

# LABOR MARKET ANALYSIS

FOR PROGRAM RECOMMENDATION



**C·O·E**

CENTERS OF EXCELLENCE  
FOR LABOR MARKET RESEARCH

## ENTRY-LEVEL CADD OPERATORS IN THE GREATER SACRAMENTO REGION

North (Greater Sacramento)  
Center of Excellence

**OCTOBER 2022**

# TABLE OF CONTENTS

Summary.....	3
Introduction.....	4
Occupational Demand.....	5
Wages.....	6
Job Postings.....	7
Occupations and Job Titles.....	7
Employers.....	8
Certifications, Skills, and Experience.....	9
Education and Training.....	11
Educational Supply.....	12
Community College Supply.....	12
Findings.....	14
Recommendations.....	15
Appendix A. Methodology and Sources.....	17
Appendix B. Glossary of Key Terms.....	18

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## SUMMARY

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The North (Greater Sacramento) of Excellence for Labor Market Research prepared this report to provide a labor market analysis of educational supply and occupational demand for middle-skilled career pathways in the North (Greater Sacramento) subregion. This report aims to determine if demand in the local labor market is unmet by the supply from existing community college programs and other postsecondary training providers.

This report primarily focuses on training that leads to jobs in middle-skilled occupations - jobs that typically require education beyond a high school diploma but less than a bachelor's degree - but may include higher-skilled occupations for training pathways that lead to a bachelor's degree. Lowered skilled occupations are rarely considered in this analysis due to the lessened barriers for entry-level work, such as no formal education and on-the-job training requirements.

Key findings include:

- The North (Greater Sacramento) subregion held 1,658 drafting jobs in 2021. These jobs are projected to increase by 2% over the next five years, adding 40 new jobs to the subregion by 2026.
- Over the next five years, drafting jobs are projected to have 169 annual openings in the North (Greater Sacramento) subregion.
- Wage data shows that drafting occupations earn \$8 to \$13 above the single adult living wage of \$14.53 per hour.
- Awards data analysis shows that North (Greater Sacramento) training providers conferred an average of 84 awards (certificates and associate degrees) in drafting related programs over the last three academic years.

Recommendations include:

- The North (Greater Sacramento) Center of Excellence recommends that community colleges ensure drafting certificates stack to related associate degree programs so that students have the greatest flexibility in obtaining skills and education that leads to employment in the Greater Sacramento area.
- The North (Greater Sacramento) Center of Excellence recommends moving forward with the program.

# INTRODUCTION

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The North (Greater Sacramento) Center of Excellence (COE) was asked to provide labor market information for a proposed program at a regional community college. This report focuses on the following Standard Occupational Classification (SOC) occupations and codes:

- These middle-skill occupations require more education and training beyond a high school diploma but less than a four-year degree:
  - Architectural and Civil Drafters (17-3011)
  - Electrical and Electronics Drafters (17-3012)
  - Mechanical Drafters (17-3013)
  - Drafters, All Other (17-3019)

A review of related programs revealed the following Taxonomy of Programs (TOP) title(s) and code(s) are appropriate for inclusion in this report:

- Drafting Technology (0953.00)
- Architectural Drafting (0953.10)
- Electrical, Electronic, and Electro-Mechanical Drafting (0953.30)
- Mechanical Drafting (0953.40)

The corresponding Classification of Instructional Program (CIP) title(s) and code(s) are:

- Drafting and Design Technology/Technician, General. (15.1301)
- CAD/CADD Drafting and/or Design Technology/Technician. (15.1302)
- Architectural Drafting and Architectural CAD/CADD. (15.1303)
- Electrical/Electronics Drafting and Electrical/Electronics CAD/CADD. (15.1305)
- Mechanical Drafting and Mechanical Drafting CAD/CADD. (15.1306)

# OCCUPATIONAL DEMAND

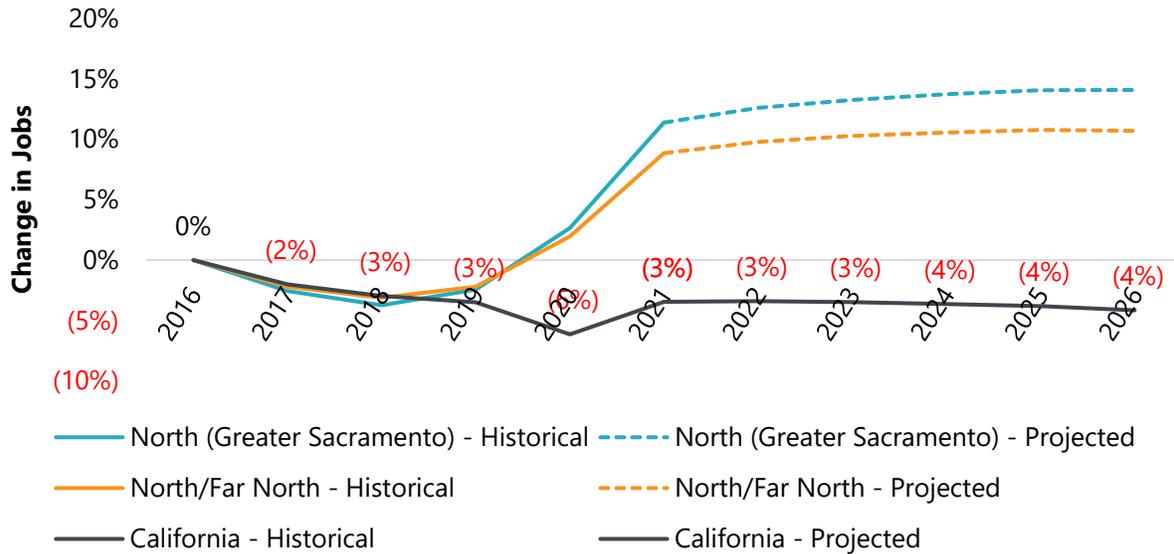
Exhibit 1 summarizes the five-year projected job growth for middle-skill and high-skill occupations in the North, North/Far North, and California.

**Exhibit 1. Employment and projected demand, 2021-2026**

Occupation	2021 Jobs	2026 Jobs	2021-2026 Change	2021-2026 % Change	2021-2026 Annual Openings
Architectural and Civil Drafters	959	974	15	2%	96
Electrical and Electronics Drafters	280	292	11	4%	29
Mechanical Drafters	284	294	11	4%	30
Drafters, All Other	134	137	3	3%	14
<b>North (Greater Sacramento)</b>	<b>1,658</b>	<b>1,698</b>	<b>40</b>	<b>2%</b>	<b>169</b>
Architectural and Civil Drafters	1,170	1,181	11	1%	117
Electrical and Electronics Drafters	308	319	11	3%	32
Mechanical Drafters	337	346	9	3%	35
Drafters, All Other	155	157	2	1%	16
<b>North/Far North</b>	<b>1,970</b>	<b>2,003</b>	<b>34</b>	<b>2%</b>	<b>200</b>
Architectural and Civil Drafters	14,670	14,662	(8)	(0%)	1,430
Electrical and Electronics Drafters	3,367	3,371	3	0%	333
Mechanical Drafters	4,796	4,699	(97)	(2%)	460
Drafters, All Other	2,194	2,112	(82)	(4%)	206
<b>California</b>	<b>25,027</b>	<b>24,844</b>	<b>(183)</b>	<b>(1%)</b>	<b>2,428</b>

Exhibit 2 compares the percent change in jobs between 2016 through 2021 and the projected changes through 2026. The rate of change is indexed to the total number of jobs in 2016.

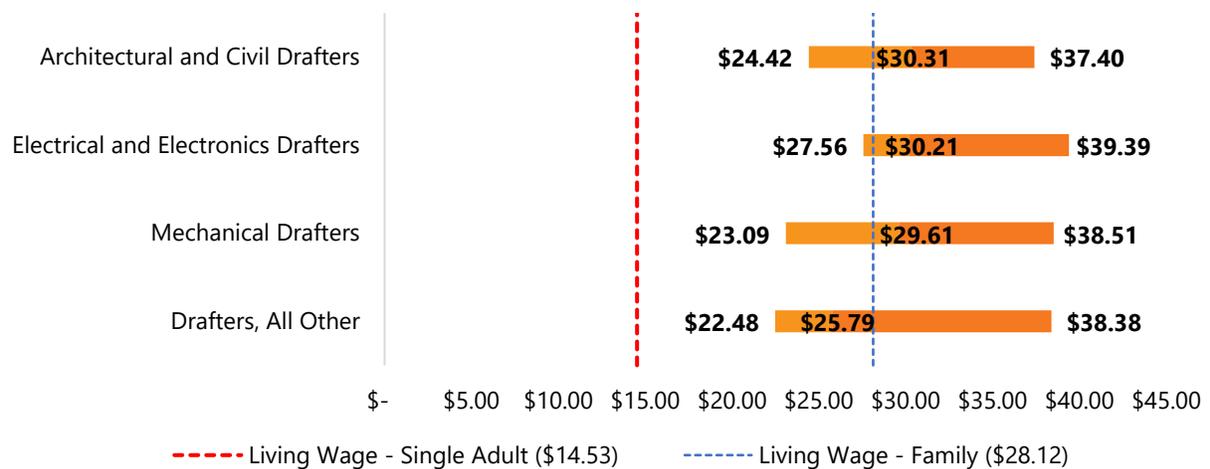
**Exhibit 2. Changes in employment, 2016-2026**



## WAGES

Exhibit 3 compares the entry-level, median, and experienced wages for the selected occupations to the North (Greater Sacramento) living wage<sup>1</sup> for a single adult (\$14.53 per hour) and a small family<sup>2</sup> (\$28.12 per hour).

**Exhibit 3. Comparison of wages by occupation, 2021**



<sup>1</sup> Living wage is defined as the level of income a single adult with no children must earn to meet basic needs, including food, housing, transportation, healthcare, taxes, and other miscellaneous basic needs. Please note that the 25th-percentile and 75th-percentile hourly wages are used as proxy for entry-level and experienced-level wages.

<sup>2</sup> A small family is defined as a single adult and one school aged child (between the ages of 5 and 12 years).

# JOB POSTINGS

This section analyzes recent data from online job postings (real-time LMI). Online job postings may provide additional insight into recent changes in the labor market that are not captured by historical trends.

The North COE identified 634 online job postings for the selected occupations in the Greater Sacramento subregion. Job posting data comes from Lightcast (formerly EMSI Burning Glass) and represents new listings posted online within the last year, from October 1, 2021, to September 30, 2022. The median posting duration for these job postings was 34 days vs. 30 days for all job postings in Sacramento.

## Occupations and Job Titles

Exhibit 4 details the number of online job postings for the selected occupations.

**Exhibit 4. Number of job postings by occupation**

Occupation	Job Postings	Share of Job Postings
Drafters, All Other	231	36%
Electrical and Electronics Drafters	186	29%
Mechanical Drafters	138	22%
Architectural and Civil Drafters	79	12%
<b>Total Job Postings</b>	<b>634</b>	<b>100%</b>

Exhibit 5 compares the average number of online job postings to the average number of hires between January 2021 and September 2022 for the selected occupations.

**Exhibit 5. Monthly jobs postings vs. monthly hires**

Occupation	Avg. Monthly Job Postings	Avg. Monthly Hires
Drafters, All Other	21	6
Electrical and Electronics Drafters	17	10
Mechanical Drafters	11	12
Architectural and Civil Drafters	8	39

Exhibit 6 shows the top 10 job titles with the most job postings and the share. All job postings included a job title.

**Exhibit 6. Top jobs titles**

Job Title	Job Postings	Share of Job Postings
Drafters	69	11%
CAD Drafters	41	6%
Electrical Designers	32	5%
AutoCAD Drafters	29	5%
CAD Drafters/Designers	29	5%
Designers	18	3%
Electrical CAD Designers	14	2%
Mechanical Designers	13	2%
Distribution Designers	11	2%
CAD Designers	10	2%

**Employers**

Exhibit 7 shows the top 10 employers with the most job postings for the selected occupations.

**Exhibit 7. Employers with the most job postings**

Employer	Job Postings	Share of Job Postings
Intel	31	5%
Tesco Controls	21	3%
Cupertino Electric	17	3%
GPAC*	11	2%
Rex Moore	11	2%
Jobot*	11	2%

Employer	Job Postings	Share of Job Postings
Javelin Utility Services	8	1%
Tetra Tech	7	1%
Actalent*	6	1%
Engineering Solutions	6	1%

An asterisk (\*) denotes an employer that is a staffing or recruiting company.

## Certifications, Skills, and Experience

Exhibit 8 shows the most relevant certifications requested by employers for the selected occupations.

### Exhibit 8. Most in-demand certifications

Certification	Job Postings	Share of Job Postings
Security Clearance	10	2%
NICET (National Institute for Certification in Engineering Technologies) Certification	7	1%
LEED Accredited Professional	6	1%
Autodesk Certified Professional in Revit for Electrical Design	5	1%
NICET Level II Certification	2	<1%

Exhibit 9 shows the top 10 skills across three categories for the studied occupations: specialized, human-centered, and technical skills.

### Exhibit 9. Most in-demand specialized skills

Top 10 Specialized Skills	Top 10 Human-Centered Skills	Top 10 Technical Skills
AutoCAD	Communications	AutoCAD
Computer-Aided Design	Microsoft Office	Autodesk Revit
Autodesk Revit	Detail Oriented	Microsoft Office

Top 10 Specialized Skills	Top 10 Human-Centered Skills	Top 10 Technical Skills
Electrical Engineering	Microsoft Excel	Microsoft Excel
Construction	Management	Microsoft Outlook
Architectural Drawing	Problem Solving	Microsoft Word
Building Information Modeling	Planning	SolidWorks (CAD)
Shop Drawing	Microsoft Outlook	AutoCAD Civil 3D
Bill Of Materials	Coordinating	Microsoft PowerPoint
Engineering Design Process	Time Management	Microsoft Access

Exhibit 10 shows employers' minimum level of education for job postings for the selected occupations.

**Exhibit 10. Employer-preferred minimum education levels**

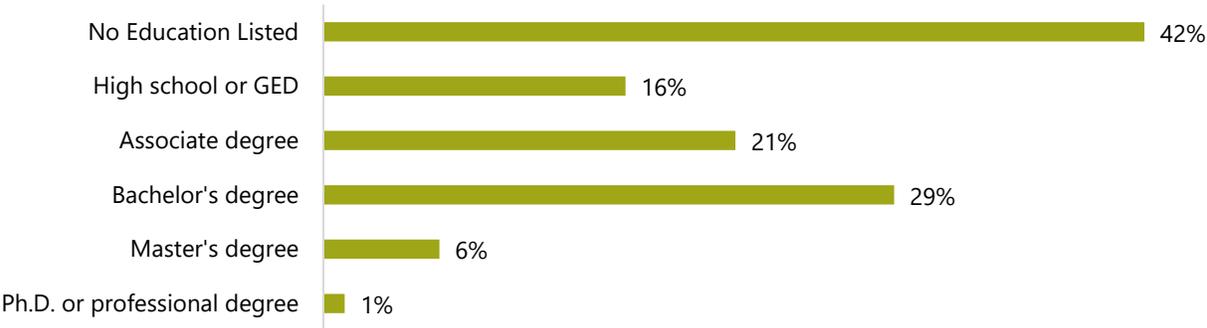
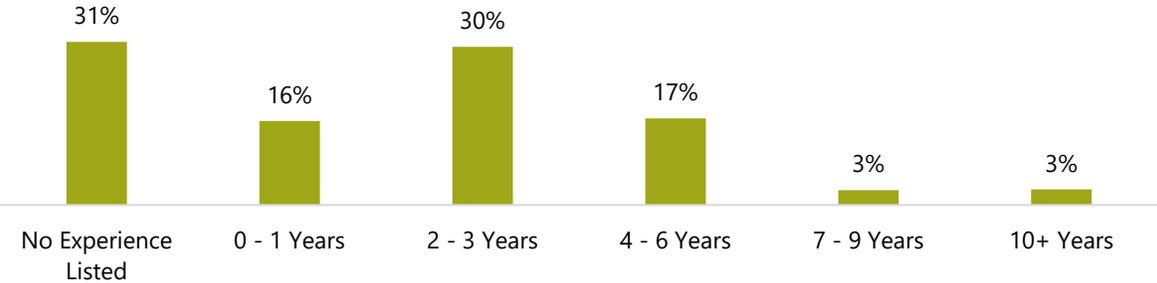


Exhibit 11 shows the experience levels required by employers for job postings for the selected occupations.

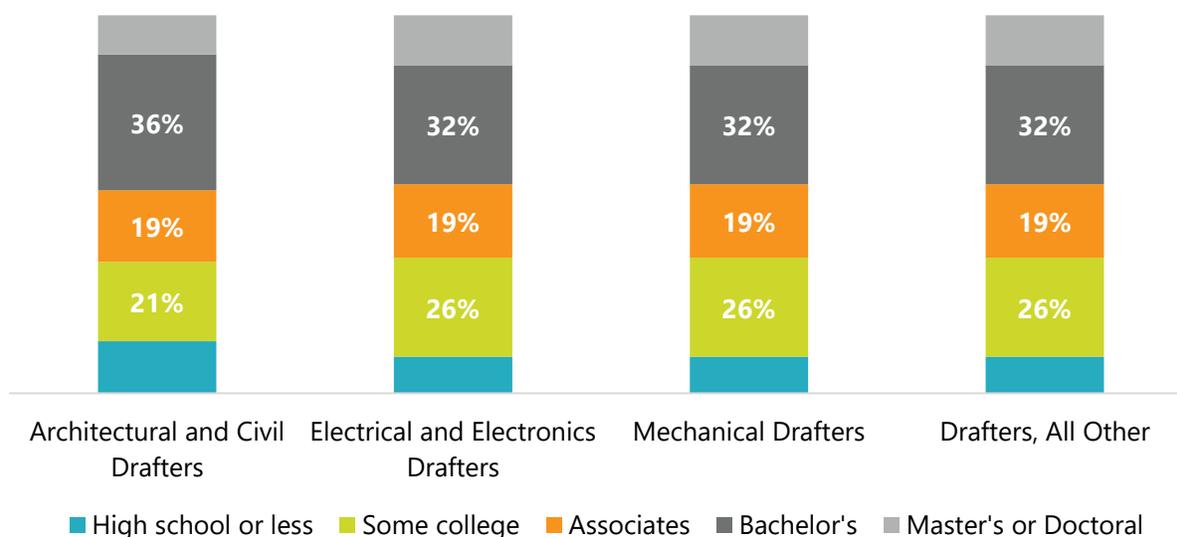
**Exhibit 11. Employer-preferred experience levels**



## EDUCATION AND TRAINING

The U.S. Census Bureau collects education data from workers employed in occupations. Exhibit 12 shows the state-level educational attainment of the current workforce in the selected occupations.

**Exhibit 12. California worker educational attainment for selected occupations, 2019**



The Bureau of Labor Statistics (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 the BLS publishes projections data. Exhibit 13 shows the selected occupations' entry-level job requirements.

**Exhibit 13. Typical education, work experience, and on-the-job training requirements**

Occupation	Typical Entry-level Education	Work Experience Required	On-the-job Training Required
Architectural and Civil Drafters	Associate degree	None	None
Electrical and Electronics Drafters	Associate degree	None	None
Mechanical Drafters	Associate degree	None	None
Drafters, All Other	Associate degree	None	None

## EDUCATIONAL SUPPLY

Educational supply for an occupation can be estimated by analyzing the number of awards issued in related Taxonomy of Programs (TOP) or Classification of Instructional Programs (CIP) codes. Exhibit 14 shows the TOP and CIP codes for educational programs related to the selected occupations.

**Exhibit 14. TOP and CIP codes for training programs related to the selected occupations**

TOP Programs and Codes	Aligned CIP Programs and Codes
Drafting Technology (0953.00)	Drafting and Design Technology/Technician, General. (15.1301) CAD/CADD Drafting and/or Design Technology/Technician. (15.1302)
Architectural Drafting (0953.10)	Architectural Drafting and Architectural CAD/CADD. (15.1303)
Electrical, Electronic, and Electro-Mechanical Drafting (0953.30)	Electrical/Electronics Drafting and Electrical/Electronics CAD/CADD. (15.1305)
Mechanical Drafting (0953.40)	Mechanical Drafting and Mechanical Drafting CAD/CADD. (15.1306)

### Community College Supply

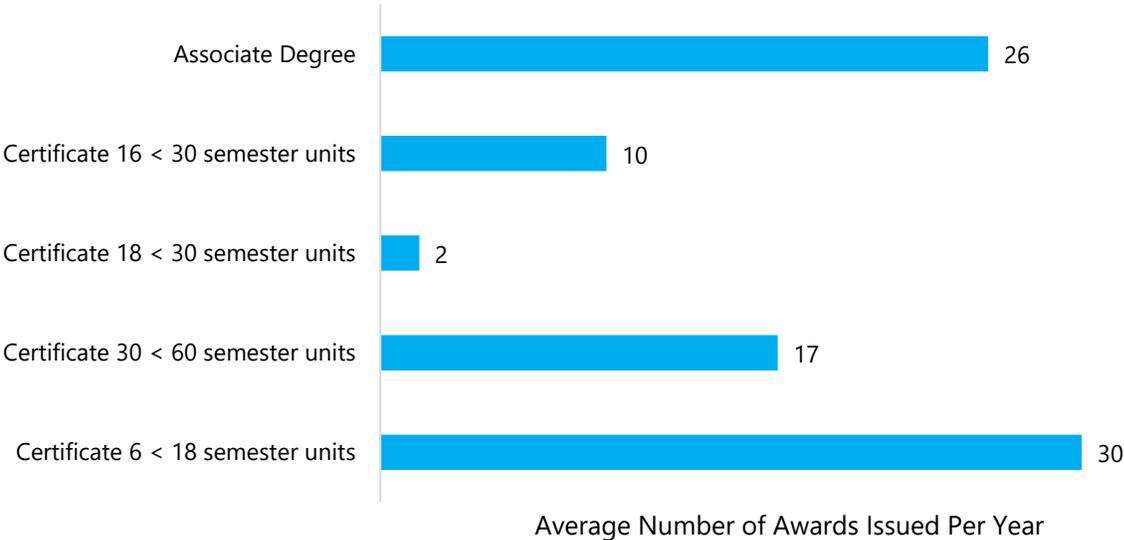
Exhibits 15 and 16 compare the average number of certificates and degrees from selected community college programs over the last three academic years.

**Exhibit 15. Annual average community college awards by program, 2018-19 through 2020-21**

Program - TOP Code	College	Annual Awards 2018-19	Annual Awards 2019-20	Annual Awards 2020-21	3-Yr Annual Awards Average
Drafting Technology (0953.00)	American River	25	11	13	16
	Sacramento City	5	3	21	10
	Sierra	21	13	7	14

Program - TOP Code	College	Annual Awards 2018-19	Annual Awards 2019-20	Annual Awards 2020-21	3-Yr Annual Awards Average
	<b>Subtotal</b>	<b>51</b>	<b>27</b>	<b>41</b>	<b>40</b>
Architectural Drafting (0953.10)	Sacramento City	1	5	6	4
	Sierra	24	18	20	20
	<b>Subtotal</b>	<b>25</b>	<b>23</b>	<b>26</b>	<b>24</b>
Electrical, Electronic, and Electro-Mechanical Drafting (0953.30)	Sacramento City	7	6	10	8
	<b>Subtotal</b>	<b>7</b>	<b>6</b>	<b>10</b>	<b>8</b>
Mechanical Drafting (0953.40)	Sacramento City	--	2	1	1
	Sierra	12	17	5	11
	<b>Subtotal</b>	<b>12</b>	<b>19</b>	<b>6</b>	<b>12</b>
	<b>Grand Total</b>	<b>95</b>	<b>75</b>	<b>83</b>	<b>84</b>

**Exhibit 16. Annual average community college awards by type, 2018-19 through 2020-21**



## FINDINGS

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- This report focuses on four occupations in the entry-level CADD operators' career pathway: architectural and civil drafters, electrical and electronics drafters, mechanical drafters, and drafters all others.
- CADD, or Computer-Aided Design and Drafting, is a process in which computers are used to create, modify, analyze, or optimize a design. CADD operators, or drafters, use software, such as AutoCAD or Revit, to convert engineering and architectural designs into 2D and 3D technical drawings. Drafters can specialize in architectural, civil, electrical, and mechanical drafting.
- The North (Greater Sacramento) subregion held 1,658 drafting jobs in 2021. These jobs are projected to increase by 2% over the next five years, adding 40 new jobs to the subregion by 2026.
- Drafting jobs are projected to grow faster in the North (Greater Sacramento) subregion than in California.
- Over the next five years, drafting jobs are projected to have 169 annual openings in the North (Greater Sacramento) subregion.
- Wage data shows that drafting occupations earn \$8 to \$13 above the single adult living wage of \$14.53 per hour.
- According to real-time labor market information, there were about 634 job postings for drafters between October 1, 2021, and September 30, 2022.
- Forty percent of incumbent drafters in California have educational attainment levels consistent with community college offerings (some college or associate degrees). Another 32% to 36% of these workers hold a bachelor's degree.
- Three Greater Sacramento community colleges offer degrees and certificates in programs related to CADD and drafting. Together, these programs conferred an average of 84 awards (certificates and associate degrees) in drafting programs over the last three academic years (2018-19 through 2020-21).
- Other postsecondary institutions in the Greater Sacramento area do not offer training for drafting careers.

# RECOMMENDATIONS

- Based on a three-year average of annual awards in North (Greater Sacramento) subregion drafting programs and projected yearly openings, the supply gap analysis shows that the region has room for additional training.
  - Community colleges and other postsecondary training providers issued an average of 84 awards over the last three years.
  - There are 169 projected annual openings for drafting jobs.
- Workers in drafting jobs typically require a minimum of an associate degree in a related field of study for entry-level work. As a result, a certificate in drafting technology may not be sufficient for entry-level employment. However, the community college's certificate pathways allow incumbent workers to upskill. The community colleges should ensure drafting certificates stack to related associate degree programs so that students have the greatest flexibility in obtaining skills and education that leads to employment in the Greater Sacramento area.
- The North (Greater Sacramento) Center of Excellence recommends moving forward with the program.

New Program Recommendation		
<b>Move forward with the new program</b>	<b>Proceed with caution</b>	<b>A new program is not recommended</b>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Program Modification	
<b>Move forward with program modifications</b>	<b>Program modifications are not recommended</b>
<input checked="" type="checkbox"/>	<input type="checkbox"/>



## APPENDIX A. METHODOLOGY AND SOURCES

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This report identified Occupations using the Center of Excellence TOP-to-CIP-to-SOC crosswalk and O\*Net OnLine. This report's findings were determined using labor market data from the Bureau of Labor Statistics (BLS), U.S. Census Bureau data from Emsi, and jobs posting data from Burning Glass.

Lightcast (Formerly EMSI/Burning Glass) 2022.3; QCEW Employees, Non-QCEW Employees, and Self-Employed. <https://www.economicmodeling.com/>. *Note: EMSI occupational employment data are based on final EMSI industry data and final EMSI staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors).*

Integrated Postsecondary Education Data System (IPEDS). National Center for Education Statistics. U.S. Department of Education. <https://nces.ed.gov/ipeds/>.

Labor Market Information Division. California Employment Development Department. <https://labormarketinfo.edd.ca.gov/>.

Management Information Systems (MIS) Data Mart. California Community Colleges Chancellor's Office. <https://datamart.cccco.edu/>.

O\*NET OnLine. U.S. Department of Labor/Employment and Training Administration (DOL ETA). <https://www.onetonline.org/>.

Public Use Microdata Sample (PUMS). U.S. Census Bureau American Community Survey (ACS). <https://www.census.gov/programs-surveys/acs/microdata.html>

Self-Sufficiency Standard Tool for California. The University of Washington. <http://www.selfsufficiencystandard.org/>

"Taxonomy of Programs." California Community Colleges Chancellor's Office. June 2012, 6<sup>th</sup> Edition. <https://www.cccco.edu/-/media/CCCCO-Website/About-Us/Divisions/Educational-Services-and-Support/Academic-Affairs/What-we-do/Curriculum-and-Instruction-Unit/Files/TOPmanual6200909corrected12513pdf.ashx>

"TOP-CIP-SOC Crosswalk." Centers of Excellence for Labor Market Research. June 2021 Edition. <http://coecc.net/>

## APPENDIX B. GLOSSARY OF KEY TERMS

Key Terms	Definition
<b>Occupation</b>	Occupation refers to professions, or careers, in the workforce. Occupations differ from jobs in that jobs show the number of positions held in a given occupation.
<b>Jobs</b>	<p>A job is any position where a worker provides labor for monetary compensation.</p> <p>Job numbers include employees (those who work for businesses) and proprietors (those who work for themselves). Full- and part-time jobs are included and counted equally (i.e., not adjusted to full-time equivalents). Data for jobs, or employment, are annual averages.</p>
<b>Job Change</b>	Job change is the net increase or decrease of jobs over a given timeframe.
<b>Job Openings</b>	<p>Job openings are the projected number of positions available for workers entering an occupation.</p> <p>Openings include growth and replacement jobs. Growth jobs are the positive change in the total number of workers employed. Replacement jobs are the estimates of new workers needed to replace workers permanently leaving the occupation.</p>
<b>Wages</b>	Wages, or compensation, show workers' percentile and average earnings in a given occupation. The 25th-percentile and 75th-percentile hourly wages are used as a proxy for entry-level and experienced-level wages.
<b>Living Wage</b>	The living wage is the level of income a single adult with no children must earn to meet basic needs. The living wage is calculated using basic levels of allowances for food, housing, transportation, healthcare, taxes, and other miscellaneous basic needs.
<b>Educational Attainment</b>	Educational attainment is the level of education achieved by workers in a given occupation. The data includes workers aged 25 years and older.
<b>Typical Entry-level Education</b>	The education level generally required for employment in an occupation. It may differ from the actual educational levels attained by workers in any given occupation.
<b>Work Experience Required</b>	The level of prior experience a worker needs to enter a job in a given occupation.
<b>On-the-job Training Required</b>	The level of on-the-job training a worker needs to obtain competency in a given occupation.
<b>Awards</b>	Awards are the number of certificates and degrees conferred for a specific course of study in a given year. Awards counts "papers" and, as a result, may be greater than the actual number of students who complete a program.

**COVID-19 Statement:** This report includes employment projection data by EMSI. 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 or potential output. To the extent that a recession or labor shock, such as the economic effects of COVID-19, can cause long-term structural change, they 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. Other measures such as unemployment rates and monthly industry employment estimates will reflect the most recent information on employment and jobs in the state and, in combination with input from local employers, may help validate current and future employment needs as depicted here.

**Important Disclaimer:** 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. Efforts have been made to qualify and validate the accuracy of the data and the reported findings; however, neither the Centers of Excellence, COE host District, nor California Community Colleges Chancellor's Office are responsible for applications or decisions made by recipient community colleges or their representatives based upon components or recommendations contained in this study.

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Centers of Excellence for Labor Market Research, Economic and  
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CENTERS OF EXCELLENCE  
FOR LABOR MARKET RESEARCH

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