

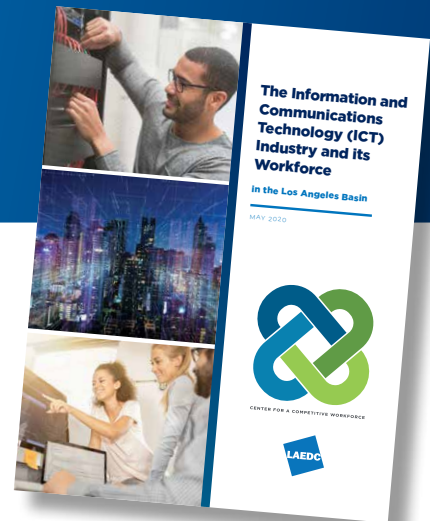


CENTER FOR A COMPETITIVE WORKFORCE



# The Information and Communications Technology (ICT) Industry and its Workforce

in the Los Angeles Basin



HIGHLIGHTS OF THE 2020 REPORT

## ABOUT CENTER FOR A COMPETITIVE WORKFORCE

CCW links education and workforce partners to establish high-performing regional talent development systems in the Los Angeles region for the rapidly changing industries that will dominate our economic future. The center's work addresses the talent gaps employers face and the supply of skilled talent to meet projected workforce demand. CCW was founded as a Strong Workforce Program regional project of the 19 community colleges in the Los Angeles region, the L.A./O.C. Center of Excellence for Labor Market Research (COE), and the LAEDC and its Institute of Applied Economics. CCW has several work streams:

- Labor Market Analysis
- Industry Councils
- Regional Program Advisory Meetings
- Work-Based Learning Partnerships
- Company Visits and Career Videos
- Workforce and Education Partners Portal
- Bioscience Industry Portal

Learn more about CCW's work!

In this report, CCW

- Analyzes the major shifts occurring in the information and communication technology sector
- Identifies the jobs that represent the best targets for community college students in the region
- Compares supply of talent to demand
- Identifies key skills that are valued by employers



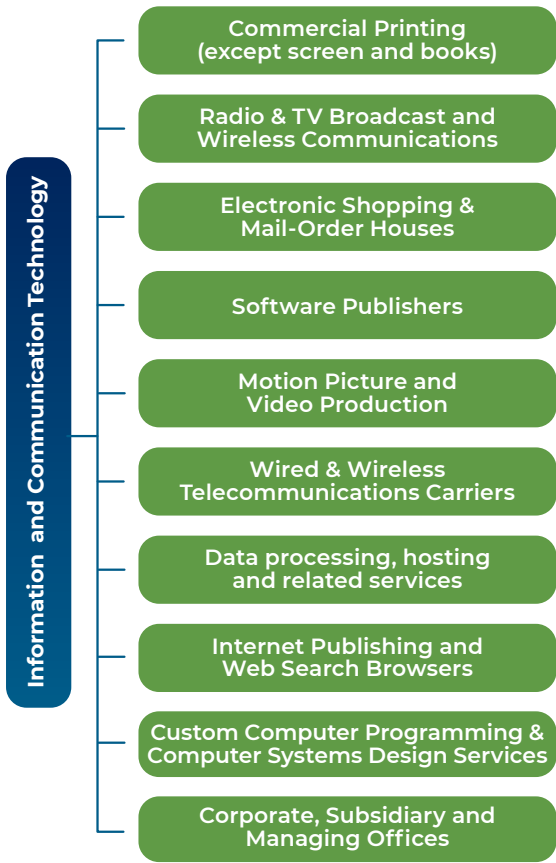
## The Information and Communications Technology (ICT) Industry and its Workforce in the Los Angeles Basin

**Information and communication technology is a growing area that is particularly promising because it supports many middle skill occupations that both pay well and are represented across numerous industries that are benefitting from technological advances.**

With over **43 percent** of the projected ICT industry job openings over the next five years in the LA Basin **being middle-skill occupations**, the community colleges should prioritize the ICT industry for the development and expansion of training and educational programs

- o Based on regional community college completions, there will be a projected **undersupply** of ICT industry workers each year over the next five years in the LA Basin. More than 2,400 annual job openings are projected for middle-skill and higher-skill “pathway” occupations in the 10 ICT industry subsectors studied in the full report; yet, LA Basin community college completions only totaled about 1,370 awards in the last full academic year (2018-19).
- o Looking more broadly at employment opportunities, there will be even greater opportunity with 9,800 ICT-related annual job openings over the next five years across all industries.

**ICT Defined:** At its core, ICT is an industry that connects and “touches” literally every industry. Ten distinct component industries make up the ICT industry:



ICT industry employees typically earn **higher-than-average wages** compared to the regional economy, earning, on average, \$108,000 annually, which is much more than the regional average across the regional economy, \$61,520. During the past decade, real wages in ICT grew by 21.2 percent overall, far outpacing wage growth across all industries.

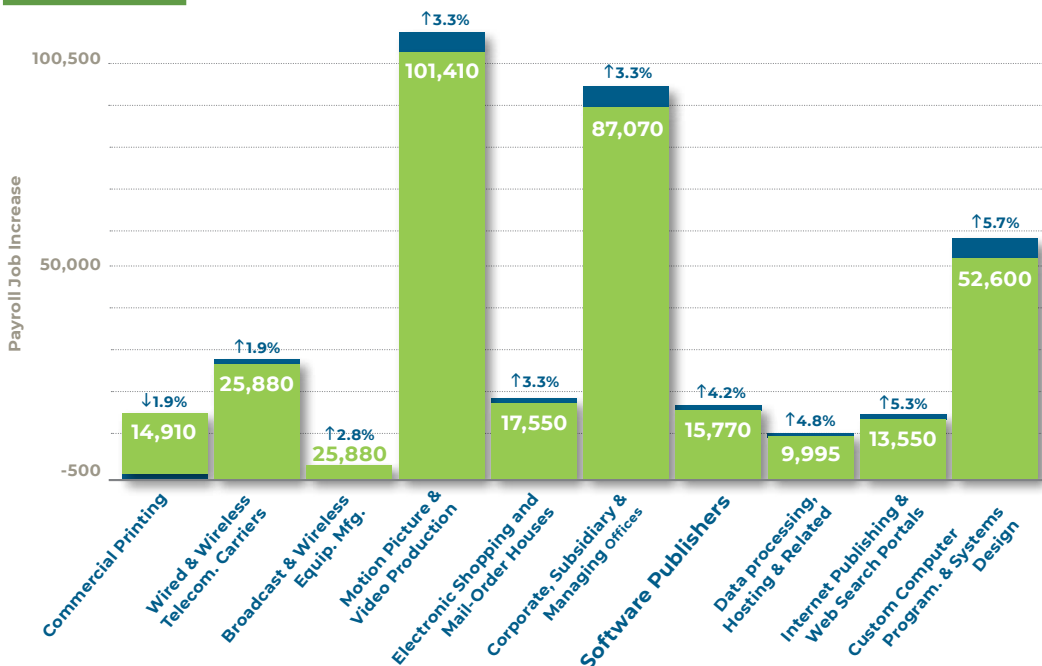
The ICT industry employs 341,610 payroll workers across all educational attainment levels in the Los Angeles Basin (2017); there will be over 200,000 total job openings over the next five years due primarily to replacement job openings, with net new jobs being added too.

Employment is more than three times more concentrated in LA County (259,330 payroll employees) than in Orange County (82,280 payroll employees).

Three component industries employ the bulk of these workers: **motion picture and video production** industries, which accounted for nearly one-third of total industry employment; **corporate**, subsidiary and regional managing offices, which accounted for a quarter of all industry employment; and **custom computer programming** services, which made up another 15 percent.

Employment in the LA region has shown **continuous growth in the last five years**, with an average annual growth rate of 1.1 percent per year. Much of the job growth in ICT can be attributed to increases in the electronic shopping and internet publishing industries.

### ICT Industry Outlook



The rapid penetration and integration of new digital infrastructure and technologies in the workplace will have great potential to replace ICT jobs and/or job activities through the automation of certain routine and/or repetitive tasks, ...but these new technologies also represent an important labor productivity-augmenting asset for firms to embrace, creating new workstreams and perhaps new types of jobs that we don't even know about today

### Current Degree of Automation

#### HIGHLY AUTOMATED

- Telephone Operators

#### MODERATELY AUTOMATED

- Geospatial Information Scientists and Technologists
- Computer Programmers
- Computer Systems Analysts
- Network and Computer Systems Administrators

#### SLIGHTLY AUTOMATED

- Computer Network Support Specialists
- Multimedia Artists and Animators
- Telecommunications Line and Equipment Installers and Repairers
- Information Security Analysts

#### VERY LITTLE AUTOMATED

- Film and Video Editors
- Graphic Designers
- Video Game Designers



# WHERE THE JOBS ARE FOR COMMUNITY COLLEGE GRADUATES

## Top-10 Middle-Skill & Pathway Occupations:

Within the ICT industry, Center for a Competitive Workforce has identified two groups of target occupations with good wages and significant job openings, five (5) of which are middle-skill occupations and five (5) of which are pathway occupations, which typically stipulate a bachelor's degree but where at least 25 percent of incumbent workers have less than a bachelor's degree, for community colleges to train students looking to further their education with a bachelor's degree:

Students, employers and the colleges all stand to benefit from investment in postsecondary degree, non-degree and certificate programs in these programs:

Looking at the subsectors of the ICT industry, over the past five years, wage growth has been fastest in data processing, hosting and related services, with 56 percent growth, followed by internet publishing and web search with close to 43 percent. Motion picture and video production, software publishers and wireless telecommunications carriers experienced more than 20 percent growth.

Occupation	ICT Industry Annual Openings	All Industries Annual Openings
<b>Middle-Skill Occupations</b>		
Web Developers	260	670
Computer User Support Specialists	280	3,540
Computer Network Support Specialists	80	480
Telecom Equip. Installers/Repairers	450	980
Telecom Line Installers/Repairers	190	440
<b>High-Skill "Pathway" Occupations</b>		
Computer Systems Analysts	400	1310
Information Security Analysts	50	140
Computer Programmers	440	930
Database Administrators	90	290
Network & Computer Systems Admin.	180	1,020
<b>Total Employment</b>	<b>1,770</b>	<b>9,800</b>

### From Where the ICT Talent Will Come:

Currently, there are **17 community college programs**, which conferred **1,371 certificates and associate degrees** (2018-19 academic year), that prepare students for ICT-related occupations.

Program	2018-19 Awards
E-Commerce (Business Emphasis)	-
Electronic Game Design	3
Website Design and Development	26
Information Technology, General	152
Computer Information Systems	113
Software Applications	81
Computer Software Development	26
Computer Programming	319
Database Design and Administration	16
Computer Systems Analysis	4
Computer Infrastructure and Support	91
Computer Networking	364
Computer Support	46
World Wide Web Administration	50
E-Commerce (Technology Emphasis)	7
Telecommunications Technology	17
Forensics, Evidence, and Investigation	56
<b>Total</b>	<b>1,371</b>

### Five-Year ICT Workforce Shortage in the LA Basin

If the current trend continues, there appears to be an undersupply of qualified workers to fill projected annual job openings in the 10 target middle-skill and pathway occupations, as there were **only 1,371 awards** conferred during the 2018-19 academic year; compared to **1,770 annual openings** within ICT industry subsectors and a total of **9,800 annual openings** across all industries for just these 10 targeted ICT occupations.

## WORKER SKILLS IN DEMAND

Transforming Industries = Changing Worker Skills



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WORKERS CAPABLE OF GATHERING DATA AND STRUCTURING IT IN EASILY ACCESSIBLE FORMATS

---

WORKERS PROFICIENT AT BOTH ASSESSING ALTERNATIVES AND MAKING DECISIONS USING ANALYTICS

---

WORKERS SKILLED AT DIAGNOSING AND SOLVING TECHNICAL, INFRASTRUCTURE AND/OR HARDWARE PROBLEMS

---

WORKERS WHO ARE HIGHLY ADAPTABLE AND ABLE TO WORK WITH NEW TECHNOLOGIES AND ON NEW PRODUCTS IN REAL-TIME, OFTEN LEARNING SPECIALIZED SKILLS ON THE JOB

---

WORKERS THAT CAN PERFORM MANY DIFFERENT TASKS INSTEAD OF BEING RELEGATED OR RESTRICTED TO ONLY ONE RESPONSIBILITY

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WORKERS WITH STRONG INTERPERSONAL AND ORAL AND WRITTEN COMMUNICATION SKILLS, AS EFFECTIVE COMMUNICATION, RELATIONSHIP-BUILDING AND CLIENT INTERACTION AND SUPPORT WILL BE GREATLY EMPHASIZED

### SOFT SKILLS











In addition to the specific skill sets within each of the ICT occupations, there are general competencies that will be required of nearly all workers moving forward. These include adaptability, the use of technology, cross-training, and advanced communication and interpersonal skills, not only to interact with customers but also with other co-workers in team-based environments. Additional people skills, along with high social and emotional intelligence, will be invaluable.



Information and communication technology employers are citing technical training, including internships and job readiness skills, among the most desirable qualifications for new hires.

# JOBS WITH A BRIGHT FUTURE

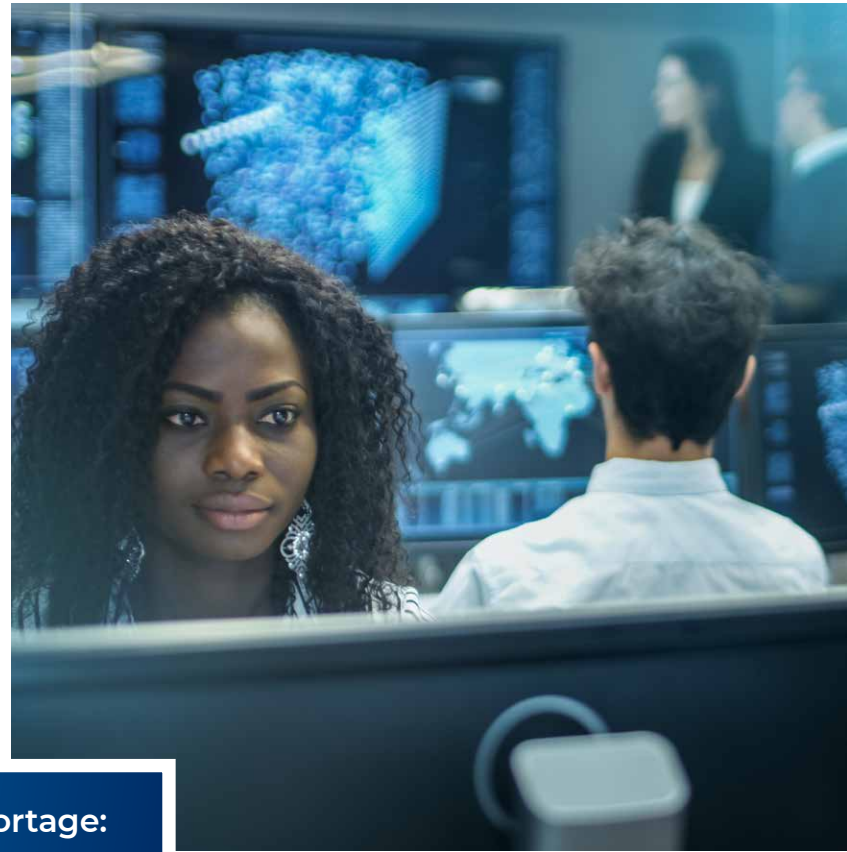
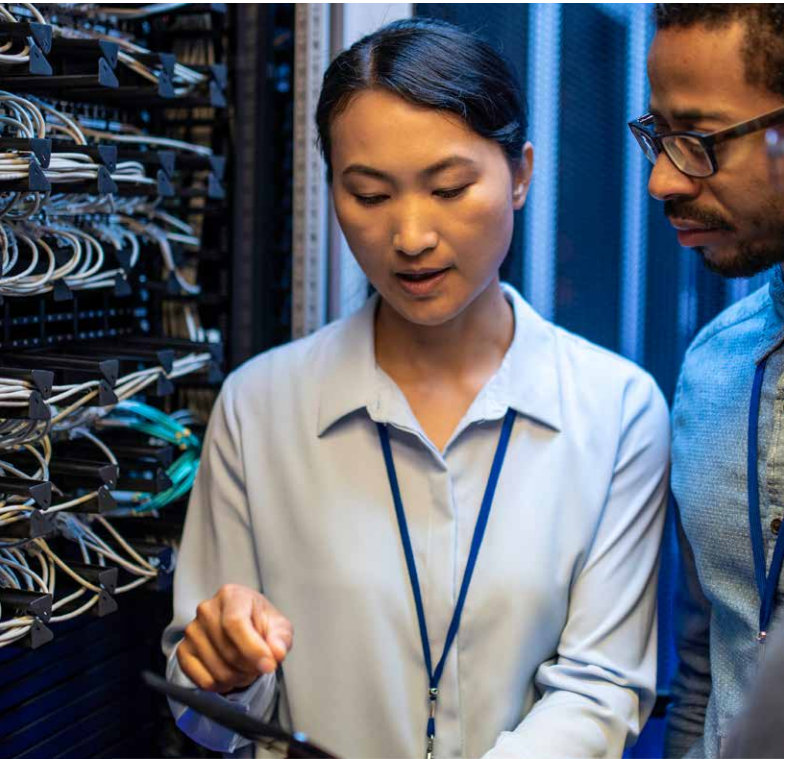
## 10 Middle-Skill Manufacturing Occupations with Potential

	JOB TITLE	“WHAT THEY DO”	5-YEAR JOB OPENINGS	\$
<b>MIDDLE-SKILL OCCUPATIONS</b>				
	<b>Computer user support specialists</b>	Provide technical assistance to computer users. Answer questions or resolve computer problems for clients regarding hardware and software, including printing, installation, word processing, email and operating systems.	17,720	\$27/hr.
	<b>Telecom equipment installers and repairers</b>	Install, set-up, rearrange or remove switching, distribution, routing and dialing equipment used in central offices or head-ends. Repair telephone, cable television, internet and other communications equipment on customer properties.	4,880	\$27/hr.
	<b>Web developers</b>	Design, create, and modify websites. Analyze user needs to implement website content, graphics, performance, and capacity. May integrate websites with other computer applications and convert content to compatible Web formats.	3,360	\$33/hr.
	<b>Computer network support specialists</b>	Analyze, test, troubleshoot, maintain and evaluate existing network systems, such as local and wide area networks and internet systems.	2,380	\$33/hr.
	<b>Telecom line installers and repairers</b>	Install and repair telecommunications cable, including fiber optics.	2,210	\$31/hr.
<b>HIGH-SKILL “PATHWAY” OCCUPATIONS</b>				
	<b>Computer systems analysts</b>	Analyze science, engineering, business, and other data processing problems to implement and improve computer systems. Analyze user needs and problems to automate and improve systems, including review system capabilities, workflow and scheduling limitations.	1,970	\$45/hr.
	<b>Network and computer system administrators</b>	Install, configure and support an organization's networks and internet systems. Monitor network availability, test website performance, assist in network modeling, analysis, planning and coordination between network and hardware/software. May supervise staff or administer network security.	920	\$43/hr.
	<b>Computer programmers</b>	Create, modify and test the code, forms and script that allow computer applications to run. Work from specifications drawn up by software developers. May analyze user needs and design software solutions, including to store and retrieve documents and data.	2,190	\$42/hr.
	<b>Database administrators</b>	Administer, test and implement computer databases, applying knowledge of database management systems. Coordinate changes to computer databases. May plan and implement security measures to safeguard databases.	1,450	\$45/hr.
	<b>Information security analysts</b>	Plan, implement, upgrade or monitor security measures for the protection of computer networks and information. May ensure security controls are in place to safeguard digital files and electronic infrastructure. May respond to computer security breaches and viruses.	700	\$49/hr.



# KEY CAREER EDUCATION FINDINGS AND RECOMMENDATIONS

Additional intelligence for college faculty



## Addressing an Impending Worker Shortage: Recommendations & Opportunities

- There is some urgency for the creation and expansion of community college programs targeting the ICT industry
- Programs that offer opportunities for students to get internships and on-the-job experience in higher-skill jobs within the ICT industry should be prioritized, as one-third of openings are projected to require more than a middle-skill level of education attainment
- Immediate attention should be directed toward component industries within the ICT industry where the greatest amount of growth is expected to occur:
  - computer systems design and custom computer programming will add **2,200 new jobs** to the region by 2022
  - internet publishing and web search portals will add **730 new jobs** to the region by 2022
- Partnerships should be formed with industry stakeholders to update and/or expand programs in ICT occupations where the technology changes with great frequency and rapidity such as in web and graphic design and computer information systems
- Prioritization should be given to developing student expertise in design and security, as occupations in the ICT industry exhibiting the most robust growth have the shared characteristic of being driven by the importance of data and network security due to cyber threats. For example, security analyst jobs, with an **8.9 percent growth** in projected employment from 2017 to 2022, have the fastest growth rate of the ICT target occupations.
- Prioritization should be given to developing student expertise in data analysis, as a major technological trend for businesses is harnessing data analytics and the internet of things to gain better insight into industry opportunities and weaknesses; thus making decisions informed by this understanding
- Stock of current community college ICT-related program offerings and enrollments should be taken to ensure students will be able to obtain employment upon graduation; for example, commercial printing is expected to lose 270 jobs by 2022, and wireless and wired telecommunications industries are projected to experience very limited growth, adding just 460 jobs
- Overall, **201,380 total ICT industry job openings** will be created in the LA Basin over the next five years, with employers seeking to fill many of those openings with middle-skill workers.



CALIFORNIA COMMUNITY COLLEGES  
CAREER EDUCATION

## 19 COMMUNITY COLLEGES IN L.A. COUNTY

- 1**  
**Cerritos College**  
[www.cerritos.edu/cte](http://www.cerritos.edu/cte)  
11110 Alondra Blvd.  
Norwalk, CA 90650  
562.860.2451
- 2**  
**Citrus College**  
[www.citruscollege.edu/academics/cte](http://www.citruscollege.edu/academics/cte)  
1000 West Foothill Blvd.  
Glendora, CA 91741  
626.914.8700
- 3**  
**Compton College**  
[www.compton.edu/academics/cte](http://www.compton.edu/academics/cte)  
1111 E. Artesia Blvd.  
Compton, CA 90221  
310.900.1600 ext 2273
- 4**  
**East Los Angeles College**  
[www.elac.edu/academics/workforce/cte](http://www.elac.edu/academics/workforce/cte)  
1301 Avenida Cesar Chavez  
Monterey Park, CA 91754  
323.265.8610
- 5**  
**El Camino College**  
[www.elcamino.edu/academics/cte/](http://www.elcamino.edu/academics/cte/)  
16007 Crenshaw Blvd.  
Torrance, CA 90506  
310.660.3593 ext 3778
- 6**  
**Glendale Community College**  
[www.glendale.edu/CareerEd](http://www.glendale.edu/CareerEd)  
1500 Verdugo Road  
Glendale, CA 91208  
818.240.1000 ext 5158
- 7**  
**Long Beach City College**  
[www.lbcc.edu](http://www.lbcc.edu)  
Liberal Arts Campus  
4901 East Carson Street  
Long Beach, CA 90808  
562.938.4624
- 8**  
**Los Angeles City College**  
<https://www.lacitycollege.edu/Academics/Workforce-Education/>  
855 N. Vermont Avenue  
Los Angeles, CA 90029  
323.953.4000 ext 1523
- 9**  
**Harbor College**  
[www.lahc.edu/cte](http://www.lahc.edu/cte)  
1111 Figueroa Place  
Wilmington, CA 90744  
310.233.4042
- 10**  
**Los Angeles Mission College**  
[www.lamission.edu/careereducation](http://www.lamission.edu/careereducation)  
13356 Eldridge Ave.  
Sylmar, CA 91342  
818.364.7729
- 11**  
**Los Angeles Pierce College**  
[www.piercecollege.edu/pierce\\_career.asp](http://www.piercecollege.edu/pierce_career.asp)  
6201 Winnetka Ave.  
Los Angeles, CA 91371  
818.710.2249
- 12**  
**Los Angeles Southwest College**  
[www.lasc.edu/cte](http://www.lasc.edu/cte)  
1600 W. Imperial Hwy.  
Los Angeles, CA 90047  
323.241.5388
- 13**  
**Los Angeles Trade Tech**  
[pathways.lattc.edu](http://pathways.lattc.edu)  
400 W. Washington Blvd.  
Los Angeles, CA 90015  
213.763.7385
- 14**  
**Los Angeles Valley College**  
[www.lavc.edu/techeducation](http://www.lavc.edu/techeducation)  
5800 Fulton Ave.  
Valley Glen, CA 91401  
818.778.5747
- 15**  
**Mt. San Antonio College**  
[www.mtsac.edu/cte](http://www.mtsac.edu/cte)  
1100 N. Grand Ave.  
Walnut, CA 91789  
909.274.5140
- 16**  
**Pasadena City College**  
[www.pasadena.edu/ewd](http://www.pasadena.edu/ewd)  
1570 E. Colorado Blvd.  
Pasadena, CA 91106  
626.585.7693
- 17**  
**Rio Hondo College**  
[www.riohondo.edu/career-and-technical-education](http://www.riohondo.edu/career-and-technical-education)  
3600 Workman Mill Rd.  
Whittier, CA 90601  
562.463.7368
- 18**  
**Santa Monica College**  
[www.smc.edu/cte](http://www.smc.edu/cte)  
1900 Pico Blvd.  
Santa Monica, CA 90405  
310.434.4040
- 19**  
**West Los Angeles College**  
[www.wlac.edu/Academic/areas-of-study.aspx](http://www.wlac.edu/Academic/areas-of-study.aspx)  
9000 Overland Ave.  
Culver City, CA 90230  
310.287.4464
- 20**  
**Los Angeles Community College District**  
[www.laccd.edu](http://www.laccd.edu)  
707 Wilshire Blvd  
Los Angeles, CA 90017  
213.891.2000

Previous CCW labor market reports about the Los Angeles region include:

- Powering Economic Opportunity
- High Growth Occupations
- Health Care Services
- Professional Services
- Entertainment and the Rise of Digital Media
- Manufacturing: A Changing Middle-skill Workforce

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