Concept Proposal

Vision for the Regional Growth Cluster

Maryland is the nation’s cybersecurity capital, and the Maryland Cyber Workforce Solutions (Solutions) region is at the center. With the National Security Agency (NSA), U.S. Cyber Command, and Defense Information Systems Agency, at the core the region is rich with data defense companies of all sizes and focus. According to Cyberseek, a national database, demand for cybersecurity talent in Maryland is high, supply is low, and there are more than 19,600 job openings in cybersecurity. Therefore, our targeted growth cluster is cybersecurity, a rapidly growing and transformational industry. Our vision leverages industry demands and aligns the assets of the cybersecurity community to drive economic prosperity and employment opportunities for regional residents, employers, entrepreneurs, and jobseekers. Solutions aligns to three U.S. Economic Development Administration (EDA) priorities: equity, workforce development, and technology-based economic development.

Our concept incorporates five elements that complement each other: (1) removing barriers to expand entry into the cybersecurity industry, (2) publicizing opportunities through a focused and sustained effort targeting employers and candidates to build a robust pipeline to fulfil cybersecurity job openings, (3) applying a broad array of work-based learning approaches to train entry-level professionals and upgrade the skills of existing information technology and cybersecurity professionals, (4) providing experiential learning through a state-of-the-art cyber range for jobseekers to acquire in-demand skills, employers to test skills, and incumbent workers to acquire new skills, and (5) identifying emerging training demands, creating the curriculum to meet those demands, and deploying those new resources. Howard County Economic Development Authority (HCEDA) is the Solutions lead. Participating jurisdictions include Anne Arundel County, Baltimore City, Baltimore County, Carroll County, Charles County, Harford County, Howard County, Frederick County, Montgomery County, and Prince George’s County. Solutions is driven by a steering committee of regional cybersecurity leaders. Project implementation will be overseen by the steering committee, HCEDA, and industry partner and project manager ICF Incorporated, L.L.C. (ICF). Performance metrics include growth in diversity, equity, and inclusion, employment, retention, wages, and GDP.

Economic Opportunity Presented by the Regional Growth Cluster

Maryland has a cyber workforce of over 41,700 and more than 19,600 cybersecurity job openings. Demand is high, supply is low, and geographic concentration is extremely high. Top cybersecurity job titles are cybersecurity manager, cybersecurity analyst, systems engineer, software developer, network engineer, cybersecurity consultant, systems administrator, cybersecurity specialist, and penetration and vulnerability tester. Maryland’s cybersecurity job openings require roles/certifications to include certified information systems security professional (5,760), CompTIA Security+ (3,738), Global Information Assurance Certificate (2,883), certified information systems auditor (1,797), certified information security manager (1,262), and certified information privacy professional (51). The 2020 wages for IT in the Towson, Baltimore and Columbia, Maryland Metropolitan Statistical Areas were $98,894 at the median and $156,345 at 90 percentiles. Our economic opportunity is clear: Solutions increases the region’s talent supply to meet these high-wage and high-demand cybersecurity opportunities.

Capacity to Successfully Execute Large Federal Grants

HCEDA and its project management industry partner, ICF, have the capacity to successfully execute large federal grants and subawards and meet stated performance metrics. HCEDA is a public-private partnership affiliated with and funded, in part, by the Howard County government. For fiscal year (FY) 2021, the approved Howard County government general fund budget was $1.176 billion. Within the county government’s budget, HCEDA’s FY 2021 approved budget was $4.146 million. The primary goal of HCEDA
is to be the catalyst for economic growth and sustainability. Cybersecurity and workforce development are critical elements of HCEDA’s strategic economic development plan.\textsuperscript{iv} Over the last four fiscal years HCEDA has managed 166 successful projects creating 7,564 new and retained jobs, impacting 2.87M sq./ft. and capital investments of $216M dollars. In addition, HCEDA established the Maryland Innovation Center in our 60,000-square-foot headquarters in Columbia, MD, and currently supports a cybersecurity roundtable of regional cyber leaders from companies focused on the government, military, and commercial sectors. Memorandums of understanding and cooperation agreements are in place with both NSA and Johns Hopkins University’s Applied Physics Laboratory (APL) as well as the Cyber Security Council of Germany. Our project manager is ICF, which is a 52-year-old global professional services firm. ICF has more than 7,500 subject matter experts worldwide, a revenue of $1.5 billion in 2020, and 90 offices around the globe. Three ICF offices are in the \textit{Solutions} region, including Howard County, which is the headquarters for ICF’s cybersecurity services and operations and is in the same corporate business park as HCEDA.

\textbf{COVID-19 Impact}

COVID-19 impacted and distressed Maryland. As of October 13, 2021, there were 545,699 cases and 10,627 deaths because of the pandemic.\textsuperscript{v} Of this amount, the \textit{Solutions} region had 457,823 total cases (84\% of the state) and 8,581 deaths (81\% of the state). The number of people unemployed in Maryland peaked in April 2020 at 282,222. As of August 2021, there are still 185,002 unemployed and the state’s unemployment rate is above the national average.\textsuperscript{vi} Since the beginning of the pandemic, over $1.5 billion in benefits have been awarded from Maryland’s Unemployment Insurance Trust Fund.\textsuperscript{vii}

Despite the devastating impact of COVID-19, demand for cybersecurity professionals remains high as individuals and employers have pivoted to working and learning from home. More than 460,000 online job listings for U.S. cybersecurity-related positions were posted from April 2020 through March 2021. The Towson-Baltimore-Columbia region alone had 11,254 cybersecurity job openings and low supply.\textsuperscript{viii} The latest ISACA (formerly Information Systems Audit and Control Association) State of Cybersecurity report based on survey results from 3,659 cybersecurity professional respondents indicates that 55\% of organizations have unfilled cybersecurity positions, that only 28\% of hiring managers believe half or more cybersecurity job applicants are well qualified, and that prior hands-on cybersecurity experience is, by far, the most important factor in determining if a cybersecurity candidate is qualified.\textsuperscript{ix}

\textbf{Coalition Members and Roles}

HCEDA is the EDA-eligible grant submission entity and grant recipient. \textit{Solutions} is directed by the regional economic competitiveness officer (RECO), who reports to HCEDA’s chief executive officer (CEO). A steering committee is composed of cybersecurity leaders, and their responsibility is to provide strategic guidance, monitor implementation, and drive innovation and continuous improvement. Exhibit 1 shows our initial steering committee members.

\begin{table}[h]
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\begin{tabular}{|l|l|l|}
\hline
\textbf{Member} & \textbf{Title and Organization} & \textbf{Role} \\
\hline
Margaret Dean & Chief Government Relations Officer, Johns Hopkins University’s APL & Higher Education and Employer \\
Theresa Dessaso & Vice President, Trinia, Inc. & Employer \\
Trisha Dixon & Vice President of Cyber Security, Atlantic Data Forensics & Employer \\
Matthew Dunlop & Vice President, Chief Information Security Officer, Under Armour & Employer \\
Dr. Gregory Fowler & President, University of Maryland Global Campus & Higher Education \\
Cyndi Gula & Managing Director and Co-founder, Gula Tech Adventures & Employer \\
Larry “Lee” Hencshel & Director of Operations, Office of the Secretary, U.S. Department of Defense & Employer \\
Katie Fry Hester & Maryland State Senator–9th Legislative District, Joint Committee on Cybersecurity, Information Technology, and Biotechnology & State \\
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\end{tabular}
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Exhibit 2 provides an organizational chart to develop, implement, monitor, and continuously improve **Solutions**. ICF is a **Solutions** industry partner and global professional services firm with expertise in cybersecurity services, workforce innovation, human capital, strategic communications, adult learning, and research and evaluation. ICF will be subcontracted by HCEDA to provide complex project management services for **Solutions**.

**Proposed Component Projects**

The five **Solutions** projects are described below:

1. **Remove Barriers to Expand Access**
   **Solutions** will help regional employers and institutions reimagine how they conceptualize and invest in job expansion and workforce development. The three key components include guiding organizations to (1) identify opportunities to invest in the full spectrum of the cybersecurity professional pipeline, (2) identify and remove obstacles to expand the workforce diversity, equity, and inclusion (DEI) candidate pool, and (3) better align job design and processes, roles, and job descriptions to occupationally relevant criteria.

2. **Publicize Opportunities to Employers and Current and Future Cybersecurity Professionals**
   **Solutions** will develop and execute a comprehensive social media and traditional communications and marketing campaign to engage employers and promote opportunities to qualified candidates, especially DEI individuals, using podcasts, seminar series and receptions, cyber defense and offense competitions, career days, targeted recruiting for paid internships, registered apprenticeships and employment opportunities, summer programs, and initiatives to upgrade the skills of incumbent workers.

3. **Provide Work-Based Learning to Build a Pipeline**
   **Solutions** will invest in employer-driven, community-based, and outcomes-focused pipeline programs that include mentoring, scholarships, experiential learning, paid internships, pre-apprenticeships, registered apprenticeships, and incumbent worker training to expand the pipeline and overcome funding barriers.
4. Establish Cyber Range to Provide Experiential Learning

*Solutions* will establish a state-of-the-art cyber range to develop unique experiential learning opportunities that frame cybersecurity challenges in real-world contexts and target programs that address the critical skill gaps identified by the steering committee. The cyber range will be interactive and provide simulated representations of an organization’s local network, system, tools, and applications that are connected to a simulated internet-level environment. Cyber ranges provide a safe, legal environment to gain hands-on cyber skills in a secure environment for product development and security posture testing.

5. Develop Future Employer-Driven Solutions

*Solutions* will research critical skills gaps identified by the steering committee and other engaged cybersecurity employers. *Solutions* will support mapping knowledge, skills, and abilities critical to government and civilian cybersecurity workforce demands by investing in curriculum development and deployment with postsecondary institutions. Employers will be able to capitalize upon these newly developed cybersecurity education, training, and employment resources.

**Preliminary Metrics of Success for Proposed Projects**

The *Solutions* team will collect data that measures both program performance and regional impact. Metrics include measuring program performance, such as the number of individuals trained; the number employed, retained, and advanced in cybersecurity; credential attainment; wages paid; and wage gains over time. Employers will be regularly surveyed for their satisfaction and ideas to improve *Solutions*. Input and outcome data will be collected on all *Solutions* programs and participants and broken out by demographic characteristics, such as race and gender, to monitor DEI impact. To measure the impact of *Solutions* on the region, we will use employment and wage data to measure the economic impact, such as growth in GDP, number of direct, indirect, and induced jobs created, and growth in personal income.

**Accessibility of Matching Funds for Phase 2 and Other Complementary Investments**

The *Solutions* team has identified the below matching funds and other corresponding investments for Phase 2: Full Applications.

In March 2021, the Maryland Governor and Maryland General Assembly agreed to invest $75 million in work-based learning. Funds are allocated to the state’s 13 local workforce development boards, and 8 of those boards are in the region. *Solutions* strategically augments and complements these funds.

The Maryland Apprenticeship Tax Credit provides a state income tax credit to registered apprenticeship sponsors or participating employers, which hire an eligible registered apprentice. The employer may qualify for a $1,000 tax credit for each eligible registered apprentice, which complements *Solutions*.

The Maryland Department of Labor’s Maryland Business Works funds are invested to upgrade the skills of current employees while creating opportunities for new hires in in-demand occupations and skills. Participants completing the program gain transferable skills or industry-recognized certifications or credentials, leading to potential career growth and increased wages. Projects are industry-focused and employer-based, targeting small businesses, which complements *Solutions* at the local level.

In June 2019, ICF was awarded a 5-year, $10.8 million contract to the U.S. Department of Labor (DOL), Employment and Training Administration’s (ETA’s) Office of Apprenticeship to establish nationwide at least 900 cybersecurity youth registered apprenticeships for individuals aged 16–21. The project is known as Cybersecurity Youth Apprenticeship Intermediary (CYAI). At the end of year 2, ICF had already established 445 cybersecurity youth registered apprenticeships. Enrolled apprentices are from historically underserved communities, including women, Black, Indigenous, and other people of color. ICF will apply CYAI’s technical capabilities to complement *Solutions*. 
In January 2021, ICF was awarded a 4-year, $8.6 million H-1B employer-funded One Workforce Grant by ETA. The project is known as Learning, Employment and (Economic) Development for Information Technology (LEAD4IT). The project uses an array of employer-driven, work-based learning strategies, including paid summer internships, paid work experience, pre-apprenticeships, registered apprenticeships, on-the-job training, customized training, and incumbent worker training. Focus is on employing the underemployed and unemployed and upgrading the skills of incumbent workers. Starting February 1, 2022, ICF will deploy LEAD4IT resources nationwide and augment Solutions.

On September 30, 2021, ICF was awarded a 5-year contract worth up to $45 million by DOL ETA to provide training and technical assistance for workforce programs across the nation. Under this federal contract, ICF can provide training and technical assistance to the Maryland Department of Labor and the local workforce development boards to optimize their employer-driven, work-based learning capabilities to complement and expand the reach of Solutions.

### Potential Barriers to Implementation and Mitigation Strategies

Exhibit 3 describes potential barriers to implementation and corresponding mitigation strategies.

#### Exhibit 3. Potential Barriers to Implementation and Mitigation Strategies

<table>
<thead>
<tr>
<th>Potential Barriers to Implementation</th>
<th>Mitigation Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>There is a conflicting narrative. What is the truth about the “labor shortage” and “skills gap”?</td>
<td>Provide analysis and strategic communications and marketing to provide facts about the labor shortage, skills gap, and Solutions.</td>
</tr>
<tr>
<td>Arbitrary degree requirements exclude majority of the workforce; 60% of the workforce has access to only 26% of new jobs.</td>
<td>Employ work-based learning to acquire skills and cyber range to demonstrate skills to employers.</td>
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<tr>
<td>Employers are leaving talent on the table.</td>
<td>Highlight benefits of alternative cybersecurity labor sources, such as transitioning military who have gained skills through their service, paid on-the-job training, paid internships, and long-term registered apprenticeships.</td>
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<tr>
<td>Technology talent “gap” is mostly an opportunity gap.</td>
<td>Distill job descriptions to essential elements to expand pool of job candidates.</td>
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<tr>
<td>Traditional publicly financed workforce ecosystem is difficult to understand and navigate.</td>
<td>Provide a single regional point of entry for employers, job candidates, and training providers.</td>
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<tr>
<td>Opportunity for region is substantial.</td>
<td>Strategically align regional assets; and become a national laboratory for employer-driven, community-based, and outcomes-focused cybersecurity workforce solutions.</td>
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<tr>
<td>Prior regional attempts have not achieved the desired impacts and outcomes.</td>
<td>Solutions is ground up and built to meet the demands of employers.</td>
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### Timeline for Implementation

The timeline for our 13-month implementation schedule is described in Exhibit 4.

#### Exhibit 4. Project Timeline

<table>
<thead>
<tr>
<th>2021</th>
<th>2022</th>
</tr>
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<tbody>
<tr>
<td>Dec</td>
<td>Jan</td>
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<tr>
<td>EDA Solutions award</td>
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<tr>
<td>Steering committee</td>
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<td>RECO and ICF onboard</td>
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<tr>
<td>Phase 2 planning</td>
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<td>Phase 2 submission</td>
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<tr>
<td>Community engagement</td>
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<td>Phase 2 award</td>
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<tr>
<td>Transition to Phase 2</td>
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<tr>
<td>Phase 1 closeout</td>
<td></td>
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