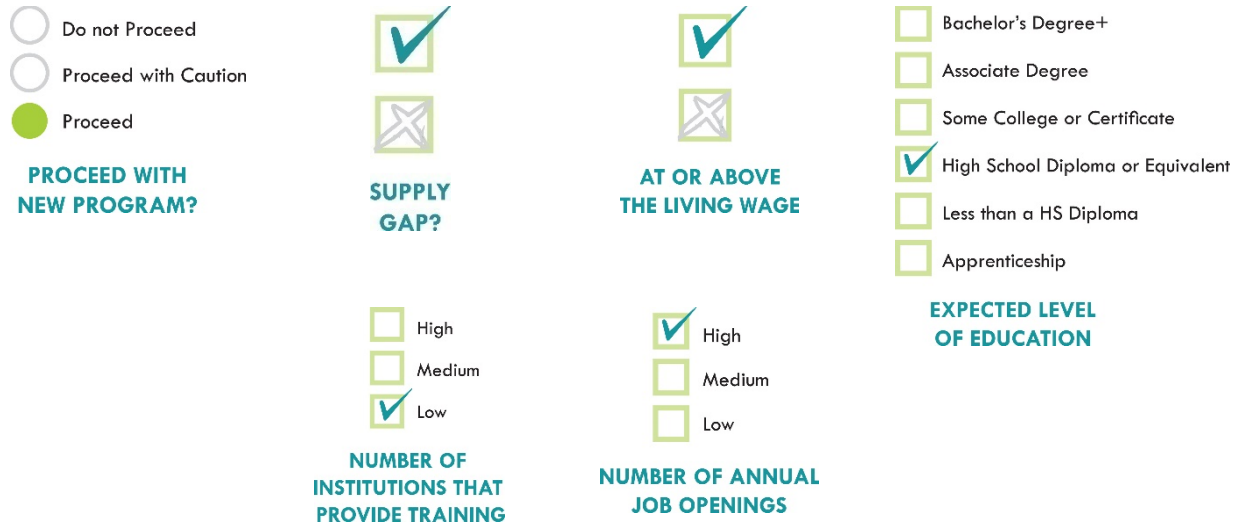


Maintenance and Repair Workers, General

Labor Market Analysis: San Diego County

July 2020

Summary



The San Diego-Imperial Center of Excellence for Labor Market Research (COE) developed this brief to assist community colleges in the region with decision-making in processes such as program development. According to available labor market information, *Maintenance and Repair Workers, General* has a labor market demand of 1,521 annual job openings, while average demand for an occupation in San Diego County is 277 annual job openings. No educational institutions in San Diego County supply awards for this occupation, which suggests that there is a supply gap in the labor market. This occupation's entry-level earnings are below the living wage, but its median earnings are above the living wage. According to the California Community Colleges' outcomes data, 67 percent of students statewide who completed a related program (e.g., Industrial Systems Technology and Maintenance) earned a living wage, compared to 52 percent of students who completed Career Education programs in general. The typical entry-level education for *Maintenance and Repair Workers, General* is a high school diploma or equivalent. The COE recommends to proceed with a new program for this occupation because a supply gap and a high number of annual openings exist. However, the COE also insists that colleges communicate to students that this occupation's entry-level wages are below the living wage, and that training and experience are needed for workers in this occupation to reach median wage levels.

Introduction

According to a recent study by the San Diego-Imperial Center of Excellence for Labor Market Research (COE), *Maintenance and Repair Workers, General* had the largest labor market demand out of 10 *Industrial Automation Occupations*.¹ Subsequently, this follow-up study provides a more in-depth analysis of the following occupational code in the Standard Occupational Classification (SOC)² system in San Diego County to help the region’s community colleges with program development and strategic planning:

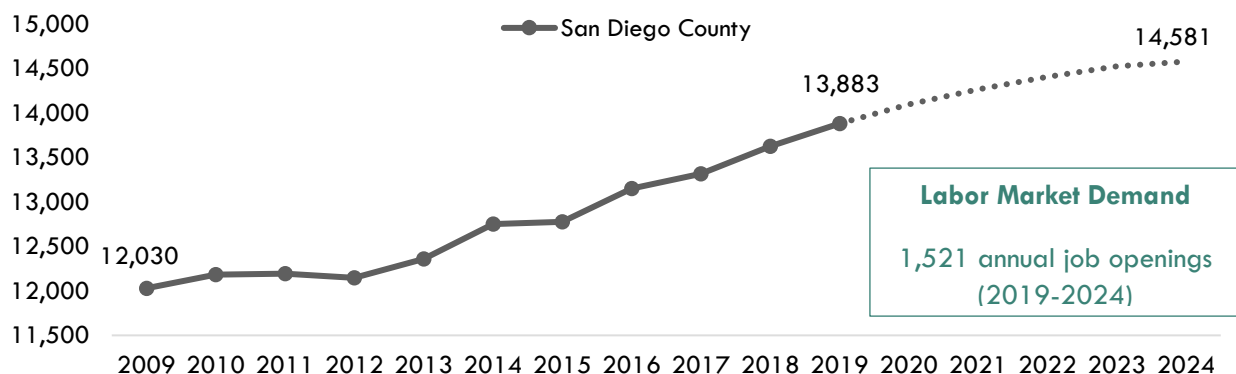
Maintenance and Repair Workers, General (SOC 49-9071): Perform work involving the skills of two or more maintenance or craft occupations to keep machines, mechanical equipment, or the structure of an establishment in repair. Duties may involve pipe fitting; boiler making; insulating; welding; machining; carpentry; repairing electrical or mechanical equipment; installing, aligning, and balancing new equipment; and repairing buildings, floors, or stairs. Sample reported job titles include:

- Maintenance Mechanic
- Plant Maintenance Technician
- Maintenance Technician
- Maintenance Specialist
- Maintenance Engineer
- Field Service Engineer
- Facilities Technician
- Facilities Engineer
- Building Mechanic

Projected Employment and Labor Market Demand

Between 2019 and 2024, *Maintenance and Repair Workers, General* are projected to increase by 698 net jobs or five percent (Exhibit 1). Employers in San Diego County will need to hire 1,521 workers annually to fill new jobs and backfill jobs due to attrition caused by turnover and retirement.

Exhibit 1: Number of Jobs for *Maintenance and Repair Workers, General* (2009-2024)³



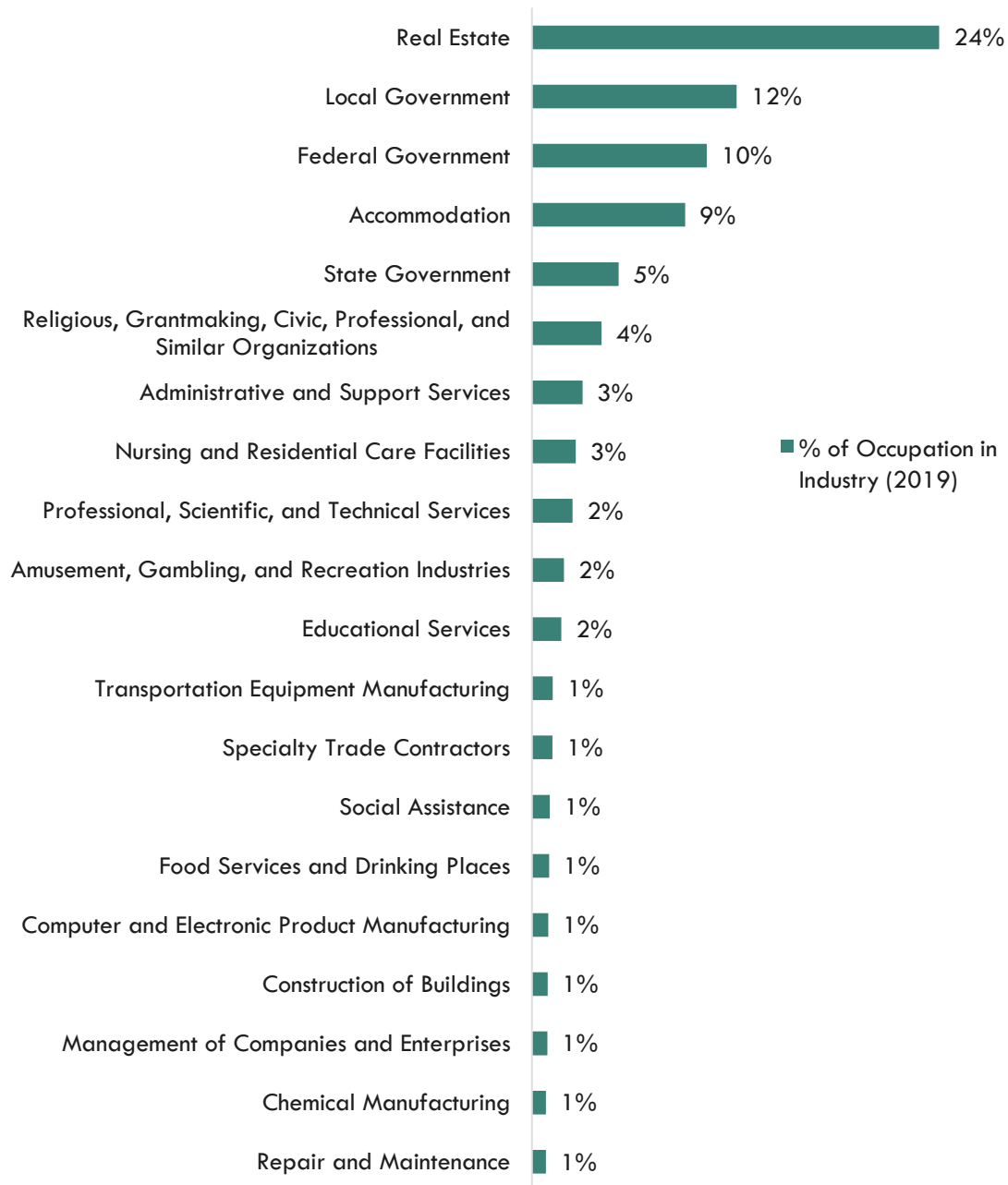
¹ Industrial Automation Occupations report. coecc.net/reports/Industrial_Automation_Occupations.

² 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.

³ EMSI 2020.02; QCEW, Non-QCEW, Self-Employed.

Of the 13,883 *Maintenance and Repair Workers, General* jobs in San Diego County in 2019, 24 percent were employed in the *Real Estate* industry (Exhibit 2). For more information about these industries, see Appendix A: Industry Definitions.

Exhibit 2: Percentage of *Maintenance and Repair Workers, General* Employed by Industry in San Diego County (2019)⁴

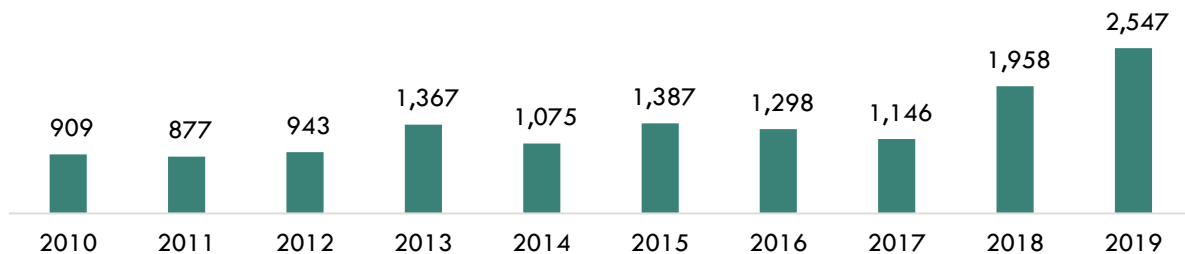


⁴ EMSI 2020.02; QCEW, Non-QCEW, Self-Employed. Inverse Staffing Patterns for *Maintenance and Repair Workers, General*.

Online Job Postings

This report analyzes not only historical and projected data (traditional labor market information or LMI), 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 demand that are not captured by historical data. Between 2010 and 2019, there was an average of **1,351** online job postings per year in San Diego County for *Maintenance and Repair Workers, General* (Exhibit 3). The increased frequency in which employers posted online job postings for this occupation suggests that employers may have had difficulty filling job openings.

Exhibit 3: Number of Online Job Postings for *Maintenance and Repair Workers, General* in San Diego County (2010-2019)⁵



Comparing 2016 and 2019 online job postings by industry further demonstrates that *Real Estate* hires the most *Maintenance and Repair Workers, General*; the *Real Estate* industry was among the top 10 industries that posted online job postings for this occupation for both years (Exhibit 4). The top 10 industries with the most online job postings for this occupation are identified in **bold** in the exhibit.

⁵ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2010-2019.

Exhibit 4: Number of Online Job Postings for Maintenance and Repair Workers, General by Industry in San Diego County (2016 vs. 2019)⁶

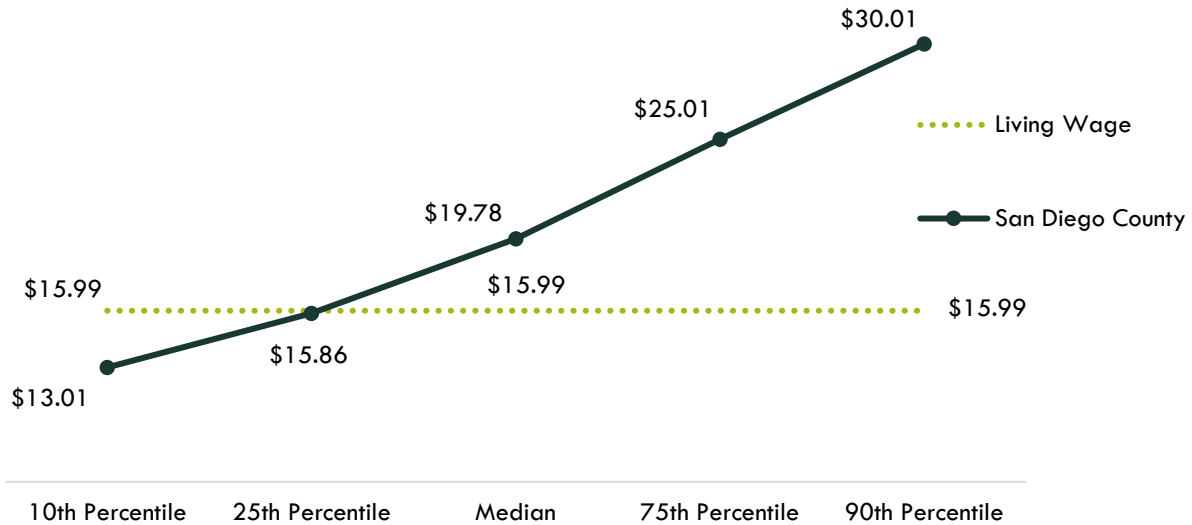
Ranking	Industry	# Online Job Postings (2016)	Industry	# Online Job Postings (2019)
#1	Accommodation	295	Real Estate	601
#2	Real Estate	151	Accommodation	542
#3	Professional, Scientific, and Technical Services	131	Administrative and Support Services	323
#4	Educational Services	102	Professional, Scientific, and Technical Services	241
#5	Transportation Equipment Manufacturing	79	Specialty Trade Contractors	169
#6	General Merchandise Stores	65	National Security and International Affairs	153
#7	Computer and Electronic Product Manufacturing	62	Educational Services	133
#8	Amusement, Gambling, and Recreation Industries	55	Repair and Maintenance	120
#9	Insurance Carriers and Related Activities	54	Transportation Equipment Manufacturing	117
#10	Administrative and Support Services	53	Amusement, Gambling, and Recreation Industries	87
#11	Specialty Trade Contractors	43	Nursing and Residential Care Facilities	65
#12	Food Services and Drinking Places	40	Insurance Carriers and Related Activities	61
#13	National Security and International Affairs	39	Food Services and Drinking Places	59
#14	Hospitals	37	Computer and Electronic Product Manufacturing	57
#15	Miscellaneous Manufacturing	35	Building Material and Garden Equipment and Supplies Dealers	57
#16	Sporting Goods, Hobby, Musical Instrument, and Book Stores	31	Personal and Laundry Services	56
#17	Nursing and Residential Care Facilities	26	Construction of Buildings	41
#18	Repair and Maintenance	23	Social Assistance	40
#19	Chemical Manufacturing	22	Utilities	38
#20	Personal and Laundry Services	20	Miscellaneous Manufacturing	35

⁶ Labor Insight/Jobs. Burning Glass Technologies. "San Diego, CA." Full year 2016 and 2019.

Earnings

Maintenance and Repair Workers, General receive median hourly earnings of **\$19.78**; this is more than the living wage for a single adult in San Diego County, which is **\$15.99** per hour (Exhibit 5).⁷ However, entry-level earnings for this occupation are slightly lower than the living wage at \$15.99 per hour.

Exhibit 5: Hourly Earnings⁸ for *Maintenance and Repair Workers, General* in San Diego County⁹



While entry-level wages for this occupation are generally slightly lower than the living wage, earnings for *Maintenance and Repair Workers, General* differ by industry. According to online job postings in 2019, *Maintenance and Repair Workers, General* are expected to earn the most wages in the Professional, Scientific, and Technical Services¹⁰ industry, with entry-level and median earnings at \$17.83 and \$20.51, respectively (Exhibit 6).

⁷ "California Family Needs Calculator (formerly the Self-Sufficiency Standard)," Insight: Center for Community Economic Development, last updated 2018. insightccd.org/2018-self-sufficiency-standard.

⁸ 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.

⁹ EMSI 2020.02; QCEW, Non-QCEW, Self-Employed.

¹⁰ Professional, Scientific, and Technical Services industry. census.gov/cgi-bin/sssd/naics/naicsrch?code=541&search=2017%20NAICS%20Search.

Exhibit 6: Hourly Earnings for Maintenance and Repair Workers, General by Industry in San Diego County (Online Job Postings, 2019)¹¹

Industry	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
<u>Professional, Scientific, and Technical Services</u>	\$17.83	\$20.51	\$25.70
<u>Transportation Equipment Manufacturing</u>	\$16.38	\$19.40	\$23.03
<u>Specialty Trade Contractors</u>	\$15.86	\$17.49	\$20.51
<u>National Security and International Affairs</u>	\$15.51	\$19.86	\$24.66
<u>Educational Services</u>	\$15.44	\$17.62	\$20.23
<u>Administrative and Support Services</u>	\$15.24	\$17.58	\$20.89
<u>Repair and Maintenance</u>	\$15.21	\$16.80	\$20.05
<u>Real Estate</u>	\$14.60	\$15.87	\$17.54
<u>Accommodation</u>	\$13.61	\$15.67	\$18.53
<u>Amusement, Gambling, and Recreation Industries</u>	\$13.35	\$14.75	\$17.78

Top Employers

Between January 1, 2016 and December 31, 2019, the top employers in San Diego County for *Maintenance and Repair Workers, General* were [Marriott International](#), [Sysco Corporation](#), [The Home Depot](#), [McDonald's](#), and [CBRE](#) (Exhibit 7).

¹¹ Labor Insight/Jobs. Burning Glass Technologies. "San Diego, CA." Full year 2019.

**Exhibit 7: Top Employers for Maintenance and Repair Workers, General in Online Job Postings by
Number of Postings in San Diego County¹²**

Employer	# Online Job Postings
Marriott International Incorporated	398
Sysco Corporation	179
The Home Depot Incorporated	152
McDonald's	111
Hilton Hotel Corporation	75
General Dynamics	74
Toys R Us, Inc	73
Avalonbay Communities Incorporated	72
ConAm Incorporated	71
Hyatt	70
Omni Hotel Corporation	68
SeaWorld Parks & Entertainment	66
Becton Dickinson	65
U.S. Marine Corps	64
Siemens	62
University of California San Diego	57
Interstate Hotels & Resorts	57
FPI Management	57
BAE Systems	55
U.S. Navy	54

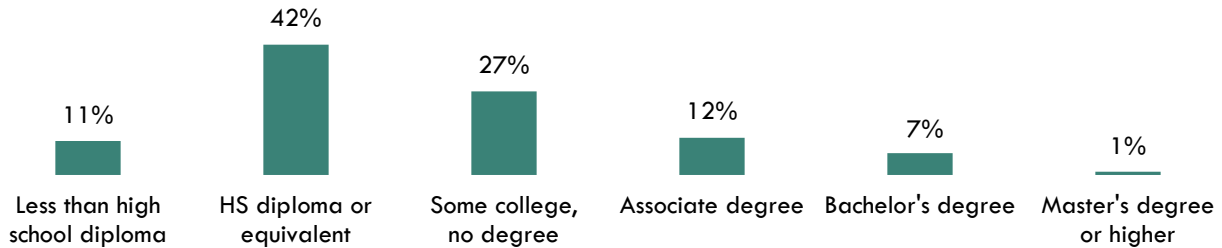
Employer	# Online Job Postings
Hawthorne Cat	53
General Atomics	53
G6 Hospitality	51
24 Hour Fitness	51
Lockheed Martin Corporation	50
Sodexo	47
Northrop Grumman	47
AIMCO	47
AECOM Technology Corporation	47
San Diego Community College District	45
U.S. Government	44
Macy's	44
JC Resorts	44
Equity Residential	41
Navy Exchange Service Command	40
Atria Senior Living	39
San Diego State University	38
La Quinta Inns	38
CoreCivic	38
Residential Property Management	37

¹² Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2019.

Educational Attainment

Exhibit 8 indicates the educational attainment for the occupation found currently in the national labor force. The typical on-the-job training for this profession is *moderate-term on-the-job training*. The typical entry-level education is a *high school diploma or equivalent*.¹³

Exhibit 8: National Educational Attainment of Maintenance and Repair Workers, General¹⁴



Certifications and Qualifications

Between January 1, 2016 and December 31, 2019, employers in San Diego County listed *Commercial Driver's License (CDL)* as the top certification or qualification in online job openings (Exhibit 9).

Exhibit 9: Top Certifications or Qualifications in Online Job Postings by Number of Postings in San Diego County (2016-2019)¹⁵

Certification or Qualification	# Online Job Postings	Certification or Qualification	# Online Job Postings
Driver's License	4,327	OSHA Safety 10 Hour	23
Security Clearance	681	Certified Pest Control	21
Environmental Protection Agency CFC/HCFC Certification	236	Licensed Vocational Nurse (LVN)	20
Certified A+ Technician	133	Fair Housing	19
Forklift Operator Certification	122	Department of Transportation (DOT) Medical Certification	19
EPA 608	84	Lock Out Tag Out	16
First Aid CPR AED	82	Bloodborne Pathogens Certification	16
CompTIA Security+	81	Casino Gaming License	15

¹³ Emsi 2020.01; QCEW, Non-QCEW, Self-Employed.

¹⁴ "Educational Attainment for Workers 25 Years and Older by Detailed Occupation," Bureau of Labor Statistics, last modified September 4, 2019. bls.gov/emp/tables/educational-attainment.htm.

¹⁵ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2017-2019.

Certification or Qualification	# Online Job Postings	Certification or Qualification	# Online Job Postings
Automotive Service Excellence (ASE) Certification	79	Wastewater Treatment Plant Operator	14
CDL Class C	65	Cisco Certified Network Professional (CCNP)	14
Project Management Certification	63	Carpentry Certification	14
Certified Pool/Spa Operator	63	Plumbing License	13
CompTIA Network+	59	Microsoft Certified Professional (MCP)	13
Occupational Safety and Health Administration Certification	55	Certified Repair Technician	13
CDL Class B	53	NICET II	12
Cisco Certified Network Associate (CCNA)	47	Microsoft Certified Solutions Expert (MCSE)	12
Air Conditioning (AC) Certification	43	Applicators License	12
IT Infrastructure Library (ITIL) Certification	42	Plumbing Certification	11
Certified Information Systems Security Professional (CISSP)	37	Microsoft Certified Solutions Associate (MCSA)	11
CDL Class A	36	Electronic Technician Certification	11
Boiler Operator License	36	Commercial Food Equipment Service Association (CFESA)	11
Electrician Certification	35	Back-Flow Certification	11
Maintenance Certification	33	ServSafe	10
Appliance Repair Certificate	25	Certified Professional - Food Safety	10
ITIL Certification	24	OSHA Safety 30 Hour	9

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.¹⁶ There is **one** TOP code and **one** CIP code related to *Maintenance and Repair Workers, General* (Exhibit 10).

¹⁶ 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).

Exhibit 10: Related TOP and CIP Codes for *Maintenance and Repair Workers, General*

Maintenance and Repair Workers, General

TOP 094500: Industrial Systems Technology and Maintenance

CIP 47.0303: Industrial Mechanics and Maintenance Technology

According to TOP and CIP data, **no** community college or other institution supplies the region with awards for this occupation (Exhibit 11).

Exhibit 11: Number of Awards (Certificates and Degrees) Conferred by Postsecondary Institutions (Program Year 2014-15 through PY2018-19 Average)

TOP6 or CIP	TOP6 or CIP Title	3-Yr Annual Average CC Awards (PY16-17 to PY18-19)	Other Educational Institutions 3-Yr Annual Average Awards (PY14-15 to PY16-17)	3-Yr Total Average Supply (PY14-15 to PY18-19)
094500	Industrial Systems Technology and Maintenance	0	0	0
47.0303	Industrial Mechanics and Maintenance Technology	0	0	0
			Total	0

Demand vs. Supply

Comparing labor demand (annual openings) with labor supply¹⁷ suggests that there is a **supply gap** for this occupation in San Diego County, with **1,521** annual openings and **no** awards. Comparatively, there are **17,213** annual openings in California and **439** awards, demonstrating that there is a supply gap across the state¹⁸ (Exhibit 12).

¹⁷ Labor supply can be found from two different sources: EMSI or the California Community Colleges Chancellor's Office MIS Data Mart. EMSI uses CIP codes while MIS uses TOP codes. Different coding systems result in differences in the supply numbers.

¹⁸ "Supply and Demand," Centers of Excellence Student Outcomes, coecc.net/Supply-and-Demand.aspx.

Exhibit 12: Labor Demand (Annual Openings) vs. with Labor Supply (Annual Awards)

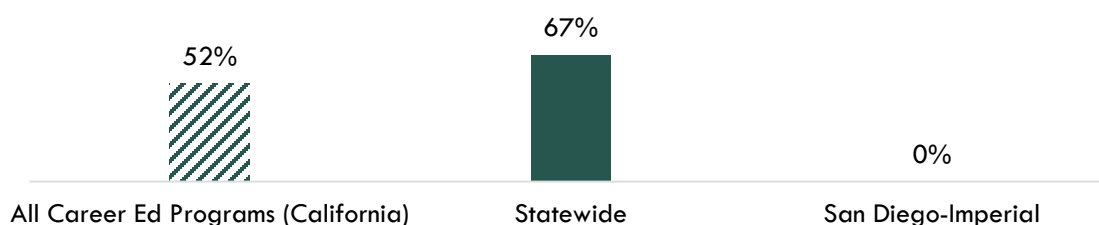
Community Colleges and Other Postsecondary Educational Institutions	Demand (Average Annual Openings)	Supply (Average Annual Supply)	Supply Gap or Oversupply
San Diego	1,521	0	1,521
California	17,213	439	16,774

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.

Student Outcomes and Regional Comparisons

According to the California Community Colleges LaunchBoard, 67 percent of students statewide earned a living wage after completing an Industrial Systems Technology and Maintenance (TOP 094500) program, compared to 52 percent of students in Career Education programs in general across the state (Exhibit 13a).

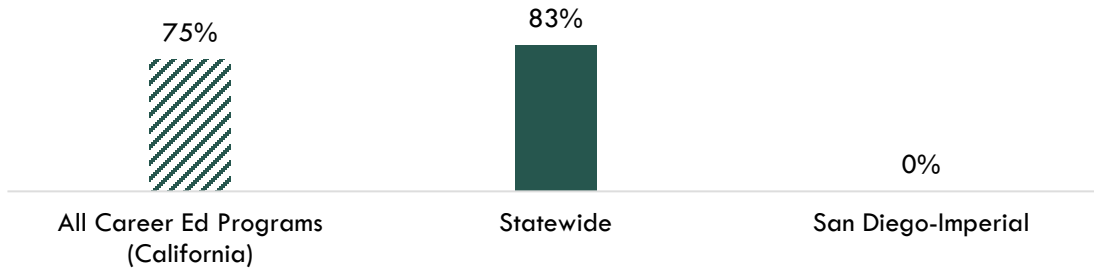
Exhibit 13a: Proportion of Students Who Earned a Living Wage Industrial Systems Technology and Maintenance, PY2016-17¹⁹



According to the California Community Colleges LaunchBoard, 83 percent of students obtained a job closely related to their field of study after completing an Industrial Systems Technology and Maintenance (TOP 094500) program, compared to 75 percent of students in Career Education programs in general across the state (Exhibit 13b).

¹⁹ Among completers and skills builders who exited, the proportion of students who attained a living wage. calpassplus.org/LaunchBoard/SWP.aspx

**Exhibit 13b: Percentage of Students in a Job Closely Related to Field of Study
Industrial Systems Technology and Maintenance, PY2016-17²⁰**



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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.

This workforce demand report uses state and federal job projection data that was developed before the economic impact of COVID-19. The COE is monitoring the situation and will provide more information as it becomes available. Please consult with local employers to understand their current employment needs.

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. calpassplus.org/LaunchBoard/SWP.aspx

Appendix A: Industry Definitions

Industry	NAICS Code	Definition
Accommodation	721	Provide lodging or short-term accommodations for travelers, vacationers, and others. There is a wide range of establishments in these industries. Some provide lodging only, while others provide meals, laundry services, and recreational facilities, as well as lodging. Lodging establishments are classified in this subsector even if the provision of complementary services generates more revenue. The types of complementary services provided vary from establishment to establishment.
Administrative and Support Services	561	Establishments engaged in activities that support the day-to-day operations of other organizations. The processes employed in this sector (e.g., general management, personnel administration, clerical activities, cleaning activities) are often integral parts of the activities of establishments found in all sectors of the economy. The establishments classified in this subsector have specialization in one or more of these activities and can, therefore, provide services to clients in a variety of industries and, in some cases, to households. The individual industries of this subsector are defined on the basis of the particular process that they are engaged in and the particular services they provide.
Amusement, Gambling, and Recreation Industries	713	These establishments (1) operate facilities where patrons can primarily engage in sports, recreation, amusement, or gambling activities and/or (2) provide other amusement and recreation services, such as supplying and servicing amusement devices in places of business operated by others; operating sports teams, clubs, or leagues engaged in playing games for recreational purposes; and guiding tours without using transportation equipment.
Chemical Manufacturing	325	Based on the transformation of organic and inorganic raw materials by a chemical process and the formulation of products. This subsector distinguishes the production of basic chemicals that comprise the first industry group from the production of intermediate and end products produced by further processing of basic chemicals that make up the remaining industry groups.
Computer and Electronic Product Manufacturing	334	Establishments that manufacture computers, computer peripherals, communications equipment, and similar electronic products, and establishments that manufacture components for such products. The design and use of integrated circuits and the application of highly specialized miniaturization technologies are common elements in the production technologies of the Computer and Electronic Product Manufacturing subsector.

Industry	NAICS Code	Definition
Construction of Buildings	236	Establishments primarily responsible for the construction of buildings. The work performed may include new work, additions, alterations, or maintenance and repairs. The on-site assembly of precut, panelized, and prefabricated buildings and construction of temporary buildings are included in this subsector. Part or all of the production work for which the establishments in this subsector have responsibility may be subcontracted to other construction establishments--usually specialty trade contractors.
Educational Services	611	Provide instruction and training in a wide variety of subjects. The instruction and training is provided by specialized establishments, such as schools, colleges, universities, and training centers.
Federal Government	901	Federal government agencies that administer, oversee, and manage public programs and have executive, legislative, or judicial authority over other institutions within a given area. These agencies also set policy, create laws, adjudicate civil and criminal legal cases, and provide for public safety and for national defense.
Food Services and Drinking Places	722	Prepare meals, snacks, and beverages to customer order for immediate on-premises and off-premises consumption. There is a wide range of establishments in these industries. Some provide food and drink only, while others provide various combinations of seating space, waiter/waitress services, and incidental amenities, such as limited entertainment. The industries in the subsector are grouped based on the type and level of services provided. The industry groups are Special Food Services, such as food service contractors, caterers, and mobile food services; Drinking Places (Alcoholic Beverages); and Restaurants and Other Eating Places.
Local Government	903	Local government agencies that administer, oversee, and manage public programs and have executive, legislative, or judicial authority over other institutions within a given area. These agencies also set policy, create laws, adjudicate civil and criminal legal cases, and provide for public safety.
Management of Companies and Enterprises	551	(1) those that hold the securities of (or other equity interests in) companies and enterprises; (2) those (except government establishments) that administer, oversee, and manage other establishments of the company or enterprise but do not hold the securities of these establishments; and (3) those that both administer, oversee, and manage other establishments of the company or enterprise and hold the securities of (or other equity interests in) these establishments.
Nursing and Residential Care Facilities	623	Residential care combined with either nursing, supervisory, or other types of care as required by the residents. In this subsector, the facilities are a significant part of the production process, and the care provided is a mix of health and social services with the health services being largely some level of nursing services.

Industry	NAICS Code	Definition
Professional, Scientific, and Technical Services	541	Establishments engaged in processes where human capital is the major input. These establishments make available the knowledge and skills of their employees, often on an assignment basis, where an individual or team is responsible for the delivery of services to the client. The individual industries of this subsector are defined on the basis of the particular expertise and training of the services provider.
Real Estate	531	Establishments primarily engaged in renting or leasing real estate to others; managing real estate for others; selling, buying, or renting real estate for others; and providing other real estate related services, such as appraisal services.
Religious, Grantmaking, Civic, Professional, and Similar Organizations	813	Establishments that organize and promote religious activities; support various causes through grantmaking; advocate various social and political causes; and promote and defend the interests of their members.
Repair and Maintenance	811	Restore machinery, equipment, and other products to working order. These establishments also typically provide general or routine maintenance (i.e., servicing) on such products to ensure they work efficiently and to prevent breakdown and unnecessary repairs.
Social Assistance	624	Provide a wide variety of social assistance services directly to their clients. These services do not include residential or accommodation services, except on a short-stay basis.
Specialty Trade Contractors	238	Establishments whose primary activity is performing specific activities (e.g., pouring concrete, site preparation, plumbing, painting, and electrical work) involved in building construction or other activities that are similar for all types of construction, but that are not responsible for the entire project. The work performed may include new work, additions, alterations, maintenance, and repairs. The production work performed by establishments in this subsector is usually subcontracted from establishments of the general contractor type or for-sale builders, but especially in remodeling and repair construction, work also may be done directly for the owner of the property.
State Government	902	State government agencies that administer, oversee, and manage public programs and have executive, legislative, or judicial authority over other institutions within a given area. These agencies also set policy, create laws, adjudicate civil and criminal legal cases, and provide for public safety.
Transportation Equipment Manufacturing	336	Produce equipment for transporting people and goods. Transportation equipment is a type of machinery. An entire subsector is devoted to this activity because of the significance of its economic size in all three North American countries.