

Program reviews are conducted by individual colleges to periodically review curriculum of their existing programs, and in the case of career technical education programs, ensure continued alignment with regional labor market needs. Because a program review evaluates an existing program, rather than establishing a new program, additional supply will not be added; therefore, the endorsement criteria included in this report is determined slightly differently than it is for a new program that requires regional recommendation.

Summary

Program LMI Endorsement	Endorsed: All 🛛 🗠	Endorsed: Some LMI Criteria Met	□ Not LMI Endorsed			
	Program LMI Endo	orsement Criteria				
	Yes 🗹		No 🗆			
Supply Gap:	Comments: There are projected to be 121 middle-skill annual job openings throughout Los Angeles and Orange counties for mechanical drafters, which is less than the 456 awards conferred by educational institutions. However, these educational programs also prepare students for 22 other related occupations, which account for 8,950 additional annual job openings. Because these programs train for a variety of occupations with high demand, there is an undersupply of labor for mechanical drafters.					
	Yes 🗹		No 🗆			
Living Wage: (Entry-Level, 25 th)	Comments: Entry-level hourly wages for mechanical drafters are \$24.71, which is significantly above the OC living wage of \$20.63.					
	Yes 🗹		No 🗆			
Education: Comments: The typical entry-level education for mechanical drafters is an associate degree and 57% workers in the field have completed some college or an associate degree as their highest level of education.						
	Emerging Occupation(s)					
Ye	es 🛛		No 🗹			
Comments: N/A						

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/Orange County regional labor market related to one middle-skill occupation:

• Mechanical Drafters (17-3013)

Based on the available data, there appears to be a supply gap for *mechanical drafters*. Though the number of awards for this occupation exceeds demand, supply is overstated because the related educational programs train for an additional 22 occupations. When considering the high demand for these occupations, there is an undersupply of labor for *mechanical drafters*. In addition, typical education

requirements for this occupation align with a community college education and typical entry-level wages are above the living wage. Therefore, due to all 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 occupations included in this report.

Occupation (SOC)	Demand (Annual Openings)	Supply (CC and Non-CC)	Entry-Level Hourly Earnings (25 th Percentile)	Typical Entry-Level Education	Community College Educational Attainment
Mechanical	LA: 76	LA: 362		Associate	F-70/
Drafters (17-3013)	OC: 45	OC: 94	OC: \$24.71	degree	57%
Total	121	456	N/A	N/A	N/A

Exhibit 1: Labor Market Endorsement Summary

Demand:

- The number of jobs related to *mechanical drafters* is projected to decrease 4% through 2027. There is projected to be 121 annual job openings due to retirements and replacements.
- Hourly entry-level wages for *mechanical drafters* are \$24.71 in Orange County, which is above the living wage of \$20.63.
- There were 67 online job postings for *mechanical drafters* over the past 12 months. The highest number of postings were for mechanical drafters, drafters, and technical designers.
- The typical entry-level education for *mechanical drafters* is an associate degree.
- Approximately 57% of workers in the field have completed some college or an associate degree as their highest level of educational attainment.

Supply:

- There was an average of 412 awards conferred by 16 community colleges in Los Angeles and Orange Counties from 2019 to 2022.
- Non-community college institutions conferred an average of 44 awards from 2019 to 2021.
- Orange County community college students that exited mechanical drafting programs in the 2020-21 academic year had a median annual wage of \$52,568 (\$25.27 per hour) after exiting the program and 69% attained the regional living wage.
- Due to a low number of students, the percentage of Orange County community college mechanical drafting students that exited their program in 2019-20 and are working in a job closely related to their field of study is unavailable.

Demand

Occupational Projections:

Exhibit 2 shows the annual percent change in jobs for *mechanical drafters* from 2017 through 2027. Employment for *mechanical drafters* in Orange County decreased 8% in 2020 due to the COVID-19 pandemic, which is similar to the 7% decline across all occupations in Los Angeles and Orange counties during the same period.,. In addition, employment for this occupation continued to decrease at varying rates through 2022.

In the years preceding the pandemic, employment for *mechanical drafters* declined at varying degrees in Orange County. However, unlike employment for all occupations in Los Angeles and Orange counties, which are projected to increase 1% through 2027, employment for this occupation is projected to remain flat in Orange County during the same period.

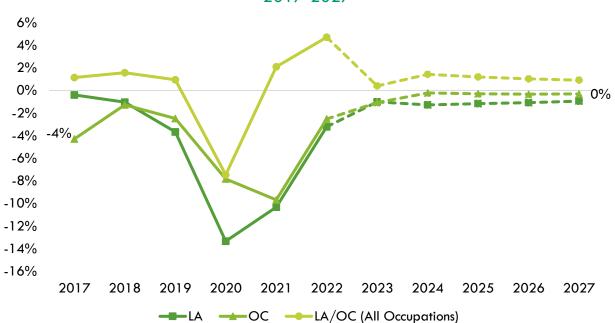


Exhibit 2: Annual Percent Change in Jobs for Mechanical Drafters, 2017-2027

Exhibit 3 shows the five-year occupational demand projections for *mechanical drafters*. In Los Angeles/Orange County, the number of jobs related to this occupation is projected to decrease by 4% through 2027. There is projected to be 121 jobs available annually.

Geography	2022 Jobs	2027 Jobs	2022-2027 Change	2022- 2027 % Change	Annual Openings
Los Angeles	965	913	(52)	(5%)	76
Orange	560	547	(12)	(2%)	45
Total	1,524	1,460	(64)	(4%)	121

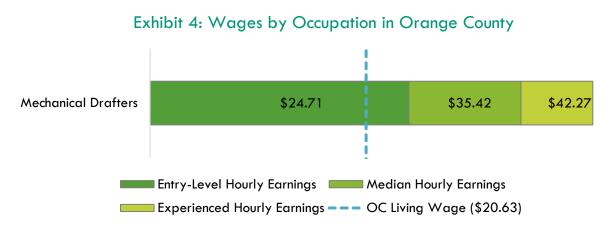
Exhibit 3: Occupational Demand in Los Angeles and Orange Counties¹

Wages:

The labor market endorsement in this report considers the entry-level hourly wages for *mechanical drafters* 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.

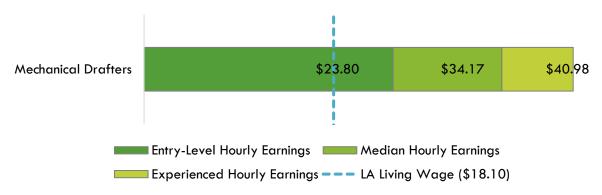
¹ Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

The typical entry-level hourly wage for *mechanical drafters* is \$24.71, which is significantly above the living wage for one adult (\$20.63 in Orange County). Orange County's average wage of \$35.59 is below the average statewide wage of \$36.55 for this occupation. Exhibit 4 shows the wage range for *mechanical drafters* in Orange County and how it compares to the regional living wage.



The typical entry-level hourly wage for *mechanical drafters* is \$23.80, which is significantly above the living wage for one adult (\$18.10 in Los Angeles County). Los Angeles County's average wage of \$34.58 is below the average statewide wage of \$36.55 for this occupation. Exhibit 5 shows the wage range for *mechanical drafters* in Los Angeles County and how it compares to the regional living wage.

Exhibit 5: Wages by Occupation in Los Angeles County



Job Postings:

Important Online Job Postings Data Note: Online job postings data is sourced from Lightcast, a labor market analytics firm that scrapes, collects, and organizes data from online job boards such as LinkedIn, Indeed, Glassdoor, Monster, GovernmentJobs.com, and thousands more. Lightcast uses natural language processing (NLP) to determine the related company, industry, occupation, and other information for each job posting. However, NLP has limitations that include understanding contextual words of phrases; determining differences in words that can be used as nouns, verbs, and/or adjectives; and misspellings or grammatical errors.² For these reasons, job postings could be assigned to the wrong employer, industry, or occupation within Lightcast's database.

Additionally, there are several limitations when analyzing job postings. A single job posting may not represent a single job opening, as employers may be creating a pool of candidates for future openings or hiring for multiple positions with a single posting. Additionally, not all jobs are posted online, and jobs may be filled through other methods such as internal promotion, word-of-mouth advertising, physical job boards, or a variety of other channels.

There were 67 online job postings related to *mechanical drafters* listed in the past 12 months, as shown in Exhibit 6.

Exhibit 6: Number of Job Posti	ings by Occupatio	n (n=67)
Occupation	Job Postings	Percentage of Job Postings
Mechanical Drafters	67	100%

The top employers in the region, by number of job postings, are shown in Exhibit 7.

Employer	Job Postings	Percentage of Job Postings
Actalent	11	16%
Randstad	3	4%
Tru Talent Agency	3	4%
Utility Trailer Manufacturing Company	3	4%
Express Employment Professionals	2	3%
Harley Ellis Devereaux	2	3%
Moog	2	3%
NetEffects	2	3%
SkillsetGroup	2	3%
Solid Rock Structural Solutions	2	3%

Exhibit 7: Top Employers by Number of Job Postings (n=67)

² K. R. Chowdhary, Fundamentals of Artificial Intelligence (Basingstoke: Springer Nature, 2020), <u>https://link.springer.com/book/10.1007/978-81-322-3972-7</u>.

The top specialized, soft, and computer skills listed by those most frequently mentioned in job postings (denoted in parentheses) are shown in Exhibit 8.

Skills by Number of Job P	ostings (n=67)
Top Soft Skills	Top Computer Skills
Microsoft Excel (20)	SolidWorks (CAD) (30)
Communication (17)	Microsoft Excel (20)
Mathematics (11)	AutoCAD (17)
Mechanical Aptitude (10)	Microsoft Office (9)
Microsoft Office (9)	Autodesk Inventor (7)
Organizational Skills (9)	Microsoft Word (7)
Detail Oriented (8)	PTC Creo (CAD Suite) (5)
	Computer Aided Three-
Management (8)	Dimensional Interactive
	Application (CATIA) (4)
Problem Solving (8)	Microsoft Outlook (4)
Computer Literacy (7)	Autodesk Revit (3)
	Microsoft Excel (20) Communication (17) Mathematics (11) Mechanical Aptitude (10) Microsoft Office (9) Organizational Skills (9) Detail Oriented (8) Management (8) Problem Solving (8)

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Educational Attainment:

The Bureau of Labor Statistics (BLS) lists an associate degree as the typical entry-level education for mechanical drafters. In addition, the national-level educational attainment data indicates 57% of workers in the field have completed some college or an associate degree as their highest level of education. Exhibit 9 shows the educational attainment for mechanical drafters.

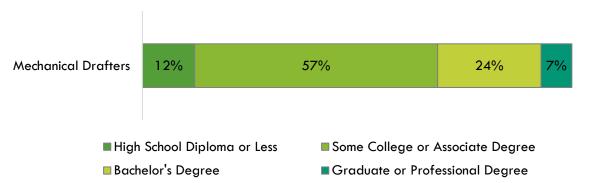


Exhibit 9: National-level Educational Attainment for Occupations

Of the 60% of the cumulative job postings for mechanical drafters that listed a minimum education requirement in Los Angeles/Orange County, 88% (35) requested a high school diploma or an associate degree and 13% (5) requested a bachelor's degree.

Educational Supply

Community College Supply:

Exhibit 10 shows the three-year average number of awards conferred by community colleges in the related TOP codes:

- Engineering Technology, General (requires Trigonometry) (0924.00)
- Aeronautical and Aviation Technology (0950.00)

No awards were conferred under the following TOP codes:

• Aircraft Electronics (Avionics) (0950.40)

- Mechanical Drafting (0953.40)
- Manufacturing and Industrial Technology (0956.00)
- Drafting Technology (0953.00)

The colleges with the most completions in the region are Pasadena, Orange Coast, and Fullerton. Over the past 12 months, there were 3 other related program recommendation requests from regional community colleges.

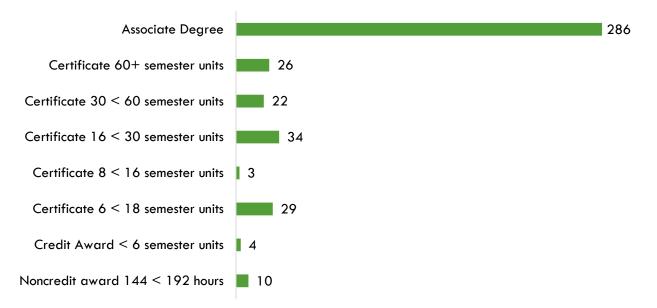
Exhibit 10: Regional Community College Awards (Certificates and Degrees), 2019-2022

TOP Code	Program	College	2019- 2020 Awards	2020- 2021 Awards	2021- 2022 Awards	3-Year Award Average
		Cerritos	15	6	15	12
		East LA	1	1	0	1
	Engineering	Glendale	7	14	3	8
0924.00	Technology,	Mt San Antonio	2	0	6	3
0924.00	General (requires	Pasadena	216	238	211	222
	Trigonometry)	LA Subtotal	241	259	235	245
		Santa Ana	3	5	0	3
		OC Subtotal	3	5	0	3
Supply Subtotal/Average		244	264	235	248	
		Long Beach	1	1	0	1
		Mt San Antonio	4	10	12	9
0050.00	Aeronautical and	West LA	6	10	16	11
0950.00	Aviation Technology	LA Subtotal	11	21	28	20
		Orange Coast	43	29	37	36
		OC Subtotal	43	29	37	36
	Supply	Subtotal/Average	54	50	65	56
		Glendale	11	13	10	11
		LA Valley	9	5	0	5
0953.40	Mechanical Drafting	Long Beach	10	7	4	7
	Diatility	LA Subtotal	30	25	14	23
		Irvine	5	3	10	6

TOP Code	Program	College	2019- 2020 Awards	2020- 2021 Awards	2021- 2022 Awards	3-Year Award Average
		Santa Ana	0	0	8	3
		OC Subtotal	5	3	18	9
Supply Subtotal/Average		35	28	32	32	
		Cerritos	0	1	1	1
		El Camino	0	0	4	1
		Glendale	2	0	1	1
		LA Trade	9	9	15	11
		LA Valley	9	7	0	5
	Manufacturing	Mt San Antonio	14	4	13	10
0956.00	and Industrial	LA Subtotal	34	21	34	30
	Technology	Fullerton	38	20	18	25
		Irvine	0	4	2	2
		Saddleback	7	4	8	6
		Santa Ana	3	2	4	3
		Santiago Canyon	10	12	7	10
		OC Subtotal	58	42	39	46
	Supply	Subtotal/Average	92	63	73	76
	Sup	ply Total/Average	425	405	405	412

Exhibit 11 shows the annual average community college awards by type from 2019-20 to 2021-22. The plurality of the awards are for associate degrees, followed by certificates between 16 and less than 30 semester units and certificates between 6 and less than 18 semester units.

Exhibit 11: Annual Average Community College Awards by Type, 2019-2022



Community College Student Outcomes:

Exhibit 12 shows the Strong Workforce Program (SWP) metrics for mechanical drafting programs in Rancho Santiago Community College District (RSCCD), the Orange County Region, and California. According to Chancellor's Office Curriculum Inventory (COCI) data, there are two active mechanical drafting programs in Orange County, both of which are hosted at RSCCD. Therefore, outcomes data are identical across district and county levels. However, several metrics are unavailable due to a low number of students,

Orange County/RSCCD students that exited mechanical drafting programs in the 2020-21 academic year had higher median annual earnings (\$52,568 or \$25.27 per hour) compared to all mechanical drafting students statewide (\$50,246 or \$24.16 per hour). A lower percentage of Orange County/RSCCD mechanical drafting students attained the living wage (69%) when compared to all mechanical drafting students in the state (73%).

SWP Metric	RSCCD	OC Region	California
SWP Students	127	Same as RSCCD	736
SWP Students Who Earned 9 or More Career Education Units in the District in a Single Year	49%	Same as RSCCD	35%
SWP Students Who Completed a Noncredit CTE or	Insufficient	Same as	35%
Workforce Preparation Course	Data	RSCCD	
SWP Students Who Earned a Degree or Certificate	Insufficient	Same as	41
or Attained Apprenticeship Journey Status	Data	RSCCD	
SWP Students Who Transferred to a Four-Year	Insufficient	Same as	59
Postsecondary Institution (2019-20)	Data	RSCCD	
SWP Students with a Job Closely Related to Their	Insufficient	Same as	74%
Field of Study (2019-20)	Data	RSCCD	
Median Annual Earnings for SWP Exiting Students	\$52,568	Same as	\$50,246
	(\$25.27)	RSCCD	(\$24.16)
Median Change in Earnings for SWP Exiting Students	21%	Same as RSCCD	31%
SWP Exiting Students Who Attained the Living Wage	69%	Same as RSCCD	73%

Exhibit 12: Mechanical Drafting (0953.40) Strong Workforce Program Metrics, 2020-213

Non-Community College Supply:

To comprehensively analyze the regional supply, it is crucial to include data from other institutions offering mechanical drafting training programs. Exhibit 13 displays the annual and two-year average awards granted by these institutions under the related Classification of Instructional Programs (CIP) codes:

- Aeronautical/Aerospace Engineering Technology/Technician (15.0801)
- Drafting and Design Technology/Technician, General (15.1301)
- Mechanical/Mechanical Engineering Technology/Technician (15.0805)

No awards were conferred under the following related CIP codes:

³ All SWP metrics are for 2020-21 unless otherwise noted.

- CAD/CADD Drafting and/or Design Technology/Technician (15.1302)
- 3-D Modeling and Design Technology/Technician (15.1307)
- Mechanical Drafting and Mechanical Drafting CAD/CADD (15.1306)

The available data covers 2019 to 2021. During this period, non-community college institutions in the region conferred an average of 54 awards annually in related programs.

Exhibit 13: Regional Non-Community College Awards, 2019-2021					
CIP Code	Program	College	2019- 2020 Awards	2020- 2021 Awards	3-Year Award Average
15.0801	Aeronautical / Aerospace Engineering Technology / Technician	Loyola Marymount University	0	0	0
	Supply	Subtotal/Average	0	0	0
15.0805	Mechanical / Mechanical Engineering Technology / Technician	California State Polytechnic University- Pomona	34	54	44
	Supply	Subtotal/Average	34	54	44
15.1301	Drafting and Design Technology / Technician, General	Woodbury University	0	0	0
	Supply	Subtotal/Average	0	0	0
	Sup	ply Total/Average	34	54	44

Exhibit 13: Regional Non-Community College Awards, 2019-2021

Regional Demographics

This section examines demographic data for Orange County community college students in mechanical drafting programs compared to the OC population, along with occupational data, to identify potential diversity and equity issues addressable by community college programs.

Ethnicity:

Exhibit 14 compares the ethnicity of Orange County community college students enrolled in mechanical drafting programs, the overall Orange County population, and occupation-specific data for *mechanical drafters*.

The plurality of workers (46%) in the field and individuals in the population (40%) are white, which is higher than their shares of community college mechanical drafting students (0%). Conversely, half of all community college mechanical drafting students are Hispanic or Latino (50%), which accounts for a higher percentage relative to their share of the county population (34%) and more than double the percentage of workers in the field (19%). In addition, 12% of community college mechanical drafting student data is masked or unknown, which may provide reasoning for why 0% of students identify as Black or African American, white, and of another race or ethnicity.

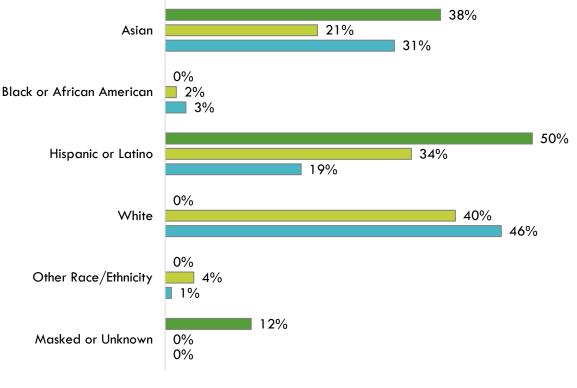


Exhibit 14: Program and County Demographics by Ethnicity

■ OC Community College Students (0953.40) ■ OC Population ■ Mechanical Drafters

Age:

Exhibit 15 compares the age of Orange County community college students enrolled in mechanical drafting programs, the overall Orange County population, and occupation-specific data for *mechanical drafters*.

Though individuals 50 and older account for the plurality of individuals in the population (34%) and workers in the field (41%), this age group represents 0% of community college mechanical drafting students. Conversely, despite accounting for only 14% of the population, individuals 25 to 34 represent the plurality (40%) of community college mechanical drafting students and 36% of workers in the field. In addition, though 24% of the population is 20 to 24, this age group accounts for only 7% of the population and 3% of workers in the field. Furthermore, 0% of community college mechanical drafting students are 19 or less and 50 and older, which may be a result of 15% of student data being masked or unknown.

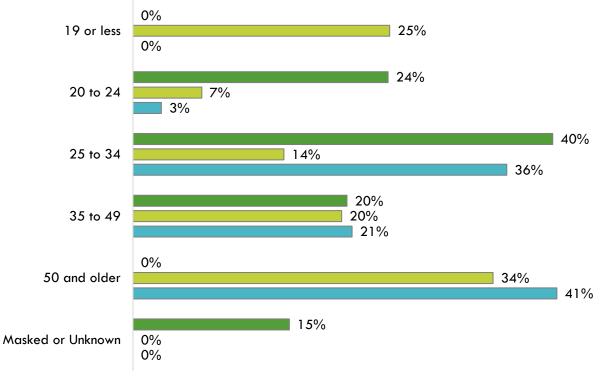


Exhibit 15: Program and County Demographics by Age

■ OC Community College Students (0953.40) ■ OC Population ■ Mechanical Drafters

Sex:

Exhibit 16 compares the sex of Orange County community college students enrolled in mechanical drafting programs, the overall Orange County population, and occupation-specific data for *mechanical drafting*.

Though the population is split nearly evenly between women and men, only 13% of community college mechanical drafting students and 22% of workers in the field are women.

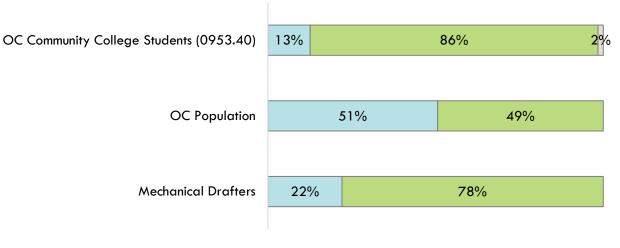


Exhibit 16: Program and County Demographics by Sex

■ Female ■ Male ■ Masked or Unknown

Appendix A: Methodology

The OC COE prepared this report by analyzing data from occupations and education programs. Occupational data is derived from Lightcast, a labor market analytics firm that consolidates data from the California Employment Development Department (EDD), U.S. Bureau of Labor Statistics (BLS) and other government agencies. Program supply data is drawn from two systems: Taxonomy of Programs (TOP) and Classification of Instructional Programs (CIP).

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 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.

The OC COE determined labor market supply for an occupation or SOC code by analyzing the number of program completers or awards in a related TOP or CIP code. The COE developed a "supply table" with this information, which is the source of the program supply data for this report. TOP code data comes from the California Community Colleges Chancellor's Office MIS Data Mart (datamart.cccco.edu) and CIP code data comes from the Integrated Postsecondary Education Data System (nces.ed.gov/ipeds/use-the-data), also known as IPEDS. 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 in the United States and Canada. Institutions outside of the California Community College system do not use TOP codes in their reporting systems.

Data included in this analysis represent the labor market demand for relevant positions most closely related to the proposed program as expressed by the requesting college in consultation with the OC COE. Traditional labor market information was used to show current and projected employment based on data trends, as well as annual average awards granted by regional community colleges. Real-time labor market information captures job post advertisements for occupations relevant to the field of study which can signal demand and show what employers are looking for in potential employees, but is not a perfect measure of the quantity of open positions.

All representations have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. The most recent data available at the time of the analysis was examined; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor's Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.

Appendix B: Data Sources

Data Type	Source
Occupational Projections, Wages, and Job Postings	Traditional labor market information data is sourced from Lightcast, a labor market analytics firm. Lightcast occupational employment data are based on final Lightcast industry data and final Lightcast staffing patterns. Wage estimates are based on Occupational Employment Statistics and the American Community Survey. For more information, see <u>https://lightcast.io/</u>
Living Wage	The living wage is derived from the Insight Center's California Family Needs Calculator, which measures the income necessary for an individual of family to afford basic expenses. The data assesses the cost of housing, food, child care, health care, transportation, and taxes. For more information, see: <u>https://insightcced.org/family-needs-calculator/</u> The living wage for one adult in Orange County is \$20.63 per hour (\$42,910.40 annually). This figure is used by the CCCCO to calculate the percentage of students that attained the regional living wage.
Typical Education and Training Requirements, and Educational Attainment	The Bureau of Labor Statistics (BLS) provides information about education and training requirements for hundreds of occupations. 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. For more information, see <u>https://www.bls.gov/emp/documentation/education/tech.htm</u>
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. For more information, see <u>https://www.onetonline.org/help/online/</u>
	The CCCCO Data Mart provides information about students, courses, student services, outcomes and faculty and staff. For more information, see: https://datamart.cccco.edu
Educational Supply	The National Center for Education Statistics (NCES) Integrated Postsecondary Integrated Data System (IPEDS) collects data on the number of postsecondary awards earned (completions). For more information, see <u>https://nces.ed.gov/ipeds/use-the-data/survey- components/7/completions</u>
Student Metrics and Demographics	LaunchBoard, a statewide data system supported by the California Community Colleges Chancellor's Office and hosted by Cal-PASS Plus, provides data on progress, success, employment, and earnings outcomes for California community college students. For more information, see: <u>https://www.calpassplus.org/LaunchBoard/Home.aspx</u>

Data Type	Source
Population and Occupation Demographics	 The Census Bureau's American Community Survey (ACS) is the premier source for detailed population and housing information. For more information, see: https://www.census.gov/programs-surveys/acs Data is sourced from IPUMS USA, a database providing access to ACS and other Census Bureau data products. For more information, see: https://usa.ipums.org/usa/about.shtml

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