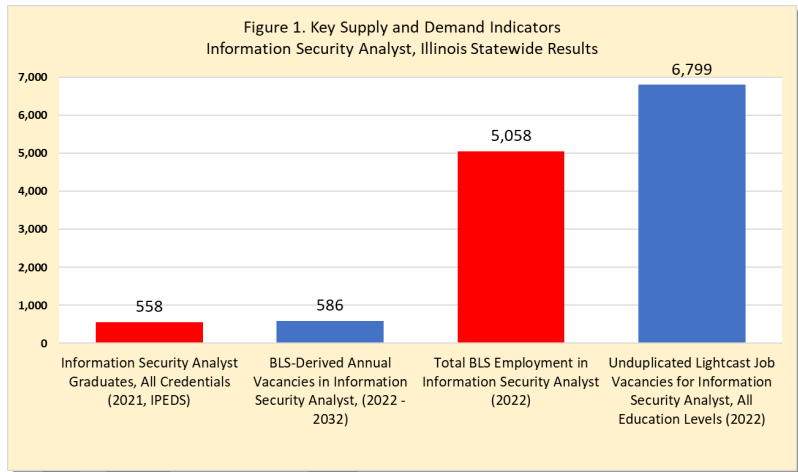


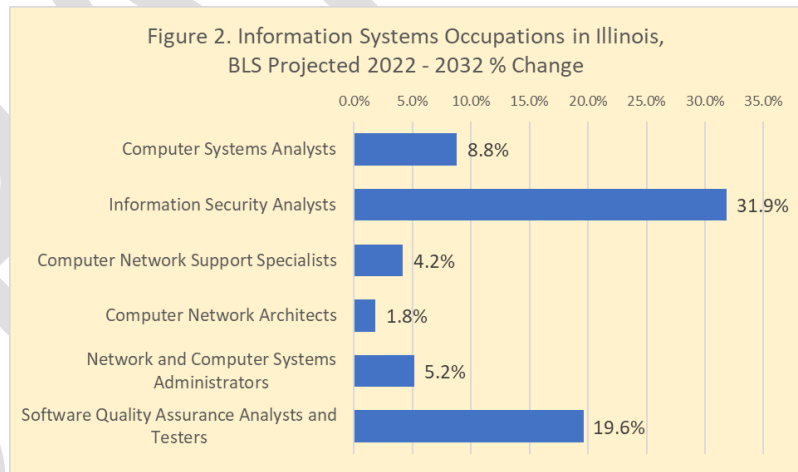
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In 24 states, community colleges offer bachelor's programs that provide local access and open economic and professional doors for students, but Illinois state law does not currently permit community colleges to do so. These occupational briefs provide information regarding career areas where these degrees may be needed in Illinois.¹

Information Security Analysts Overview: Information Security Analysts (SOC Code 15-1212)² plan and carry out security measures to protect an organization's computer networks and systems (i.e., cybersecurity). They monitor their organization's networks for security breaches and investigate when one occurs. The increased dependence on the Internet for e-commerce and other functions has increased the importance of this cybersecurity function in most organizations.ⁱ Robust employment growth is expected in this occupation over the next decade, particularly for baccalaureate-prepared job seekers. Projected job vacancies in Illinois are expected to exceed the current capacity for completers of all credential types (Figure 1)ⁱⁱ. Jobs in this occupation are well-paid, with a median annual salary in Illinois of about \$120,000.



Overall Demand Trends: Statewide employment of information security analysts is projected to grow by 32 percent between 2022 and 2032. This is by far the most rapid projected growth among all information systems occupations (Figure 2)ⁱⁱⁱ. The number of job vacancies projected by the Bureau of Labor Statistics (BLS) (which include net growth and replacements of those permanently leaving the



¹ This Occupational Brief was authored by Timothy Harmon, President, Workforce Enterprise Services (WES), and Debra Bragg, Bragg & Associates, Inc., with grant funding awarded to the Illinois Community College Trustees Association (ICCTA) led Jim Reed, Jr. J.D., Executive Director of ICCTA. We appreciate the generous funding and support that we have received from the Joyce Foundation and ICCTA to carry out this research.

² Demand data, which includes data on current and projected employment, as well as earnings, are organized around occupational codes such as the Standard Occupational Classification (SOC) codes. SOC 15-1212 is the occupational code for Information Security Analysts.

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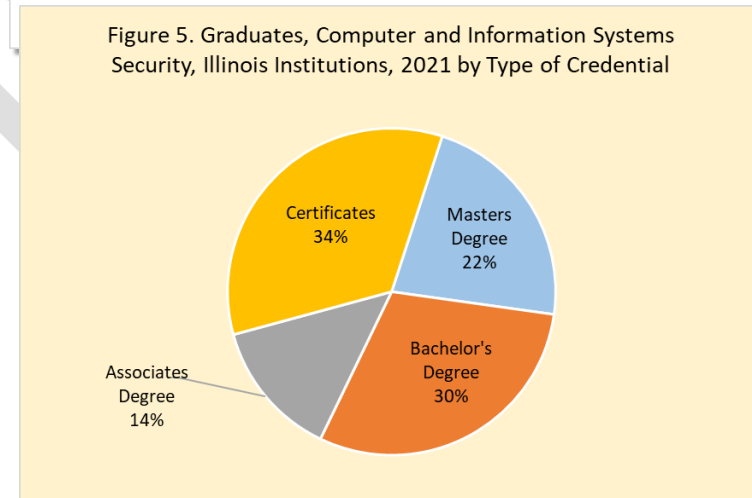
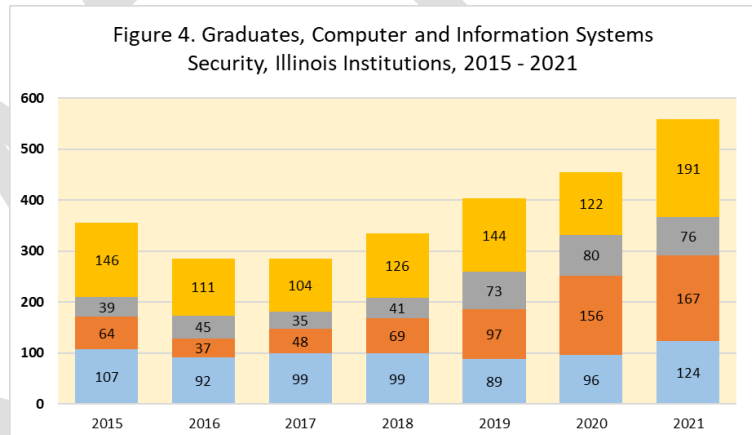
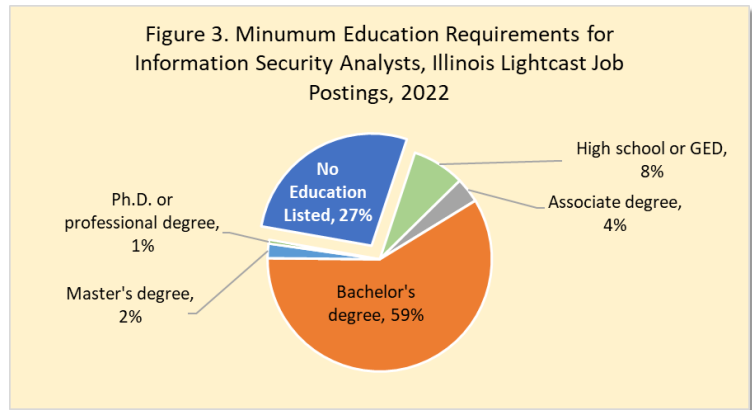
occupation) is 586 per year over the next ten years. Lightcast unduplicated on-line job vacancies in 2022 (which includes turnover as well as net change in jobs) is 6,799, which is many times the number of graduates from Illinois schools (558) (Figure 1).

Demand for Baccalaureate Graduates:

Employers are seeking to hire employees with baccalaureate degrees or higher for most job openings in this occupation. Sixty-two percent of all 2022 Lightcast job openings included a minimum educational requirement of a bachelor's degree or higher (Figure 3). This percentage should be considered a floor, since the 62 percent figure is computed on a base that includes 27 percent of total job openings for which employers did not mention any educational preference. Many of these employers may in fact prefer to hire those with a particular degree. If we look at those job openings where the employer specified a maximum educational preference (i.e., two or more education levels were mentioned), 99 percent of those openings requested a baccalaureate degree or higher.^{iv}

Supply Trends in Computer and Information Systems Security Programs:

Illinois colleges and universities have substantially increased their conferral of all credential types in Computer and Information Systems Security programs of study (CIP Code 11.1003)³, particularly since 2016 (Figure 4). By far the strongest growth has been in the baccalaureate category, which now represents 30 percent of all completions (Figure 5). However, the 167 bachelor's degree conferrals in 2021 (latest year available)

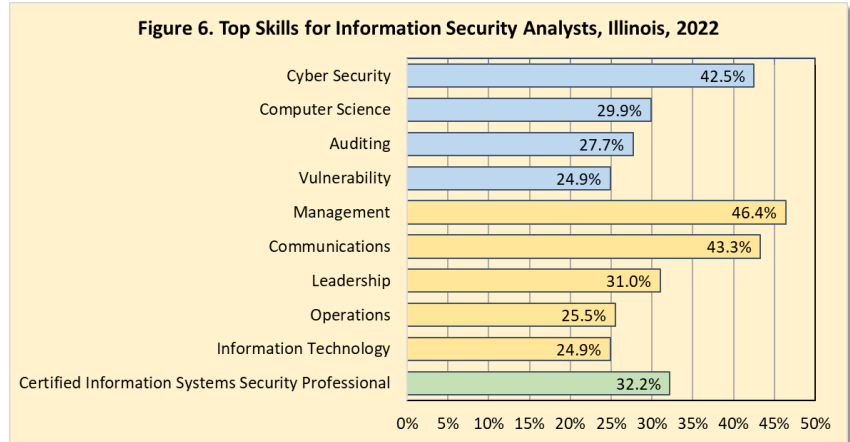


³ Supply data, which includes data on graduates of postsecondary institutions, are organized around program codes, using the Classification of Instructional Program (CIP) system. CIP 11.1003 is the program code for Computer and Information Systems Security, which is the instructional program that is most closely related to the Information Security Analyst occupation. See page six for a discussion of this program in its broader computer science context.

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are still short of the number of graduates needed to fulfill even the most conservative estimate of demand for these positions (Figure 1).

Top Skills for Information Security Analysts: Illinois employers with job openings for Information Security Analysts seek specialized skills such as cybersecurity and computer science, and common skills such as management and communications. Information Systems Security Professional certification is a qualification also frequently sought for these job openings (Figure 6)^v. The skill requirements in Figure 6 are for all job openings, regardless of the educational levels included in the online posting.



Regional Overview: Table 1 shows the extent of job demand in each of the state’s official economic development regions. The strongest demand is in the Chicago metro region, which represents 67 percent of current employment, 55 percent of projected annual vacancies, and 79 percent of current Lightcast job openings. There is also substantial demand in other parts of the state, particularly the North Central and Southwestern regions. Median earnings vary widely across the regions, from a low of \$79,000 to a high of \$124,000. See Attachment 1 for a map of these regions.

Table 1. Regional Demand for Information Security Analysts, Illinois, 2022 - 2032^{vi}					
Illinois Economic Development Regions ^{vii}	Base year employment total (2022)	Projected year employment total (2032)	Median annual earnings	Projected annual vacancies	Most recent period Lightcast job postings count (2022)
Central Illinois Region 1	167	206	\$98,712	17	194
East Central Illinois Region 2	106	139	\$105,152	12	67
North Central Illinois Region 3	368	443	\$100,757	37	275
Northeast Illinois Region 4	3,046	3,816	\$102,869	325	5,370
Northern Illinois Stateline Region 5	80	96	\$78,919	8	79
Northwest Illinois Region 6	161	163	\$104,832	14	93
Southeastern Illinois Region 7	73	96	\$123,606	8	18
Southern Illinois Region 8	44	66	\$113,866	6	15
Southwestern Illinois Region 9	409	493	\$114,379	41	336
West Central Illinois Region 10	21	27	\$86,108	2	12
Statewide Estimate	5,058	6,655	\$119,924	586	6,799

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Top Schools: Table 2 shows the schools with at least five graduates in this program area in 2021, along with the number of these graduates by type of credential and the cost for in-state tuition and fees for each institution. Students attending 12 public community colleges (highlighted in green) account for 46% of the total graduates in all computer and information systems security programs, with all these colleges offering certificates and six awarding associate degrees. Enrollment in six private universities (yellow) accounts for 38% of the total, with two public universities making up only 16% of the total. Average tuition and fees vary greatly by institution type, from about \$3,800 for community colleges to about \$10,300 for public universities to almost \$40,000 for private universities.

Table 2. Top Schools in Illinois for Computer and Information Systems Security^{viii}							
School	Certificates	Associate Degree	Bachelor's Degree	Master's Degree	All Completions	In-District Avg. Tuition, Full-Time Undergrads.	State Region
DePaul University	0	*	29	82	111	\$41,361	4
Illinois State University	5	*	64	*	69	\$10,932	3
Moraine Valley Community College	47	19	*	*	66	\$3,144	4
Illinois Institute of Technology	*	*	1	28	29	\$48,555	4
Lewis University	*	*	13	14	27	\$35,262	4
City Colleges of Chicago-Wilbur Wright College	24	0	*	*	24	\$4,380	4
College of DuPage	23	*	*	*	23	\$3,240	4
John A Logan College	*	22	*	*	22	\$3,990	8
Rock Valley College	9	13	*	*	22	\$3,600	5
University of Illinois Springfield	*	*	19	*	19	\$9,645	1
Southwestern Illinois College	18	*	*	*	18	\$3,390	9
Loyola University Chicago	*	*	17	*	17	\$46,410	4
Rend Lake College	8	9	*	*	17	\$3,300	8
Spoon River College	16	*	*	*	16	\$4,470	3
Elgin Community College	5	4	*	*	9	\$3,168	4
Joliet Junior College	9	*	*	*	9	\$3,390	4
Olivet Nazarene University	*	*	9	*	9	\$36,450	4
Carl Sandburg College	8	*	*	*	8	\$5,200	10
City Colleges of Chicago-Malcolm X College	7	*	*	*	7	\$4,380	4
Roosevelt University	*	*	6	*	6	\$31,493	4
Totals	179	67	158	124	528		

*Not Offered. Zero values indicate the credential was available, but none were awarded in the academic year.

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Percentage of Racially Minoritized Graduates: Table 3 shows gender and racial/ethnic percentages for Illinois schools with at least 50 graduates in Information Systems Security from 2017 to 2022. The highlighted cells are where the percentage exceeds the statewide percentage for that category. This table shows that there are substantial differences in the racial and ethnic distribution of graduates across institutions. For example, the percentage of Black graduates varies from 1.5 to 21.4 percent, and the percentage of Hispanic/Latinx graduates varies from zero to 39.3 percent. The percentage of graduates that are female varies from 8.2 to 32.1 percent. Community colleges, public universities and private colleges are each represented among those schools reaching a diverse population. Having a mix of higher ed institutions may provide greater diversity in graduates and could help the state meet its equity goals for baccalaureate attainment in this field, particularly for Black, Latinx and female students.

Table 3. Racial and Gender Diversity in Illinois Schools for Computer and Information Systems Security^{ix}									
Institution	Total Credentials Conferred	% Female	% Black	% American Indian/Alaskan Native	% Hispanic/Latinx	% Asian	% Native Hawaiian/Other Pacific Islander	% White	% Multi Racial
DePaul University*	498	20.5	5.4	0.0	12.0	10.2	0.0	36.3	1.2
Illinois State University	259	10.8	5.4	0.4	8.1	4.6	0.0	72.6	3.1
Moraine Valley Community College	258	14.7	5.0	0.0	20.5	3.5	0.0	60.1	2.7
Lewis University*	250	22.8	10.0	0.0	11.2	8.0	0.4	37.2	4.0
College of DuPage	194	8.2	6.2	0.0	11.3	11.9	0.5	60.8	2.1
John A. Logan College	125	16.8	4.0	2.4	0.0	4.0	0.0	84.8	0.0
University of Illinois Springfield	106	17.0	11.3	0.0	5.7	8.5	0.0	69.8	2.8
Illinois Institute of Technology*	102	20.6	2.9	0.0	12.7	6.9	0.0	19.6	2.0
Rock Valley College	78	14.1	7.7	0.0	10.3	0.0	0.0	78.2	2.6
Southwestern Illinois College	72	19.4	12.5	0.0	2.8	2.8	0.0	61.1	12.5
Loyola University of Chicago	66	22.7	1.5	0.0	12.1	21.2	0.0	57.6	3.0
CCC - Wilbur Wright College	56	32.1	21.4	0.0	39.3	8.9	0.0	28.6	1.8
Statewide Totals	2,435	17.5	7.4	0.2	12.1	6.9	0.1	54.9	2.5

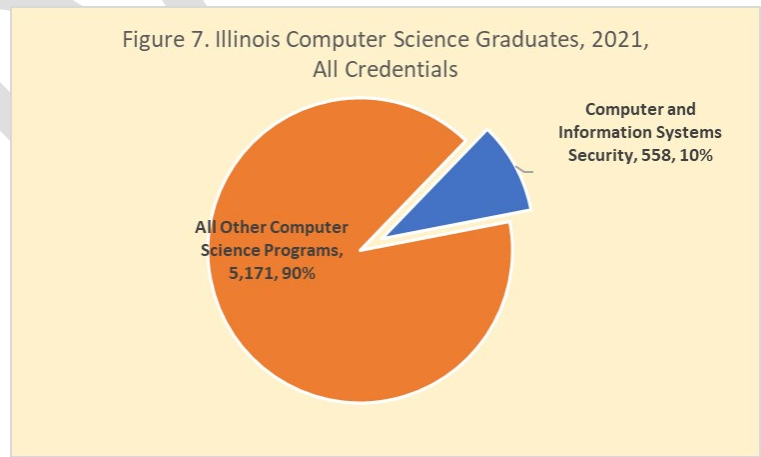
* Race/ethnicity data for these institutions may not be reliable, as “unknown race/ethnicity” was reported for more than ten percent of graduates during the period.

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Top Employers: Table 4 shows the thirteen Illinois employers that had over 50 unique job openings for Information Security Analysts during 2022, along with the number of job postings in 2022.

Table 4. Top Illinois Employers for Information Security Analyst Job Openings, Illinois 2022^x	
Company	Unique Postings (Jan 2022 - Dec 2022)
Edward Jones (Multiple locations, headquarters in St. Louis)	228
KPMG (Chicago, Lisle, St. Louis)	225
Request Technology (Naperville)	209
Bank of America (Chicago)	121
TEKsystems (Multiple locations)	109
Randstad (Multiple locations)	107
Elevance Health (Chicago, headquarters in Indianapolis)	71
Northern Trust (Chicago)	71
Jacobs Engineering Group (Chicago)	59
Deloitte (Multiple locations)	58
Wells Fargo (Multiple locations)	56
Capital One (Multiple locations)	55
Uline (Headquarters in Kenosha)	55

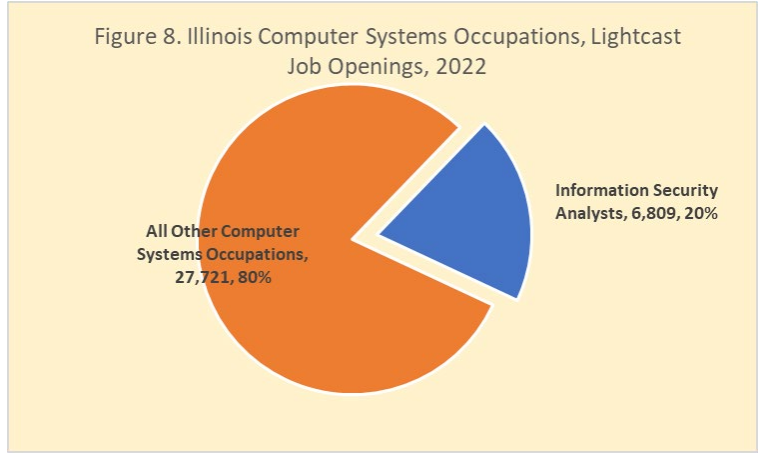
Information Security Analysts in the Broader Occupational and Program Context: The supply and demand for Information Security Analysts exist within the broader context of overall demand for computer systems occupations, and the overall supply of graduates from related computer science programs of study. When we look at this broader context, we see that the overall demand for jobs across the computer systems occupational category is many times the number of total graduates of Illinois schools in all computer science programs of study (Figures 7 and 8)^{xi}. In 2021, Illinois schools produced 5,729 computer science graduates across all related programs and credential types. In contrast, during 2022 there were 34,530 Lightcast job openings across all computer systems occupations. It is important to look at this broader context since there is not a one-to-one correspondence between information security analyst job demand and the graduates of computer and information



system security programs of study. In other words, graduates of other computer science programs may be able to compete for information security analyst openings, and graduates of computer and information systems security programs may be able to compete for jobs in software quality assurance, systems analysis, and other related occupations. In addition, these data show that while computer and information

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systems security program graduates constitute just 10% of all computer science graduates across all credential types, information security analysts made up 20% of all computer systems related Lightcast job openings in 2022, suggesting that there is disproportionate demand for employees in this occupation compared to other computer systems jobs. These Lightcast job openings data, which reflect the current needs of Illinois employers, provide better insight into where the job market is heading than past program graduates, which reflect institutional and student choices made some years ago.



Conclusion: Illinois should take steps now to expand baccalaureate capacity for the preparation of graduates for job openings as Information Security Analysts. This recommendation is supported by the following findings:

- Cybersecurity is a mission-critical function across the economy and will continue to grow in importance.
- There is very strong projected employment growth (32 percent over next ten years) and excellent earnings for information security analysts as measured by BLS. Statewide median earnings are \$120,000.
- There is robust current job demand for this occupation as measured by Lightcast on-line job openings, including disproportionate demand for employees in this occupation compared to other computer systems jobs. There were 6,800 Lightcast job openings in 2022.
- Nearly eighty percent of the current job openings for this occupation is in the Chicago metro area, but substantial demand also exists in other regions, such as the North Central and Southwestern regions.
- Employers have a very strong preference (at least 60 percent) for baccalaureate-prepared employees in this occupation, based on current job openings.
- Illinois benefits from numerous schools offering an array of credentials in the computer and information systems security program, from short-term certificates to advanced degrees. Nearly half of all graduates are from certificate or associate programs at community colleges.
- Although the number of baccalaureate program graduates has increased in recent years, current graduate production from these programs (167 in 2021) is still far below even the most conservative estimate of demand for bachelor's-prepared workers (60 percent of the BLS annual vacancies, or approx. 350). While information security analysts constitute 20 percent of job openings across all computer systems occupations, they comprise on 10 percent of program graduates across all computer science programs in the state.

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- There are substantial differences in the racial and ethnic distribution of graduates across institutions in this program. Community colleges, public universities and private colleges are each represented among those schools reaching a diverse population.

Several Illinois community colleges may be well-positioned to help respond to the unmet need for baccalaureate-prepared employees, if state policy could be changed to allow this, as it has been in 24 other states.

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Attachment 1

Illinois Economic Development Regions



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Endnotes

ⁱ Bureau of Labor Statistics, U.S. Department of Labor, *Occupational Outlook Handbook*, Information Security Analysts, at <https://www.bls.gov/ooh/computer-and-information-technology/information-security-analysts.htm> (visited April 12, 2023).

ⁱⁱ The data in Figure 1 are derived from three Lightcast reports: the Program Table, the Occupation Table, and the Job Posting Analytics report, each from Lightcast Q2 2023 Data Set, July 2023.

ⁱⁱⁱ Occupation Table, 6 Computer and Mathematical Occupations in Illinois, Lightcast Q3 2023 Data Set, July 2023.

^{iv} Occupation Table, Information Security Analysts in Illinois, Lightcast Q2 2023 Data Set, July 2023.

^v Job Posting Analytics, Information Security Analysts in Illinois, Lightcast Q2 2023 Data Set, July 2023.

^{vi} Occupation Table, Information Security Analysts in each Illinois region, Lightcast Q2 2023 Data Set, July 2023.

^{vii} Illinois' Economic Development Regions were determined based on the following factors: Workforce: Demographics, Labor Force, Commuting Patterns. Geography: Metropolitan Statistical Areas (MSAs). Business & Industry: Employers & Major Industries. These regions were originally defined in 2003 and reaffirmed in 2017. Sources: Illinois WorkNet Local Workforce Innovation Area Realignment Briefing, September, 2018, and Illinois WIOA State Plan Two-Year Modification, PY 2018-2019, found at <https://wioaplans.ed.gov/node/196646>.

^{viii} Program Table, Computer and Information Systems Security/Auditing/Information Assurance in Illinois, Lightcast Q2 2023 Data Set, July 2023. Displaying schools with at least five graduates for the sum of all credential types.

^{ix} Enrollment and completion data from the Illinois Board of Higher Education (IBHE), August 2023. Table 3 includes Illinois schools with at least 50 total graduates of any credential type during the 2016-2017 to 2021-2022 academic years. Note: race/ethnicity data are not reported for international students, and totals include graduates whose race/ethnicity is unknown. Therefore, totals of these percentages will usually not sum to 100 percent.

^x Job Posting Analytics, Information Security Analysts in Illinois, Lightcast Q2 2023 Data Set, July 2023.

^{xi} The data in Figures 7 and 8 are derived from two Lightcast reports: the Program Table, and the Job Posting Analytics report, each for related computer and information systems occupations and programs in Illinois, Lightcast Q2 2023 Data Set, July 2023.