C·O·E CENTERS OF EXCELLENCE
FOR LABOR MARKET RESEARCH

Drafting and Design Occupations

Labor Market Analysis: San Diego County

August 2023

Summary

NEW PROGRAM RECOMMENDATION?	EVIDENCE OF A SUPPLY GAP?	AT OR ABOVE THE LIVING WAGE?	EXPECTED EDUCATION FOR MAJORITY OF OCCUPATIONS ANALYZED
● **Proceed with New Program**	☑ ☒	☑ ☒	☐ Doctorate Degree ☐ Master's Degree ☐ Bachelor's Degree ☑ Associate Degree
SUPPORT FOR PROGRAM MODIFICATION?	**NUMBER OF INSTITUTIONS THAT PROVIDE TRAINING**	**NUMBER OF ANNUAL JOB OPENINGS**	☐ Some College or Certificate ☐ HS Diploma or Equivalent ☐ Less than a HS Diploma
☑ ☒	HIGH	LOW	☐ Apprenticeship

This brief provides labor market information about *Drafting and Design Occupations* to assist the San Diego and Imperial Counties Community Colleges with program development and strategic planning. *Drafting and Design Occupations* include "Architectural and Civil Drafters," "Commercial and Industrial Designers," "Drafters, All Other," "Electrical and Electronics Drafters," and "Mechanical Drafters." According to available labor market information, *Drafting and Design Occupations* in San Diego County have a labor market demand of 284 annual job openings (while average demand for a single occupation in San Diego County is 289 annual job openings), and eight institutions supply 151 awards for these occupations, suggesting that there is a supply gap in the labor market. On average, entry-level wages are above the living wage. This brief recommends proceeding with developing a new program or modifying an existing program because 1) entry-level wages pay at or above the living wage and 2) a supply gap exists for these occupations.

Introduction

This report provides labor market information in San Diego County for the following occupational codes in the Standard Occupational Classification (SOC)[1] system:

- **Architectural and Civil Drafters** (SOC 17-3011): Prepare detailed drawings of architectural and structural features of buildings or drawings and topographical relief maps used in civil engineering projects, such as highways, bridges, and public works. Use knowledge of building materials, engineering practices, and mathematics to complete drawings.

- **Commercial and Industrial Designers** (SOC 27-1021): Design and develop manufactured products, such as cars, home appliances, and children's toys. Combine artistic talent with research on product use, marketing, and materials to create the most functional and appealing product design.

- **Drafters, All Other** (SOC 17-3019) All drafters not listed separately.

- **Electrical and Electronics Drafters** (SOC 17-3012): Prepare wiring diagrams, circuit board assembly diagrams, and layout drawings used for the manufacture, installation, or repair of electrical equipment.

- **Mechanical Drafters** (SOC 17-3013): Prepare detailed working diagrams of machinery and mechanical devices, including dimensions, fastening methods, and other engineering information.

For the purpose of this report, these occupations are referred to as *Drafting and Design Occupations*.

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[1] The Standard Occupational Classification (SOC) system is used by federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data. bls.gov/soc/.

Projected Occupational Demand

Between 2022 and 2027, *Drafting and Design Occupations* are projected to increase by 102 net jobs or four percent (Exhibit 1a). Employers in San Diego County will need to hire 284 workers annually to fill new jobs and backfill jobs due to attrition caused by turnover and retirement, for example.

Exhibit 1a: Number of Jobs for *Drafting and Design Occupations* (2012-2027)[2]
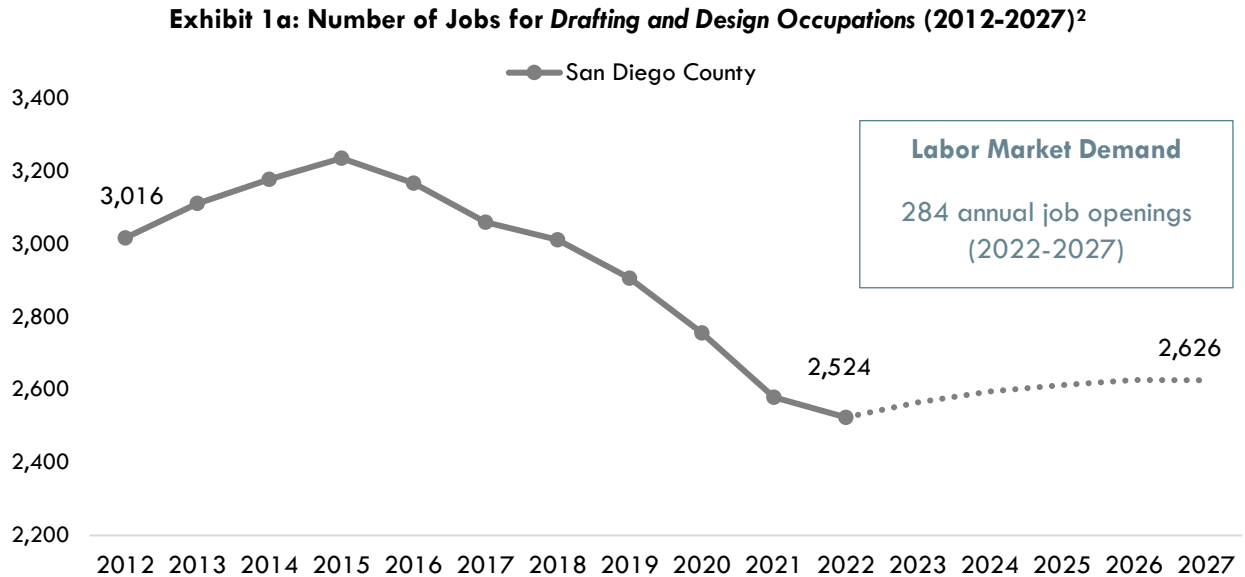
Exhibit 1b disaggregates the projected number of jobs change by occupation. "Architectural and Civil Drafters" are projected to have the most labor market demand between 2022 and 2027, with 152 annual job openings.

Exhibit 1b: Number of Jobs for *Drafting and Design Occupations* in San Diego County (2022-2027)[3]

Occupational Title	2022 Jobs	2027 Jobs	2022 - 2027 Net Jobs Change	2022- 2027 % Net Jobs Change	Annual Job Openings (Demand)
Architectural and Civil Drafters	1,181	1,246	65	5%	152
Mechanical Drafters	504	507	3	1%	48
Commercial and Industrial Designers	384	399	15	4%	37
Drafters, All Other	240	247	7	3%	24
Electrical and Electronics Drafters	215	227	12	6%	23
Total	2,524	2,625	102	4%	284

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[2] Lightcast 2023.03; QCEW, Non-QCEW, Self-Employed.
[3] Lightcast 2023.03; QCEW, Non-QCEW, Self-Employed.

Earnings

Exhibit 2a disaggregates hourly earnings by occupation. The entry-level hourly earnings for *Drafting and Design Occupations* range from $26.77 to $33.99.

Exhibit 2a: Hourly Earnings for *Drafting and Design Occupations* in San Diego County[4]

Occupational Title	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Commercial and Industrial Designers	$33.99	$41.25	$52.76
Electrical and Electronics Drafters	$27.36	$33.16	$41.90
Architectural and Civil Drafters	$27.19	$30.45	$37.35
Drafters, All Other	$27.11	$36.03	$44.67
Mechanical Drafters	$26.77	$35.90	$44.48

On average, the entry-level hourly earnings for *Drafting and Design Occupations* are $28.48; this is more than the living wage for a single adult in San Diego County, which is $18.43 per hour (Exhibit 2b).[5]

Exhibit 2b: Average Hourly Earnings[6] for *Drafting and Design Occupations* in San Diego County[7]
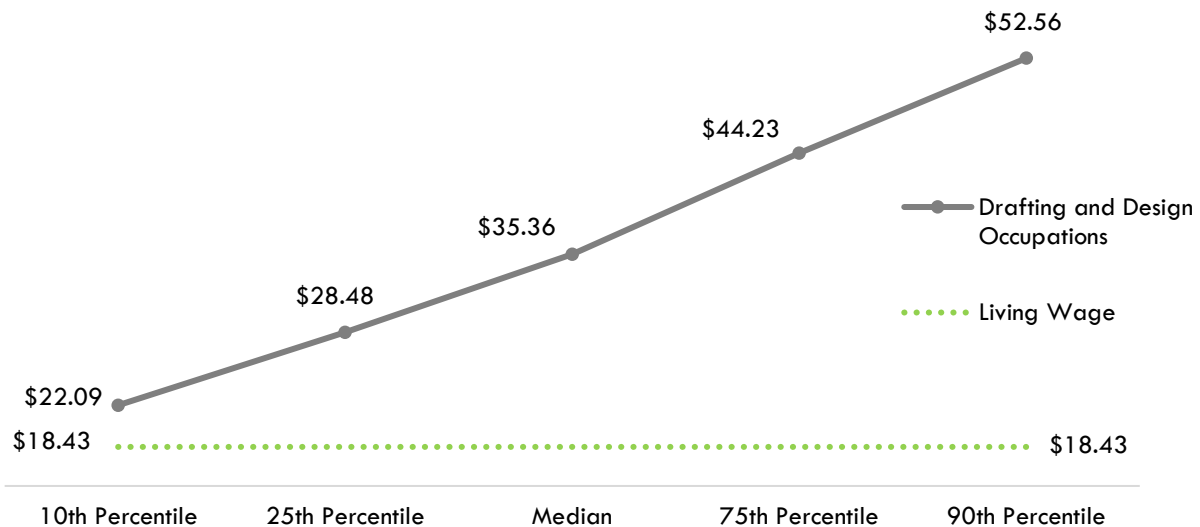
[4] Lightcast 2023.03; QCEW, Non-QCEW, Self-Employed.
[5] "Family Needs Calculator (formerly the California Family Needs Calculator)," Insight: Center for Community Economic Development, last updated 2021. insightcced.org/family-needs-calculator/.
[6] 10th and 25th percentiles could be considered entry-level wages, and 75th and 90th percentiles could be considered experienced wages for individuals who may have been in the occupation longer, received more training than others, etc.
[7] Lightcast 2023.03; QCEW, Non-QCEW, Self-Employed.

Educational Supply

Educational supply for an occupation can be estimated by analyzing the number of awards in related Taxonomy of Programs (TOP) or Classification of Instructional Programs (CIP) codes.[8] There are eight TOP codes and 12 CIP codes related to *Drafting and Design Occupations* (Exhibit 3).

Exhibit 3: Related TOP and CIP Codes for *Drafting and Design Occupations*[9]

TOP or CIP Code	TOP or CIP Program Title
TOP 0201.00	Architecture and Architectural Technology
TOP 0953.00	Drafting Technology
TOP 0953.10	Architectural Drafting
TOP 0953.20	Civil Drafting
TOP 0953.30	Electrical, Electronic, and Electro-Mechanical Drafting
TOP 0953.40	Mechanical Drafting
TOP 0953.60	Technical Illustration
TOP 1009.00	Applied Design
CIP 04.0401	Environmental Design/Architecture
CIP 04.0901	Architectural Technology/Technician
CIP 15.0101	Architectural Engineering Technology/Technician
CIP 15.1301	Drafting and Design Technology/Technician, General
CIP 15.1302	CAD/CADD Drafting and/or Design Technology/Technician
CIP 15.1303	Architectural Drafting and Architectural CAD/CADD
CIP 15.1304	Civil Drafting and Civil Engineering CAD/CADD
CIP 15.1305	Electrical/Electronics Drafting and Electrical/Electronics CAD/CADD
CIP 15.1306	Mechanical Drafting and Mechanical Drafting CAD/CADD
CIP 50.0401	Design and Visual Communications, General
CIP 50.0404	Industrial and Product Design
CIP 50.0410	Illustration

[8] TOP data comes from the California Community Colleges Chancellor's Office MIS Data Mart (datamart.cccco.edu) and CIP data comes from the Integrated Postsecondary Education Data System (nces.ed.gov/ipeds/use-the-data).
[9] This brief uses a conservative estimate of program supply and only calculates awards from the TOP codes in Exhibit 3.

According to TOP data, six community colleges supply the region with awards for these occupations: Cuyamaca College, MiraCosta College, Palomar College, San Diego City College, San Diego Mesa College, and Southwestern College. According to CIP data, two non-community-college institutions supply the region with awards Newschool of Architecture and Design and University of California-San Diego (Exhibit 4).

Exhibit 4: Number of Awards (Certificates and Degrees) Conferred by Postsecondary Institutions (Program Year 2019-20 through Program Year 2020-21 Average)

TOP6 or CIP Code	TOP6 or CIP Program Title	3-Yr Annual Average CC Awards (PY19-20 to PY21-22)	Other Educational Institutions 2-Yr Annual Average Awards (PY19-20 to PY20-21)	Total Average Supply (PY19-20 to PY21-22)
0201.00	Architecture and Architectural Technology	**43**	**0**	**43**
	• MiraCosta	9	0	
	• Palomar	8	0	
	• San Diego Mesa	12	0	
	• Southwestern	14	0	
0953.00	Drafting Technology	**41**	**0**	**41**
	• MiraCosta	16	0	
	• Palomar	19	0	
	• Southwestern	6	0	
0953.10	Architectural Drafting	**17**	**0**	**17**
	• Cuyamaca	7	0	
	• Palomar	10	0	
0953.30	Electrical, Electronic, and Electro-Mechanical Drafting	**5**	**0**	**5**
	• Palomar	5	0	
0953.40	Mechanical Drafting	**12**	**0**	**12**
	• Cuyamaca	6	0	
	• MiraCosta	3	0	
	• Palomar	3	0	
0953.60	Technical Illustration	**1**	**0**	**1**
	• San Diego City	1	0	
1009.00	Applied Design	**3**	**0**	**3**

TOP6 or CIP Code	TOP6 or CIP Program Title	3-Yr Annual Average CC Awards (PY19-20 to PY21-22)	Other Educational Institutions 2-Yr Annual Average Awards (PY19-20 to PY20-21)	Total Average Supply (PY19-20 to PY21-22)
	• MiraCosta	3	0	
50.0401	Design and Visual Communications, General	**0**	**23**	**23**
	• University of California-San Diego	0	23	
50.0404	Industrial and Product Design	**0**	**6**	**6**
	• Newschool of Architecture and Design	0	6	
			Total	**151**

Demand vs. Supply

Comparing labor demand (annual openings) with labor supply[10] suggests that there is a supply gap for these occupations in San Diego County, with 284 annual openings and 151 awards. Comparatively, there are 3,233 annual openings in California and 2,645 awards, suggesting that there is also a supply gap across the state[11] (Exhibit 5).

Exhibit 5: Labor Demand (Annual Openings) Compared with Labor Supply (Average Annual Awards)

	Demand (Annual Openings)	**Supply[12]** (Total Annual Average Supply)	**Supply Gap or Oversupply**
San Diego	284	151	**133**
California	3,233	2,645	**588**

Please note: This is a basic analysis of supply and demand of labor. The data does not include workers currently in the labor force who could fill these positions or workers who are not captured by publicly available data. This data should be used to discuss the potential gaps or oversupply of workers; however, it should not be the only basis for determining whether or not a program should be developed.

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[10] Labor supply can be found from two different sources: Lightcast or the California Community Colleges Chancellor's Office MIS Data Mart. Lightcast uses CIP codes while MIS uses TOP codes. Different coding systems result in differences in the supply numbers.
[11] "Supply and Demand," Centers of Excellence Student Outcomes, https://coeccc.net/our-resources/.
[12] Awards included: associate degree; award <1 year; award 1<2 years; and postsecondary awards.

Student Outcomes and Regional Comparisons

According to the California Community Colleges LaunchBoard, 51 to 55 percent of students in the San Diego-Imperial region earned a living wage after completing a program related to *Drafting and Design Occupations,* compared 33 to 85 percent statewide and *57* percent of students in Career Education programs in general across the state (Exhibit 6a).[13]

Exhibit 6a: Percentage of Students Who Earned a Living Wage by Program, PY2020-21[14]
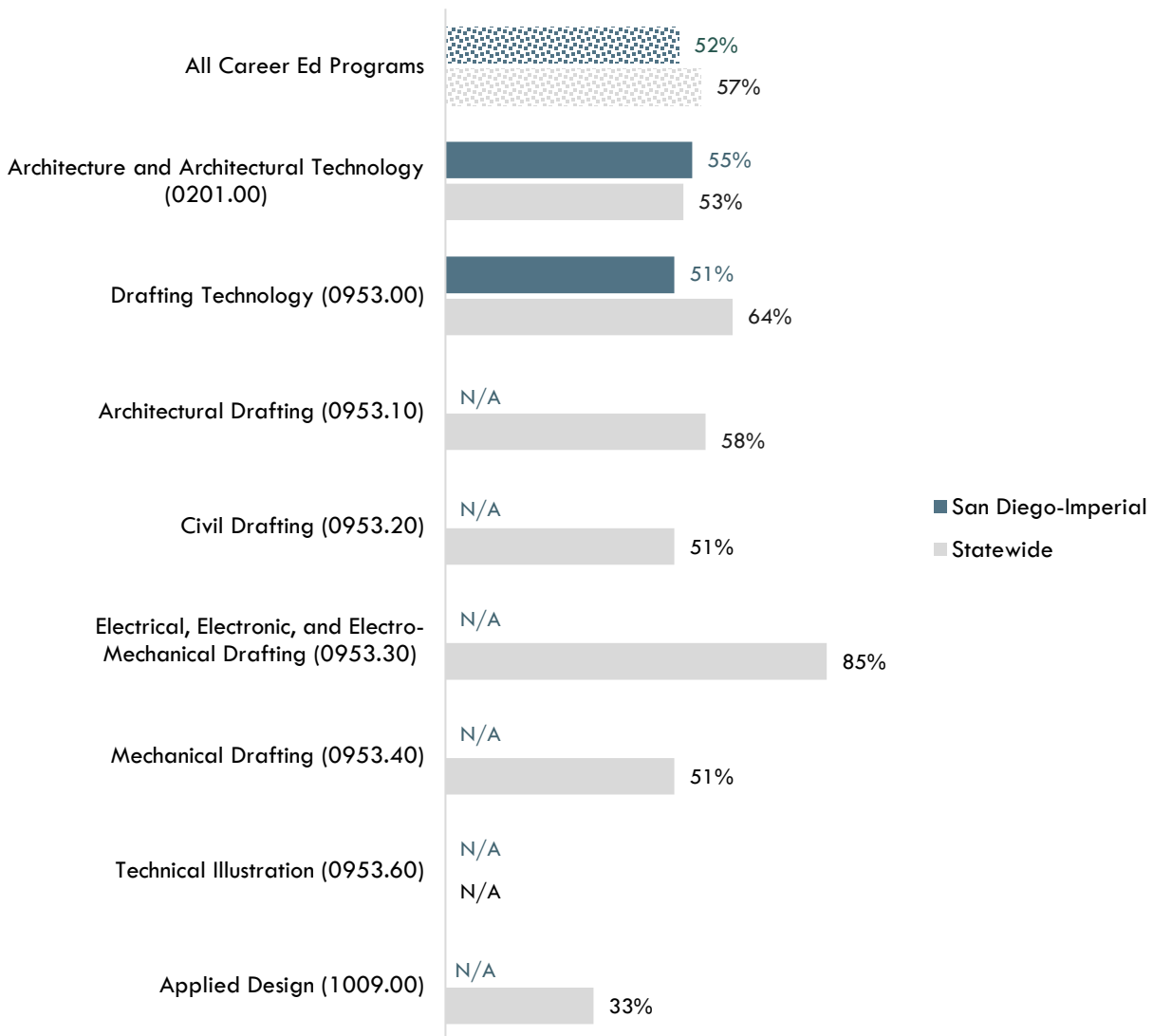
"N/A" indicates insufficient data

[13] "California Community Colleges Strong Workforce Program," California Community Colleges, calpassplus.org/LaunchBoard/SWP.aspx.
[14] Most recent year with available data is Program Year 2020-21. Among completers and skills builders who exited, the percentage of students who attained a living wage.

According to the California Community Colleges LaunchBoard, 50 to 88 percent of students in the San Diego-Imperial region obtained a job closely related to their field of study after completing a program related to *Drafting and Design Occupations,* compared to 46 to 100 percent statewide and 69 percent of students in Career Education programs in general across the state (Exhibit 6b).[15]

Exhibit 6b: Percentage of Students in a Job Closely Related to Field of Study by Program, PY2019-20[16]

Legend: ■ San Diego-Imperial ■ Statewide

- All Career Ed Programs: San Diego-Imperial 66%, Statewide 69%
- Architecture and Architectural Technology (0201.00): San Diego-Imperial 88%, Statewide 72%
- Drafting Technology (0953.00): San Diego-Imperial 50%, Statewide 65%
- Architectural Drafting (0953.10): San Diego-Imperial N/A, Statewide 67%
- Civil Drafting (0953.20): San Diego-Imperial N/A, Statewide 100%
- Electrical, Electronic, and Electro-Mechanical Drafting (0953.30): San Diego-Imperial N/A, Statewide N/A
- Mechanical Drafting (0953.40): San Diego-Imperial N/A, Statewide 50%
- Technical Illustration (0953.60): San Diego-Imperial N/A, Statewide N/A
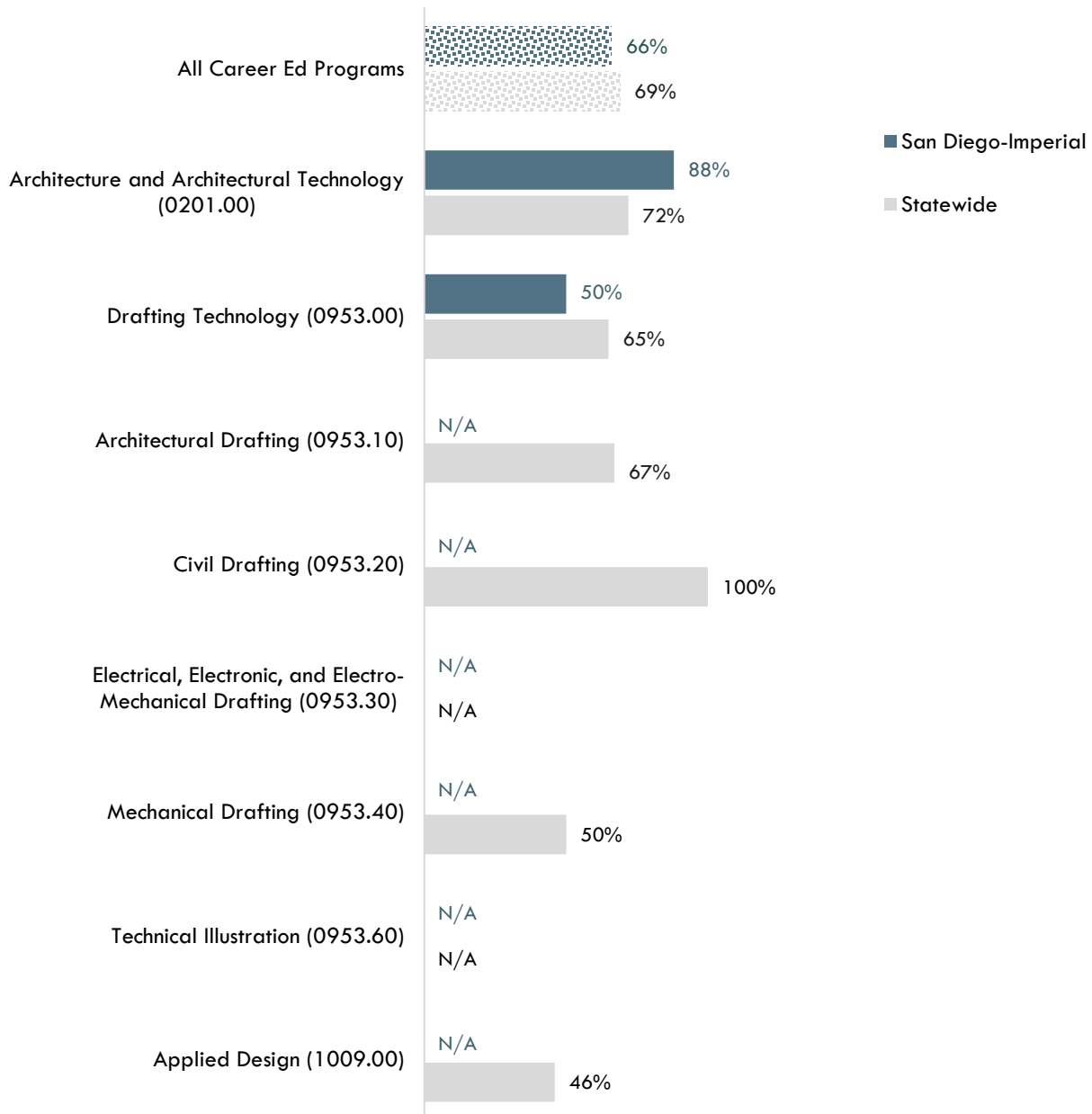- Applied Design (1009.00): San Diego-Imperial N/A, Statewide 46%

"N/A" indicates insufficient data

[15] "California Community Colleges Strong Workforce Program," California Community Colleges, calpassplus.org/LaunchBoard/SWP.aspx.
[16] Most recent year with available data is Program Year 2019-20. Percentage of Students in a Job Closely Related to Field of Study: Among students who responded to the CTEOS, the percentage reporting employment in the same or similar field as their program of study.

Online Job Postings

This report analyzes not only historical and projected (traditional LMI) data, but also recent data from online job postings (real-time LMI). Online job postings may provide additional insight about recent changes in the labor market that are not captured by historical data. Between 2019 and 2022, there was an average of 17,296 online job postings per year for *Drafting and Design Occupations* in San Diego County (Exhibit 7). Please note that online job postings do **not** equal labor market demand; demand is represented by annual job openings (see Exhibit 1b). While this brief includes online jobs postings data to help with curriculum development, the community colleges should note that this type of data is impacted by several variables: employers may post a position multiple times to increase the pool of applicants; a job posting can remain posted after a business decides not to fill a position; or an employer may use one posting to fill multiple positions, for example.

Exhibit 7: Number of Online Job Postings for *Drafting and Design Occupations* in San Diego County (2019-2022)[17]

2019	2020	2021	2022
18,857	13,378	17,371	19,578

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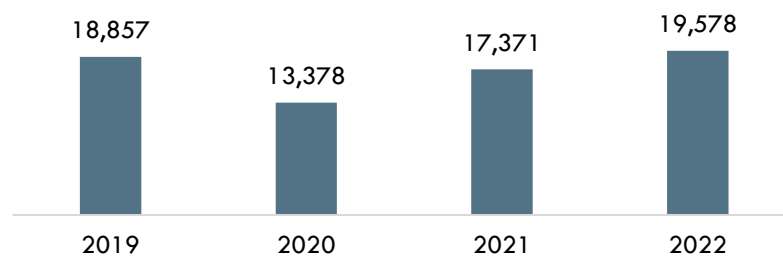
[17] Lightcast; "Job Posting Analytics." 2018-2022.

Top Employers

Between January 1, 2020 and December 31, 2022, the top five employers in San Diego County for *Drafting and Design Occupations* were GPAC, Apple, Randstad, Motion Recruitment, and CyberCoders based on online job postings (Exhibit 8).

Exhibit 8: Top Employers for *Drafting and Design Occupations* in San Diego County[18]

Top Employers	
• GPAC	• Esri
• Apple	• Intel
• Randstad	• Aerotek
• Motion Recruitment	• Actalent
• CyberCoders	• Boeing

Education, Skills, and Certifications

Drafting and Design Occupations have a national educational attainment ranging from an associate degree to a bachelor's degree (Exhibit 9a).

Exhibit 9a: National Educational Attainment for *Drafting and Design Occupations*[19]

Occupational Title	Typical Entry-Level Education
Commercial and Industrial Designers	Bachelor's degree
Architectural and Civil Drafters	Associate degree
Drafters, All Other	Associate degree
Electrical and Electronics Drafters	Associate degree
Mechanical Drafters	Associate degree

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[18] Lightcast; "Job Posting Analytics." 2020-2022.
[19] Lightcast 2023.03; QCEW, Non-QCEW, Self-Employed.

Based on online job postings between January 1, 2020 and December 31, 2022 in San Diego County, employers posted a bachelor's degree as the most requested educational requirement for *Drafting and Design Occupations* (Exhibit 9b).[20]

Exhibit 9b: Educational Requirements for *Drafting and Design Occupations* in San Diego County[21]

		61%	
14%	17%		8%
HS diploma or equivalent	Associate degree	Bachelor's degree	Master's degree or higher
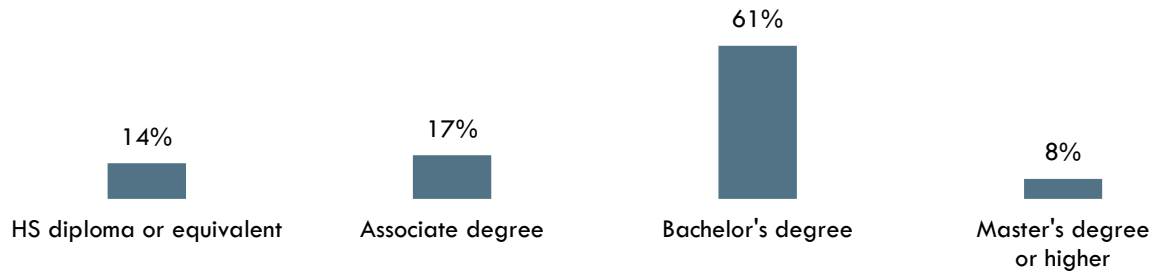
*May not total 100 percent due to rounding

Exhibit 10 lists the top specialized, soft, and software skills that appeared in online job postings between January 1, 2020 and December 31, 2022.

Exhibit 10: Top Skills for *Drafting and Design Occupations* in San Diego County[22]

Specialized Skills	Soft Skills	Software Skills
• Product Design	• Communications	• AutoCAD
• Computer-Aided Design	• Research	• Figma
• Prototyping	• Detail Oriented	• Autodesk Revit
• New Product Development	• Problem Solving	• SolidWorks
• User Experience	• Management	• Microsoft Excel
• Project Management	• Self-Motivation	• Python
• Visual Design	• Leadership	• Adobe Photoshop
• Product Engineering	• Writing	• Microsoft Outlook
• Wireframing	• Innovation	• Invision
• User Research	• Customer Service	• Cascading Style Sheets
• Marketing	• Verbal Communication Skills	• Adobe Illustrator
• Electrical Engineering	• Presentations	• HyperText Markup Language
• User Interface	• Planning	• Microsoft PowerPoint
• Interaction Design	• Operations	• Adobe Creative Suite
• Workflow Management	• Sales	• Apple IOS

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[20] Lightcast; "Job Posting Analytics." 2020-2022.
[21] "Educational Attainment for Workers 25 Years and Older by Detailed Occupation," Bureau of Labor Statistics, last modified April 9, 2021. bls.gov/emp/tables/educational-attainment.htm.
[22] Lightcast; "Job Posting Analytics." 2020-2022.

Exhibit 11 lists the top certification that appeared in online job postings between January 1, 2020 and December 31, 2022.

Exhibit 11: Top Certification for *Drafting and Design Occupations* in San Diego County[23]

Top Certification in Online Job Postings
1. Enterprise Desktop Administrator (Microsoft Certified IT Professional)
2. Security Clearance
3. LEED Accredited Professional (AP)
4. Engineer in Training
5. Secret Clearance
6. Master Of Business Administration (MBA)
7. Professional Engineer (PE) License
8. Product Certification
9. Top Secret Clearance
10. Six Sigma Green Belt
11. Top Secret-Sensitive Compartmented Information (TS/SCI Clearance)
12. NICET Certification (National Institute For Certification In Engineering Technologies)
13. Project Management Professional Certification
14. Land Surveyor In Training
15. Microsoft Certified Professional

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[23] Lightcast; "Job Posting Analytics." 2020-2022.

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Important Disclaimers

All representations included in this report have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. This study examines the most recent data available at the time of the analysis; 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 the report 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.