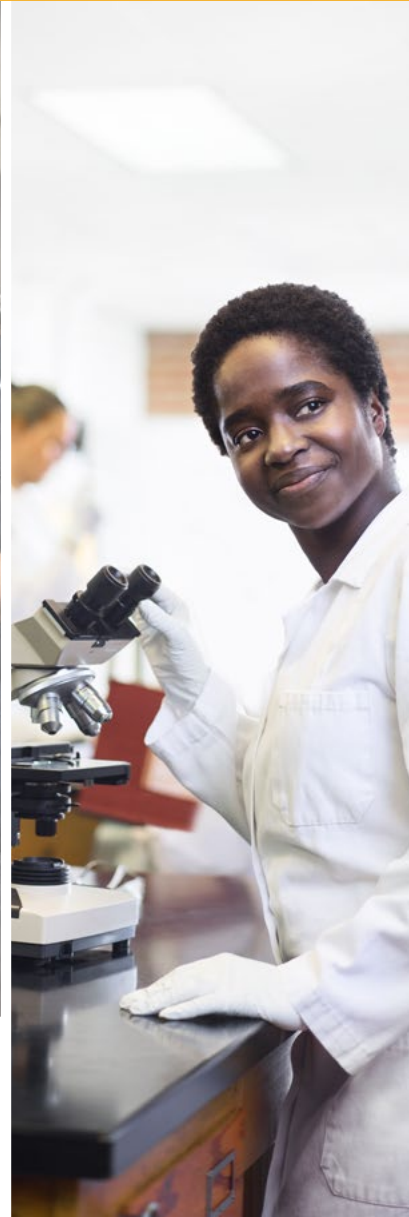


ORANGE COUNTY SECTOR ANALYSIS PROJECT: EXECUTIVE SUMMARY



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2020

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Orange County
Center of Excellence
for Labor Market Research



EXECUTIVE SUMMARY

Demand and Supply Analysis: Orange County

TABLE OF CONTENTS

INTRODUCTION	2
ORANGE COUNTY'S TOP MIDDLE-SKILL JOBS.....	5
ORANGE COUNTY'S MIDDLE-SKILL JOBS WITH ENTRY-LEVEL WAGES BELOW CALIFORNIA FAMILY NEEDS CALCULATOR	7
FOCUS GROUP INSIGHTS – THE BIG PICTURE.....	9
KEY FINDINGS: ORANGE COUNTY'S EIGHT PRIORITY AND EMERGING SECTORS	11
APPENDIX A: METHODOLOGY AND DATA DEFINITIONS	13

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 college/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.

INTRODUCTION

Orange County's nine community colleges and one noncredit school have a long history of serving the region by teaching students the skills and helping them earn the awards necessary to satisfy the region's industry demand for qualified workers in a wide-range of occupations. However, while there currently are a number of funding initiatives supporting career education, there is always a finite amount of resources – physical and human as well as financial. The Orange County region is committed to strategically using all of the resources at its disposal to address its current supply gap of 47,040 awards. Furthermore, Orange County wants to focus investments that will continue to see outcomes in the future. To this end, the Orange County Center of Excellence for Labor Market Research (COE) embarked on an almost year-long research project, the Orange County Sector Analysis Project, to combine quantitative labor market demand and supply data with qualitative insights from the region's community college experts – its faculty and administrators – in order to produce a series of briefs that identifies areas of opportunity for the region to positively impact its supply gap.

This executive summary is a product of the Orange County Sector Analysis Project. It provides labor market information about eight –six emerging and two priority– sectors. Orange County's six priority sectors include:

- Advanced Transportation and Logistics
- Business and Entrepreneurship
- Energy, Construction and Utilities
- Health
- ICT and Digital Media
- Retail, Hospitality and Tourism

The two emerging Orange County sectors are:

- Advanced Manufacturing
- Life Sciences and Biotechnology

In addition to this Executive Summary, a brief for each of the eight sectors was completed that compares labor market demand with educational program supply for middle-skill jobs and provides qualitative information from experts in the field. Orange County community colleges could use the information in these reports for strategic planning and discussions about program development, career pathways work, sector strategies, noncredit-to-credit pipelines, apprenticeship programs, and work-based learning opportunities.

All of the Orange County Sector Analysis Project briefs began with quantitative labor market demand and supply analysis; however, they also include qualitative information derived from the project's focus group discussions. Between July and August 2019, the Orange County Center of Excellence for Labor Market Research (COE) hosted a total of 12 sector-specific focus groups with regional stakeholders, including faculty and deans, as well as regional and state directors for employer engagement. Four of the sectors: Business & Entrepreneurship, Energy, Construction & Utilities, ICT/Digital Media, and Retail, Hospitality & Tourism had two focus groups each in order to accommodate participants' scheduling needs. The objectives of the focus groups were to identify labor market supply gaps (supply gaps) in middle-skill jobs; understand where programs exist or do not exist to fill in the supply gaps; and discuss how Orange County's community colleges could close the supply gaps. Focus group participants reviewed the demand and supply analysis prior to meeting and provided intelligence regarding how they are working to close supply gaps as well as the challenges they encounter in their programs; this valuable information could not be captured via traditional labor market research methods. The COE recorded then analyzed these discussions which resulted in the "Focus Group Insights" sections throughout this brief, supplementing traditional, quantitative labor market data with important, qualitative information.

Middle-Skill Jobs and Living Wage Introduction

For the Orange County Sector Analysis Project, middle-skill jobs include: all occupations that require an educational requirement of some college, associate degree or apprenticeship; all occupations that require a bachelor's degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or all occupations that require a high school diploma or equivalent or no formal education, but also require short- to long-term on-the-job training.

For the Orange County Sector Analysis Project, top middle-skill jobs are defined as jobs that have both the most labor market demand (annual job openings) and entry-level wages at or above the California Family Needs Calculator¹ (commonly known as a “living wage”). The living wage is the hourly wage that a single adult needs to earn in order to meet basic needs in Orange County, and is currently \$17.39 per hour. The living wage is defined by the California Family Needs Calculator, which calculates the income necessary to cover costs including housing, food, transportation, health care, and other basic necessities.

Entry-level wage is defined as the 25th percentile hourly wage, which means that 25% of all workers in that occupation earn equal to or below this amount. Percentile wages represent the distribution of wages for each occupation. Generally, workers with minimal education and experience can expect to earn wages near the 10th percentile. With the additional education and training students receive in community college programs, they are more likely to earn wages at the 25th percentile, rather than the 10th percentile. Generally, with even more education and experience, students could expect to progress and earn the median wage, which is defined as the 50th percentile hourly wage.

Demand Introduction

For the purpose of these reports, labor market demand is determined by the number of annual job openings employers expect to fill due to job growth and employee turnover between 2018 and 2023. Job growth is when an employer experiences increased demand for products and hires new employees to increase production, while employee turnover is when an employer hires replacement workers for employees who leave the workforce or change occupations.

Supply Introduction

Supply is determined by the average annual-number of related awards (e.g., certificates, degrees) generated between 2015 and 2017 by the region’s community colleges and other educational institutions (e.g., private providers) for the purpose of this report. However, it should be noted that a student may earn more than one award; therefore, supply may be overestimated for certain occupations.

Whether or not there is a supply gap is determined by the difference between the demand and supply. The methodology regarding how these numbers are calculated is described in Appendix A for each of the sector briefs.

FOCUS GROUP INSIGHTS

The sector focus groups included 65 unique participants representing the Orange County community college region. There was a total of 35 faculty – two counselors and 33 academic – and 20 administrators, from all 10 educational institutions – nine community colleges and one noncredit school – that offered career education programs in Orange County between 2015 and 2017. Additionally, there were 10 directors for employer engagement – all seven regional plus three statewide directors who also attended the focus groups. Some participants attended more than one focus group. Faculty were able to attend up to two focus groups and some administrators attended up to three sessions.

Focus group participants identified several data limitations, challenges in expanding programs, and other issues that were common across multiple sectors. These cross-sector, common themes are expanded on and explained in further detail in this standalone Orange County Sector Analysis Project Executive Summary report. Focus group participants also reported on limitations and challenges that were unique to individual sectors. Sector-specific information is highlighted throughout each of the eight sector briefs. In both the Executive Summary as well as the individual sector briefs, the qualitative information is highlighted in the green Focus Group Insights and the Focus Group Insights – The Big Picture sections.

Reporting Limitations and Data Quality Issues

Focus group participants in all sectors agreed that supply data from traditional labor market information is limited; it does not capture awards from programs that do not report outcomes data to the California Community Colleges Chancellor’s Office (CCCCO) or to the Integrated Postsecondary Education Data System (IPEDS), including, but not limited to:

- Locally-issued certificate programs,
- Fee-based (not-for-credit) programs,

¹ <https://insightccd.org/2018-family-needs-calculator/>

- Contracted education (or customized training) programs, and
- Nonprofit programs offered in the community outside of postsecondary education.

Focus group participants indicated that a supply-data-collection system does not currently exist for all these programs, and suggested that the supply numbers are underestimated across all sectors. Focus group participants in each of the sectors also said that their programs attract industry professionals who are interested in upskilling or learning new skills for their current jobs. However, the supply data does not capture students that take a small number of courses to gain additional skills if colleges do not report data for local low-unit certificate programs. This could result in an under-reporting of the supply number.

Additionally, there is a lag in reporting supply data to the CCCCCO; therefore, recently created programs will not be represented in traditional labor market information either.

Low Completion Numbers

According to the demand and supply exhibits (Exhibits 1, 2, 3, and 4), the community colleges in Orange County are undersupplying for both types of jobs analyzed in this brief: 1) top middle-skill jobs and 2) jobs that have entry-level wages below the California Family Needs Calculator (CFNC), but have median wages above the CFNC. According to the CCCCCO LaunchBoard², 127,556 (unduplicated) students took one or more CTE courses across all programs in Program Year 2016-17. However, in that same year, only 8,423 students earned a certificate or degree.

Focus group participants provided the following explanations as to some of the reasons why supply numbers are so low:

- Because programs in all sectors tend to attract industry professionals, students may drop out or withdraw from a program before completion because they learned what they needed to learn and returned to their jobs.
- In order to close so many supply gaps, companies may also hire students before they complete their programs as long as they have the foundational skills needed for the job. Once hired, companies could then provide training specific to their policies and procedures.
- Students may decide that instead of just obtaining an associate degree, they would rather transfer to a four-year institution because employers typically list “bachelor’s degree” as the minimum educational requirement for many occupations. During this transition, if the student does not complete the necessary paperwork to be issued their associate degree, then even though they may have earned it, there is no official award to be counted.

Faculty and administrators shared that although completion numbers appeared low, they know that many non-completers have positive employment outcomes from the stories shared with them by their former students. Some faculty members said that they are developing internal tracking systems to identify non-completers in order to track student outcomes. However, the CTE Outcomes Survey (CTEOS) is already tracking this information and could help colleges better understand outcomes for students who leave a program before completing a degree or certificate.

² <https://www.calpassplus.org/LaunchBoard/Home.aspx>

ORANGE COUNTY'S TOP MIDDLE-SKILL JOBS

Comparing Orange County's labor market demand for the top middle-skill jobs, those with entry-level wages³ higher than the \$17.39 per hour living wage, in all sectors with program supply from the region's community colleges and non-community college providers (Exhibits 1 and 2) results in an overarching supply gap of 19,069. Business and Entrepreneurship has both the largest demand and supply of all eight sectors; however, it accounts for 48% (9,157) of the supply gap for top middle-skill jobs in Orange County. While Energy, Construction, and Utilities has the second largest demand, it has the fourth largest supply which equals a supply gap of 22% (4,204) of the top middle-skill jobs in Orange County.

Exhibit 1. All Sectors Top Middle-Skill Jobs in Orange County: Labor Market Demand

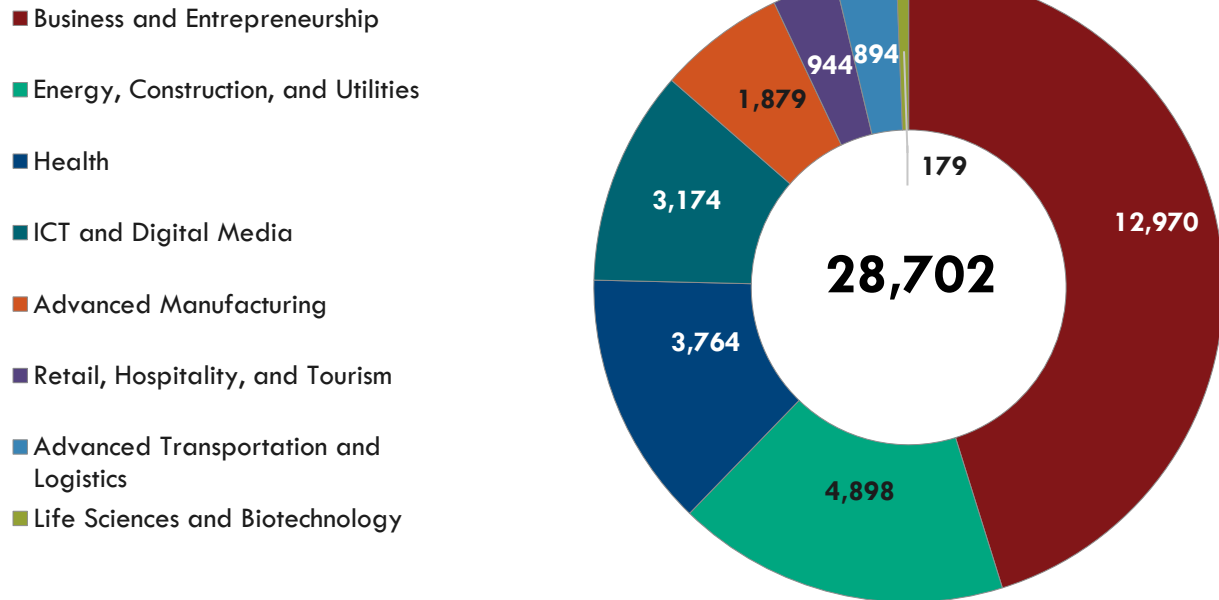
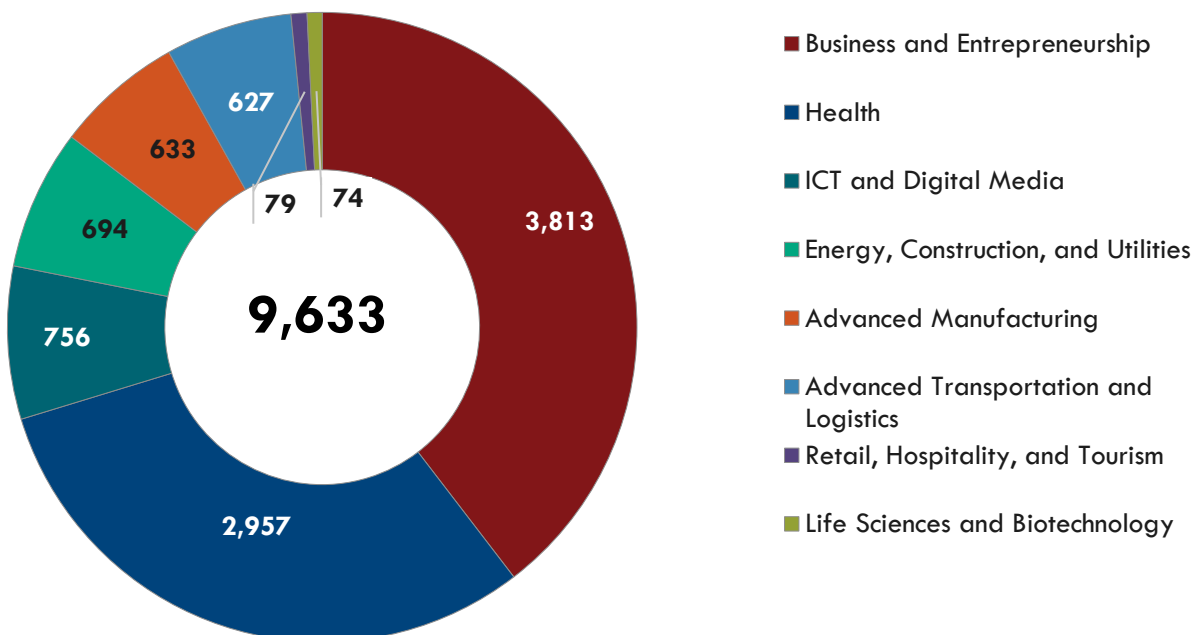


Exhibit 2. All Sectors Top Middle-Skill Jobs in Orange County: Labor Market Supply



³ In this report, entry-level wage is defined as the 25th percentile hourly wage, which means that 25% of all workers in the field earn equal to or below this amount. Generally, workers with less experience earn lower wages.

Exhibit 3 shows entry-level and median wages for the top 20 middle-skill jobs by number of annual openings across all sectors. The entry-level wages for these top middle-skill jobs are higher than the \$17.39 per hour living wage. Of these occupations, nine are in the Business and Entrepreneurship sector, five are in the Energy, Construction, and Utilities sector, and two each are in the ICT and Digital Media as well as the Health sectors, and one each are in the Advanced Manufacturing as well as the Retail, Hospitality, and Tourism sectors. There are only two sectors – Advanced Transportation and Logistics as well as Life Sciences and Biotechnology – that are not represented in the top 20 occupations.

Exhibit 3. Top 20 Middle-Skill Jobs in Orange County Across All Sectors: Entry-Level and Median Wages

SOC Code	SOC (Occupational) Title	Sector	Demand (Annual Openings)	Entry-Level Wage (25 th Percentile)	Median Wage
43-3031	Bookkeeping, Accounting, and Auditing Clerks	Business and Entrepreneurship	2,383	\$17.61	\$22.05
41-3099	Sales Representatives, Services, All Other	Business and Entrepreneurship	2,009	\$18.32	\$26.33
43-1011	First-Line Supervisors of Office and Administrative Support Workers	Business and Entrepreneurship	1,986	\$18.32	\$26.33
29-1141	Registered Nurses	Health	1,783	\$32.88	\$42.47
41-3021	Insurance Sales Agents	Business and Entrepreneurship	1,216	\$17.50	\$23.63
47-2111	Electricians	Energy, Construction, and Utilities	1,178	\$17.93	\$26.22
47-1011	First-Line Supervisors of Construction Trades and Extraction Workers	Energy, Construction, and Utilities	1,044	\$26.88	\$36.62
47-2152	Plumbers, Pipefitters, and Steamfitters	Energy, Construction, and Utilities	955	\$17.52	\$24.89
13-2072	Loan Officers	Business and Entrepreneurship	844	\$18.53	\$30.89
43-6011	Executive Secretaries and Executive Administrative Assistants	Business and Entrepreneurship	779	\$25.93	\$31.80
15-1151	Computer User Support Specialists	ICT and Digital Media	765	\$21.70	\$26.86
39-9031	Fitness Trainers and Aerobics Instructors	Retail, Hospitality, and Tourism	739	\$17.45	\$20.97
29-2061	Licensed Practical and Licensed Vocational Nurses	Health	652	\$20.63	\$25.57
41-9022	Real Estate Sales Agents	Business and Entrepreneurship	648	\$19.12	\$20.16
49-9071	First-Line Supervisors of Production and Operating Workers	Advanced Manufacturing	620	\$19.57	\$26.77
11-9021	Construction Managers	Energy, Construction, and Utilities	543	\$20.89	\$41.93
11-3011	Administrative Services Managers	Business and Entrepreneurship	471	\$41.40	\$55.21
11-9141	Property, Real Estate, and Community Association Managers	Business and Entrepreneurship	455	\$20.64	\$26.36
49-9021	Heating, Air Conditioning, and Refrigeration Mechanics and Installers	Energy, Construction, and Utilities	418	\$17.57	\$23.85
15-1199	Computer Occupations, All Other	ICT and Digital Media	408	\$27.90	\$40.40

ORANGE COUNTY'S MIDDLE-SKILL JOBS WITH ENTRY-LEVEL WAGES BELOW CALIFORNIA FAMILY NEEDS CALCULATOR

While it is important to understand which top middle-skill jobs across the sectors have opportunities for increased program supply, it is also important to consider middle-skill occupations that have entry-level wages below the regional living wage, but median wages near or above it. Since wages generally increase from entry-level to median earnings with additional experience and training, students could potentially earn self-sustaining wages with additional apprenticeship or work-based learning opportunities.

As seen in Exhibits 4 and 5, middle-skill jobs with entry-level wages below the regional living wage have more annual job openings (labor market demand) than the top-middle skill jobs, but program supply from Orange County educational institutions is lower. Program supply for these occupations is particularly low for the Energy, Construction, and Utilities (eight awards) and Retail, Hospitality, and Tourism (25 awards) sectors.

Exhibit 4. All Sectors Middle-Skill Jobs with Entry-Level Wages Below the California Family Needs Calculator in Orange County: Labor Market Demand

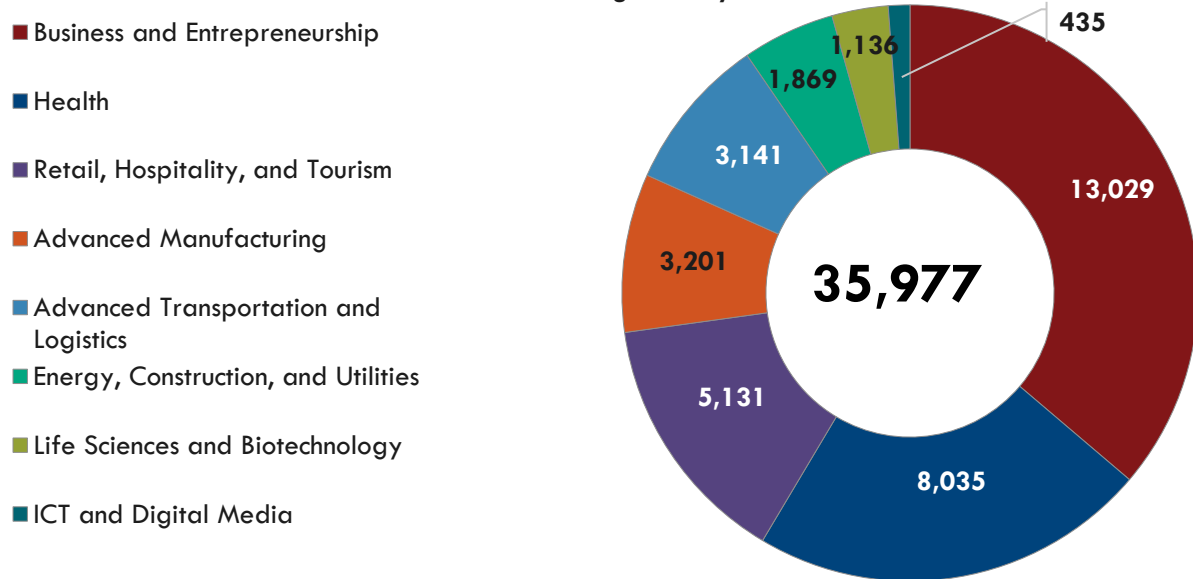


Exhibit 5. All Sectors Middle-Skill Jobs with Entry-Level Wages Below the California Family Needs Calculator in Orange County: Labor Market Supply

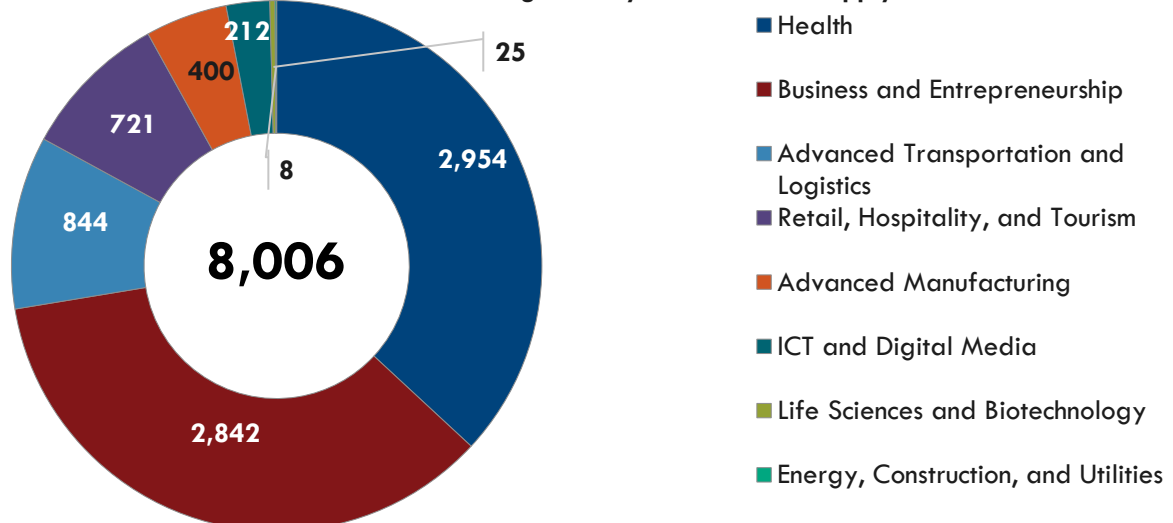


Exhibit 6 shows entry-level and median wages for the top 20 jobs with entry-level wages below the regional living wage by number of annual openings across all sectors. While these occupations have entry-level wages below the \$17.39 per hour California Family Needs Calculator, occupations such as Customer Service Representatives, Carpenters, Nursing Assistants, and Dental Assistants have median wages higher than the regional living wage, as denoted by the gray shading in Exhibit 4. Of these occupations, six each are in the Business and Entrepreneurship and Health sectors, three are in the Retail, Hospitality, and Tourism sector, one each in the Advanced Manufacturing, Advanced Transportation and Logistics, Energy, Construction, and Utilities, and Life Sciences and Biotechnology sectors.

Exhibit 6. 20 All-Sectors Middle-Skill Jobs with Entry-Level Earnings Below the California Family Needs Calculator in Orange County: Entry-Level and Median Wages

SOC Code	SOC (Occupational) Title	Sector	Demand (Annual Openings)	Entry-Level Wage (25 th Percentile)	Median Wage
43-4051	Customer Service Representatives	Business and Entrepreneurship	3,453	\$14.58	\$17.83
43-6014	Secretaries and Administrative Assistants, Except Legal, Medical, and Executive	Business and Entrepreneurship	2,835	\$15.69	\$19.66
41-4012	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	Business and Entrepreneurship	1,770	\$17.38	\$25.34
41-1011	First-Line Supervisors of Retail Sales Workers	Retail, Hospitality, and Tourism	1,488	\$13.15	\$16.63
35-1012	First-Line Supervisors of Food Preparation and Serving Workers	Retail, Hospitality, and Tourism	1,486	\$12.60	\$15.01
49-9071	Maintenance and Repair Workers, General	Advanced Manufacturing	1,474	\$15.51	\$19.18
47-2031	Carpenters	Energy, Construction, and Utilities	1,470	\$14.75	\$21.72
31-9092	Medical Assistants	Health	1,305	\$13.86	\$16.72
43-6013	Medical Secretaries	Health	1,164	\$14.67	\$17.76
31-1014	Nursing Assistants	Health	1,130	\$12.62	\$14.24
53-3032	Heavy and Tractor-Trailer Truck Drivers	Advanced Transportation and Logistics	1,093	\$16.95	\$20.85
39-5012	Hairdressers, Hairstylists, and Cosmetologists	Business and Entrepreneurship	1,079	\$11.55	\$12.00
51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	Life Sciences and Biotechnology	884	\$14.46	\$18.78
31-1011	Home Health Aides	Health	853	\$11.07	\$12.12
31-9091	Dental Assistants	Health	773	\$14.70	\$17.18
43-4131	Loan Interviewers and Clerks	Business and Entrepreneurship	734	\$14.54	\$20.22
49-3023	Automotive Service Technicians and Mechanics	Advanced Transportation and Logistics	721	\$11.94	\$16.74
31-9011	Massage Therapists	Health	711	\$11.92	\$14.08
39-9032	Recreation Workers	Retail, Hospitality, and Tourism	698	\$11.17	\$12.35
43-3071	Tellers	Business and Entrepreneurship	628	\$12.61	\$14.09

FOCUS GROUP INSIGHTS – THE BIG PICTURE

Focus group participants addressed issues and challenges that cannot be captured by traditional labor market information. They also provided insight on the tactics colleges and employers are currently using to address supply gaps in all sectors.

Challenges in Expanding Programs

Focus group participants acknowledged the supply gaps for occupations across all sectors, but also reported several challenges at the community colleges in expanding programs to close the gaps:

Lack and cost of space and equipment

- Focus group participants conveyed that certain courses and programs are at capacity due to lack of physical space – especially for those that require lab classrooms. Much of the equipment for programs in all sectors tend to be large in size and require a significant amount of space. Even if companies are willing to donate machinery or other equipment, not all community college facilities have enough space to house it. In order to increase capacity, the community colleges would have to invest in developing new or expanding current facilities to accommodate training equipment.
- Additionally, resources for equipment repair and maintenance may fluctuate from year to year. While a college may use Strong Workforce Program (SWP) funds one year to purchase equipment and space, funding in subsequent years may decline, which would affect future equipment maintenance and repair.

Lack of qualified faculty

- Focus group participants in all sectors shared that it can be difficult to hire program-specific faculty. Despite the fact that colleges would have to hire additional qualified staff in order to increase program capacity, finding qualified staff can be challenging. Focus group participants reported that the private sector often pays higher wages and offers more consistent hours and schedules than the community colleges, so potential candidates prefer to continue working in the private sector.
- Another challenge in staffing is the lack of teaching experience. Industry professionals may have a lot of work experience and be experts in their respective fields; however, not all industry professionals know how to appropriately and/or engagingly teach curriculum in the classroom.

Long program development/curriculum approval timelines

- Jobs and companies in all sectors are constantly affected by changes in technology. While the community colleges attempt to meet employers' demand for skills in a timely manner, developing new—or changing existing—programs and/or curriculum takes a significant amount of time to accomplish. In many cases, companies are not interested in partnering with community colleges to develop new programs or curriculum because creating a new program can take anywhere from one to two years. Companies cannot wait that long to get qualified workers according to the focus group participants.

Skills and Certifications

According to the focus group participants, many skills taught in community college career education programs are transferable and are not exclusive to a single/particular job. For example, the Advanced Manufacturing and Energy, Construction, and Utilities focus group participants shared that these two sectors are intersecting and overlapping due to technological advances. Additionally, faculty and administrators in the Life Sciences and Biotechnology shared that many skills taught in programs for quality assurance or quality control jobs can be used in other sectors such as the food and beverage industry or Advanced Manufacturing.

Focus group participants in all sectors said that Orange County community colleges provide numerous courses that are designed to add a skill or set of skills, but do not fully train for a specific occupation. Since this report uses awards as the measurement for supply, these courses are not captured in the data. In some sectors, such as Retail, Hospitality, and Tourism, faculty and administrators also said, in their experience, employers tend to hire based on skills, rather than degrees and certificates. Gaining a better understanding of the knowledge, skills, and abilities (also known as “KSAs”) employers request for specific jobs could be useful for Orange County’s community colleges.

Additionally, focus group participants identified dozens of state licenses or third-party certifications for which their programs train. One sector, Health, has a large number of occupations that require a state license. In all other sectors, third-party certifications such as those offered by the National Institute for Automotive Service Excellence (ASE), CompTIA, and ServSafe, provide another way for students to demonstrate skill attainment. However, focus group participants noted that it is difficult to determine the actual value of these certifications by employers and that they can be cost prohibitive for students.

Creative Ways Community Colleges are Offering Programs

Focus group participants in all sectors discussed several creative ways they are offering programs and some of the challenges they face when developing new means to offer them:

- All colleges are strategically scheduling in-person, hybrid, and online courses to accommodate a variety of students. Generally, offering career education courses in the evenings has been most successful, as evening classes allow working professionals to work during the day and take classes at night.
- In nearly all sectors, colleges currently have, or are in the process of developing, dual enrollment programs with K-12 partners within their service area. Focus group participants said that dual enrollment provides benefits for both the community colleges and high school students. Community colleges are able to make students aware of career education programs and get students acclimated to college-level coursework while they are still in high school and while able to earn college credit for free.
- Several colleges are working with local employers to develop internship programs in nearly all sectors. Some colleges currently have robust internship programs and plan to expand these programs due to past successes. However, focus group participants also noted that maintaining relationships with employers can be time consuming and difficult.

New Programs

Faculty and administrators identified dozens of new credit and noncredit programs that they are either in the process of creating or plan to create in the near future for all sectors. Several of these programs will address new and emerging areas such as automation, cybersecurity, data analytics, and environmental sustainability. Other programs, such as Certified Nursing Assistant (CNA), accounting and bookkeeping, and retail sales, will focus on traditional occupations that currently have supply gaps.

KEY FINDINGS: ORANGE COUNTY'S EIGHT PRIORITY AND EMERGING SECTORS

Based on the demand and supply data, as well as the focus group insights analyzed in this brief, the COE identified the following key research findings and recommendations:

Demand and Supply

64,679 annual job openings (labor market demand)	17,639 average annual program awards (labor market supply)	47,040 supply gap (number of awards needed to close the gap)
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Focus Group Key Findings and Recommendations

Key Finding	Recommendation
<p>1. Retention and success rates are high for courses in all sectors, but program completion numbers are low: Community colleges in Orange County are undersupplying for middle-skill jobs in all sectors. Nearly 6.7% of all students enrolled in CTE programs completed a degree or certificate in the 2016-2017 academic year. Students often take one or two courses to gain additional skills, then exit the community college system or they find a job before completing their program. These explanations suggest that some programs may be overdesigned, meaning that they require more courses than necessary for students to gain the needed skills to obtain employment.</p>	<p>1. To increase completion rates of students in CTE programs, colleges could re-work overdesigned programs or consider moving these programs to enhanced noncredit. Noncredit certificates are included in the Strong Workforce Program (SWP) metrics, Student Success metrics, and the Vision for Success. Enhanced noncredit programs could be a way to satisfy student needs for short-term programs and still benefit colleges. Additionally, college faculty, deans, and the Regional Directors for Employer Engagement for each sector should review program and course data to determine the specific barriers that prevent students from successfully completing a program (e.g., challenging introductory courses and differing pre-requisites across colleges for higher level courses). SWP funds could be invested at the college level to address students' specific barriers to course/program retention and completion.</p>

Key Finding	Recommendation
<p>2. Tracking employment outcomes for students is difficult, time consuming, and not consistent across all colleges: Several faculty and administrators shared stories about individual students with successful employment outcomes, but reported that it is difficult to track outcomes for all students. Tracking outcomes for students that took one or two classes but did not complete a degree or certificate is particularly difficult.</p>	<p>2. To better understand employment outcomes for students, colleges should invest more resources to promote and use the California Community Colleges Chancellor's Office-approved CTE Outcomes Survey (CTEOS). Since this system has been in place for eight years, it is already established as a validated tracking system for student outcome data. By informing faculty and students about the CTEOS and its purpose, it is possible for the region to increase its response return rate. This information could help colleges better understand outcomes for all students and provide valuable data on students who leave a program before completing a degree or certificate.</p>
<p>3. Orange County community colleges face similar challenges to expanding programs across all colleges: Orange County community colleges have courses and programs that are at capacity due to a lack of physical lab space. They also do not have steady and ongoing financial resources for new equipment and maintenance for that equipment. Additionally, community colleges have trouble finding industry professionals with teaching experience and face long program development and curriculum approval timelines, making it difficult to quickly respond to employer needs and rapid changes in economic conditions, such as those posed by the coronavirus disease (COVID-19) pandemic. These challenges hinder the community colleges' ability to increase program capacity and close supply gaps.</p>	<p>3. While it is difficult to address these structural issues, Orange County community colleges should leverage existing regional Strong Workforce Program projects and other initiatives such as Perkins V and could focus their finite resources on items that would be most effective for students. For instance, colleges should collaborate with Orange County's six Regional Directors for Employer Engagement to connect with employers and find out which equipment is most important to the training of their prospective employees. Additionally, colleges could collaborate with the OC Careers in Education Pathway Collaborative project, which is part of the Teacher Preparation Pipeline initiative, to provide professional development for newly hired faculty.</p>
<p>4. Knowledge, Skills, and Abilities (KSAs) for the sector have not been validated by employers: The OC Sector Analysis Project brief examines job gaps but does not explore the specific KSAs taught at the colleges and compare them to the labor market's demand for KSAs.</p>	<p>4. To determine if the region's community colleges are training for the right KSAs, the Regional Directors for Employer Engagement should convene employers in a "regional advisory group" where employers can review program KSAs, provide feedback, and validate the KSAs' current relevance and demand in the labor market</p>

APPENDIX A: METHODOLOGY AND DATA DEFINITIONS

The Centers of Excellence for Labor Market Research (COE) prepared this report by analyzing data from occupations and education programs. Occupational data is derived from Emsi, a software program that consolidates data from the California Employment Development Department (EDD), U.S. Bureau of Labor Statistics (BLS), and other government agencies. Program supply data is drawn from two systems: Taxonomy of Programs (TOP) and Classification of Instructional Programs (CIP).

The California Community Colleges (CCC) define “sectors” by TOP codes. To determine what occupations should be analyzed in each brief, the COE first reviewed the TOP codes associated with each sector and then matched them with the SOC codes. The six-digit TOP codes for each sector are included in their respective briefs

Using a TOP-SOC crosswalk, the COE then identified middle-skill jobs for which programs within these TOP codes train. The COE examined more than 850 occupational codes from the Standard Occupational Classification (SOC)⁴ system and identified approximately 300 occupational codes as middle-skill jobs.

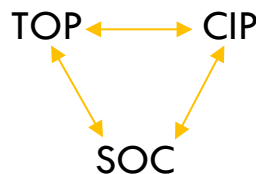
Middle-skill jobs include:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor’s degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or
- All occupations that require a high school diploma or equivalent or no formal education, but also require short-to long-term on-the-job training where multiple community colleges have existing programs.

For each sector, the COE analyzed occupations with a labor market demand of at least 50 annual job openings, with the exception of the Life Sciences and Biotechnology, which analyzed occupations with a demand of at least 28 annual openings. Life Sciences and Biotechnology is the smallest of all eight sectors and has a lower number of annual openings compared to those sectors. If the same 50 annual job openings threshold was used, there would have been only six occupations to analyze. (For comparison, the average and median demand for an occupation in Orange County is 307 and 63 annual job openings, respectively.)⁵ The number of annual job openings estimates employment change and turnover for an occupation each year between 2018 and 2023. Annual job openings include:

- Job Growth: An employer experiences increased demand for products and hires new employees to increase production. If job growth is zero or negative, then any and all openings are due to replacement needs.
- Replacement Needs: An employer hires replacement workers for employees who leave the workforce or change occupations. Replacement rates are derived from national 10-year, occupation-specific percentages published by the U.S. BLS’s Employment Projections program.

The COE then cross-referenced the SOC codes with CIP and TOP codes to compare labor market demand with program supply. The following diagram illustrates this process:



⁴ SOC is a federal statistical standard used by EDD, BLS and other federal agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data.

⁵ Emsi. Data set 2019.2. QCEW Employees + Non-QCEW + Self-Employed. 2018-2023.

The COE determined labor market supply for an occupation or SOC code by analyzing the number of program completers or awards in a related TOP or CIP code. The COE developed a “supply table” with this information, which is the source of the program supply data for this report. 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), also known as IPEDS. TOP is a system of numerical codes used at the state level to collect and report information on California community college programs and courses throughout the state that have similar outcomes. CIP codes are a taxonomy of academic disciplines at institutions of higher education in the United States and Canada. Institutions outside of the California community college system do not use TOP codes in their reporting systems.

Because a TOP/CIP code may train for more than one occupation, simply aggregating all supply from all related codes may overestimate supply for an occupation. Therefore, the COE de-duplicated TOP codes that trained for more than one occupation to avoid counting the program supply more than once. Doing so provides a more accurate representation of the supply gaps in the region by occupation. This information can be seen in the demand and supply tables in Appendix C of each study.

Qualitative Methodology

An integral aspect of the Orange County Sector Analysis Project was the qualitative data collected during the project’s focus groups. In May 2019, the COE created an advisory group comprised of the Orange County Regional Consortium Director as well as five CTE deans and directors that represented the four community college districts in Orange County. The advisory group created a process and timeline for inviting faculty and administrators to participate in focus groups to better understand where programs exist or do not exist to fill supply gaps and discuss how Orange County’s community colleges could close the supply gaps for the county’s eight priority and emerging sectors.

To create the invite list of faculty and administrators, Regional Directors for Employer Engagement and career education deans at each college were asked to identify faculty and administrators that could represent their respective colleges in the sector-specific focus groups. Once this list was compiled, the career education deans invited faculty and administrators to express their interest in participating in a focus group via email. The email introduced the COE, provided an overview of the Orange County Sector Analysis Project, described the goals of the focus groups, and informed faculty that they would be compensated for their participation, and that lunch would be provided for all participants. All those that stated their interest were then connected with the COE who managed the focus groups scheduling and details.

In order to be as inclusive as possible, 12 focus groups were scheduled for the eight sectors – four sectors had one focus group each and four sectors had two focus groups each, during a three-week period from July to August 2019. All focus groups participants received a confirmation email before the event that included the focus group agenda, their sector-specific draft brief, and a pre-assignment with questions based off of the information contained in the draft sector briefs. Focus group participants were instructed to complete and bring the pre-assignment to the convening so that they were prepared to discuss the data, the challenges they face in their programs, and strategies to close supply gaps. Each focus groups was recorded, with permission of the participants, by the COE solely for transcription purposes.

The COE conducted no more than two focus group sessions per day. During the focus groups the Orange County Sector Analysis Project was explained and then the information contained in the draft sector briefs was presented in detail. Participants were encouraged to ask questions and engage in dialogue throughout the entire focus group session. The COE took notes of each discussion as well as recorded the sessions, with permission of the participants and solely for transcription purposes.

Following the conclusion of the focus groups, the COE compiled the audio files, transcripts, notes, and pre-assignments to conduct a qualitative analysis of the themes for each focus group and to identify commonalities across multiple focus groups. The findings from this analysis have been highlighted throughout this report in the “Focus Group Insight” sections.