

Program Endorsement Brief: 0924.00/Engineering Technology, General Engineering Technology and Surveying

Los Angeles/Orange County Center of Excellence, May 2020

Summary Analysis

The Los Angeles/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 related to three middle-skill occupations: civil engineering technicians (17-3022), industrial engineering technicians (17-3026), and surveying and mapping technicians (17-3031). Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree.¹ 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 the engineering technology and surveying occupations in the region. **Therefore, the COE endorses this proposed program.** Reasons include:

Demand:

- Over the next five years, there is projected to be **662 jobs available annually** in the region due to new job growth and replacements, **which is more than the 261 awards conferred annually** by educational institutions in the region.
- The national-level educational attainment data indicates **between 53.5% and 59.0% of workers in the field have completed some college or an associate degree.**
- **Typical entry-level hourly wages** for occupations throughout the region are between \$24.15 and \$26.83, **which are higher than the California Family Needs Calculator** hourly wage (living wage) for one adult in the region (\$15.04 in Los Angeles County and \$17.36 in Orange County).²

Supply:

- There are **5 community colleges** in the region that issued awards related to engineering technology and surveying, conferring an average of **234 awards annually** between 2016 and 2019.
- Between 2014 and 2017, there was an average of **27 awards conferred annually** in related training programs by non-community college institutions, all of which were generated by **2 individual four-year colleges throughout** the region.

¹ 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.

² Living wage data was pulled from California Family Needs Calculator on 5/6/20. For more information, visit the California Family Needs Calculator website: <https://insightcced.org/2018-family-needs-calculator/>

Occupational Demand

Exhibit 1, shows the five-year occupational demand projections for these three occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to increase by 2% through 2024. There will be more than 650 job openings per year through 2024 due to job growth and replacements.

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.

Exhibit 1: Occupational demand in Los Angeles and Orange Counties³

Geography	2019 Jobs	2024 Jobs	2019-2024 Change	2019-2024 % Change	Annual Openings
Los Angeles	4,060	4,093	33	1%	427
Orange	2,125	2,200	75	4%	235
Total	6,185	6,293	108	2%	662

Wages—Typical entry-level hourly wages for engineering technology and surveying positions throughout the region are between \$24.15 and \$26.83.⁴ Entry-level wages for these occupations are higher than the living wage for one adult in the region (\$15.04 in Los Angeles County and \$17.36 in Orange County). Experienced workers can expect to earn between \$41.15 and \$46.63, which is higher than the living wage estimates for both counties. Regional average wages are above the average statewide wage of \$32.68 for these occupations. Wage information, by county, is included in Appendix A.

Job Postings—There were 484 online job postings related to engineering technology and surveying listed in the past 12 months. The highest number of job postings were for engineering technicians, field technicians, structural technicians/draftspersons, and survey technicians. The top skills were: AutoCAD, repair, project management, calculation, and civil engineering. The top three employers, by number of job postings, in the region were: CBRE, The Boeing Company, and Edison International.

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.

³ Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

⁴ Entry-level wage is defined as the twenty-fifth percentile hourly wage. Wages for experienced workers are defined as the seventy-fifth percentile hourly wage.

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 and an associate degree for civil engineering technicians and industrial engineering technicians. The national-level educational attainment data indicates that between 53.5% and 59.0% of workers in the field have completed some college or an associate degree. Of the 64% of engineering technology and surveying job postings listing a minimum education requirement in Los Angeles/Orange County, 42% (130) requested a high school diploma or vocational training, 12% (37) requested an associate degree, and 46% (143) requested a bachelor’s degree.

Educational Supply

Community College Supply—Exhibit 2 shows the three-year average number of awards conferred by community colleges in the related TOP codes: Engineering Technology, General (0924.00) and Surveying (0957.30). The college with the most completions in the region is Pasadena. Over the past 12 months, there was one other related program recommendation request from a regional community college.

Exhibit 2: Regional community college awards (certificates and degrees), 2016-2019

TOP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
0924.00	Engineering Technology, General	Cerritos	6	23	26	18
		East LA	1	-	-	0
		Glendale	12	17	14	14
		Pasadena	122	173	176	157
		LA Subtotal	141	213	216	190
		Santa Ana	5	1	1	2
		OC Subtotal	5	1	1	2
Supply Subtotal/Average			146	214	217	192
0957.30	Surveying	East LA	-	4	-	1
		LA Subtotal	-	4	-	1
		Santa Ana	11	46	64	40
		OC Subtotal	11	46	64	40
Supply Subtotal/Average			11	50	64	42
Supply Total/Average			157	264	281	234

Non-Community College Supply— It is important to consider the supply from four-year institutions in the region that provide training programs for engineering technology and surveying occupations. Exhibit 3 shows the annual and three-year average number of awards conferred by these institutions in the related Classification of Instructional Programs (CIP) Code: Engineering Technology, General (15.0000). Due to different data collection periods, the most recent three-year period of available data is from 2014 to 2017. Between 2014 and 2017, four-year colleges in the region conferred an average of 27 awards annually in related training programs.

Exhibit 3: Regional non-community college awards, 2014-2017

CIP Code	Program	College	2014-2015 Awards	2015-2016 Awards	2016-2017 Awards	3-Year Award Average
15.0000	Engineering Technology, General	California State Polytechnic University-Pomona	26	42	11	26
		California State University-Long Beach	1	-	-	0
Supply Total/Average			27	42	11	27

Appendix A: Occupational demand and wage data by county

Exhibit 4. Los Angeles County

Occupation (SOC)	2019 Jobs	2024 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)
Civil Engineering Technicians (17-3022)	2,188	2,204	16	1%	216	\$27.26	\$34.15	\$41.78
Industrial Engineering Technicians (17-3026)	1,038	1,025	(13)	(1%)	103	\$23.77	\$34.47	\$44.54
Surveying and Mapping Technicians (17-3031)	834	864	30	4%	108	\$24.82	\$37.83	\$46.55
Total	4,060	4,093	33	1%	427			

Exhibit 5. Orange County

Occupation (SOC)	2019 Jobs	2024 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)
Civil Engineering Technicians (17-3022)	1,122	1,178	56	5%	123	\$26.10	\$32.62	\$39.84
Industrial Engineering Technicians (17-3026)	600	609	9	2%	61	\$24.80	\$35.15	\$44.61
Surveying and Mapping Technicians (17-3031)	402	412	10	2%	51	\$25.29	\$38.13	\$46.78
Total	2,125	2,200	75	4%	235			

Exhibit 6. Los Angeles and Orange Counties

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Civil Engineering Technicians (17-3022)	3,310	3,382	72	2%	339	\$26.83	\$33.62	\$41.15
Industrial Engineering Technicians (17-3026)	1,638	1,634	(4)	(0%)	164	\$24.15	\$34.72	\$44.56
Surveying and Mapping Technicians (17-3031)	1,236	1,276	40	3%	159	\$25.02	\$37.92	\$46.63
Total	6,185	6,293	108	2%	662			

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
- Employment Development Department, Unemployment Insurance Dataset
- Living Insight Center for Community Economic Development
- 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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May 2020

