

**Program Endorsement Brief: 2206.10/Geographic Information Systems  
Geospatial Technologies Certificate**  
Orange County Center of Excellence, May 2021

**Summary Analysis**

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

The Orange County Center of Excellence for Labor Market Research (COE) prepared this report to provide Los Angeles/Orange County regional labor market supply and demand data for three occupations related to geospatial technologies. To illuminate which occupations are immediately accessible to community college graduates, these geospatial technologies occupations have been divided into middle-skill and above middle-skill occupation groups. Middle-skill occupations typically accommodate community college graduates, while above middle-skill occupations typically require a four-year degree and/or prior work experience. The occupations included in the **middle-skill** geospatial technologies occupation group are: *geographic information systems technologists and technicians* (15-1299.02), an emerging occupation, and *survey and mapping technicians* (17-3031). The related occupation that is considered **above middle-skill** is: *cartographers and photogrammetrists* (17-1021). This report is intended to help determine whether there is demand in the local 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 these geospatial technologies occupations in the region. While the majority of annual openings for the occupations in this report typically require a bachelor's degree, entry-level wages exceed the living wage in both Los Angeles and Orange counties. **Therefore, due to some of the criteria being met, the COE endorses this proposed program.** Detailed reasons include:

**Demand:**

- **Supply Gap Criteria** – Over the next five years, there is projected to be **1,911 jobs available annually** in the region due to new job growth and replacements, **which is more than the 192 awards conferred annually** by educational institutions in the region.
  - However, the computer occupations, all other (15-1299) SOC code includes various emerging occupations, including *geographic information systems technologists and technicians* (15-1299.02). Since the SOC code does not solely represent geospatial technologies occupations, **the number of annual job openings is overstated.**

- Over the past 12 months, there were **190 online job postings related to these geospatial technologies occupations**. The highest number of job postings were for survey technicians, party crew chiefs (also known by the job title: survey crew chiefs), GIS technicians, site survey technicians, and GIS engineers.
- **Living Wage Criteria** – Within Orange County, **all of the annual job openings** for these geospatial technologies occupations have **entry-level wages above the county's living wage** (\$17.36/hour).<sup>1</sup>
- **Educational Criteria** – Within the LA/OC region, **92% of the annual job openings** for occupations related to geospatial technologies **typically require a bachelor's degree**.
  - While the national-level educational attainment data indicates **between 26.2% and 53.6% of workers in the field have completed some college or an associate degree**, the occupation with the majority of the annual openings (*computer occupations, all other*) have **26.2% of workers in the field who have completed some college or an associate degree**.

#### Supply:

- There are **5 community colleges** in the LA/OC region that issue awards related to geospatial technologies, conferring an average of **87 awards annually** between 2017 and 2020.
- Between 2016 and 2019, there was an average of **105 awards conferred annually** in related training programs by non-community college institutions throughout the region.

#### Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for the middle-skill group of geospatial technologies occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to increase by 1% through 2024. There will be more than 1,900 job openings per year through 2024 due to job growth and replacements. It is important to note that the *computer occupations, all other* (15-1299) SOC code includes various emerging occupations and not solely *geographic information systems technologists and technicians* (15-1299.02). Therefore, the data in Exhibit 1 is overstated for geospatial technologies-related occupations.

*This report includes employment projection data by Emsi which uses EDD information. Emsi's projections are modeled on recorded (historical) employment figures and incorporate several underlying assumptions, including the assumption that the economy, during the projection period, will be at approximately full employment. To the extent that a recession or labor shock, such as the economic effects of COVID-19, can cause long-term structural change, it may impact the projections. At this time, it is not possible to quantify the impact of COVID-19 on projections of industry and occupational employment. Therefore, the projections included in this report do not take the impacts of COVID-19 into account.*

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<sup>1</sup> Living wage data was pulled from California Family Needs Calculator on 5/13/2021. For more information, visit the California Family Needs Calculator website: <https://insightcced.org/2018-family-needs-calculator/>.

**Exhibit 1: Middle-skill occupational demand in Los Angeles and Orange Counties<sup>2</sup>**

Geography	2019 Jobs	2024 Jobs	2019-2024 Change	2019-2024 % Change	Annual Openings
Los Angeles	18,099	18,257	158	1%	1,327
Orange	7,771	7,898	127	2%	584
<b>Total</b>	<b>25,870</b>	<b>26,155</b>	<b>285</b>	<b>1%</b>	<b>1,911</b>

Exhibit 2 shows the five-year occupational demand projections for the above middle-skill geospatial technologies occupation in this report. In Los Angeles/Orange County, the number of jobs related to this occupation is projected to increase by 7% through 2024. There will be approximately 20 job openings per year through 2024 due to job growth and replacements.

**Exhibit 2: Above middle-skill occupational demand in Los Angeles and Orange Counties<sup>3</sup>**

Geography	2019 Jobs	2024 Jobs	2019-2024 Change	2019-2024 % Change	Annual Openings
Los Angeles	159	170	11	7%	14
Orange	60	64	4	6%	5
<b>Total</b>	<b>219</b>	<b>234</b>	<b>15</b>	<b>7%</b>	<b>19</b>

**Wages**

The labor market endorsement in this report considers the entry-level hourly wages for all these geospatial technologies occupations (both middle-skill and above middle-skill) 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. Detailed wage information, by county, is included in Appendix A.

**Orange County—** All of the annual openings for these geospatial technologies occupations have entry-level wages above the living wage for one adult (\$17.36 in Orange County). Typical entry-level hourly wages for the middle-skill group of occupations are in a range between \$26.40 and \$28.38. Experienced workers in the middle-skill group of occupations can expect to earn wages between \$47.55 and \$52.12, which are higher than the living wage estimate. Orange County's average wages for these middle-skill occupations are below the average statewide wage of \$51.74 for these occupations.

Typical entry-level hourly wages for the one above middle-skill occupation, Cartographers and Photogrammetrists, are \$35.48, which is above the living wage for one adult in Orange County. Experienced workers in this occupation can expect to earn \$48.91. Orange County's average wages are above the average statewide wage of \$42.88 for this occupation.

**Los Angeles County—** All of the annual openings for these geospatial technologies occupations have entry-level wages above the living wage for one adult (\$15.04 in Los Angeles County).

<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.

<sup>3</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.

Typical entry-level hourly wages are in a range between \$27.21 and \$37.39. Experienced workers can expect to earn wages between \$47.20 and \$53.77, which are higher than the living wage estimate. Los Angeles County's average wages for these middle-skill occupations are below the average statewide wage of \$51.74 for these occupations.

Typical entry-level hourly wages for the one above middle-skill occupation, Cartographers and Photogrammetrists, are \$37.39, which is above the living wage for one adult in Los Angeles County. Experienced workers in this occupation can expect to earn \$51.32. Los Angeles County's average wages for this occupation are above the statewide wage of \$42.88 for this occupation.

### **Job Postings**

There were 190 online job postings related to geospatial technologies occupations listed in the past 12 months. The highest number of job postings were for survey technicians, party crew chiefs (also known by the job title: survey crew chiefs, GIS technicians, site survey technicians, and GIS engineers. The top skills were: surveys, AutoCAD, project management, scheduling, and geographic information system (GIS). The top employers, by number of job postings, in the region were: Bock Clark and Corrective Solutions.

*It is important to note that the job postings data included in this section reflects online job postings listed in the past 12 months and does not yet demonstrate the impact of COVID-19. While employers have generally posted fewer online job postings since the beginning of the pandemic, the long-term effects are currently unknown.*

### **Educational Attainment**

The Bureau of Labor Statistics (BLS) lists a bachelor's degree as the typical entry-level education for *computer occupations, all other* and *cartographers and photogrammetrists*, and a high school diploma for *surveying and mapping technicians*. In the LA/OC region, the majority of annual job openings (92%) typically require a bachelor's degree. While the national-level educational attainment data indicates between 26.2% and 53.6% of workers in the field have completed some college or an associate degree, the occupation with the majority of the annual openings (*computer occupations, all other*) has 26.2% of workers in the field who have completed some college or an associate degree. Of the 66% of geospatial technologies job postings listing a minimum education requirement in Los Angeles/Orange County, 40% (50) requested a bachelor's degree, 30% (38) requested an associate degree and 30% (38) requested a high school diploma.

### **Educational Supply**

**Community College Supply**—Exhibit 3 shows the 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 and Rio Hondo. Over the past 12 months, there were two other related program recommendation requests from regional community colleges.

**Exhibit 3: Regional community college awards (certificates and degrees), 2017-2020**

TOP Code	Program	College	2017-2018 Awards	2018-2019 Awards	2019-2020 Awards	3-Year Award Average
0957.30	Surveying	East LA	4	-	-	1
		LA Subtotal	4	-	-	1
		Santiago Canyon	46	64	44	51
		OC Subtotal	46	64	44	51
Supply Subtotal/Average			50	64	44	53
2206.10	Geographic Information Systems	LA Pierce	-	7	2	3
		Rio Hondo	36	19	15	23
		LA Subtotal	36	26	17	26
		Cypress	12	8	4	8
		OC Subtotal	12	8	4	8
Supply Subtotal/Average			48	34	21	34
Supply Total/Average			98	98	65	87

**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 geospatial technologies. Exhibit 4 shows the annual and three-year average number of awards conferred by these institutions in the related Classification of Instructional Programs (CIP) Code: Geographic Information Science and Cartography (45.0702). Due to different data collection periods, the most recent three-year period of available data is from 2016 to 2019. Between 2016 and 2019, four-year colleges in the region conferred an average of 105 awards annually in related training programs.

**Exhibit 4: Regional non-community college awards, 2016-2019**

Table 1: Regional non-community college awards, 2016-2019						
CIP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
45.0702	Geographic Information Science and Cartography	CSU-Long Beach	21	23	23	22
		CSU-Northridge	2	5	6	4
		Mount Saint Mary's Univ.	-	6	1	2
		Univ. of Southern California	71	71	86	76
Supply Total/Average			94	105	116	105

## Appendix A: Occupational demand and wage data by county

### Exhibit 5. Orange County

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)
Computer Occupations, All Other (15-1299)	7,359	7,468	109	1%	534	\$26.40	\$37.17	\$52.12
Surveying and Mapping Technicians (17-3031)	411	429	18	4%	50	\$28.38	\$38.90	\$47.55
<b>Middle-Skill Total</b>	<b>7,771</b>	<b>7,898</b>	<b>127</b>	<b>2%</b>	<b>584</b>			
Cartographers and Photogrammetrists (17-1021)	60	64	4	6%	5	\$35.48	\$42.37	\$48.91
<b>Above Middle-Skill Total</b>	<b>60</b>	<b>64</b>	<b>4</b>	<b>6%</b>	<b>5</b>			
<b>Total</b>	<b>7,831</b>	<b>7,962</b>	<b>131</b>	<b>2%</b>	<b>589</b>			

### Exhibit 6. Los Angeles County

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)
Computer Occupations, All Other (15-1299)	17,255	17,376	121	1%	1,225	\$27.21	\$38.34	\$53.77
Surveying and Mapping Technicians (17-3031)	844	881	37	4%	102	\$27.99	\$38.46	\$47.20
<b>Middle-Skill Total</b>	<b>18,099</b>	<b>18,257</b>	<b>158</b>	<b>1%</b>	<b>1,327</b>			
Cartographers and Photogrammetrists (17-1021)	159	170	11	7%	14	\$37.39	\$44.51	\$51.32
<b>Above Middle-Skill Total</b>	<b>159</b>	<b>170</b>	<b>11</b>	<b>7%</b>	<b>14</b>			
<b>Total</b>	<b>18,258</b>	<b>18,427</b>	<b>169</b>	<b>1%</b>	<b>1,341</b>			

### Exhibit 7. Los Angeles and Orange Counties

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings
Computer Occupations, All Other (15-1299)	24,614	24,844	230	1%	1,758
Surveying and Mapping Technicians (17-3031)	1,255	1,310	55	4%	152
<b>Middle-Skill Total</b>	<b>25,870</b>	<b>26,155</b>	<b>285</b>	<b>1%</b>	<b>1,911</b>
Cartographers and Photogrammetrists (17-1021)	219	234	15	7%	19
<b>Above Middle-Skill Total</b>	<b>219</b>	<b>234</b>	<b>15</b>	<b>7%</b>	<b>19</b>
<b>Total</b>	<b>26,089</b>	<b>26,388</b>	<b>300</b>	<b>1%</b>	<b>1,930</b>

### Appendix B: Sources

- O\*NET Online
- Labor Insight/Jobs (Burning Glass)
- Economic Modeling Specialists, International (Emsi)
- Bureau of Labor Statistics (BLS)
- Employment Development Department, Labor Market Information Division, OES
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- California Family Needs Calculator, Insight Center for Community Economic Development
- Chancellor's Office Curriculum Inventory (COCI 2.0)

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