

Telecommunications Technology Occupations

Labor Market Analysis: San Diego County

January 2021

Summary



The brief provides labor market information about *Telecommunications Technology Occupations* to assist the San Diego and Imperial Counties Community Colleges with program development and strategic planning. *Telecommunications Technology Occupations* include “Computer and Information Systems Managers,” “Electronics Engineers, Except Computer,” “Telecommunications Equipment Installers and Repairers, Except Line Installers,” and “Telecommunications Line Installers and Repairers.” According to available labor market information, *Telecommunications Technology Occupations* in San Diego County have a labor market demand of 1,464 annual job openings (while average demand for a single occupation in San Diego County is 277 annual job openings), and two educational institutions in San Diego County supply 142 awards for these occupations, suggesting that there is a supply gap in the labor market. Entry-level and median wages for all occupations are above the living wage. This brief recommends proceeding with developing a new program because 1) these occupations’ entry-level and median earnings are above the living wage; 2) a low number of institutions provide awards for these occupations.; and 3) a supply gap exists for these positions. Colleges should note that **employers typically require a bachelor’s degree as the minimum educational requirement 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:

- **Computer and Information Systems Managers (SOC 11-3021):** Plan, direct, or coordinate activities in such fields as electronic data processing, information systems, systems analysis, and computer programming.
- **Electronics Engineers, Except Computer (SOC 17-2072):** Research, design, develop, or test electronic components and systems for commercial, industrial, military, or scientific use employing knowledge of electronic theory and materials properties. Design electronic circuits and components for use in fields such as telecommunications, aerospace guidance and propulsion control, acoustics, or instruments and controls.
- **Telecommunications Equipment Installers and Repairers, Except Line Installers (SOC 49-2022):** Install, set up, rearrange, or remove switching, distribution, routing, and dialing equipment used in central offices or headends. Service or repair telephone, cable television, Internet, and other communications equipment on customers' property. May install communications equipment or communications wiring in buildings.
- **Telecommunications Line Installers and Repairers (SOC 49-9052):** Install and repair telecommunications cable, including fiber optics.

For the purpose of this report, these occupations are referred to as *Telecommunications Technology Occupations*.

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](https://www.bls.gov/soc).

Projected Occupational Demand

Between 2019 and 2024, *Telecommunications Technology Occupations* are projected to increase by 321 net jobs or two percent (Exhibit 1 a). During this period, employers in San Diego County are projected to hire 1,464 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 Telecommunications Technology Occupations (2009-2024)²

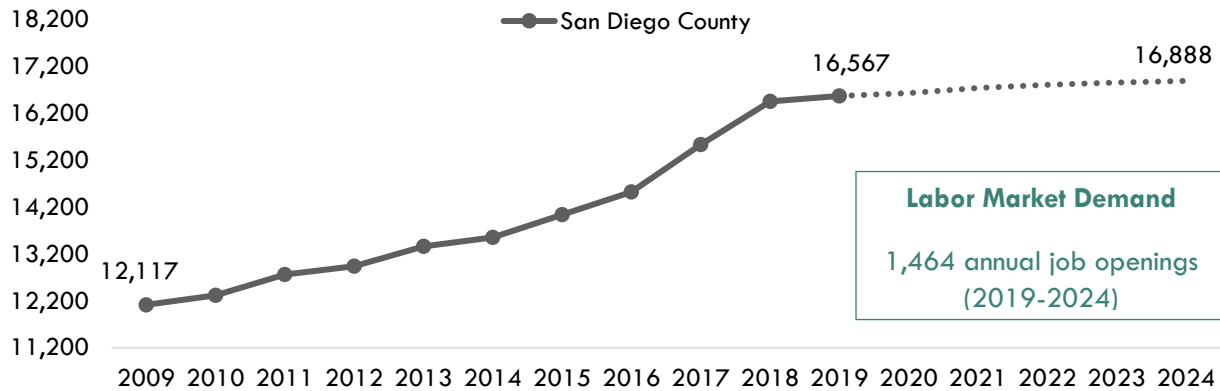


Exhibit 1b breaks down the projected number of annual job openings by occupation more specifically: *Computer and Information Systems Managers* are projected to have the most labor market demand between 2019 and 2024, with 614 annual job openings.

Exhibit 1b: Number of Jobs for Telecommunications Technology Occupations in San Diego County (2019-2024)³

Occupational Title	2019 Jobs	2024 Jobs	2019 - 2024 Net Jobs Change	2019- 2024 % Net Jobs Change	Annual Job Openings (Demand)
Computer and Information Systems Managers	6,648	7,085	437	7%	614
Electronics Engineers, Except Computer	5,771	5,785	13	0%	389
Telecommunications Equipment Installers and Repairers, Except Line Installers	3,428	3,247	-181	-5%	368
Telecommunications Line Installers and Repairers	720	772	52	7%	93
Total	5,252	5,291	39	1%	529

² EMSI 2020.04; QCEW, Non-QCEW, Self-Employed.

³ EMSI 2020.04; QCEW, Non-QCEW, Self-Employed

Earnings

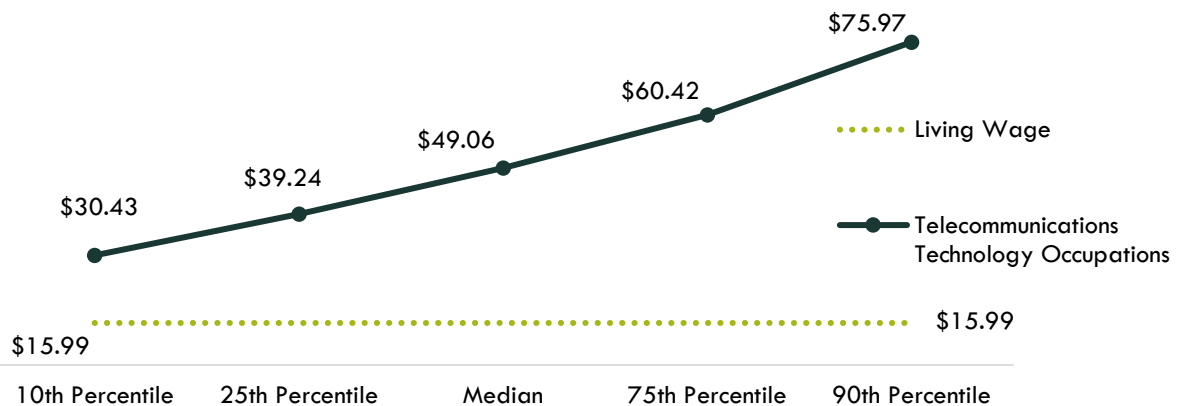
The entry-level hourly earnings for *Telecommunications Technology Occupations* range from \$20.25 to \$60.85 (Exhibit 2a).

Exhibit 2a: Hourly Earnings for Telecommunications Technology Occupations in San Diego County⁴

Occupational Title	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
Computer and Information Systems Managers	\$60.85	\$74.95	\$91.67
Electronics Engineers, Except Computer	\$49.64	\$60.43	\$75.79
Telecommunications Equipment Installers and Repairers, Except Line Installers	\$26.20	\$29.83	\$36.96
Telecommunications Line Installers and Repairers	\$20.25	\$31.04	\$37.24

On average, entry-level hourly earnings for *Telecommunications Technology Occupations* are \$39.24; this is more than the living wage for a single adult in San Diego County, which is \$15.99 per hour (Exhibit 2b).⁵

Exhibit 2b: Average Hourly Earnings⁶ for Telecommunications Technology Occupations in San Diego County⁷



⁴ EMSI 2020.04; QCEW, Non-QCEW, Self-Employed

⁵ "California Family Needs Calculator (formerly the Self-Sufficiency Standard)," Insight: Center for Community Economic Development, last updated 2018. insightccd.org/2018-self-sufficiency-standard.

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 EMSI 2020.04; 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 **two** TOP codes and **seven** CIP codes related to *Telecommunications Technology Occupations* (Exhibit 3).

Exhibit 3: Related TOP and CIP Codes for *Telecommunications Technology Occupations*

<i>Telecommunications Technology Occupations</i>
TOP 0934.00: Electronics and Electric Technology
TOP 0934.30: Telecommunication Technology
CIP 15.0303: Electrical, Electronic and Communications Engineering Technology/Technician
CIP 15.0305: Telecommunications Technology/Technician
CIP 15.0399: Electrical and Electronic Engineering Technologies/Technicians, Other
CIP 15.0406: Automation Engineer Technology/Technician
CIP 47.0101: Electrical/Electronics Equipment Installation and Repair, General
CIP 47.0103: Communications Systems Installation and Repair Technology
CIP 47.0199: Electrical/Electronics Maintenance and Repair Technology, Other

According to TOP data, **two** community colleges supply the region with awards for this occupation: **San Diego City College and San Diego Continuing Education**. According to CIP data, **no** non-community college supplies the region with awards (Exhibit 4).

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).

**Exhibit 4: 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 (PY15-16 to PY17-18)	Other Educational Institutions 3-Yr Annual Average Awards (PY14-15 to PY16-17)	3-Yr Total Average Supply (PY14-15 to PY17-18)
0934.00	Electronics and Electric Technology	137	0	137
	<ul style="list-style-type: none"> • San Diego City • San Diego Cont. Ed. 	5	0	
		132	0	
0934.30	Computer Electronics	5	0	5
	<ul style="list-style-type: none"> • San Diego City 	5	0	
			Total	142

Demand vs. Supply

Comparing labor demand (annual openings) with labor supply⁹ suggests that there is a **supply gap** for these occupations in San Diego County, with **1,464** annual openings and **142** awards. Comparatively, there are **14,348** annual openings in California and **1,293** awards, suggesting that there is a supply gap across the state¹⁰ (Exhibit 5).

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

	Demand (Annual Openings)	Supply (Total Annual Average Supply)	Supply Gap or Oversupply
San Diego	1,464	142	1,322
California	14,348	1,293	13,055

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.

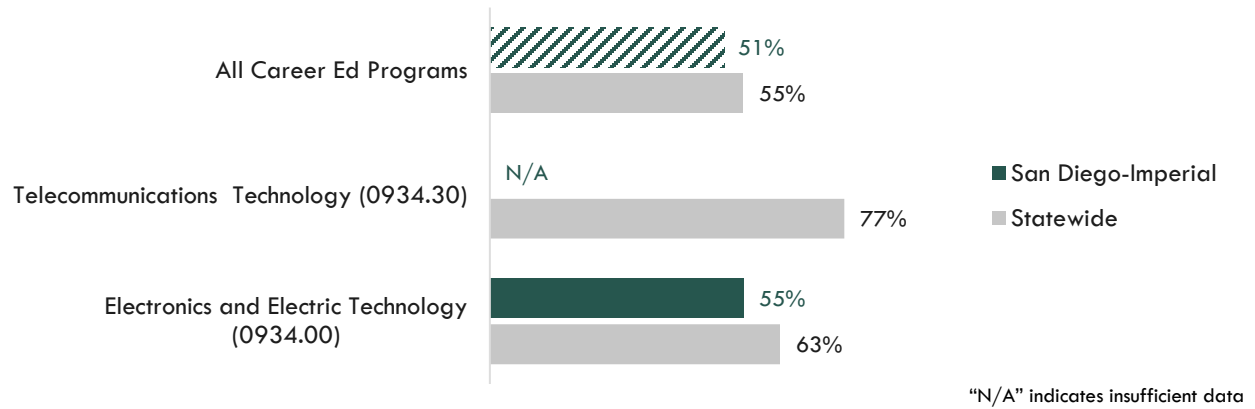
⁹ Labor supply can be found from two different sources: EMSI or the California Community Colleges Chancellor's Office MIS Data Mart. EMSI uses CIP codes while MIS uses TOP codes. Different coding systems result in differences in the supply numbers.

¹⁰ "Supply and Demand," Centers of Excellence Student Outcomes, coecc.net/Supply-and-Demand.aspx.

Student Outcomes and Regional Comparisons

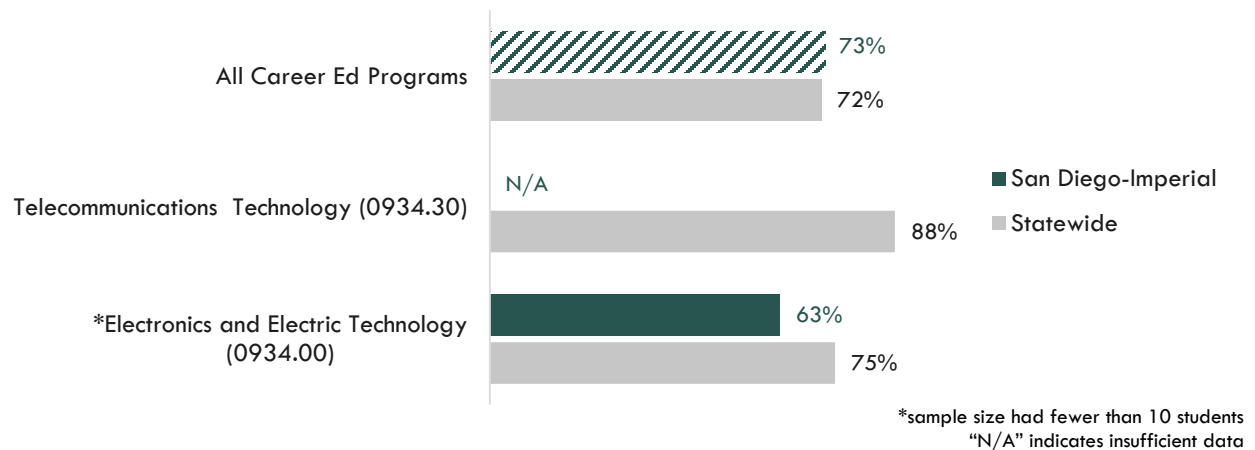
According to the California Community Colleges LaunchBoard, **55** percent of students in the San Diego-Imperial region earned a living wage after completing a program related to *Telecommunications Technology Occupations*, compared to **63** to **77** percent statewide and 55 percent of students in Career Education programs in general across the state (Exhibit 6a).

Exhibit 6a: Proportion of Students Who Earned a Living Wage, PY2017-18¹¹



According to the California Community Colleges LaunchBoard, **63** percent of students in the San Diego-Imperial region obtained a job closely related to their field of study after completing a related program, compared to **75** to **88** percent statewide and 72 percent of students in Career Education programs in general across the state (Exhibit 6b).

Exhibit 6b: Percentage of Students in a Job Closely Related to Field of Study, PY2016-17¹²



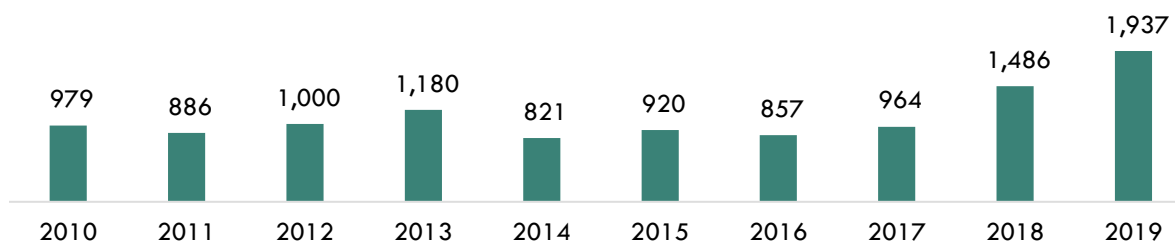
¹¹ Among completers and skills builders who exited, the proportion of students who attained a living wage.

¹² Most recent year with available data is Program Year 2016-17. 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 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 that are not captured by historical data. Between 2010 and 2019, there was an average of 1,103 online job postings per year in San Diego County for *Telecommunications Technology Occupations* (Exhibit 7). Please note that online job postings do not equal labor market demand; demand is represented by annual job openings (see Exhibit 1 b above). Employers may post a position multiple times for various reasons, such as increasing the pool of applicants, for example.

Exhibit 7: Number of Online Job Postings for *Telecommunications Technology Occupations* in San Diego County (2010-2019)¹³



Top Employers

Between January 1, 2017 and December 31, 2019, the top five employers in San Diego County for these occupations were [Qualcomm](#), [Northrop Grumman](#), [General Atomics](#), [CACI](#), and [Leidos](#) (Exhibit 8).

Exhibit 8: Top Employers in San Diego County for *Telecommunications Technology Occupations*¹⁴

Top Employers	
<ul style="list-style-type: none"> • Qualcomm • Northrop Grumman • General Atomics • CACI • Leidos 	<ul style="list-style-type: none"> • University of California San Diego • Spectrum • Scripps Health • Viasat • Teradata Operations, Inc.

¹³ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2010-2019.

¹⁴ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2017-2019.

Education, Skills and Certifications

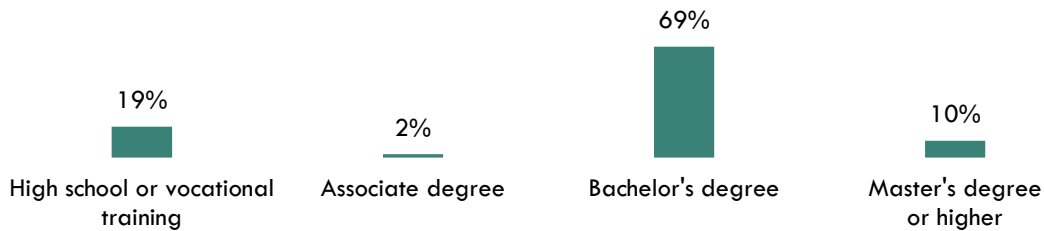
Telecommunications Technology Occupations have a national educational attainment ranging from a [high school diploma or equivalent](#) to a [bachelor's degree](#) (Exhibit 9a).

Exhibit 9a: National Educational Attainment for *Telecommunications Technology Occupations* ¹⁵

Occupational Title	Typical Entry-Level Education
Computer and Information Systems Managers	Bachelor's degree
Electronics Engineers, Except Computer	Bachelor's degree
Telecommunications Equipment Installers and Repairers, Except Line Installers	Postsecondary non-degree award
Telecommunications Line Installers and Repairers	High school diploma or equivalent

Based on online job postings between January 1, 2017 and December 31, 2019 in San Diego County, the top listed educational requirement for *Telecommunications Technology Occupations* is a [bachelor's degree](#) (Exhibit 9b).¹⁶

Exhibit 9b: Educational Requirements for *Telecommunications Technology Occupations* in San Diego County¹⁷



*May not add to 100% due to rounding

¹⁵ EMSI 2020.04; QCEW, Non-QCEW, Self-Employed.

¹⁶ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2017-2019.

¹⁷ "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.

Exhibit 10 lists the top specialized, soft and software skills that appeared in online job postings between January 1, 2017 and December 31, 2019.

Exhibit 10: Top Skills for Telecommunications Technology Occupations in San Diego County¹⁸

Specialized Skills	Soft Skills	Software Skills
<ul style="list-style-type: none"> • Budgeting • Repair • Test Equipment • Simulation • Telecommunications • Scheduling • Software Engineering • Project Management • Radio Frequency (RF) Engineering • Systems Engineering • Information Systems • Software Development • Oscilloscopes • Customer Service • Product Development 	<ul style="list-style-type: none"> • Communication Skills • Troubleshooting • Planning • Teamwork / Collaboration • Problem Solving • Computer Literacy • Research • Physical Abilities • Writing • Leadership • Self-Starter • Organizational Skills • English • Creativity • Verbal / Oral Communication 	<ul style="list-style-type: none"> • Microsoft Excel • C++ • Python • Java • Debugging • MATLAB • Firmware • LabVIEW • PERL Scripting Language • Microsoft PowerPoint • SQL • Linux • Enterprise Resource Planning • Verilog • UNIX

¹⁸ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2017-2019.

Exhibit 11 lists the top certifications that appeared in online job postings between January 1, 2017 and December 31, 2019.

Exhibit 11: Top 15 Certifications for Telecommunications Technology Occupations in San Diego County¹⁹

Top Certifications in Online Job Postings

1. Security Clearance
2. IPC Certification
3. CompTIA Security+
4. Licensed Professional Engineer
5. IT Infrastructure Library (ITIL) Certification
6. Engineer in Training Certification
7. Cisco Certified Network Associate (CCNA)
8. Cisco Certified Entry Networking Technician (CCENT)
9. American Board for Engineering and Technology (ABET) Accredited
10. Project Management Certification
11. Certified Energy Manager
12. Six Sigma Certification
13. CompTIA Network+
14. Microsoft Certified Solutions Expert (MCSE)
15. Microsoft Certified Professional (MCP)

Prepared by:

Tina Ngo Bartel, Director

John Edwards, Research Analyst

San Diego-Imperial Center of Excellence for Labor Market Research

tngobartel@miracosta.edu

jedwards@miracosta.edu



¹⁹ Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool." 2017-2019.

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.