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

Program Endorsement Brief: 0702.00/Computer Information Systems
Cybersecurity Analyst

Los Angeles/Orange County Center of Excellence, October 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 self-sufficiency standard 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:

[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.

Demand:

- ***Supply Gap Criteria –*** Over the next five years, there is projected to be **3,553 jobs available annually** in the region due to new job growth and replacements, **which is more than the 1,932 awards conferred annually** by educational institutions in the region.
- ***Living Wage Criteria –*** Within Los Angeles County, **all of the annual job openings** for these cybersecurity occupations have **entry-level wages above the self-sufficiency standard hourly wage** ($18.10/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 26.5% and 40% 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 **826 awards annually** between 2017 and 2020.
- Between 2016 and 2019, there was an average of **1,106 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 4% through 2025. There will be more than 3,550 job openings per year through 2025 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 full impact of COVID-19 on projections of industry and occupational employment. Therefore, the projections included in this report do not take the full impacts of COVID-19 into account.

Self-Sufficiency Standard wage data was pulled from The Self-Sufficiency Standard Tool for California on 10/13/2021. For more information, visit: http://selfsufficiencystandard.org/california.

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

Geography	2020 Jobs	2025 Jobs	2020-2025 Change	2020-2025 % Change	Annual Openings
Los Angeles	34,130	35,201	1,071	3%	2,421
Orange	15,020	15,773	753	5%	1,132
Total	**49,150**	**50,974**	**1,824**	**4%**	**3,553**

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 self-sufficiency standard 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 self-sufficiency standard wage for one adult ($18.10 in Los Angeles County).[4] Typical entry-level hourly wages are in a range between $21.91 and $44.21. Experienced workers can expect to earn wages between $36.47 and $72.55, which are higher than the self-sufficiency standard.

Orange County— All of the annual openings for these occupations related to cybersecurity have entry-level wages above the self-sufficiency standard wage for one adult ($20.63 in Orange County).[5] Typical entry-level hourly wages are in a range between $21.39 and $43.05. Experienced workers can expect to earn wages between $35.62 and $71.04, which are higher than the self-sufficiency standard.

Job Postings

There were 25,445 online job postings for occupations related to cybersecurity listed in the past 12 months. The highest number of job postings were for systems administrators, network engineers, IT support specialists, desktop support technicians, and IT technicians. The top skills were technical support, customer service, Microsoft Active Directory, help desk support, and information security. The top three employers, by number of job postings, in the region were Anthem Blue Cross, Northrop Grumman, and Best Buy.

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 full 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.

[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.

[4] Self-Sufficiency Standard wage data was pulled from The Self-Sufficiency Standard Tool for California on 10/13/2021. For more information, visit: http://selfsufficiencystandard.org/california.

[5] Ibid.

Educational Attainment
The Bureau of Labor Statistics (BLS) lists the following typical entry-level education levels for the cybersecurity occupations in this report:

- **Bachelor's degree:** *Information security analysts; computer network architects;* and *network and computer systems administrators*
- **Associate degree:** *Computer network support specialists*
- **Some college, no degree:** *Computer user support specialists*

In the LA/OC region, the majority of annual job openings (64%) typically require an associate degree or some college, no degree. Furthermore, the national-level educational attainment data indicates between 26.5% and 40% of workers in the field have completed some college or an associate degree. Of the 58% of cybersecurity-related job postings listing a minimum education requirement in Los Angeles/Orange County, 69% (10,083) requested a bachelor's degree, 23% (3,438) requested a high school diploma and 8% (1,132) requested an associate degree.

Educational Supply
Community College Supply—Exhibit 2 shows the three-year average number of awards conferred by community colleges in the related TOP codes: Information Technology, General (0701.00), Computer Information Systems (0702.00), Computer Systems Analysis (0707.30), Computer Infrastructure and Support (0708.00), Computer Networking (0708.10), Computer Support (0708.20), and World Wide Web Administration (0709.00). The colleges with the most completions in the region are Mt. San Antonio, Long Beach, and West LA, and Coastline. Over the past 12 months, there were 28 other related program recommendation requests from regional community colleges.

It is worth noting that the Taxonomy of Programs does not include a single, designated code for cybersecurity programs. Cybersecurity programs appear under several Informational Technology TOP codes, which makes it difficult to accurately measure the number of awards related to cybersecurity. Thus, not all awards below are specifically related to cybersecurity.

Exhibit 2: Regional community college awards (certificates and degrees), 2017-2020

TOP Code	Program	College	2017-2018 Awards	2018-2019 Awards	2019-2020 Awards	3-Year Award Average
0701.00	Information Technology, General	East LA	15	23	10	16
		LA Harbor	6	-	-	2
		LA Mission	1	1	3	2
		Long Beach	25	34	64	41
		Mt San Antonio	79	74	90	81
		Santa Monica	-	39	-	13
		West LA	4	4	5	4
		LA Subtotal	**130**	**175**	**172**	**159**
Supply Subtotal/Average			**130**	**175**	**172**	**159**
		Citrus	7	5	8	7

TOP Code	Program	College	2017-2018 Awards	2018-2019 Awards	2019-2020 Awards	3-Year Award Average
0702.00	Computer Information Systems	Compton	-	1	-	0
		East LA	16	19	15	17
		El Camino	18	14	21	18
		Glendale	-	-	5	2
		LA City	4	1	1	2
		LA Mission	9	5	1	5
		LA Trade	14	8	20	14
		Mt San Antonio	-	-	79	26
		Pasadena	1	-	-	0
		Rio Hondo	19	21	10	17
		West LA	6	8	10	8
		LA Subtotal	**94**	**82**	**170**	**115**
		Cypress	8	5	4	6
		Fullerton	20	15	11	15
		Irvine	-	-	2	1
		Orange Coast	3	4	2	3
		Santa Ana	6	4	2	4
		Santiago Canyon	2	3	4	3
		OC Subtotal	**39**	**31**	**25**	**32**
Supply Subtotal/Average			**133**	**113**	**195**	**147**
0707.30	Computer Systems Analysis	Cerritos	4	2	3	3
		East LA	-	-	1	0
		LA Mission	-	-	1	0
		LA Subtotal	**4**	**2**	**5**	**4**
		Cypress	5	2	-	2
		OC Subtotal	**5**	**2**	**-**	**2**
Supply Subtotal/Average			**9**	**4**	**5**	**6**
0708.00	Computer Infrastructure and Support	Cerritos	-	-	4	1
		Glendale	-	-	3	1
		LA City	-	-	3	1
		LA Harbor	1	1	1	1
		LA Mission	-	2	12	5
		LA Valley	8	5	2	5
		Long Beach	1	3	8	4
		Mt San Antonio	20	24	24	23

TOP Code	Program	College	2017-2018 Awards	2018-2019 Awards	2019-2020 Awards	3-Year Award Average
		Pasadena	-	1	1	1
		Rio Hondo	-	-	9	3
		West LA	-	4	15	6
		LA Subtotal	**30**	**40**	**82**	**51**
		Coastline	65	49	46	53
		Cypress	1	2	3	2
		Orange Coast	-	-	7	2
		OC Subtotal	**66**	**51**	**56**	**58**
Supply Subtotal/Average			**96**	**91**	**138**	**108**
0708.10	Computer Networking	Cerritos	8	11	9	9
		Glendale	6	3	3	4
		LA City	37	23	-	20
		LA Pierce	23	39	20	27
		Long Beach	27	55	47	43
		Mt San Antonio	2	8	11	7
		Rio Hondo	-	5	7	4
		West LA	43	77	48	56
		LA Subtotal	**146**	**221**	**145**	**171**
		Coastline	12	38	59	36
		Cypress	37	70	95	67
		Irvine	12	11	21	15
		Saddleback	17	10	21	16
		Santa Ana	7	14	12	11
		OC Subtotal	**85**	**143**	**208**	**145**
Supply Subtotal/Average			**231**	**364**	**353**	**316**
0708.20	Computer Support	Citrus	-	-	1	0
		Glendale	3	10	7	7
		LA Pierce	7	9	8	8
		Long Beach	1	8	14	8
		Pasadena	3	7	30	13
		LA Subtotal	**14**	**34**	**60**	**36**
		Cypress	1	3	5	3
		Santa Ana	10	9	-	6
		OC Subtotal	**11**	**12**	**5**	**9**
Supply Subtotal/Average			**25**	**46**	**65**	**45**

TOP Code	Program	College	2017-2018 Awards	2018-2019 Awards	2019-2020 Awards	3-Year Award Average
0709.00	World Wide Web Administration	Glendale	9	6	7	7
		LA Pierce	5	9	-	5
		Long Beach	4	22	24	17
		West LA	24	13	9	15
		LA Subtotal	**42**	**50**	**40**	**44**
		Saddleback	-	-	2	1
		LA Subtotal	**-**	**-**	**2**	**1**
		Supply Subtotal/Average	**42**	**50**	**42**	**45**
		Supply Total/Average	**666**	**843**	**970**	**826**

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 cybersecurity. Exhibit 3 shows the annual and three-year average number of awards conferred by these institutions in the related Classification of Instructional Programs (CIP) Codes: Computer and Information Sciences, General (11.0101), Information Technology (110103), Computer and Information Sciences, Other (11.0199), Computer Systems Analysis/Analyst (11.0501), Computer Systems Networking and Telecommunications (11.0901), Network and System Administration/Administrator (11.1001), System, Networking, and LAN/WAN Management/Manager (11.1002), Computer and Information Systems Security/Information Assurance (11.1003), Web/Multimedia Management and Webmaster (11.1004), Information Technology Project Management (11.1005), Computer Support Specialist (11.1006), and Computer Technology/Computer Systems Technology (151202). Due to different data collection periods, the most recent three-year period of available data is from 2016 to 2019. Between 2016 and 2019, four-year colleges in the region conferred an average of 1,106 awards annually in related training programs.

Exhibit 3: Regional non-community college awards, 2016-2019

CIP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
11.0101	Computer and Information Sciences, General	Azusa Pacific University	19	26	30	25
		Brand College	-	2	-	1
		Brandman University	26	20	20	22
		Chapman University	5	12	13	10
		Loyola Marymount University	19	42	32	31
		Pacific States University	1	-	2	1
		The Master's University & Seminary	7	6	7	7
		University of California-Irvine	1	-	1	1
		University of La Verne	19	18	39	25

CIP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
		University of the People	57	100	80	79
		Vanguard Univ. of Southern CA	-	1	-	0
11.0103	Information Technology	Abraham Lincoln University	-	1	1	1
		Brand College	28	37	50	38
		California Intercontinental Univ.	1	-	-	0
		CSU-Dominguez Hills	-	1	5	2
		CSU-Los Angeles	117	162	158	146
		CSU-Northridge	43	54	54	50
		Platt College-Anaheim	-	1	11	4
		Platt College-Los Angeles	-	-	6	2
		Stanbridge University	25	-	-	8
		Trident University International	74	93	75	81
		University of La Verne	-	-	3	1
		University of Phoenix-California	16	60	57	44
11.0199	Computer and Information Sciences, Other	Antioch University-Los Angeles	20	47	4	24
		Brand College	2	-	2	1
		CSU-Dominguez Hills	66	59	55	60
		CSU-Northridge	77	77	87	80
11.0501	Computer Systems Analysis/Analyst	Brand College	4	2	-	2
		DeVry University-California	94	55	49	66
		University of Phoenix-California	4	4	-	3
11.0901	Computer Systems Networking and Telecommunications	Brand College	2	-	2	1
		DeVry University-California	135	106	86	109
		Mt Sierra College	5	4	-	3
		University of Phoenix-California	27	18	3	16
11.1001	Network and System Administration/ Administrator	ABCO Technology	-	13	5	6
		Brand College	2	6	23	10
		California Intercontinental Univ.	-	1	3	1
		University of Phoenix-California	1	12	13	9
11.1002	System, Networking, and LAN/WAN Management/Manager	ABCO Technology	10	7	9	9
11.1003	Computer and Information Systems Security/ Information Assurance	Azusa Pacific University	3	-	-	1
		Learnet Academy	48	17	-	22
		Loyola Marymount University	-	-	-	-
		Mt Sierra College	8	13	-	7
		University of Phoenix-California	71	42	32	48

CIP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
11.1004	Web/Multimedia Management and Webmaster	ABCO Technology	12	17	24	18
		Pepperdine University	-	2	-	1
		University of Phoenix-California	4	-	1	2
11.1005	Information Technology Project Management	California Intercontinental Univ.	2	-	1	1
11.1006	Computer Support Specialist	Southern California Institute of Tech.	16	26	25	22
		University of Phoenix-California	1	2	-	1
15.1202	Computer Technology/ Computer Systems Technology	Learnet Academy	11	1	-	4
		Supply Total/Average	**1,083**	**1,167**	**1,068**	**1,106**

Appendix A: Occupational demand and wage data by county

Exhibit 4. Los Angeles County

Occupation (SOC)	2020 Jobs	2025 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)	2,042	2,339	297	15%	201	$44.21	$55.62	$67.93
Computer Network Support Specialists (15-1231)	4,017	4,146	129	3%	299	$26.78	$32.32	$40.09
Computer User Support Specialists (15-1232)	16,668	17,226	557	3%	1,246	$21.91	$28.02	$36.47
Computer Network Architects (15-1241)	3,491	3,507	16	0%	201	$41.80	$58.05	$72.55
Network and Computer Systems Administrators (15-1244)	7,912	7,983	71	1%	475	$35.43	$45.81	$57.01
Total	**34,130**	**35,201**	**1,071**	**3%**	**2,421**			

Exhibit 5. Orange County

Occupation (SOC)	2020 Jobs	2025 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)	987	1,161	174	18%	104	$43.05	$54.17	$66.21
Computer Network Support Specialists (15-1231)	1,685	1,747	63	4%	127	$26.58	$32.07	$39.83
Computer User Support Specialists (15-1232)	7,473	7,848	376	5%	588	$21.39	$27.35	$35.62
Computer Network Architects (15-1241)	1,658	1,704	46	3%	104	$40.98	$56.88	$71.04
Network and Computer Systems Administrators (15-1244)	3,218	3,313	95	3%	209	$34.80	$45.01	$56.06
Total	**15,020**	**15,773**	**753**	**5%**	**1,132**			

Exhibit 6. Los Angeles and Orange Counties

Occupation (SOC)	2020 Jobs	2025 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Typical Entry-Level Education
Information Security Analysts (15-1212)	3,029	3,499	470	16%	304	Bachelor's degree
Computer Network Support Specialists (15-1231)	5,701	5,893	192	3%	426	Associate degree
Computer User Support Specialists (15-1232)	24,141	25,074	933	4%	1,833	Some college, no degree
Computer Network Architects (15-1241)	5,149	5,211	62	1%	305	Bachelor's degree
Network and Computer Systems Administrators (15-1244)	11,130	11,296	167	1%	684	Bachelor's degree
Total	**49,150**	**50,974**	**1,824**	**4%**	**3,553**	

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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