria Met <input checked="" type="checkbox"/>	Endorsed: Some Criteria Met <input type="checkbox"/>	Not Endorsed <input type="checkbox"/>
Program Endorsement Criteria			
Supply Gap:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Living Wage: (Entry-Level, 25th)	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Education:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Emerging Occupation(s)			
Yes <input checked="" type="checkbox"/>		No <input type="checkbox"/>	

The Los Angeles Center of Excellence for Labor Market Research (LA COE) prepared this report to provide regional labor market supply and demand data related to one middle-skill occupation:

- **Surveying and Mapping Technicians (17-3031)** Perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist, to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps;¹

and one emerging occupation:

- **Geographic Information Systems Technologists and Technicians (15-1299.02)** Assist scientists or related professionals in building, maintaining, modifying, or using geographic information systems (GIS) databases. May also perform some custom application development or provide user support.²

Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree.³ This report is intended to help determine whether there is demand in the local

¹ [Surveying and Mapping Technicians \(bls.gov\)](https://www.bls.gov/occupations/17-3031)

² [15-1299.02 - Geographic Information Systems Technologists and Technicians \(onetonline.org\)](https://www.onetonline.org/occupations/15-1299.02)

³ The COE classifies middle-skill jobs as the following:

- 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.

labor market that is not being met by the supply from community college programs that align with the relevant occupations.

Based on the available data, there appears to be a supply gap for *surveying and mapping technicians* in the region. Furthermore, entry-level wages exceed the self-sufficiency standard wage in both Los Angeles and Orange counties, and more than half of current workers in the field have completed some college or an associate degree. **Therefore, due to all the criteria being met, the LA COE endorses this proposed program.** Detailed reasons include:

Demand:

- **Supply Gap Criteria** – Over the next five years, **142 jobs are projected to be available annually** in the region due to new job growth and replacements, **which is more than the three-year average of 84 awards conferred** by educational institutions in the region.
 - There were **906 online job postings related to geographic information systems** listed in the past 12 months. The highest number of job postings were for survey technicians, GIS analysts, GIS specialists, ServiceNow developers, and Golang developers.
- **Living Wage Criteria** – Within Los Angeles County, **typical entry-level hourly wages for surveying and mapping technicians are \$26.27, which is higher than the self-sufficiency standard** hourly wage (living wage) for one adult in the region (\$18.10 in Los Angeles County).⁴
- **Educational Criteria** – The Bureau of Labor Statistics (BLS) lists a high school diploma as the typical entry-level education for *surveying and mapping technicians*.
 - However, the national-level educational attainment data indicates **56% of workers in the field have completed some college or an associate degree.**

Supply:

- There are **5 community colleges** in the greater LA/OC region that issue awards related to geographic information systems, conferring an average of **83 awards annually** between 2018 and 2021.
- Between 2017 and 2020, there was an average of **1 award conferred annually** in related training programs by non-community college institutions throughout the greater LA/OC region.

Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for *surveying and mapping technicians*. In the greater Los Angeles/Orange County region, the number of jobs related to these occupations is projected to increase by 3% through 2026. There will be nearly 150 job openings per year through 2026 due to job growth and replacements.

⁴ Self-Sufficiency Standard wage data was pulled from The Self-Sufficiency Standard Tool for California. For more information, visit: <http://selfsufficiencystandard.org/california>.

Exhibit 1: Occupational demand in Los Angeles and Orange Counties⁵

Geography	2021 Jobs	2026 Jobs	2021-2026 Change	2021-2026 % Change	Annual Openings
Los Angeles	718	736	17	2%	93
Orange	362	378	15	4%	49
Total	1,081	1,113	33	3%	142

Wages

The labor market endorsement in this report considers the entry-level hourly wages for *surveying and mapping technicians* in Los Angeles County as they relate to the county’s self-sufficiency standard wage. Orange County wages are included below in order to provide a complete analysis of the greater LA/OC region. Detailed wage information, by county, is included in Appendix A.

Los Angeles County—The typical entry-level hourly wages for *surveying and mapping technicians* are \$26.27, which is above the self-sufficiency standard wage for one adult (\$18.10 in Los Angeles County). Experienced workers can expect to earn wages of \$46.14.

Exhibit 2: Hourly Earnings for Occupations in LA County

Occupation	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
Surveying and Mapping Technicians (17-3031)	\$26.27	\$35.79	\$46.14

Orange County— The typical entry-level hourly wages for *surveying and mapping technicians* are \$27.29, which is above the self-sufficiency standard wage for one adult (\$20.63 in Orange County). Experienced workers can expect to earn wages of \$47.45.

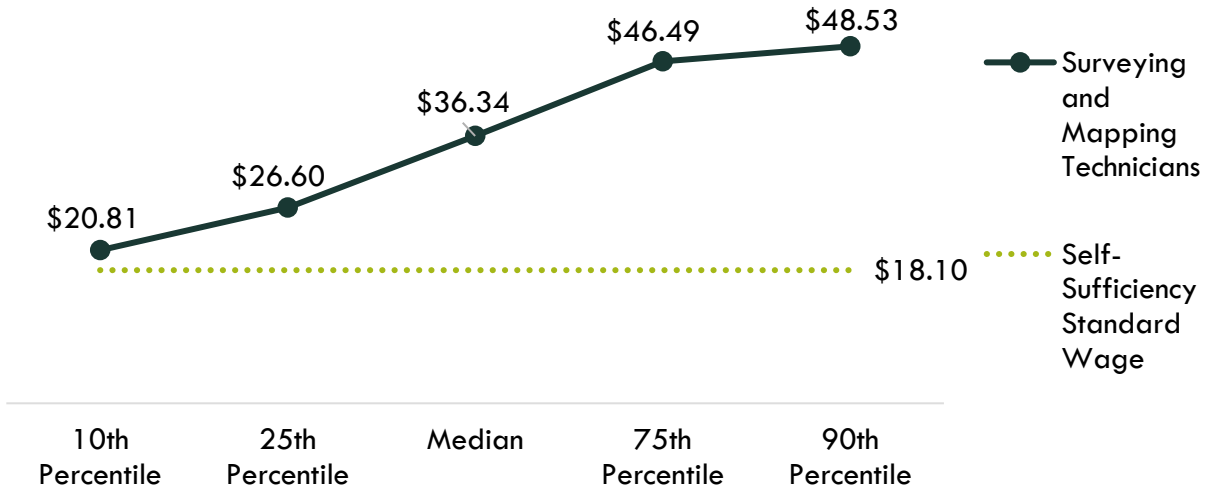
Exhibit 3: Hourly Earnings for Occupations in Orange County

Occupation	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
Surveying and Mapping Technicians (17-3031)	\$27.29	\$37.08	\$47.45

On average, the entry-level earnings for the occupations in this report are \$26.60; this is above the living wage for one single adult in Los Angeles County (\$18.10). Exhibit 4 shows the average wage for the occupations in this report, from entry-level to experienced workers.

⁵ Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

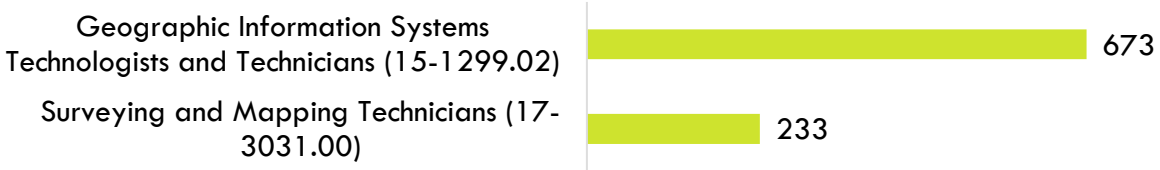
Exhibit 4: Average Hourly Earnings for Surveying and Mapping Technicians in LA/OC



Job Postings

There were 906 online job postings related to geographic information systems listed in the past 12 months. Exhibit 5 displays the number of job postings by occupation. The majority of job postings (74%) were for *geographic information systems technologists and technicians*, followed by *surveying and mapping technicians* (26%). The highest number of job postings were for survey technicians, GIS analysts, GIS specialists, ServiceNow developers, and Golang developers. The top skills were geographic information systems, ArcGIS (GIS software), computer science, Python (programming language) and JavaScript (programming language). The top three employers, by number of job postings, in the region were CyberCoders, Jobot, and Cannon Agency.

Exhibit 5: Job postings by occupation (last 12 months)



Educational Attainment

The Bureau of Labor Statistics (BLS) lists a high school diploma as the typical entry-level education for *surveying and mapping technicians*. However, the national-level educational attainment data indicates 56% of workers in the field have completed some college or an associate degree. Of the 54% of geographic information systems job postings listing a minimum education requirement in the greater Los Angeles/Orange County region, 20% (100) requested high school or vocational training, 11% (56) requested an associate degree, and 68% (334) requested a bachelor's degree.

Educational Supply

Community College Supply—Exhibit 6 shows the annual and three-year average number of awards conferred by community colleges in the related TOP codes: Surveying (0957.30) and Geographic Information Systems (2206.10). The colleges with the most completions in the region are: Santiago Canyon, Rio Hondo, and Cypress.

Exhibit 6: Regional community college awards (certificates and degrees), 2018-2021

TOP	Program	College	2018-19 Awards	2019-20 Awards	2020-21 Awards	3-Year Average
0957.30	Surveying	East LA	-	-	3	1
		LA Subtotal	-	-	3	1
		Santiago Canyon	64	44	59	56
		OC Subtotal	64	44	59	56
Supply Subtotal/Average			64	44	62	57
2206.10	Geographic Information Systems	LA Pierce	7	2	-	3
		Rio Hondo	19	15	16	17
		LA Subtotal	26	17	16	20
		Cypress	8	4	9	7
		OC Subtotal	8	4	9	7
Supply Subtotal/Average			34	21	25	27
Supply Total/Average			98	65	87	83

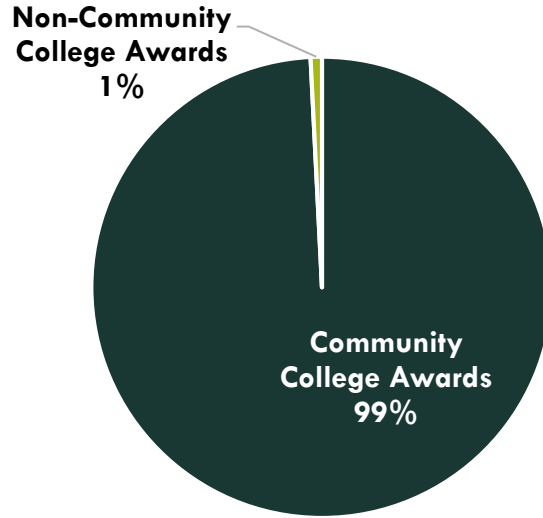
Non-Community College Supply—For a comprehensive regional supply analysis, it is important to consider the supply from other institutions in the region that provide training programs for *surveying and mapping technicians*. Exhibit 7 shows the annual and three-year average number of awards conferred by this institution in relevant programs. Due to different data collection periods, the most recent three-year period of available data is from 2017 to 2020. Between 2017 and 2020, non-community college institutions in the region conferred an average of 1 award.

Exhibit 7: Regional non-community college awards, 2017-2020

CIP	Program	Institution	2017-18 Awards	2018-19 Awards	2019-20 Awards	3-Year Average
45.0702	Geographic Information Science and Cartography	Brandman University	-	-	2	1
Supply Total/Average			-	-	2	1

Exhibit 8 shows the proportion of community college awards conferred in LA/OC compared to the number of non-community college awards for the programs in this report. Nearly all of the awards conferred in these programs are awarded by community colleges in the LA/OC region.

Exhibit 8: Community College Awards Compared to Non-Community College Awards in LA/OC Region, 3-Year Average



Appendix A: Occupational demand and wage data by county

Exhibit 9. Los Angeles County

Occupation (SOC)	2021 Jobs	2026 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
Surveying and Mapping Technicians (17-3031)	718	736	17	2%	93	\$26.27	\$35.79	\$46.14

Exhibit 10. Orange County

Occupation (SOC)	2021 Jobs	2026 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
Surveying and Mapping Technicians (17-3031)	362	378	15	4%	49	\$27.29	\$37.08	\$47.45

Exhibit 11. Los Angeles and Orange Counties

Occupation (SOC)	2021 Jobs	2026 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Typical Entry-Level Education
Surveying and Mapping Technicians (17-3031)	1,081	1,113	33	3%	142	High school diploma or equivalent

Appendix B: Sources

- O*NET Online
- Labor Insight (Burning Glass Technologies)
- Lightcast (formerly Emsi)
- Bureau of Labor Statistics (BLS)
- California Employment Development Department, Labor Market Information Division, OES
- California Community Colleges Chancellor’s Office Management Information Systems (MIS)
- Self-Sufficiency Standard at the Center for Women’s Welfare, University of Washington
- Chancellor’s Office Curriculum Inventory (COCI 2.0)

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