



# CareerSource Florida

## Credential Review and Analysis



# About

Lightcast is the world's leading authority on job skills, workforce talent, and labor market dynamics, providing expertise that empowers businesses, education providers, and governments to find the skills and talent they need and enabling workers to unlock new career opportunities. Headquartered in Boston, Massachusetts, and Moscow, Idaho, Lightcast is active in more than 30 countries and has offices in the United Kingdom, Italy, New Zealand, and India. The company is backed by global private equity leader KKR.

**Lightcast**  
**232 N Almon Street**  
**Moscow, ID 83843**  
[lightcast.io](https://lightcast.io)

## Acknowledgements

Lightcast gratefully acknowledges the support of CareerSource Florida. This report is prepared for CareerSource Florida by Lightcast. The content is solely the responsibility of the author and does not necessarily represent the official views of CareerSource Florida. Proper acknowledgement of Lightcast should be included in publications, presentations, or other developed materials.

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# Introduction

## **The REACH Act and a Framework of Quality for Credentials**

CareerSource Florida is the statewide workforce policy and investment board charged with aligning Florida's local workforce development boards under the 2021 Reimagining Education and Career Help (REACH) Act. The REACH Act is a comprehensive blueprint for enhancing access, alignment, and accountability across the state's workforce development system. The REACH Act established a Credentials Review Committee (CRC) for the state of Florida whose primary role is to develop a Master Credentials List that identifies degree and non-degree credentials that meet specific statutory criteria including linkages to in-demand occupations with middle- to high-level wages. These criteria are collectively referred to as the Framework of Quality, a rubric used to identify credentials of value.

Prior to the passing of the REACH Act in July 2021, the Florida Department of Education received a grant from the Bill and Melinda Gates Foundation and contracted with Education Strategy Group (ESG) to create a definition for credentials of value. When the REACH Act became law, ESG's work was brought in line with the new statutory requirements. ESG produced a final report in March 2022, describing how it created a draft list of credentials of value utilizing the data and tools available at the time. The final ESG report also indicated several questions and considerations for the CRC to contemplate as this work continues.

## **From a Framework of Quality to a Sequence of Credentials of Value**

One of the critical elements of the Framework of Quality is determining how a non-degree credential that does not meet a wage threshold may be evaluated for its place in a sequence of credentials required for the next level occupation that does meet a wage threshold.

For this evaluation and analysis, CareerSource Florida has partnered with Lightcast, a leader in advanced labor market analytics. Lightcast maintains two proprietary data sources that can be leveraged to identify credentials of value within career pathways leading to high-wage jobs: an exhaustive collection of online job postings listed by Florida-based employers, and online profiles from professional networking websites of Florida-based workers. These real-time sources of labor market intelligence connect credentials to occupations and reveal the realized career pathways of credential earners.

Lightcast completed the following stages of work to determine which sequences of credentials put learners on career paths to high-wage jobs:

- Stage I: Establish and validate occupational linkages for all industry certifications, non-degree credentials, and licenses provided by the Credentials Review Committee.
- Stage II: Evaluate, identify, and propose quantitative elements that establish a sequence of credentials using realized occupational career pathways and credential-to-occupation linkages.
- Stage III: Map career pathways within industry sectors to establish a well-defined sequence of credentials.

# Key Findings

## Stage I: Occupational linkages for approved credentials

Lightcast extended prior work that linked credentials to occupations in the Standard Occupation Classification (SOC) taxonomy maintained by the Bureau of Labor Statistics. For detailed information on the approach that Lightcast took to establish and validate linkages between credentials and occupations, see the Methodology section.

### **Key Findings**

- Labor market signals, including the frequency with which employers and workers refer to credentials in job postings and resumes, can be used to validate the value of a credential and establish linkages between credentials and occupations.
- About 57% of credentials were found to have signaling value in the labor market, while around 43% of credentials do not pass the relatively low bar of signaling value. The percentage of credentials that have signaling value differs by credential type, with industry certifications generally leading other types of credentials in terms of alignment. The top credentials with signaling value by supply and demand are shown in the charts below.
- Labor market signaling for credentials is driven by employer demand (as seen in job postings data) rather than by individual job seekers.
- Credentials in Information Technology, Business, and Healthcare have the greatest signaling value in the labor market.

Credentials have a human capital value and a signaling value, both of which are important factors in assessing a credential's total value.

### **Human Capital Value**

The human capital value of a credential encapsulates the knowledge, skills, and abilities gained over the course of earning the credential. The human capital value of a credential is typically validated by a test, capstone project, hours of experience requirement, or another mechanism which ensures that the expected knowledge, skills, and abilities were indeed learned over the course of credential attainment.

### **Signaling Value**

The signaling value of a credential represents how well the credential serves as an expression for those knowledge, skills, and abilities in a labor market where job seekers and employers do not have perfect information about each other. In cases where employers are not able to test for certain knowledge, skills, or abilities, they might rely on a credential to positively signal that the credential holder has them. Lightcast tested this signaling value by querying online job postings and professional profiles.

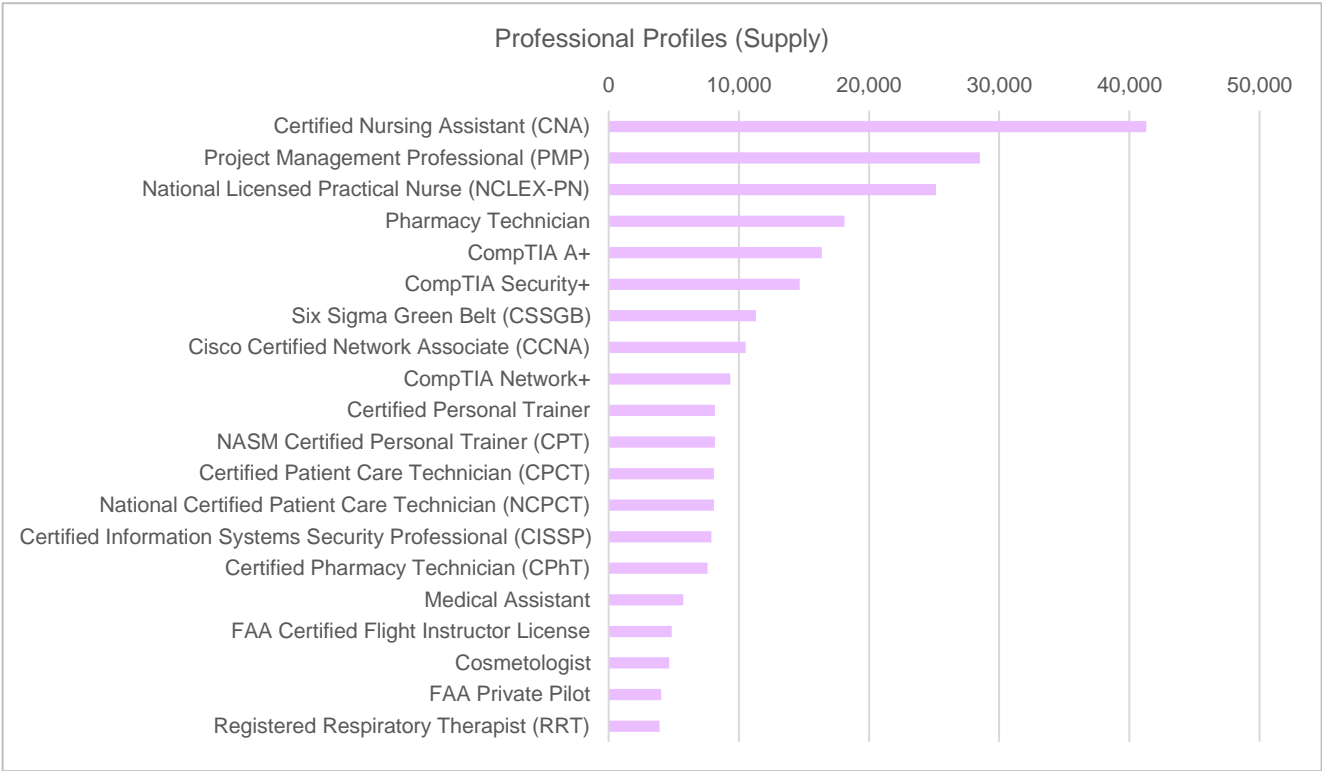
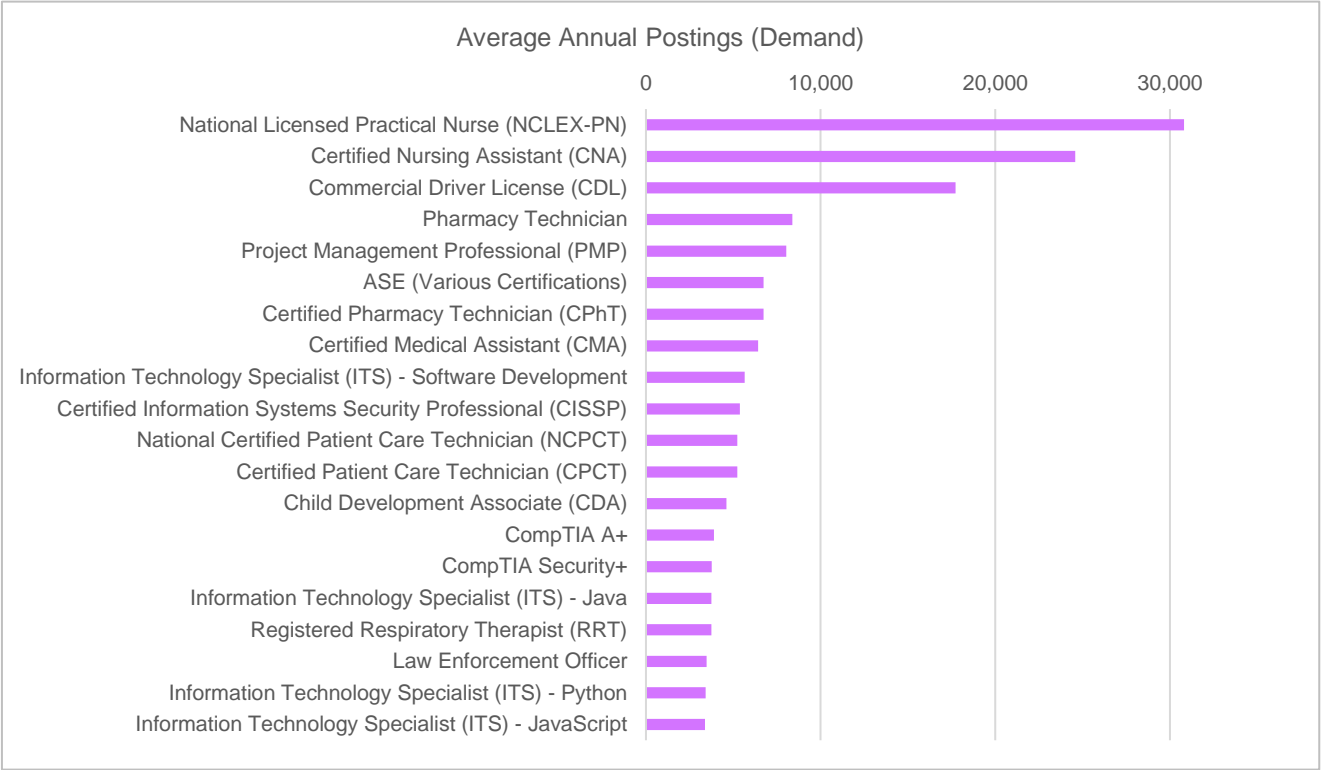
An indication of the signaling value of a credential is that employers and job seekers are referencing the credential when they interact with the labor market, as in the case when employers request credentials on job postings or job seekers advertise credentials on their resumes.

To assess the signaling value of a credential, Lightcast leveraged the queries detailed in the methodology section below (p. 15) titled Establishing Occupation (SOC) Linkages to Credentials. These queries search through Lightcast's databases of online job postings and online profiles from professional networking sites to aggregate references to each credential on the 2022-23 FDOE Approved Industry Certification List.

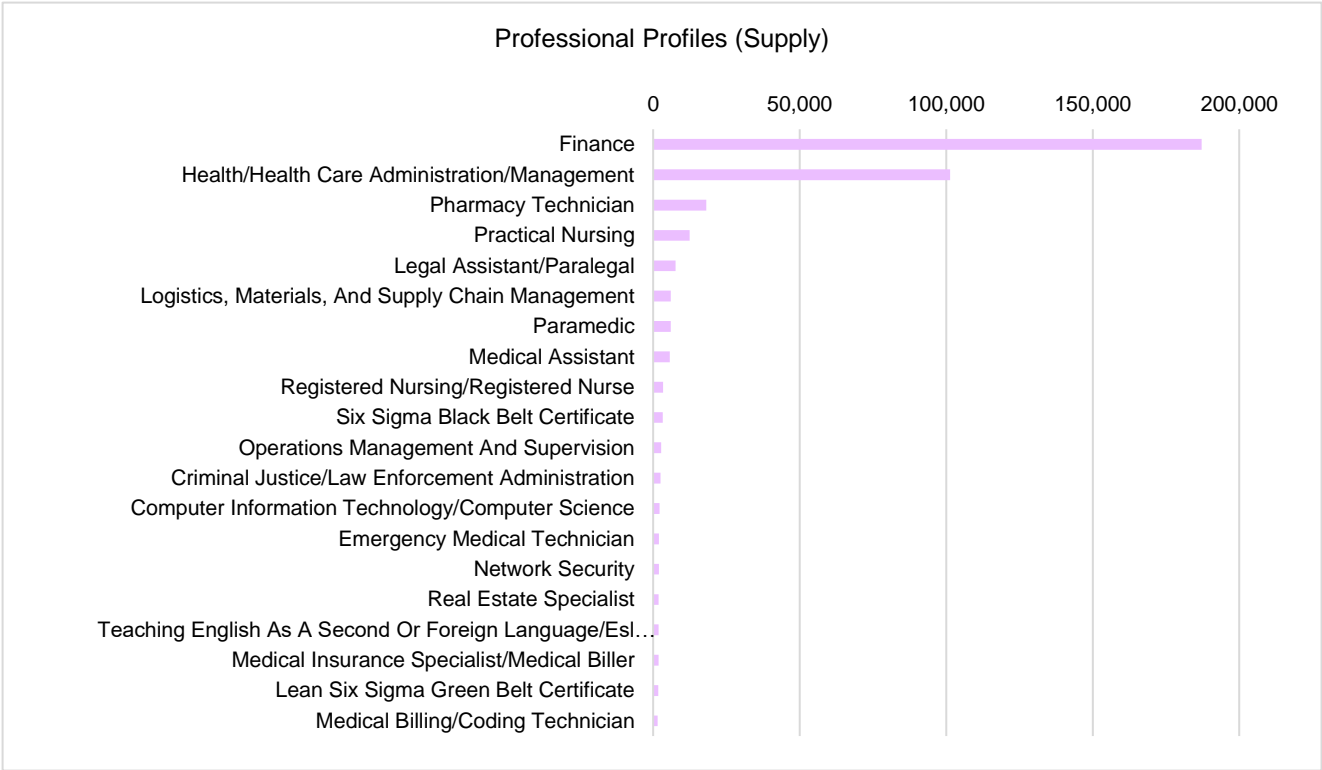
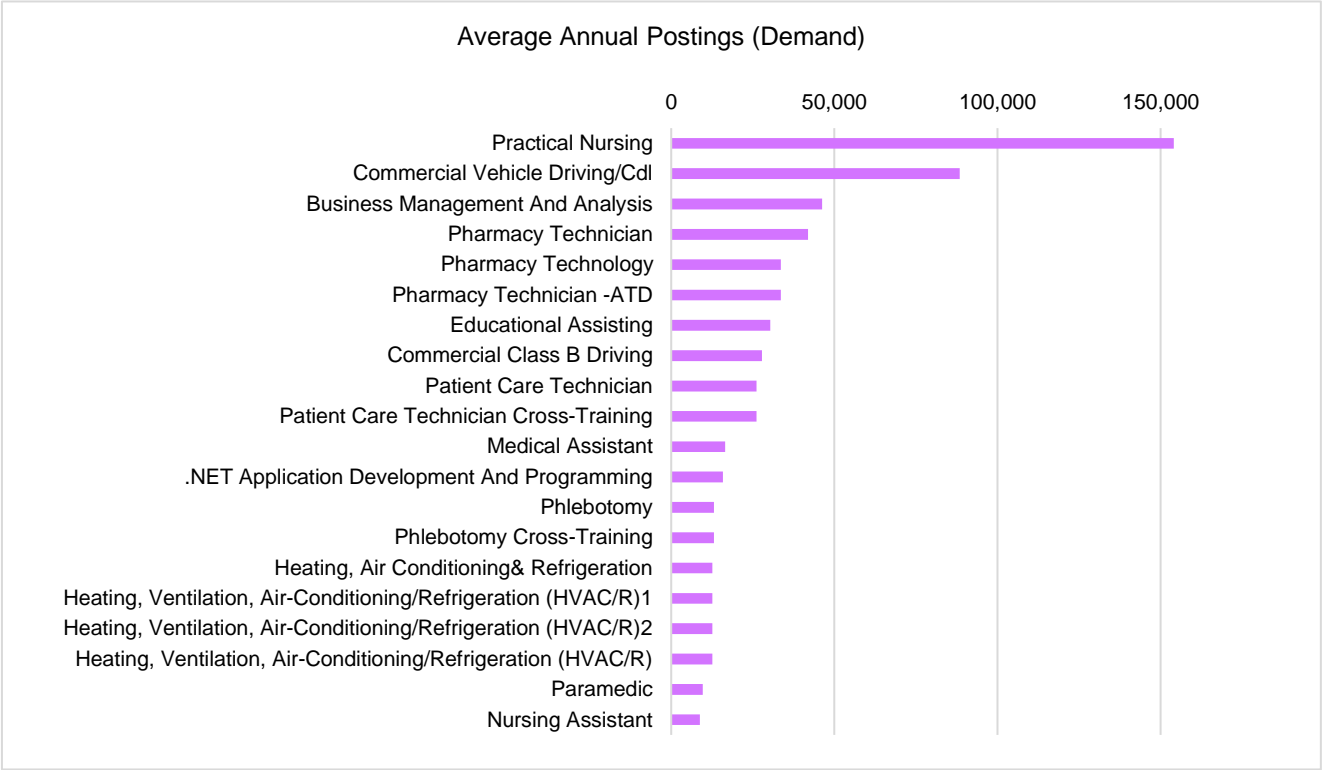
The signaling value results by credential type and the most highly signaled credentials are shown below.



**Industry Certifications – 70% have signaling value (447 out of 640 credentials)**

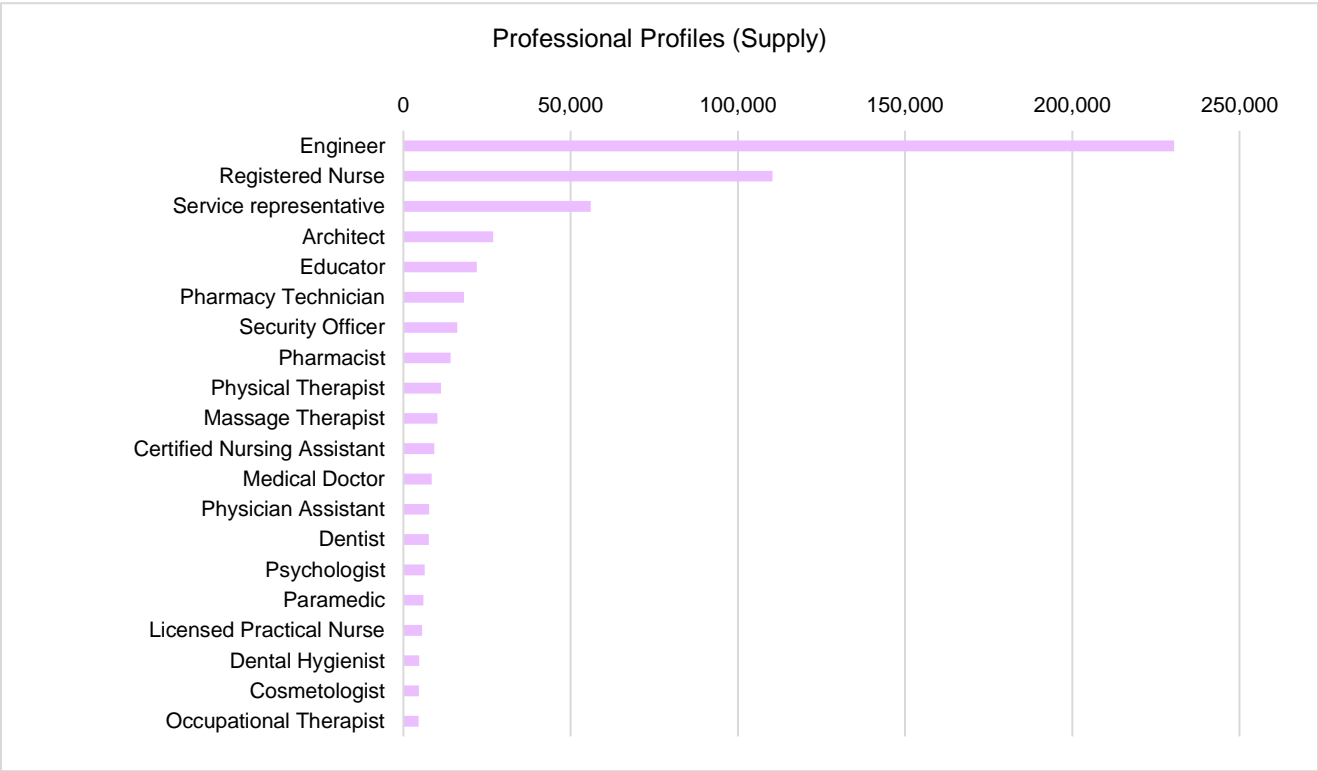
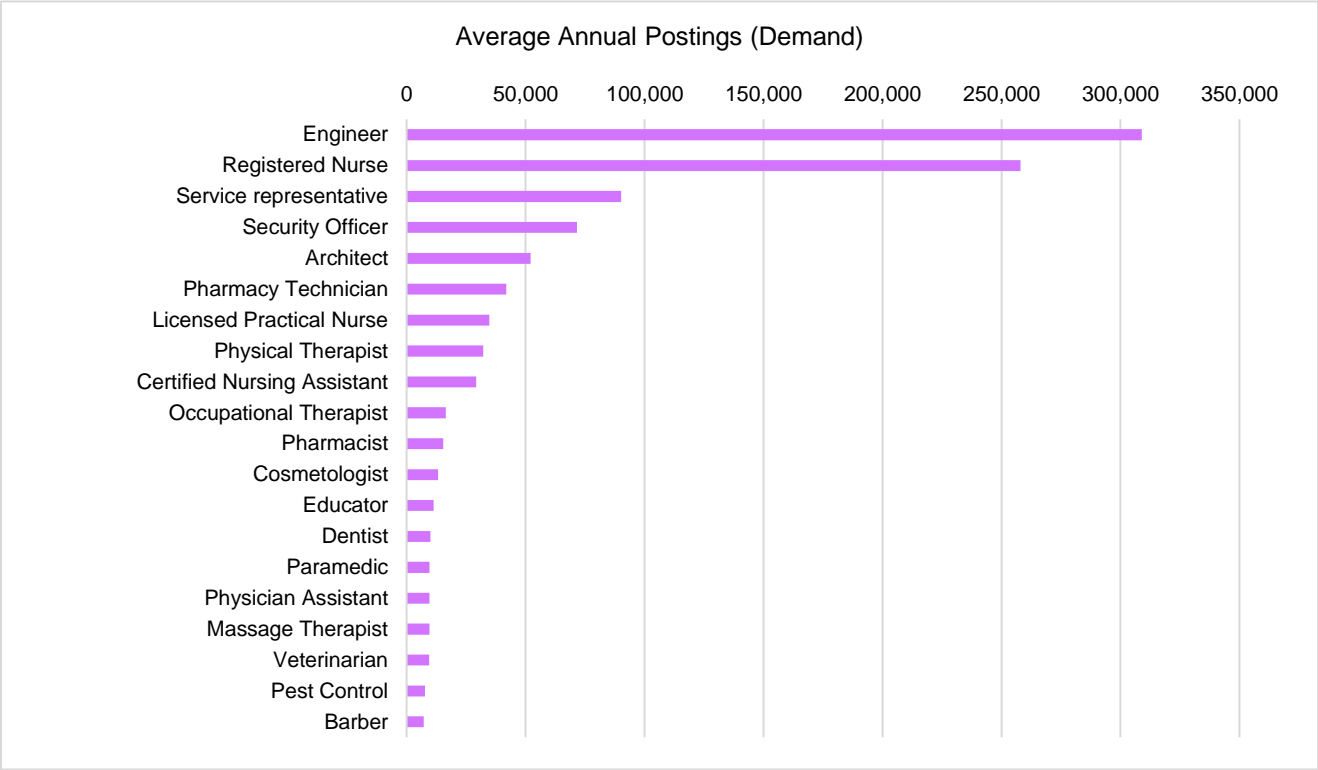


**Non-degree Programs – 46% have signaling value (321 out of 694 credentials)**





**Licenses - 53% have signaling value (86 out of 162 licenses)**



## Stage II: Sequencing credentials based on wage thresholds

Lightcast reviewed how often the occupations linked to credentials met the wage threshold for the respective education level set by the Credentials Review Committee using the Florida Labor Market Estimating Conference statewide wage summary report, which is detailed in the table below.

### ***Wage Thresholds set by the Credentials Review Committee***

	<b>Representative Starting Wage</b>	<b>Average Annual Wage</b>	<b>High-Level Wage Threshold</b>
All Occupations	\$20,530	\$50,020	\$59,380
No formal educational credential	\$19,160	\$28,040	\$31,470
High school diploma or equivalent	\$22,200	\$42,430	\$50,240
Some college, no degree	\$21,770	\$40,290	\$48,230
Postsecondary nondegree award	\$23,930	\$42,240	\$50,620
Associate's degree	\$25,650	\$53,480	\$67,370
Bachelor's degree	\$34,890	\$80,570	\$96,750
Master's degree	\$34,490	\$78,040	\$99,590
Doctoral or professional degree	\$45,510	\$134,520	\$170,700

### **Key Findings:**

- Advertised wages on postings (requesting less than a bachelor's degree and no more than two years of experience) for the occupations linked to credentials are typically greater than the representative starting wage, but only greater than the average annual wage for a slim majority of credentials and only greater than the high-level wage for 16% of credentials.
- Most sequences do not change wage levels. Averaged out across the most commonly realized transitions between occupations, only a small percentage climb over the average annual if they were not over it already. This highlights the importance of being selective and targeted about promoted sequences and pathways, rather than overemphasizing the notion that graduates will naturally transition to a job that meets wage thresholds just because they earned a first credential.

The representative starting wage threshold is sufficiently low such that all linked occupations have higher average wages as advertised in job postings. The average annual wage threshold is often nearly double the representative starting wage threshold. Overall, just over half (52%) of linked occupations have a higher wage as advertised in job postings than the average annual wage threshold. Only 16% of linked occupations beat the high-level wage threshold. This figure is lowest among jobs that require a high school diploma or equivalent and jobs that require an associate's degree.

***Number of linked occupations and the percent of those occupations that beat wage thresholds***

	Total Linked Occupations	Beat Representative Starting Wage	Beat Average Annual Wage	Beat High-Level Wage
Less than high school diploma	277	100%	68%	52%
High school diploma or equivalent	2,188	100%	51%	9%
Some college, no degree	926	100%	60%	26%
Associate's degree	393	100%	21%	8%
Overall	3,784	100%	52%	16%

Not all career pathways put credential earners on a trajectory towards a better wage. In fact, while 30% of credentials beat the average annual wage threshold, only an additional 1% of credentials beat the average annual wage threshold when comparing the next-level occupation rather than the initial occupation linked to the credential. In order to get the most out of a sequence of credentials based on career pathways, it is important to identify the precise pathways that set up credential earners to gain higher wages.

***Additional percent of credentials that beat wage thresholds in next-level occupations***

	Beat Representative Starting Wage	Beat Average Annual Wage	Beat High-Level Wage
Percent of credentials with wage data that beat wage thresholds with initial linkages	99%	30%	8%
Additional percent of credentials that beat wage thresholds with next-level linkages	0%	1%	0%



## Stage III: Sector-based sequences of credentials

Lightcast leveraged the linked occupation titles to identify credentials associated with each Industry Sector (at the two-digit SOC level) and build sector-focused credential pathways. In total, there are over 370,000 within-industry transitions. By contrast, when transitions are limited only to those where (1) the next-level occupation is above the average wage threshold and (2) there is a salary premium of at least 10% from occupation to occupation, there are nearly 66,000 within-industry transitions. These latter transitions are referred to below as high-quality sequences.

Full transition data can be found in the accompanying spreadsheet and key sector-focused pathway maps can be found in the appendix.

### Key Findings:

- The table below shows the total number of high-quality sequences within each sector.
- Computer and Information Technology sequences are versatile and cover a range of disciplines (help desk support, design, software development, and more).
- Sales sequences focus largely on automotive sales, parts sales, and machinery sales.
- Office and Administrative Support has a range of customer service and business support sequences.
- Many sequences in Production and Construction overlap with several in Extraction.



The characteristics of credential sequences differ by industry sector. Within some sectors—such as among computer and technical jobs and among installation, maintenance, and repair jobs—there are many competing credentials that link to the same occupations. The competition of credentials within a sector can push down the cost of the first credential in a sequence but can also make it challenging to assess the relative merits of different credentials that link to the same target occupation. In other sectors, such as among healthcare jobs and engineering jobs, there is more often a single credential linked to a given target occupation. The existence of a first-best credential for a given occupational target can make sequencing a credential-based career pathway more straightforward, but it can also drive up the cost of credentialing.

***Number of sequences by industry cluster***

<b>Cluster</b>	<b>Quality Sequences</b>	<b>All Sequences</b>	<b>Quality Share of Sequences</b>
Installation, Maintenance and Repair	31,136	177,471	18%
Computer and Mathematical	13,852	68,798	20%
Construction and Extraction	5,814	11,241	52%
Office and Administrative Support	4,777	17,819	27%
Sales and Related	4,094	13,415	31%
Protective Services	2,081	8,359	25%
Production	1,442	4,646	31%
Healthcare Practitioners and Technical Occupations	968	11,455	8%
Business and Financial Operations	869	8,616	10%
Transportation and Material Moving	369	1,541	24%
Architecture and Engineering	273	17,244	2%
Food Preparation and Serving Related	98	2,269	4%
Healthcare Support	72	7,661	1%
Personal Care and Service	52	2,792	2%
Arts, Design, Entertainment, Sports and Media	45	10,955	0%
Life, Physical and Social Science	36	1,641	2%
Community and Social Service	0	2,390	0%
Educational Instruction and Library	0	2,249	0%
Legal	0	453	0%
Building and Grounds Cleaning and Maintenance	0	336	0%



# Recommendations

The following recommendations outline how CareerSource Florida and the Credentials Review Committee should approach the continued review, validation, and assessment of potential sequencing relationships involving items on the statewide Industry Certifications list and on the Master Credentials List more broadly.

- **Leverage an algorithmic approach to linking credentials to occupations.** Many certifications, licenses, and non-degree credentials had occupation linkages that were made through manual review by CareerSource Florida and a third-party research group. The manual process involved searching within job titles and professional profiles for each credential or related skills, job titles, or keywords. These searches became the basis of an “algorithmic” approach which was used in this process to validate the matches. For future assessments of the statewide credential list, an algorithmic approach should be used to ensure consistent and comparable results.
- **Review this methodology and data to assess its utility in establishing proof of a sequence of credentials for the Framework of Quality.** This methodology is unique in that it shows real-world occupation to occupation sequences in the market. The Credentials Review Committee should consider allowing this data to be used to establish an official sequence of credentials, in addition to the presence of articulation agreements.
- **Build labor market signals into the ongoing validation of credentials.** On a regular basis, evaluate labor market signals (i.e., actual use by employers in job postings, advertisement of the credential by job seekers on resumes, and estimated/advertised wages) to ensure promoted credentials have value in the labor market.
- **Assess duplicative credentials.** Where there are multiple competing credentials (e.g., in cybersecurity, welding, and certain other fields), determine if there are opportunities to prioritize, consolidate, and/or de-duplicate.
- **Prioritize and promote credentials based on demand and wage data.** Leveraging the data provided in this project, prioritize credentials and credential pathways that lead to employment in high-paying occupations with the highest or most acute demand. Given that current wage thresholds are relatively low, going forward Lightcast recommends using the average wage threshold in assessing credentials.
- **Support and expand credential availability in sectors without many sequences that lead to above-average wage occupations.** For example, the agricultural sector does not currently display many high-quality credential sequences.

For those credentials that lack signaling value in the labor market, Lightcast recommends the following additional layers of scrutiny to determine if they should be included on the statewide list of approved credentials of value.

- **Conduct additional skill-based validation.** Prioritize credentials with low signal value for a review of the human capital value. In other words, confirm that attainment of these credentials involves genuine skill acquisition and that those skills are valuable in the labor market.
- **Engage employers to understand need for credentials with low signaling value.** Focusing first on those credentials that lack signaling value, but have above-average wages, engage employers to understand need for these credentials and encourage them to utilize credentials in job postings, where needed.

# Methodology

## Establishing Occupation (SOC) Linkages to Credentials

CareerSource Florida provided Lightcast with a file that included a list of credentials and a list of professions that require licenses. The credentials correspond to the 2022-23 FDOE Approved Industry Certification List. For the credentials and licenses that did not have corresponding occupation linkages, Lightcast leveraged its proprietary databases of job postings and online professional social profiles to create such a mapping.

The job posting database includes information collected from over 50,000 job boards daily. For each job posting record, Lightcast parses information including, but not limited to, the following data fields: job title, skills listed, degrees or credentials required, years of education and experience required, and the complete text of the job posting. Job postings in Florida between 2017-2022 (a total of 10 million) were used in this analysis. For each social profile record, Lightcast parses information including, but not limited, to the following data fields: current job title, past job titles, highest level of education, skills listed, degrees or credentials listed, and the complete text of the social profile. Social profiles with current locations in Florida (a total of 9.9 million) were used for this analysis.

Lightcast maps job posting records and social profile records to occupations in the SOC occupation taxonomy. This mapping is conducted using a set of rules which are triggered by positive hits in the fields listed above. For example, if a job posting or social profile lists “Accountant” in the title, that job posting, or social profile will be mapped to SOC 13-2011 Accountants and Auditors.

Because each job posting and social profile record is mapped to an occupation, Lightcast was able to calculate the distribution of records requesting or listing a relevant credential or license across occupations. This process included three steps:

1. Query the databases for the credential or license.
2. Review summary statistics associated with the query.
3. Select credential-occupation linkages.

The deliverable for Stage I of the project is an Excel spreadsheet that has been provided to the CareerSource Florida team. Additional detail for each of these steps is provided below.

### Step 1: Querying Databases

Lightcast classified each entry into four categories:

- **Required Certification:** Similar to licenses in that the certification is nearly always a requirement for a profession. Many healthcare certifications fall into this category. Required Certifications are all of the industry certifications included on the Master Credentials List. Determining which certifications are required involves desktop research, and throughout the process, Lightcast collaborated with

CareerSource Florida partners for local knowledge related to some certifications. *Example: Occupational Therapy Assistant Certification*

- Non-Required Certification: Signal of proficiency in a skill or subject area. Job postings must request the specific name of the certification. Where this was not possible, Lightcast resorted to keyword searches. *Example: Composite Boat Builder Certification*
- License: All licenses come from the Master Credentials List. Any job posting for the profession counted as a job posting for a license. *Example: Firearms Instructor*
- General Credentials: General career readiness, CTE assessments, and other certifications for foundational workplace skills. *Example: IC3 Digital Literacy Certification*

For Required Certifications and Non-Required Certifications, Lightcast took the following approach to map the entry to an occupation. First, Lightcast created a query using an exact match on the name of the certification—this is referred to as the initial query. (Note that sometimes the certification is already in Lightcast's certification taxonomy, and other times it is not). If the exact text search produced no records, Lightcast expanded the query to include a text search for relevant keywords or skills—this is referred to as the expanded query.

For example, while text queries yielded records for “Certified Biomedical Equipment Technician” and “Certified Veterinary Technician,” text queries yielded no records for “Composite Boat Builder Certification” or “Marine Diesel Certification.” In the case of the first two queries, the initial queries yielded results. For the latter two examples, Lightcast expanded the search to include a text query for “boat building” within the manufacturing industry (NAICS 31-33) and a text query for “marine diesel,” respectively.

For licenses, Lightcast searched for matches not in the job text field but in the title field. Because these professions require licenses, all job postings or social profiles with the relevant title must require or have the license. At times, the title query did not yield any records, and in these cases a slightly expanded title was used. (For example, Body Piercer could be expanded to include Body Artist.)

For General Credentials, Lightcast did not query its databases, instead preferring a qualitative approach to creating the mapping. This approach is detailed in Step 3 below.

## Step 2: Review Summary Statistics

Lightcast reviewed two sets of summary statistics, discussed in greater detail below.

1. Recall rate within occupation.
2. Distribution of records across occupation.

The recall rate within occupations is used to identify the occupations for which the credential has the *most relevance*. The recall rate within occupations is the percentage of job postings or social profiles for a given SOC occupation that references a given credential.

The distribution of records across occupations is used to identify the occupation with the *greatest volume of demand/supply (i.e., number of job postings/social profiles)* for the credential. The distribution of records across occupations is the number and share of total records across all occupations in which the credential or license is referenced. Often, the vast majority of records for a given credential/license are associated with

one occupation. Occasionally, however, there are two or more occupations with a similar volume of records for a given credential/license.

For example, there were 361 unique job postings in Florida between 2017-2022 that referenced the National Physical Therapy Exam. The distribution of records across occupations is as follows: 77% are mapped to SOC 29-1123 Physical Therapists, 18% are mapped to SOC 31-2021 Physical Therapy Assistants, and the remaining demand are distributed across a handful of other occupations. The recall rates are as follows: job postings for SOC 29-1123 Physical Therapists referenced the National Physical Therapy Exam in 1% of records, and SOC 31-2021 Physical Therapy Assistants referenced the exam in 0.5% of records.

### **Step 3: Select Credential-Occupation Linkages**

Lightcast combined two sources of credential-to-occupation maps in order to create the final map.

1. The credential-occupation map manually created by CareerSource Florida partners and updated by Lightcast.
2. An algorithmically generated credential-occupation map generated using the statistics detailed above.

For the first map, CareerSource Florida provided Lightcast with a list of credentials, the majority of which had been mapped to an occupation via a desk research project within the previous year (and performed by a third party). Lightcast used summary statistics, desktop research on credential provider websites, and critical reasoning to select a best-fit occupation for the remaining credentials, and CareerSource Florida reviewed the linkages.

For the second map, Lightcast established the following criteria for minimum viable signaling value (i.e., query results across job postings or social profiles): across all social profiles with the current locations in Florida (a total of 9.92 million) and all job postings listed in Florida between 2017-2021 (a total of 10 million), the credential must be referenced in at least 25 social profiles or 25 job postings.

Lightcast then assessed the number of occupations for which each credential registers signaling value. These signaling-value-based credential-to-occupation matches were established using the following criteria: first, the occupation or occupations that most frequently referenced the credential on job postings and social profiles were matched, as well as any occupation where more than 1% of job postings or social profiles for the occupation overall referenced the credential, as well as occupations that account for more than 25% of demand for the credential.

A spreadsheet provided to CareerSource Florida has information on reproducing the queries that Lightcast conducted. This resource can be used internally to better understand the distribution of credentials across occupations, and it was also used in subsequent phases of work between Lightcast and CareerSource Florida that involved further investigation into the labor market outcomes associated with credential or license attainment.

## Establishing Credential Sequencing

Lightcast analyzed actual job changes as detailed in the work history sections of social profiles from professional networking sites in order to develop a sequence of credentials that a learner could earn throughout the course of their career trajectory.

Lightcast created a sequence of credentials by collapsing three intermediate pairs of sequences:

1. Connect each credential to its target occupations using (a) the occupation linkages detailed in the section titled Establishing Occupation (SOC) Linkages to Credentials and (b) the credential-to-occupation matches detailed in the section titled Determining Signaling Value in the Market.
2. Connect each target occupation to the common next-level occupations as detailed in the work history sections of social profiles from professional networking sites.
3. Connect each next-level occupation back to any credential that is linked to that occupation in either (a) the occupation linkages detailed in the section titled Establishing Occupation (SOC) Linkages to Credentials or (b) the credential-occupation matches detailed in the section titled Determining Signaling Value in the Market.

These three sequences begin with one credential and end with a set of credentials, and they are connected by the common job transitions that workers who earn the initial credential are likely to pursue. The result is a map between each credential and any other credentials that will be valuable to those who have earned the initial credential. An example is provided below for the CompTIA A+ certification to demonstrate how an initial credential is sequenced to additional credentials. Stage III involved taking these results and grouping them into industry verticals, which further limits and curates the available sequences.

Lightcast created an occupation-to-occupation map using the job changes detailed in the work history sections of social profiles from professional networking sites. Lightcast uses a proprietary classification algorithm to map the job titles on social profiles to the best-fit occupations in the most current SOC taxonomy. Any occupation-to-occupation transition that accounts for 3% or more of total transitions was included as a common next-level occupation. Job changes in which the worker does not change occupations are included in the share of transitions. That is, an initial occupation and the most common next-level occupation may be the same occupation. Occupations with a high turnover rate between employers and occupations with little in-sector mobility may fall into this category. But unless these job changes account for more than 97% of all job changes from that occupation, there will be other common next-level occupations. Additionally, job changes were discarded if the social profile listed the completion of a postsecondary degree (Bachelor's or Master's) between the start of the initial job and the start of the next-level job. In these cases, the job following the degree completion is more likely a function of the degree than of the preceding work history. Finally, job changes where concurrent jobs are listed with either the initial or next-level job (i.e., someone working two jobs) are not included, since it would not be clear to which of the concurrent jobs the transition should be attributed.

Finally, Lightcast reviewed how often the occupations linked to credentials met the wage threshold for the respective education level set by the Credentials Review Committee using the Florida Labor Market Estimating Conference statewide wage summary report, which is detailed in the table below.



	<b>Representative Starting Wage</b>	<b>Average Annual Wage</b>	<b>High-Level Wage Threshold</b>
All Occupations	\$20,530	\$50,020	\$59,380
No formal educational credential	\$19,160	\$28,040	\$31,470
High school diploma or equivalent	\$22,200	\$42,430	\$50,240
Some college, no degree	\$21,770	\$40,290	\$48,230
Postsecondary nondegree award	\$23,930	\$42,240	\$50,620
Associate's degree	\$25,650	\$53,480	\$67,370
Bachelor's degree	\$34,890	\$80,570	\$96,750
Master's degree	\$34,490	\$78,040	\$99,590
Doctoral or professional degree	\$45,510	\$134,520	\$170,700

Occupations were associated with educational levels according to the education and training assignments by detailed occupation produced by BLS<sup>1</sup>. Salaries were calculated by taking an average of the wages and salaries advertised in job postings requesting fewer than two years of experience and no more than an Associate's degree.

Multiple occupations are often linked to a credential, and even more next-level occupations follow along the credential sequence, as detailed above. In order to summarize the wage assessment at the credential level (rather than at the credential-occupation level or the credential-occupation-occupation level, which quickly gets unwieldy), Lightcast used a series of weighted averages. For target occupations (i.e., the occupation title linkages detailed in the section titled Establishing Occupation (SOC) Linkages to Credentials or the credential-occupation matches detailed in the section titled Determining Signaling Value in the Market), Lightcast compared a weighted average of advertised salaries to a weighted average of the wage thresholds, where weights were supplied by the job posting count for the occupations requesting the given credential. For next-level occupations, Lightcast compared a weighted average of advertised salaries to a weighted average of the wage thresholds, where weights were supplied by the count of job changes into a given next-level occupation. Lightcast flagged credentials with the weighted average of advertised salaries greater than the weighted average of wage thresholds with a 1, and otherwise with a 0.

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<sup>1</sup> BLS provides Typical Entry-Level Education for each SOC code - <https://www.bls.gov/emp/tables/education-and-training-by-occupation.htm>

## Example of Credential-to-Credential Sequencing

An example of the credential-to-credential mapping from the accompanying spreadsheet is provided here to demonstrate how to interpret this data.

### **CompTIA A+ Credential**

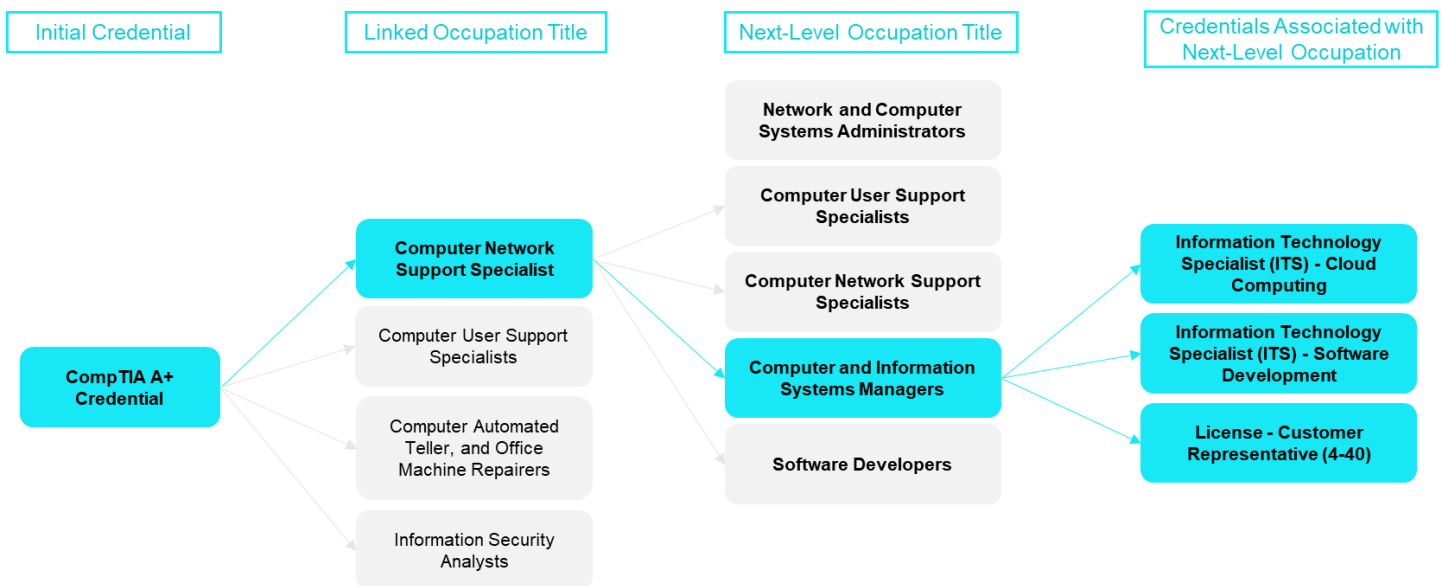
The CompTIA A+ credential maps to the following four occupations, all of which meet the current wage threshold for the typical education level required. The average wage across the linked occupations is \$45,800:

- Computer Network Support Specialists
- Computer User Support Specialists
- Computer, Automated Teller, and Office Machine Repairers
- Information Security Analysts

Looking at realized transitions for one of the occupations, Computer Network Support Specialists, 47% of transitions were into the following occupations, which also all meet the current wage thresholds. Among all next-level occupations from the CompTIA A+ certification, the average wage is \$50,173.

- Network and Computer Systems Administrators (22%)
- Computer User Support Specialists (15%)
- Computer Network Support Specialists (4%) - Transition between companies, but within the same occupation
- Computer and Information Systems Managers (3%)
- Software Developers (3%)

To make the transition from Computer Network Support Specialist to Computer and Information Systems Managers, there are three certifications that would be helpful for that next-level occupation.



# Appendix: Sector Pathway Maps

Lightcast leveraged the linked occupation to identify credentials associated with each Industry Sector (at the two-digit SOC level) and build sector-focused credential pathways. In total, there are over 370,000 within-industry transitions. By contrast, when transitions are limited only to those where (1) the next-level occupation is above the average wage threshold and (2) there is a salary premium of at least 10% from occupation to occupation, there are nearly 66,000 within-industry transitions. These latter transitions are referred to below as high-quality sequences.

Lightcast developed a [preliminary and exploratory Tableau tool](#) to demonstrate these high-quality sequences. This tool should be reviewed by the Credentials Review Committee to assess its value and utility in establishing proof of a sequence of credentials.

The tool can be used in any of the following ways:

- Select an industry to view linked SOC codes and linked occupation titles for occupations in that industry.
- Select a Credential Type or Credential Name to see linked SOC codes and linked occupation titles, then follow the resulting career paths.
- Select from other dropdown options for a more customized look at the data.

An example is provided below for the FAA Aviation Maintenance Technician – General credential. This credential maps to the occupation Avionics Technician, which has an average entry-level salary of \$48,370. From that occupation, individuals can transition to Aircraft Mechanics and Service Technicians, where average advertised salaries are \$55,892. In order to make that transition, there are a number of credentials that would be helpful for the individual to have, including Airline Maintenance Procedures and Records Management, Aviation Airframe Mechanics, several other FAA certifications and more.

Credential Sequencing Map	
Industry Sector	(All) ▼
Credential Type	(All) ▼
Credential Name	(All) ▼
Linked SOC Code	(All) ▼
Linked Occupation Title	(All) ▼
Next-Level Occupation Typical Entry-Level Education	(All) ▼
Next-Level SOC Code	(All) ▼
Next-Level Occupation Title	(All) ▼
Next-Level Credential Name	(All) ▼

### Initial Credential(s) Attained and Linked SOC Occupation(s)

Linked SOC Code	Linked SOC Name	Credential Name	
49-2091	Avionics Technicians	FAA Aviation Maintenance Technician - General	



### Average Entry-Level Salary of Linked SOC Occupation(s)

Linked SOC Code	Linked SOC Name	Average Salary
49-2091	Avionics Technicians	48,370

Users can scroll to the right to see next-level occupation and credentials linked to next-level occupation.



### Average Salary of Next-Level Occupation(s) on Credential-Sequenced Career Pathways

Next Step SOC Code	Next Step SOC Name	Average Salary
49-3011	Aircraft Mechanics and Service Technicians	55,892



### Credential(s) Linked to Next-Level SOC Occupation(s)

Next Step SOC Code	Next Step SOC Name	Next Step Credential Name	
49-3011	Aircraft Mechanics and Service Technicians	Airline Maintenance Procedures And Records Management	
		Aviation Airframe Mechanics	
		Aviation Mechanic	
		Aviation Powerplant Mechanics	
		FAA Aviation Maintenance Technician - General	
		FAA Aviation Maintenance Technician - Powerplant	
		FAA Aviation Mechanic Technician - Airframe	
		Industry 4.0 Mechanical Systems Specialist	
		Pneumatics, Hydraulics & Motors For Manufacturing	

**Note:** Average entry-level salaries are calculated only for job postings that request fewer than two years of experience. However, average next-level salary calculations are not restricted by the number of years of experience being requested in job postings. A single occupation can show up as an Initial Credential Attained and Linked to a SOC Occupation and a Credential Linked to a Next-Level Occupation if the wage premium for experience is high enough.



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