C·O·E CENTERS OF EXCELLENCE FOR LABOR MARKET RESEARCH

Program Endorsement Brief: 0708.00/Computer Infrastructure and Support *Cybersecurity Practitioner*

Los Angeles/Orange County Center of Excellence, April 2021

Summary Analysis

Program Endorsement:	Endorsed: All Criteria Met	☒	Endorsed: Some Criteria Met	☐	Not Endorsed	☐

Program Endorsement Criteria		
Supply Gap:	Yes ☑	No ☐
Living Wage: (Entry-Level, 25th)	Yes ☑	No ☐
Education:	Yes ☑	No ☐
Emerging Occupation(s)		
Yes ☐		*No* ☑

The Los Angeles/Orange County Center of Excellence for Labor Market Research (COE) prepared this report to provide Los Angeles/Orange County regional labor market supply and demand data related to five middle-skill occupations: *information security analysts* (15-1212), *computer network support specialists* (15-1231), *computer user support specialists* (15-1232), *computer network architects* (15-1241), and *network and computer systems administrators* (15-1244). Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree.[1] Although some of the occupations in this report typically require a bachelor's degree, they are considered middle-skill because approximately one-third of workers in the field have completed some college or an associate degree. This report is intended to help determine whether there is demand in the local labor market that is not being met by the supply from community college programs that align with the relevant occupations.

Based on the available data, there appears to be a supply gap for these occupations related to cybersecurity in the region. Furthermore, the majority of annual openings for the occupations in this report typically require an associate degree or some college, and entry-level wages exceed the living wage in both Los Angeles and Orange counties. **Therefore, due to all the criteria being met, the COE endorses this proposed program.** Detailed reasons include:

Demand:

- ***Supply Gap Criteria –*** Over the next five years, there is projected to be **3,812 jobs available annually** in the region due to new job growth and replacements, **which is more than the 1,415 awards conferred annually** by educational institutions in the region.

[1] The COE classifies middle-skill jobs as the following:

- 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.

- ***Living Wage Criteria –*** Within Los Angeles County, **all of the annual job openings** for these occupations related to cybersecurity have **entry-level wages above the county's living wage** ($15.04/hour).[2]
- ***Educational Criteria –*** Within the LA/OC region, **64% of the annual job openings** for occupations related to cybersecurity **typically require an associate degree or some college/no degree.**
    - Furthermore, the national-level educational attainment data indicates **between 26% and 39% of workers in the field have completed some college or an associate degree.**

Supply:

- There are **26 community colleges** in the LA/OC region that issue awards related to cybersecurity, conferring an average of **706 awards annually** between 2016 and 2019.
- Between 2014 and 2017, there was an average of **709 awards conferred annually** in related training programs by non-community college institutions throughout the region.

Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for five occupations related to cybersecurity. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to increase by 3% through 2024. There will be more than 3,800 job openings per year through 2024 due to job growth and replacements.

This report includes employment projection data by Emsi, which uses EDD information. Emsi's projections are modeled on recorded (historical) employment figures and incorporate several underlying assumptions, including the assumption that the economy, during the projection period, will be at approximately full employment. To the extent that a recession or labor shock, such as the economic effects of COVID-19, can cause long-term structural change, it may impact the projections. At this time, it is not possible to quantify the impact of COVID-19 on projections of industry and occupational employment. Therefore, the projections included in this report do not take the impacts of COVID-19 into account.

Exhibit 1: Occupational demand in Los Angeles and Orange Counties[3]

Geography	2019 Jobs	2024 Jobs	2019-2024 Change	2019-2024 % Change	Annual Openings
Los Angeles	36,925	37,827	902	2%	2,635
Orange	16,045	16,653	608	4%	1,177
Total	**52,969**	**54,479**	**1,510**	**3%**	**3,812**

[2] Living wage data was pulled from California Family Needs Calculator on 4/8/2021. For more information, visit the California Family Needs Calculator website: https://insightcced.org/2018-family-needs-calculator/.
[3] Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

Wages

The labor market endorsement in this report considers the entry-level hourly wages for these occupations related to cybersecurity in Los Angeles County, as they relate to the county's living wage. Orange County wages are included below in order to provide a complete analysis of the LA/OC region. Detailed wage information, by county, is included in Appendix A.

> **Los Angeles County—** All of the annual openings for these occupations related to cybersecurity have entry-level wages above the living wage for one adult ($15.04 in Los Angeles County). Typical entry-level hourly wages are in a range between $21.62 and $38.60. Experienced workers can expect to earn wages between $34.49 and $70.08, which are higher than the living wage estimate.
>
> **Orange County—** All of the annual openings for these occupations related to cybersecurity have entry-level wages above the living wage for one adult ($17.36 in Orange County). Typical entry-level hourly wages are in a range between $21.12 and $37.56. Experienced workers can expect to earn wages between $33.72 and $68.11, which are higher than the living wage estimate.

Job Postings

There were 23,182 online job postings related to cybersecurity listed in the past 12 months. The highest number of job postings were for systems administrators, network engineers, desktop support technicians, help desk analysts, and IT support specialists. The top skills were technical support, customer service, information security, help desk support, and system administration. The top employers, by number of job postings, in the region were Anthem Blue Cross, Northrop Grumman, and The Boeing Company.

It is important to note that the job postings data included in this section reflects online job postings listed in the past 12 months and does not yet demonstrate the impact of COVID-19. While employers have generally posted fewer online job postings since the beginning of the pandemic, the long-term effects are currently unknown.

Educational Attainment

The Bureau of Labor Statistics (BLS) lists the following typical education levels for cybersecurity-related occupations:

- **Bachelor's degree:** *information security analysts (15-1212); computer network architects (15-1241);* and *network and computer systems administrators (15-1244)*
- **Associate degree:** *Computer network support specialists (15-1231)*
- **Some college/no degree:** *Computer user support specialists (15-1232)*

In the LA/OC region, the majority of annual job openings (64%) typically require an associate degree or some college/no degree. National-level educational attainment data indicates that between 26% and 39% of workers in the field have completed some college or an associate degree. Of the 54% of cybersecurity-related job postings listing a minimum education requirement in Los Angeles/Orange County, 71% (8,909) requested a bachelor's degree, 21% (2,580) requested a high school diploma and 8% (985) requested an associate degree.

Educational Supply

Community College Supply—Exhibit 2 shows the annual and three-year average number of awards conferred by programs that have historically trained for the occupations of interest. The colleges with the most completions in the region are Mt. San Antonio, West LA, and Coastline. Over the past 12 months, there were eight other related program recommendation requests from regional community colleges.

Exhibit 2: Regional community college awards (certificates and degrees), 2016-2019

TOP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Average
0701.00	Information Technology, General	East LA	8	15	23	15
		LA Harbor	7	6	-	4
		LA Mission	4	1	1	2
		Long Beach	27	25	34	29
		Mt San Antonio	61	79	74	71
		Santa Monica	-	-	39	13
		West LA	3	4	4	4
		LA Subtotal	**110**	**130**	**175**	**138**
		Cypress	1	-	-	0
		OC Subtotal	**1**	**-**	**-**	**0**
		Supply Subtotal	**111**	**130**	**175**	**138**
0702.00	Computer Information Systems	Citrus	5	7	5	6
		Compton	1	-	1	1
		East LA	14	16	19	16
		El Camino	15	18	14	16
		Glendale	2	-	-	1
		LA City	3	4	1	3
		LA Mission	3	9	5	6
		LA Trade	23	14	8	15
		Pasadena	2	1	-	1
		Rio Hondo	10	19	21	17
		West LA	13	6	8	9
		LA Subtotal	**91**	**94**	**82**	**89**
		Cypress	5	8	5	6
		Fullerton	7	20	15	14
		Orange Coast	-	3	4	2

TOP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Average
		Santa Ana	18	6	4	9
		Santiago Canyon	2	2	3	2
		OC Subtotal	**32**	**39**	**31**	**34**
		Supply Subtotal	**123**	**133**	**113**	**123**
0707.30	Computer Systems Analysis	Cerritos	6	4	2	4
		LA Subtotal	**6**	**4**	**2**	**4**
		Cypress	-	5	2	2
		OC Subtotal	**-**	**5**	**2**	**2**
		Supply Subtotal	**6**	**9**	**4**	**6**
0708.00	Computer Infrastructure and Support	LA Harbor	-	1	1	1
		LA Mission	-	-	2	1
		LA Valley	6	8	5	6
		Long Beach	1	1	3	2
		Mt San Antonio	16	20	24	20
		Pasadena	-	-	1	0
		West LA	-	-	4	1
		LA Subtotal	**23**	**30**	**40**	**31**
		Coastline	67	65	49	60
		Cypress	1	1	2	1
		OC Subtotal	**68**	**66**	**51**	**62**
		Supply Subtotal	**91**	**96**	**91**	**93**
0708.10	Computer Networking	Cerritos	10	8	11	10
		Glendale	-	6	3	3
		LA City	11	37	23	24
		LA Pierce	37	23	39	33
		Long Beach	25	27	55	36
		Mt San Antonio	9	2	8	6
		Rio Hondo	-	-	5	2
		West LA	52	43	77	57
		LA Subtotal	**144**	**146**	**221**	**170**
		Coastline	20	12	38	23

TOP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Average
		Cypress	28	37	70	45
		Irvine	19	12	11	14
		Saddleback	21	17	10	16
		Santa Ana	-	7	14	7
		OC Subtotal	**88**	**85**	**143**	**105**
		Supply Subtotal	**232**	**231**	**364**	**276**
0708.20	Computer Support	Glendale	2	3	10	5
		LA Pierce	14	7	9	10
		Long Beach	-	1	8	3
		Pasadena	1	3	7	4
		LA Subtotal	**17**	**14**	**34**	**22**
		Cypress	3	1	3	2
		Santa Ana	-	10	9	6
		OC Subtotal	**3**	**11**	**12**	**9**
		Supply Subtotal	**20**	**25**	**46**	**30**
0709.00	World Wide Web Administration	Glendale	3	9	6	6
		LA Pierce	5	5	9	6
		Long Beach	5	4	22	10
		West LA	8	24	13	15
		LA Subtotal	**21**	**42**	**50**	**38**
		Saddleback	5	-	-	2
		OC Subtotal	**5**	**-**	**-**	**2**
		Supply Subtotal	**26**	**42**	**50**	**39**
		Grand Total	**609**	**666**	**843**	**706**

Non-Community College Supply—For a comprehensive regional supply analysis, it is also important to consider the supply from other institutions in the region that provide training programs for occupations related to cybersecurity. Exhibit 3 shows the annual and three-year average number of awards conferred by these institutions in related programs. Due to different data collection periods, the most recent three-year period of available data is from 2014 to 2017. Between 2014 and 2017, four-year colleges in the region conferred an average of 709 awards annually in related training programs.

Exhibit 3: Regional non-community college awards, 2014-2017

CIP Code	Program	College	2014-15 Awards	2015-16 Awards	2016-17 Awards	3-Year Average
11.0101	Computer and Information Sciences, General	ABCO Technology	15	0	0	5
		Azusa Pacific University	10	20	19	16
		Brand College	1	2	0	1
		Brandman University	19	14	26	20
		California Institute of Technology	48	56	0	35
		Chapman University	6	7	5	6
		Loyola Marymount University	15	16	19	17
		Pacific States University	0	2	1	1
		University of California-Irvine	31	3	1	12
		University of La Verne	14	21	19	18
		University of the People	0	36	57	31
		Supply Subtotal/Average	**159**	**177**	**147**	**161**
11.0501	Computer Systems Analysis/Analyst	Brand College	1	2	4	2
		DeVry University-California	110	103	94	102
		University of Phoenix-California	9	8	4	7
		Supply Subtotal/Average	**120**	**113**	**102**	**112**
11.0901	Computer Systems Networking and Telecommunications	Advanced Computing Institute	6	5	98	36
		Brand College	0	1	2	1
		DeVry University-California	166	154	135	152
		ITT Technical Institute-Sylmar	1	0	0	0
		Mt Sierra College	8	6	5	6
		PCI College	1	0	0	0

CIP Code	Program	College	2014-15 Awards	2015-16 Awards	2016-17 Awards	3-Year Average
		University of Phoenix-California	51	55	27	44
		Supply Subtotal/Average	**233**	**221**	**267**	**240**
11.1003	Computer and Information Systems Security/Information Assurance	Azusa Pacific University	8	4	3	5
		ITT Technical Institute-Orange	37	0	0	12
		ITT Technical Institute-San Dimas	23	0	0	8
		ITT Technical Institute-Sylmar	19	0	0	6
		ITT Technical Institute-Torrance	6	0	0	2
		Learnet Academy	0	39	48	29
		Mt Sierra College	14	9	8	10
		University of Phoenix-California	111	74	71	85
		Supply Subtotal/Average	**218**	**126**	**130**	**158**
11.1004	Web/Multimedia Management and Webmaster	ABCO Technology	7	9	12	9
		Pepperdine University	0	1	0	0
		University of Phoenix-California	7	5	4	5
		Supply Subtotal/Average	**14**	**15**	**16**	**15**
11.1006	Computer Support Specialist	Palladium Technical Academy	6	0	0	2
		Southern California Institute of Technology	13	32	16	20
		University of Phoenix-California	0	0	1	0
		Supply Subtotal/Average	**19**	**32**	**17**	**23**
		Grand Total	**763**	**684**	**679**	**709**

Appendix A: Occupational demand and wage data by county

Exhibit 4. Los Angeles County

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Information Security Analysts (15-1212)	2,016	2,287	270	13%	192	$37.46	$50.53	$62.68
Computer Network Support Specialists (15-1231)	4,476	4,583	107	2%	333	$25.63	$32.52	$41.26
Computer User Support Specialists (15-1232)	17,791	18,316	525	3%	1,347	$21.62	$27.18	$34.49
Computer Network Architects (15-1241)	3,890	3,871	(19)	(0%)	227	$38.60	$54.52	$70.08
Network and Computer Systems Administrators (15-1244)	8,752	8,771	19	0%	536	$34.08	$43.89	$55.15
Total	**36,925**	**37,827**	**902**	**2%**	**2,635**			

Exhibit 5. Orange County

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Information Security Analysts (15-1212)	948	1,102	154	16%	96	$36.26	$48.92	$60.69
Computer Network Support Specialists (15-1231)	1,852	1,906	54	3%	137	$25.03	$31.78	$40.37
Computer User Support Specialists (15-1232)	7,886	8,200	314	4%	608	$21.12	$26.56	$33.72
Computer Network Architects (15-1241)	1,802	1,823	21	1%	109	$37.56	$53.01	$68.11
Network and Computer Systems Administrators (15-1244)	3,557	3,622	65	2%	226	$33.20	$42.77	$53.73
Total	**16,045**	**16,653**	**608**	**4%**	**1,177**			

Exhibit 6. Los Angeles and Orange Counties

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Typical Entry-Level Education
Information Security Analysts (15-1212)	2,964	3,389	424	14%	288	Bachelor's degree
Computer Network Support Specialists (15-1231)	6,328	6,489	160	3%	471	Associate degree
Computer User Support Specialists (15-1232)	25,676	26,515	839	3%	1,955	Some college, no degree
Computer Network Architects (15-1241)	5,692	5,694	2	0%	336	Bachelor's degree
Network and Computer Systems Administrators (15-1244)	12,309	12,393	84	1%	763	Bachelor's degree
Total	**52,969**	**54,479**	**1,510**	**3%**	**3,812**	

Appendix B: Sources

- O*NET Online
- Labor Insight/Jobs (Burning Glass)
- Economic Modeling Specialists, International (Emsi)
- Bureau of Labor Statistics (BLS)
- Employment Development Department, Labor Market Information Division, OES
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- California Family Needs Calculator, Insight Center for Community Economic Development
- Chancellor's Office Curriculum Inventory (COCI 2.0)

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