Program Endorsement Brief: 0953.40/ Mechanical Drafting

Engineering Technology CAD & Design Drafting

Los Angeles/Orange County Center of Excellence, May 2021

Summary Analysis

Program Endorsement:	**Endorsed: All Criteria Met** ☒	**Endorsed: Some Criteria Met** ☐	**Not Endorsed** ☐

Program Endorsement Criteria		
Supply Gap:	Yes ☑	No ☐
Living Wage: (Entry-Level, 25th)	Yes ☑	No ☐
Education:	Yes ☑	No ☐
Emerging Occupation(s)		
Yes ☐		*No* ☑

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 five middle-skill occupations:

- *Architectural and civil drafters* (17-3011);
- *Electrical and Electronics Drafters* (17-3012);
- *Mechanical drafters* (17-3013);
- *Civil engineering technologists and technicians* (17-3022); and
- *Mechanical engineering technologists and technicians* (17-3027).

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 these engineering-related occupations in the region. The five occupations in this report typically require an associate degree, and entry-level wages exceed the living wage in both Los Angeles and Orange counties. **Therefore, due to all of the criteria being met, the COE endorses this proposed program.** Detailed reasons include:

[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.

Demand:

- ***Supply Gap Criteria –*** Over the next five years, there is projected to be **1,096 jobs available annually** in the region due to retirements and workers leaving the field, **which is more than the 1,001 awards conferred annually** by educational institutions in the region.
- ***Living Wage Criteria –*** In Los Angeles County, all five engineering-related occupations have entry-level wages above the county's living wage ($15.04/hour).[2]
- ***Educational Criteria –*** The Bureau of Labor Statistics (BLS) lists an associate degree as the typical entry-level education for all five occupations of interest.
    - National-level educational attainment data indicates **between 51% and 55% of workers in the field have completed some college or an associate degree.**

Supply:

- There are **20 community colleges** in the LA/OC region that issue awards related to the five occupations of interest, conferring an average of **844 awards annually** between 2017 and 2020.
- Between 2016 and 2019, there was an average of **157 awards conferred annually** in related training programs by non-community college institutions.

[2] Living wage data was pulled from California Family Needs Calculator on 5/4/2021. 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 the five engineering-related occupations studied in this report. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to decrease by 8% through 2024. However, there will be more than 1,000 job openings per year through 2024 due to retirements and workers leaving the field.

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 Counties[3]

Geography	2019 Jobs	2024 Jobs	2019-2024 Change	2019-2024 % Change	Annual Openings
Los Angeles	7,967	7,154	(813)	(10%)	631
Orange	4,434	4,212	(222)	(5%)	372
Total	**12,401**	**11,366**	**(1,035)**	**(8%)**	**1,002**

Wages

The labor market endorsement in this report considers the entry-level hourly wages for these engineering-related occupations in Los Angeles County, as they relate to the county's living wage. Orange 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.

Los Angeles County: All five engineering-related occupations have entry-level wages above the living wage for one adult ($15.04 in Los Angeles County). Typical entry-level hourly wages are in a range between $22.56 and $27.58. Experienced workers can expect to earn wages between $36.74 and $43.01, which are higher than the living wage estimate.

Orange County: All five engineering-related occupations have entry-level wages above the living wage for one adult ($17.36 in Orange County). Typical entry-level hourly wages are in a range between $23.30 and $27.61. Experienced workers can expect to earn wages between $37.80 and $43.88, which are higher than the living wage estimate.

[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.

Job Postings
Over the past 12 months, there have been 864 online job postings for the five engineering-related occupations. The highest number of job postings were for mechanical technician, mechanical inspector, and field technician. The top skills were AutoCAD, Revit, and repair. The top employers, by number of job postings, in the region were Northrop Grumman, Charter Communications, and The Boeing Company.

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 an associate degree as the typical entry-level education for all five occupations studied in this report. National-level educational attainment data indicates between 51% and 55% of workers in the field have completed some college or an associate degree. Of the 58% of job postings listing a minimum education requirement in Los Angeles/Orange County, 47% (236) requested a high school diploma, 20% (98) requested an associate degree, and 33% (167) requested a bachelor's degree.

Educational Supply

Community College Supply — Exhibit 2 shows the annual and three-year average number of awards conferred in programs that have historically trained for the occupations of interest. Programs include Architecture and Architectural Technology (0201.00); Engineering Technology, General (requires Trigonometry) (0924.00); Electro-Mechanical Technology (0935.00); Drafting Technology (0953.00); Architectural Drafting (0953.10); Civil Drafting (0953.20); Electrical, Electronic, and Electro-Mechanical Drafting (0953.30); and Mechanical Drafting (0953.40). The colleges with the most completions in the region are Pasadena, Mt. San Antonio, and Cerritos. Over the past 12 months, there were twelve other related program recommendation requests from regional community colleges.

Exhibit 2: Regional community college awards (certificates and degrees), 2017-2020

TOP Code	Program	College	2017-18 Awards	2018-19 Awards	2019-20 Awards	3-Year Average
0201.00	Architecture and Architectural Technology	Cerritos	17	24	44	28
		Citrus	2	3	6	4
		Compton	-	2	-	1
		East LA	34	57	25	39
		El Camino	35	14	21	23
		Glendale	4	6	6	5
		LA Harbor	5	5	4	5
		LA Pierce	8	9	4	7
		LA Trade	8	11	8	9

TOP Code	Program	College	2017-18 Awards	2018-19 Awards	2019-20 Awards	3-Year Average
		LA Valley	4	1	3	3
		Long Beach	10	14	13	12
		Mt San Antonio	82	97	51	77
		Pasadena	11	16	18	15
		Rio Hondo	19	20	3	14
		LA Subtotal	**239**	**279**	**206**	**241**
		Fullerton	8	5	12	8
		Orange Coast	82	40	59	60
		Saddleback	12	15	8	12
		OC Subtotal	**102**	**60**	**79**	**80**
Supply Subtotal/Average			**341**	**339**	**285**	**322**
0924.00	Engineering Technology, General (requires Trigonometry)	Cerritos	23	26	15	21
		East LA	-	-	1	0
		Glendale	17	14	7	13
		Mt San Antonio	-	-	2	1
		Pasadena	173	176	216	188
		LA Subtotal	**213**	**216**	**241**	**223**
		Santa Ana	1	1	3	2
		OC Subtotal	**1**	**1**	**3**	**2**
Supply Subtotal/Average			**214**	**217**	**244**	**225**
0935.00	Electro-Mechanical Technology	Orange Coast	3	2	-	2
		Santa Ana	-	1	8	3
		OC Subtotal	**3**	**3**	**8**	**5**
Supply Subtotal/Average			**3**	**3**	**8**	**5**
0953.00	Drafting Technology	Cerritos	48	35	14	32
		Citrus	6	13	15	11
		East LA	38	36	7	27
		El Camino	15	21	9	15
		LA Harbor	1	3	-	1
		LA Pierce	7	5	2	5
		LA Valley	4	1	3	3
		Long Beach	-	-	1	0
		Mt San Antonio	34	42	23	33

TOP Code	Program	College	2017-18 Awards	2018-19 Awards	2019-20 Awards	3-Year Average
		Pasadena	21	5	6	11
		Rio Hondo	93	14	12	40
		LA Subtotal	**267**	**175**	**92**	**178**
		Fullerton	11	5	4	7
		Golden West	18	57	9	28
		Irvine Valley	-	2	10	4
		Saddleback	2	1	2	2
		Santa Ana	23	15	27	22
		OC Subtotal	**54**	**80**	**52**	**62**
Supply Subtotal/Average			**321**	**255**	**144**	**240**
0953.10	Architectural Drafting	Citrus	-	-	2	1
		Long Beach	8	7	9	8
		Rio Hondo	-	-	8	3
		LA Subtotal	**8**	**7**	**19**	**11**
		Fullerton	4	3	1	3
		Santa Ana	3	3	1	2
		OC Subtotal	**7**	**6**	**2**	**5**
Supply Subtotal/Average			**15**	**13**	**21**	**16**
0953.20	Civil Drafting	Rio Hondo	2	1	3	2
		LA Subtotal	**2**	**1**	**3**	**2**
		Irvine Valley	1	1	3	2
		OC Subtotal	**1**	**1**	**3**	**2**
Supply Subtotal/Average			**3**	**2**	**6**	**4**
0953.30	Electrical, Electronic, and Electro-Mechanical Drafting	Glendale	6	2	2	3
		LA Subtotal	**6**	**2**	**2**	**3**
Supply Subtotal/Average			**6**	**2**	**2**	**3**
0953.40	Mechanical Drafting	Glendale	-	5	11	5
		LA Pierce	-	1	-	0
		LA Valley	8	5	9	7
		Long Beach	23	8	10	14
		LA Subtotal	**31**	**19**	**30**	**27**

TOP Code	Program	College	2017-18 Awards	2018-19 Awards	2019-20 Awards	3-Year Average
		Irvine Valley	-	4	5	3
		OC Subtotal	**-**	**4**	**5**	**3**
		Supply Subtotal/Average	**31**	**23**	**35**	**30**
		Supply Total/Average	**934**	**854**	**745**	**844**

Non-Community College Supply — It is important to consider the supply from non-community college institutions in the region that provide training programs for these engineering-related 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) Codes: 04.0401 – Environmental Design / Architecture; 15.0000 – Engineering Technology, General; 15.1302 – CAD/CADD Drafting and/or Design Technology/Technician; and 50.0404 – Industrial and Product Design.

Due to different data collection periods, the most recent three-year period of available data is from 2016 to 2019. Between 2016 and 2019, non-community college institutions in the region conferred an average of 157 awards annually in related training programs.

Exhibit 3: Regional non-community college awards, 2016-2019

CIP Code	Program	College	2016-17 Awards	2017-18 Awards	2018-19 Awards	3-Year Average
04.0401	Environmental Design / Architecture	Otis College of Arts and Design	12	18	13	14
15.0000	Engineering Technology, General	California State Polytechnic University - Pomona	11	1	4	5
50.0404	Industrial and Product Design	California State University - Fullerton	-	-	125	42
		California State University – Long Beach	39	31	37	36
		FIDM – Fashion Institute of Design and Merchandising – Los Angeles	41	28	34	34
		Otis College of Art and Design	28	30	18	25
		Supply Subtotal/Average	**131**	**108**	**231**	**157**

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 (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Architectural and Civil Drafters (17-3011)	2,899	2,728	(171)	(6%)	241	$25.80	$29.95	$36.74
Electrical and Electronics Drafters (17-3012)	736	614	(122)	(17%)	56	$23.69	$28.87	$38.30
Mechanical Drafters (17-3013)	1,348	1,154	(194)	(14%)	106	$22.56	$28.94	$38.30
Civil Engineering Technologists and Technicians (17-3022)	1,958	1,764	(194)	(10%)	151	$27.58	$34.32	$42.96
Mechanical Engineering Technologists and Technicians (17-3027)	1,026	894	(132)	(13%)	77	$26.91	$35.44	$43.01
Total	**7,967**	**7,154**	**(813)**	**(10%)**	**631**			

Exhibit 5. Orange County

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)
Architectural and Civil Drafters (17-3011)	1,675	1,644	(31)	(2%)	147	$26.65	$30.87	$37.80
Electrical and Electronics Drafters (17-3012)	429	397	(32)	(7%)	35	$24.93	$30.20	$39.85
Mechanical Drafters (17-3013)	725	693	(32)	(4%)	62	$23.30	$29.72	$39.17
Civil Engineering Technologists and Technicians (17-3022)	1,019	940	(79)	(8%)	82	$27.40	$34.02	$42.52
Mechanical Engineering Technologists and Technicians (17-3027)	586	538	(48)	(8%)	46	$27.61	$36.23	$43.88
Total	**4,434**	**4,212**	**(222)**	**(5%)**	**372**			

Exhibit 6. Los Angeles and Orange Counties

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Typical Entry-Level Education
Architectural and Civil Drafters (17-3011)	4,574	4,372	(202)	(4%)	387	Associate degree
Electrical and Electronics Drafters (17-3012)	1,165	1,011	(154)	(13%)	92	Associate degree
Mechanical Drafters (17-3013)	2,073	1,847	(226)	(11%)	168	Associate degree
Civil Engineering Technologists and Technicians (17-3022)	2,976	2,704	(272)	(9%)	232	Associate degree
Mechanical Engineering Technologists and Technicians (17-3027)	1,612	1,432	(180)	(11%)	123	Associate degree
Total	**12,401**	**11,366**	**(1,035)**	**(8%)**	**1,002**	

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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