



The Public Workforce System and Cybersecurity Youth Registered Apprenticeship

President Biden has pledged a \$50 billion investment in high-quality workforce training and to “exponentially increase the number of apprenticeships” in the United States.¹ In 2019, there were close to 25,000 active apprenticeship programs in the U.S. and 633,476 individuals active in apprenticeships, a number that has increased more than 50% since 2009.² Building off the approaches and successes of the comprehensive national strategy he developed in 2014, President Biden will continue to expand “earn and learn” models including Registered Apprenticeships³ as his Administration focuses on economic recovery and strengthening the American workforce.

The number of new apprenticeship programs is growing with over 3,000 new apprenticeship programs in 2019,⁴ and evidence indicates that participation in Registered Apprenticeship opportunities leads to higher employment and earnings over time⁵ but there is still limited uptake of Registered Apprenticeships through the public workforce system.⁶ Some states, Local Workforce Development Areas, employers, and job seekers may lack an understanding of how to fully utilize Registered Apprenticeships in conjunction with the workforce system or not realize how Registered Apprenticeship can benefit them. Bridging the knowledge gap can increase the use of Registered Apprenticeship and provide increased opportunities for living wage careers for American workers and youth.

¹ The Biden Plan for Education Beyond High School. (2020). Retrieved from: <https://joebiden.com/beyondhs/>

² U.S. Department of Labor, Employment and Training Administration, Registered Apprenticeship National Results Fiscal Year 2019, 10/01/2018 to 9/30/2019. (2019). Retrieved from: <https://www.dol.gov/agencies/eta/apprenticeship/about/statistics>

³ The White House, Ready to Work: Job-Driven Training and American Opportunity. (2014)

⁴ U.S. Department of Labor, Employment and Training Administration, Registered Apprenticeship National Results Fiscal Year 2019, 10/01/2018 to 9/30/2019. (2019). Retrieved from: <https://www.dol.gov/agencies/eta/apprenticeship/about/statistics>

⁵ Reed, D., Liu, A., Kleinman, R., Mastri, A., Reed, D., Sattar, S., & Ziegler, J. (2012). An effectiveness assessment and cost-benefit analysis of Registered Apprenticeship in 10 states. Oakland, CA: Mathematica Policy Research

⁶ Berkowitz, Kelsey. (2019). Why Do Only a Tiny Fraction of Jobseekers Participate in Registered Apprenticeships?. Third Way.

Understanding Apprenticeships in the Public Workforce System

Apprenticeship and Registered Apprenticeship have received significant recognition in the public discourse over the last several years as a solution to the nation's workforce development skill gaps. The skills gap refers to the mismatch between the skills needed for available jobs and the skills workers possess. This mismatch is a fundamental problem for the American economy and for the American worker as it leaves millions of jobs unfilled and millions of Americans un- or under-employed. The US Chamber of Commerce Foundation says almost half of employers across a range of industries indicate that job candidates do not have the skills needed for job openings.⁷ In 2020, the shortfall globally of cybersecurity professionals was over 3 million with the United States accounting for 28% of the gap.⁸ Between October 2019 and September 2020 there were over 520,000 posted job openings for cybersecurity in the United States and the supply of skilled available workers was "very low."⁹

To address the skills gap, workforce and education training providers need to link training closely to employment opportunities. Apprenticeships are an established model for on-the-job employment and training; individuals can work and be paid under the tutelage of an expert while learning new skills and credentials. Congress established Registered Apprenticeships more than 80 years ago, with the passage of the Fitzgerald Act in 1937. Historically these programs have existed mostly in the domain of the construction trades, but today apprenticeship programs cut across many industries and sponsors, including cybersecurity. The Department of Labor or a State Apprenticeship Agency (SAA) approve Registered Apprenticeship programs certifying that they are high-quality training programs. [The Department of Labor Apprenticeship Toolkit](#), defines apprenticeship as "an employer-driven, learn-while-you-earn model that combines on-the-job training, provided by the employer that hires the apprentice, with job-related instruction in curricula tied to the attainment of national skills standards. The model also involves progressive increases in an apprentice's skills and wages." Key components of apprenticeship programs include.¹⁰

- **Employer involvement** – employers, either individually or through employer groups such as industry associations or advisory councils, are foundational to launching and maintaining apprenticeship programs.
- **Structured on-the-job training and related classroom instruction** (also called Related Technical Instruction (RTI)) that meets industry standards – apprenticeships always combine classroom instruction with on-the-job training learning and skills transfer from experienced professionals. Classroom curricula is often developed by education and industry partnerships to meet industry standards and can be delivered by community colleges, trade schools, proprietary training institutes or employers at schools, online, or at jobsites.

⁷ Clark, Suzanne. (2020). Closing the Skills Gap. U.S. Chamber of Commerce. Retrieved from: <https://www.uschamber.com/series/above-the-fold/closing-the-skills-gap>

⁸ (ISC)² (2020). Cybersecurity Workforce Study. Retrieved from: <https://www.isc2.org/Research/Workforce-Study>

⁹ Cyberseek. (2020). Cybersecurity Supply/Demand Heat Map. Retrieved from: <https://www.cyberseek.org/heatmap.htm>

¹⁰ US Department of Labor. (n.d.). Apprenticeship Toolkit. Retrieved from: <https://www.dol.gov/apprenticeship/toolkit/toolkitfaq.htm#1a>

- **Incremental pay increases tied to increasing skill levels** – as classroom learning and on-the-job training progress, apprenticeships provide incremental pay increases in-line with increasing knowledge and skills, delivering earnings while apprentices are still in training and incentives to progress and complete the program.
- **Nationally recognized credentials** – apprenticeships culminate in the receipt of a transferable nationally recognized credential.

In addition, pre-apprenticeship programs and youth apprenticeship programs partner with apprenticeship programs to prepare underrepresented populations for entry into apprenticeship programs. They provide curricula based on industry standards, hands-on work experience, and education and services that support the smooth transition into apprenticeships. In some states, a Youth Apprenticeship program exists to focus specifically on youth transitioning to the labor market from secondary (usually a Career and Technical Education) school to the labor market.

With national public policy recognizing the role of Registered Apprenticeship, Congress and the Departments of Labor and Education see Registered Apprenticeship as a cost-effective method of business-based and work-based skill training. Registered Apprenticeship has taken center stage as a premier method of training not just in traditional apprenticeship industries like construction trades but also in health care, information technology, education, and other areas. The public workforce system in the United States has evolved over the past 30 years from training in a traditional classroom setting to one that incorporates experiential learning through work. Work-based learning through the workforce system includes job shadowing, internships, work experience, on-the-job training and more recently Registered Apprenticeships.

The Workforce Innovation and Opportunity Act (WIOA) establishes the public workforce system through federal legislation, but states and Local Workforce Development Areas (LWDA) drive the on-the-ground strategy and execution. WIOA requires each state establish Regional and Local Workforce Area plans to address the workforce development needs of each area. Each state or territory has at least one LWDA and there are currently approximately 600 LWDA's in the nation. Each area has a Local Workforce Development Board (LWDB) which must have at least 51% (the majority) of the member seats representing the local business sector. In partnership with local elected officials they provide the leadership, policy, and direction of the local public workforce system.

The LWDB addresses the workforce education and training needs of adults, dislocated workers, and youth through Title I formula funding allocated by Congress. They also provide development and leadership for the local workforce system. LWDBs do this in a variety of ways including leading analysis of local labor market information, convening stakeholders to address community workforce needs, and identifying and aligning resources – e.g., education, training, and supportive services to best address skills needs and other issues affecting the workforce as appropriate to the local area.

In addition to directing WIOA Title I programs, LWDBs are also responsible for coordinating and integrating programs including Adult and Family Literacy (WIOA Title II), Wagner-Peyser Employment Services (WIOA Title III), Vocational Rehabilitation (WIOA Title IV) and have both legislatively required partners such as Department of Education Carl D. Perkins Career and Technical Education programs (CTE), U.S. Department of Housing and Urban Development (HUD) Employment and Training programs, and Temporary Assistance for Needy Families (TANF) and optional partners such as the U.S. Department of Agriculture's Supplemental Nutrition Assistance Program (SNAP) Employment & Training and other education and workforce intermediaries.

On the ground, each LWDA and LWDB oversee at least one American Job Center (AJC), a physical location that employs front-line workers to provide direct services to job seekers and employers. There is a network of almost 2,400 AJCs nationwide.

Readiness of the Local Workforce Development System

Local Workforce Development Areas have two primary methods of funding training for job seekers (including Adults, Dislocated Workers and Youth) through WIOA: Individual Training Accounts (ITAs) for occupational skills training and On-the-Job Training (OJT) for work-based training by employers.¹¹

In the WIOA legislation, Congress enhanced the role of Registered Apprenticeship and encouraged State and Local Workforce Development Boards to expand and fund Registered Apprenticeships in all workforce development sectors. Each LWDB has latitude to assimilate the expansion of Registered Apprenticeship into their system in ways that reflect local circumstances and local demands in the labor market. Each state and local area interprets the guidance and administers programs in their own way with some LWDA's aggressively engaging Registered Apprenticeships while others have been slower or less aggressive in the implementation of Registered Apprenticeships. This may be because the local labor market leans towards industries that have not traditionally been strong in apprenticeships or that local employers are not ready to fully embrace Registered Apprenticeship.¹²

There are several ways LWDA's can monetarily support the use of Registered Apprenticeships through the public workforce system. Each LWDA funds skills training programs for customers through an Individual Training Account (ITA) that provides some level of funds to cover part or all the tuition and costs associated with an individual's training. ITAs provide individual choice for recipients to use with any Eligible Training Provider (ETP). This same ITA payment can also be applied to Registered Apprenticeship RTI costs. WIOA has an occupational skills training requirement that any ITA eligible program be listed on the Eligible Training Provider List (ETPL). This list includes information such as location, program length, eligibility/prerequisites, costs for tuition, books, and equipment and the expected outcomes (e.g., certifications and degrees) so that a job seeker can make an

¹¹ There are additional methods for specific circumstances, such as paid work experience for those without work history, that may also be available to support job seekers and their work.

¹² Bergman, T. & Kobes, D. (2017). The State of Apprenticeship Among Workforce Boards. Retrieved from: https://irp-cdn.multiscreensite.com/dc0a626e/files/uploaded/NAWB-Apprenticeship-092717_Final.pdf



ApprenticeshipPHL

Philadelphia Works, Inc., the city's **local workforce development board**, is a leader in apprenticeship and has embraced and championed apprenticeship in Philadelphia and in Southeast Pennsylvania and beyond. Drawing from Philadelphia's history of success with Registered Apprenticeships and identifying critical labor market needs, the Board has prioritized apprenticeship as a critical component of their workforce system investments. Using a strategy of partnering with existing Apprenticeship programs within the building trades, information technology, and healthcare, Philadelphia Works helped to create ApprenticeshipPHL, a regional public/private collaborative with the goal of aligning resources to expand and enhance Registered Apprenticeship throughout Southeast Pennsylvania. For more information, connect with ApprenticeshipPHL at ApprenticeshipPHL

informed choice selecting into a skills training program. Since WIOA, Registered Apprenticeship programs approved by DOL or SAAs are automatically eligible for inclusion on the ETPL and therefore automatically eligible for ITA funding. The Registered Apprenticeship Program must request inclusion on the ETPL. Registered Apprenticeships remain on the list until a program sponsor requests removal or the program is no longer approved by DOL or the SAAs.

Another option LWDA's have for supporting Registered Apprenticeship through the public workforce system is On-the-Job Training (OJT), which directly reimburses employers a percentage of an individual eligible worker's wages (usually 50%) to address training costs associated with a new employee. The OJT program normally reimburses for up to six months depending on the complexity of the job and the skill level of the new employee. OJT funds can be used to provide initial wage subsidies to employers giving them an incentive to hire, by reducing risk and cost, a Registered Apprentice. WIOA also establishes a separate funding stream specifically for youth age 16-24 with a required set of 14 services. These services include apprenticeship friendly supports such as occupational skills training, paid work experience, supportive services, follow up services and postsecondary preparation and transition activities.

The US Department of Labor and many states have made additional funding available for expansion of Registered Apprenticeship and have expanded the informational infrastructure for informing and assisting employers in establishing Registered Apprenticeships and hiring Apprentices on their payroll. The CYAI publication, State Incentives for Apprenticeships, summarizes by state, tax credits available for employers sponsoring apprenticeship programs or hiring apprentices.

LWDAs have flexibility in how they integrate Registered Apprenticeships. For example, some have integrated their WIOA Title I funds into the funding of Registered Apprenticeship and pre-apprenticeship. Others have identified and secured additional funds from state, federal, local or philanthropic sources to support apprenticeships. LWDA's may choose to braid funding from other WIOA programs or apprenticeship funding from WIOA partner agencies. For example, ApprenticeshipPHL described in the call out box illustrates one approach to integrating Registered Apprenticeship.

An additional hurdle to increasing use of Registered Apprenticeships can be lack of awareness or hesitancy of AJC front-line staff in recommending and championing Registered Apprenticeships to job seekers. Intentional strategies for building knowledge and the fluency of front-line staff with Registered Apprenticeship models can increase entry into apprenticeships. Examples of strategies to increase front line staff knowledge include:

- Providing focused learning opportunities for staff to learn the mechanics of apprenticeships and develop shared language and terms around apprenticeship so that the staff are as knowledgeable, competent, and confident discussing apprenticeship as they are occupational skills training.

- Establish windows for staff to collaborate and troubleshoot to share successes and challenges with building interest in apprenticeships among job seekers or employers.
- Develop or use job tools to help staff determine when an individual's interests and circumstances may fit well with apprenticeship or pre-apprenticeship opportunities.

Assessing Business Readiness for Cybersecurity Youth Registered Apprenticeship

Employers are the critical element of Registered Apprenticeships – without employer involvement and support apprenticeship opportunities do not exist. Often employers are sponsors of the apprenticeship, though an intermediary organization, industry group, or workforce board can also fill this role. Our research and work in Northwest PA Statewide Apprenticeship Expansion grants in 2019 indicate that over 50% of employers are not opposed to apprenticeship but are mostly not aware of it and have not yet formed an opinion, particularly in non-traditional areas. Another 2017 study¹³ found that employers may not be fully engaging with Registered Apprenticeship because:

- They lack knowledge or are not aware of Registered Apprenticeships.
- They are wary of the paperwork involved or government involvement.
- Are not sure of the benefits of Registered Apprenticeships.
- Are looking for a 'quick fix' to their skills gaps.
- Perceive apprenticeships to only be sponsored by unions or only exist for trade or construction industries.
- Are worried about the expense.
- Are looking for other incentives beyond a more robust employee pipeline. With the expansion of sector strategies and career pathways, many states and local areas have increased employer subsidies to hiring and employing individuals in good paying career jobs in their communities. Some employers expect similar subsidy for longer-term Registered Apprenticeships and when that comparable subsidy is not available their interest diminishes.

For organizations, whether LWDBs, intermediary organizations or employers themselves, building employer and industry knowledge and addressing misconceptions or outdated ideas about apprenticeship is necessary to getting Registered Apprenticeship programs off the ground. Through outreach and relationship building, organizations focused on establishing apprenticeships can increase employer awareness that:

¹³ Bergman, T. & Kobes, D. (2017). The State of Apprenticeship Among Workforce Boards. Retrieved from: https://irp-cdn.multiscreensite.com/dc0a626e/files/uploaded/NAWB-Apprenticeship-092717_Final.pdf

- The new approach to Registered Apprenticeship can apply to any industry and industries like cybersecurity have successfully established models of Registered Apprenticeship.
- The public workforce system can alleviate some of the employer's risk associated with apprenticeships by funding OJT, providing connections to other State incentives, recruiting and screening applicants, and providing other supportive services – such as paying for books or tools or links to other community resources – that can help retain apprentices/employees.
- Using intermediaries (i.e., organizations that manage the requirements of apprenticeship for employer(s)) is a practical and significant option for employers to reduce some of the administrative needs for sponsoring apprenticeships. For employers that wish to embrace apprenticeship, these organizations handle the paperwork, registration, reporting and in some cases serve as the employer of record usually for a fee.
- Conducting an organizational readiness assessment can support developing specific strategies, building off existing organizational strengths and targeting areas where employer operations may be less aligned to apprenticeship.

When engaging a LWDB, one of their contractor providers, or other related intermediaries (including employer consortia or industry partnerships), five key factors are significant starting points to determine organizational readiness for establishing, enhancing or expanding Registered Apprenticeships.¹⁴ The first four factors are designed for employers or employer groups to complete and determine their areas of readiness for Registered Apprenticeship. The fifth factor is for use by Workforce Development Boards, American Job Centers, Chambers of Commerce or similar groups to assess their level of employer involvement. These include:

1. Experience with Apprenticeship—what is their level of experience with any aspect of Apprenticeship such as Registered Apprenticeship or pre-apprenticeship?
2. Involvement with Work-Based Learning—how deeply involved is the organization with work-based learning, for example, creating referrals for position vacancies through the AJC, providing mock interviews for job search programs, participating with job shadowing, internships, accepting and training through paid work experience, on-the-job training, customized training and/or pre and/or Registered Apprenticeship?
3. Success with Youth Employment—what is their success with youth employment? Has the organization engaged and served youth through internships, interviews, sponsorship, work experience, or apprenticeship?
4. Expertise in Cybersecurity and IT Placement—what is the experience in education and training in Information Technology in general and specifically Cybersecurity? Is there established educational programs that address their IT or

¹⁴ Adapted from PA Business Calling program, now called Engage!: <https://dced.pa.gov/programs/engage/>

Cybersecurity needs and is this on the Eligible Training Provider List? Have they established integration of traditional classroom learning (traditional or virtual) and work-based/employer-based education? Is the experience competency or time-based?

5. Level of Employer Engagement—what level and type of employer engagement, leadership and participation do they have?
 - For WDBs, providers and other workforce intermediaries, is there significant employer leadership with industry partnerships, industry champions, employer hiring WIOA ‘graduates’?
 - For employers or intermediaries, is there significant involvement with the public workforce system? Do the employers participate in hiring events, hire ‘graduates’ of the WIOA program, contract and train WIOA participants?

The following tool provides a template for assessing organizations within these five domains and determining how ready they are to sponsor Registered Apprenticeship programs or hire Registered Apprentices.

**WIOA Registered Apprenticeship Readiness Assessment for Youth
Cybersecurity Apprenticeships**

This assessment is intended for use with employers, Local Workforce Development Boards, or intermediary organizations to aid in determining readiness of the organization to engage in or develop youth cybersecurity Registered Apprenticeships. The assessment can be used as the basis for discussion between two parties or as a self-assessment tool. Sections with a high score indicate an organizational strength and higher levels of existing engagement. Sections with lower scores indicate areas where further resources or information could build engagement. The final score gives an indication of overall organizational engagement with Cybersecurity Youth Registered Apprenticeship and can be used to compare organizations or match organizations at the same or similar level of current engagement.

Provide a rating below for each statement indicating 0 - No involvement/active efforts and no interest; 1 - little to no involvement/active efforts but interested; 2 - low or new involvement/a few active efforts; 3 - moderate or established involvement/several active efforts; 4 - intense or long-term involvement/leader in active efforts.

| I. | Experience with Registered Apprenticeship | Rate 0 to 4 |
|------------|---|-------------|
| I.A. | Organization has experience with Registered Apprenticeship | |
| I.B. | Organization has a significant number of apprenticeships of over the past two years | |
| I.C. | Organization has a significant number of pre-apprentices over the past two years | |
| I.D. | Apprenticeship has been a significant portion of hires in critical areas | |
| I.E. | Apprenticeship has expanded to multiple occupational areas the last two years | |
| | TOTAL | |
| II. | Experience with Work-Based Learning Models | |
| II.A. | Organization has participated in work-based learning | |
| II.B. | Organization has completed referrals, interviews, or filling vacancies through American Job Centers | |
| II.C. | Organization has used Internships or Job Shadowing (unpaid) | |
| II.D. | Organization has used Paid Work Experience or On-the-Job Training | |
| II.E. | Organization has used pre-apprenticeship or Registered Apprenticeship | |
| | TOTAL | |

| | |
|-------------|---|
| III. | Success with Youth Employment |
| III.A. | Organization has hired youth for temporary jobs or entry-level jobs as a priority |
| III.B. | Organization has supported youth hiring efforts through mock interviews, unpaid internships, job shadowing |
| III.C. | Organization has sponsored youth related events in the community or workforce system |
| III.D. | Organization has engaged with Paid Work Experience or other subsidized employment |
| III.E. | Organization has successfully utilized Pre-Apprenticeship or Registered Apprenticeships |
| | TOTAL |
| IV. | Expertise in Cybersecurity and Information Technology Placement |
| IV.A. | Organization has successful experience in the education or training of IT positions |
| IV.B. | Organization has experience developing work-based learning components for IT related jobs |
| IV.C. | Organization hires WIOA graduates of traditional training programs |
| IV.D. | Organizations participates in some work-based learning for IT or cybersecurity |
| IV.E. | Organization participate in Registered Apprenticeship for IT or cybersecurity |
| | TOTAL |
| V. | Level of Employer Engagement |
| V.A. | Employer engagement classified as "significant" |
| V.B. | Employers participate and lead industry partnerships, sector strategies or similar employer led initiatives |
| V.C. | Organization has identified employer "champions" |
| V.D. | Employer hires graduates of public workforce programs |
| V.E. | Employer demonstrates training of WIOA job seekers in OJT or Registered Apprenticeship |
| | TOTAL |
| | TOTAL ENGAGEMENT SCORE |

Scale

100 Total Points

15 or above in any one section is a basis for starting discussion

75 or over in total score indicates significant readiness

CYAI About CYAI

Cybersecurity
Youth Apprenticeship Initiative
CYAI2024.org

CYAI is funded by the U.S. Department of Labor's (DOL) Employment and Training Administration (ETA) Office of Apprenticeship (OA). CYAI promotes sustainable development of cybersecurity apprenticeship programs for youth aged 16–21 and is administered by ICF. The goal of the initiative is to create at least 900 new cybersecurity apprenticeships for youth by 2024.

About ICF



ICF is a global consulting services company with over 7,000 full- and part-time employees, but we are not your typical consultants. At ICF, business analysts and policy specialists work together with digital strategists, data scientists and creatives. We combine unmatched industry expertise with cutting-edge engagement capabilities to help organizations solve their most complex challenges. Since 1969, public and private sector clients have worked with ICF to navigate change and shape the future. Learn more at [icf.com](https://www.icf.com).

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