REPORT ON THE IMPLEMENTATION OF SB 18-086

OCTOBER 1, 2020

Overview

C.R.S. 24-33.5-1905 (4) directs the Department of Higher Education (DHE, the Department) to prepare a report detailing progress made towards critical state cyber-security goals at institutions of higher education that received an appropriation through SB 18-086. Specifically, the report must include, at a minimum:

1. The number of faculty or adjunct faculty hired at each institution of higher education as a result of the funding;
2. The number of student internships created with the funding at each institution of higher education;
3. The number of degrees or certificates that have been awarded at each institution of higher education in connection with the funding;
4. The number of scholarships awarded at each institution in connection with the funding;
5. The number of presentations and seminars given on cybersecurity by each institution of higher education; and
6. The amount of all other money that has been raised to match the state investment, which may include tuition, fees, federal funds, and industry donations.

Six governing boards were awarded funding in the 2019-20 fiscal year. The following report summarizes their spending.

Key Findings

Fiscal Year 2019-20 was the second year in which funding was awarded to support cybersecurity and distributed ledger technology activities at institutions. Despite the impact of the COVID-19 pandemic on campus operations, institutions remained committed to offering cybersecurity activities and programming to both students and their communities.

Table 1 shows, by governing board, SB 18-086 appropriation, actual expenditures, required scholarship award total, and actual scholarships awarded.

	SB 18-086 Appropriation	Total Amount Expended	SB 18-086 Scholarship Requirement	Total Amount Spent on Scholarships*
Colorado Mesa University	$300,000	$187,226	$30,000	$0
Metropolitan State University of Denver	$300,000	$264,805	$30,000	$17,500
Western State Colorado University	$200,000	$147,234	$20,000	$24,250
Colorado State University System	$1,200,000	$1,191,974	$180,000	$306,050
University of Colorado System	$2,800,000	$2,800,000	$420,000	$557,200
Colorado Community College System	$300,000	$300,000	$30,000	$30,000

*See page 18

Fiscal Year (FY) 2019-20 was the second year in which institutions received this funding. In addition to several programs requiring a longer period of implementation, the COVID-19 pandemic also caused interruptions on campuses across the state. As institutions continue to receive funding to support cybersecurity programs, the amount of programming they are able to offer will likely increase. Institutions that did not expend their full appropriation in FY 2019-20 indicated their intent to "catch up" in FY 2020-21, primarily through offering additional scholarships.

Table 2 summarizes activities funded by SB 18-086 funding.

	Faculty and Adjuncts Hired	Internships Created	Degrees and Certificates Awarded	Scholarships Awarded	Presentations and Seminars Given	Amount of Other Funding Raised
Colorado Mesa University	0	0	8	0	30	$70,000
Metropolitan State University of Denver	8	5	14	10	0	$190,244
Western Colorado University	0.9	1	2	5	2	$132,988
Colorado State University System	31	121	273	111	143	$7,700,000
University of Colorado System	5	28	234	211	55	$19,629,757
Colorado Community College System	2	10	45	12	6	$15,000

Full Institutional Submissions

Institutions used the funds received to support a wide range of public facing activities, such as hosting summer camps, presenting at conferences, and offering trainings for community members. Institutions also raised significant additional funds to support their work in the cybersecurity realm. For additional details on institutional activities and fund raised, each institution's full submission to the Department has been included in the subsequent pages. Responses have been edited for formatting and grammar.

COLORADO MESA UNIVERSITY

	SB 18-086 Appropriation Expenditure Report		
<1>	**Governing Board Name**	Colorado Mesa University	
<2>	Total SB 18-086 Appropriation	$	300,000
<3>	Actual Amount Spent on Scholarships	$	-
<3.5>	Total number of scholarships awarded		0
<4>	Required Allotted Amount Earmarked for Scholarships	$	30,000
<5>	**At or above allotted amount of scholarship earmark**	No	
<6>	Number of faculty/adjucts hired as a result of funding		0.0%
<7>	Number of student interships created		
<8>	Number of degrees/certificates awareded in connection with SB 086 funding		8
<9>	Number of presentations/seminars given on cybersecurity		30
	Weekly and or bi-weekly student presentations; and workshops provided for local school district.		
<10>	**Amount of all other money raised to match state investment**	$70,000	
<11>	Total Amount Expended	Colorado Mesa University	$	187,226
<12>	**Please discuss any additional ways in which SB 086 money was spent, which may not be captured in lines 6-9 and fundraising efforts as reported in FY20 and any other information you would like to be included in the report.**		
<13>	Faculty Wages and Benefits		119,706
	Student Assistants		49,310
	Software Maintenance		2,565
	Supplies		33
	Dues & Memberships		330
	Equipment		15,282
	In addition to the Cybersecurity center being closed from mid-March to August due to COVID-19 restrictions, the director of the center resigned in December of 2019 and an initial search for a new director failed to find an appropriate candidate. The search has since been re-started and the duties of the director have been temporarily reassigned across various faculty members. The resignation also affected the approvals necessary to disburse scholarships and so we are currently "catching up" of scholarship reimbursements in Fall 2020. We are on track to award all scholarships designated in the allocation. The Center's work toward NSA-CAE designation is ongoing but was interrupted by the NSA during the COVID crisis.		

METROPOLITAN STATE UNIVERSITY

		SB 18-086 Appropriation Expenditure Report	
<1>	**Governing Board Name**	Metropolitan State University of Denver	
<2>	Total SB 18-086 Appropriation	$	300,000
<3>	Actual Amount Spent on Scholarships	$	17,500
<3.5>	Total number of scholarships awarded	10	
<4>	Required Allotted Amount Earmarked for Scholarships	$	30,000
<5>	**At or above allotted amount of scholarship earmark**	No	
<6>	Number of faculty/adjucts hired as a result of funding		8.00
<7>	Number of student interships created	5	
<8>	Number of degrees/certificates awareded in connection with SB 086 funding	14	
<9>	Number of presentations/seminars given on cybersecurity	0	
<10>	**Amount of all other money raised to match state investment**	$	190,244.17
<11>	Total Amount Expended — Metropolitan State University of Denver	$	264,805
<12>	**Please discuss any additional ways in which SB 086 money was spent, which may not be captured in lines 6-9 and fundraising efforts as reported in FY20 and any other information you would like to be included in the report.**		
<13>	MSU-Denver created a scholarship in Fall of 2018 for $30,000 to be allocated for each academic year. For the 2018/2019 academic year, 7 students were awarded $9,000. For the 2019/20 academic year 10 students were awarded $17,500; however, a COVID-19 pandemic struck the country and few applicants applied or were awarded money in the Spring 2020 semester due to a national pandemic. However, in FY21 the University will award above the required 10% to catch up. As of Fall 2020, $52,500 has been awarded to 35 students to make up for lack of applicants in the Spring 2020 semester. In addition to faculty/adjuncts, funding was spent on a Cybersecurity Program Manager as well as a Cybersecurity range director. Finally, through MINDSpark, MSU-Denver was able to secure foundation funds/monies to support a STEMPath Certificate. The Fund was created to support the establishment and operations of the Cybersecurity Certificate Program, an educator preparation program that will create direct access and pathways for Colorado educators interested in pursuing STEM-Computer Science credentials. Grant funding of of approximately $180,000 for cohorts of 25 students for the Cybersecurity Certificate Program will be extended by the Donor, STEMPath, for subsequent years as the partnership develops.		

The Bachelor of Science Degree in Cyber Security

The Bachelor of Science Degree in Cyber Security successfully launched in Fall 2018 with 47 majors. Currently, (Spring of 2020) the B.S. in Cybersecurity has 218 majors. A Master's Degree in Cybersecurity started in the Fall of 2019 with 15 students and current class has 29 students. Finally, a StemPath Cybersecurity Certificate with 13 students started in Fall 2019 as well.

Faculty

The department hired a Cybersecurity Program Manager, a full-time Cybersecurity specialist faculty in Computer Information Systems and a Cyber Range Director with funding from Senate Bill 18-086. Additionally, MSU-

Denver has hired 5 part-time faculty to teach Fall, Spring and Summer cybersecurity undergraduate and graduate courses.

Scholarship

MSU-Denver created a scholarship in Fall of 2018 for $30,000 to be allocated for each academic year. For the 2018/2019 academic year, 7 students were awarded $9,000. For the 2019/20 academic year 10 students were awarded $17,500; however, a COVID-19 pandemic struck the country and few applicants applied or were awarded money in the Spring 2020 semester due to a national pandemic. However, in Fall 2020, $52,500 was awarded to 35 students to make up for lack of applicants in the Spring 2020 semester. Below is the language for the scholarship.

Other areas and institutional matches

Monies have been allocated to build a cyber range, $100,000 from SB 86 matched with $150,000 (Dean and Provost Office) and in process of raising $250,000 from public-private partnership from community participates.

Graduates or Certificates

There were 11 STEMPath students that earned graduate certificates in Cybersecurity. The 11 students are current teachers in Denver Public Schools (9) and Aurora Public Schools (2), who will teach Cybersecurity to K-12 students in their respective school districts in their individual classrooms or Cybersecurity/Computer labs. Two schools have created labs for students to learn.

There were 3 B.S. in Cybersecurity graduates for the 2019/2020 academic year.

Amount of matching monies, including tuition, fees, federal funds, and industry donations

To date, the university has received matching funds from our STEMPath Graduate Certificate. Through a partnership with MINDSpark a grant fund was established with a $180,000 to inaugurate and establish the Cybersecurity Certificate Program for the initial startup year and subsequent years as the partnership develops. Initially, $45,703 was raised for course development and program implementation. Additionally, the program has partnered on a 1.675-million-dollar Department of Defense grant with BAE Systems and IREUS to build a Cybersecurity range. The program is also partnering with Lockheed Martin to build a Cyber range with scenarios specific to satellites and securing cyberspace. $100,000 has be set aside to solicit matching donations from other private industries such as Bank of America, Xcel Energy and Plante Moran.

WESTERN COLORADO UNIVERSITY

	SB 18-086 Appropriation Expenditure Report	
<1>	**Governing Board Name**	Western State Colorado University
<2>	Total SB 18-086 Appropriation	$ 200,000
<3>	Actual Amount Spent on Scholarships	$ 24,250
<3.5>	Total number of scholarships awarded	5
<4>	Required Allotted Amount Earmarked for Scholarships	$ 20,000
<5>	**At or above allotted amount of scholarship earmark**	Yes
<6>	Number of faculty/adjucts hired as a result of funding	0.9
<7>	Number of student interships created	1
<8>	Number of degrees/certificates awareded in connection with SB 086 funding	2
<9>	Number of presentations/seminars given on cybersecurity	2
<10>	**Amount of all other money raised to match state investment**	132,988
<11>	Total Amount Expended Western State Colorado University	$ 147,234
<12>	**Please discuss any additional ways in which SB 086 money was spent, which may not be captured in lines 6-9 and fundraising efforts as reported in FY20 and any other information you would like to be included in the report.**	
<13>	50 flash drives purchased to distribute to the students. Copying costs. Two camps of 1 week each, from 7th to 12 grade - about 37 students total. Two trips to the front range for MWCC conferences.	

CSU SYSTEM

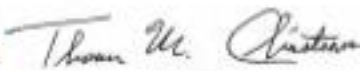|	SB 18-086 Appropriation Expenditure Report - FY 20		
<1>	**Governing Board Name**	Colorado State University System	
<2>	Total SB 18-086 Appropriation	$	1,200,000
<3>	Actual Amount Spent on Scholarships	$	306,050
<3.5>	Total number of scholarships awarded	111	
<4>	Required Allotted Amount Earmarked for Scholarships	$	180,000
<5>	**At or above allotted amount of scholarship earmark**	Yes	
<6>	Number of faculty/adjucts hired as a result of funding	31	
<7>	Number of student interships created	121	
<8>	Number of degrees/certificates awareded in connection with SB 086 funding	273	
<9>	Number of presentations/seminars given on cybersecurity	143	
<10>	**Amount of all other money raised to match state investment**	$7,700,000	
<11>	Total Amount Expended	Colorado State University - Fort Collins	$	991,974
		Colorado State University - Pueblo	$	200,000
<12>	**Please discuss any additional ways in which SB 086 money was spent, which may not be captured in lines 6-9 and fundraising efforts as reported in FY20 and any other information you would like to be included in the report.**		
<13>	**CSU was able to sustain a very high level of activity, despite uncertainties introduced by covid-19.**		
	Systems engineering was just awarded another $2.459 million CyberSecurity grant. **CSU-Pueblo is ranked #5 in the U.S. in the U.S. Cyber Power cybersecurity rankings.** **Interns significantly enhanced CSU's security posture in their operational environment.** **Blockchain courses were delivered, as well blockchain lectures in numerous other courses.**		

University of Colorado, Colorado Springs (UCCS)

Cybersecurity Initiative (CSI)

FY20 Annual Report

September 21, 2020

Approved: *Thomas M. Christensen*   16 Sept 2020

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Executive Summary

On May 30th, 2018, former Governor Hickenlooper signed Senate Bill (SB) 18-086 granting UCCS $2.8 million annually for workforce development, research and development, and support to law enforcement enhancing cybersecurity for the State and the Nation. This document provides a consolidated report of FY2019-20 CSI expenditures as required by SB18-086.

Altogether, UCCS in partnership with the National Cybersecurity Center (NCC) spent all of the FY 2019-20 State appropriation shown in Figure 1. Additionally, over $19.5 million in grants and additional funds were awarded and obtained to UCCS, NCC and Space ISAC. These numbers are also reported in Figure 1.

Figure 1: SB18-086 Reporting Criteria

SB 18-086 Appropriation Expenditure Report		
Governing Board Name	University of Colorado System	
Total SB 18-086 Appropriation	$	2,800,000
Actual Amount Spent on Scholarships	$	557,200
Total number of scholarships awarded		211
Required Allotted Amount Earmarked for Scholarships	$	420,000
At or above allotted amount of scholarship earmark		Yes
Number of faculty/adjucts hired as a result of funding		5 faculty
Number of student interships created		28
Number of degrees/certificates awarded in connection with SB 086 funding		234
Number of presentations/seminars given on cybersecurity		55
Amount of all other money raised to match state investment	$	19,629,757
Total Amount Expended	University of Colorado - Colorado Springs	$	2,800,000
Please discuss any additional ways in which SB 086 money was spent, which may not be captured in lines 6-9 and fundraising efforts as reported in FY20 and any other information you would like to be included in the report.		
UCCS had additional efforts outside the data above that supported the legislative requirements including extensive blockchain development work supporting law enforcement with cybersecurity training and equipment. Space Information Sharing and Analysis Center also created long-term partnerships and involvement of Mitre and Aerospace Corporation as directed in HB16-1453.		

In addition to SB18-086 reporting criteria, the impact of the state's investment in the Colorado cybersecurity ecosystem including academic and community programs, industry outreach and partnership and filling workforce needs cannot be understated. These efforts are critical to Colorado's pursuit of becoming the permanent home of US Space Command and to continue being a national leader in public and private sector activities related to cybersecurity. The following narrative provides more detail on the comprehensive impact UCCS efforts with these funds have had on cybersecurity in Colorado and beyond.

Together, UCCS and NCC are continuing along the path of exponentially expanding the cybersecurity ecosystem with initiatives, programs, research and partnerships that are paying large dividends by enhancing cybersecurity for Colorado and Nation. Both UCCS and NCC are grateful to the Colorado Legislature and Governor for giving us this opportunity.

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University of Colorado Colorado Springs

UCCS has leveraged SB-086/CSI $2.8 million in 2020 to achieve the following under the broad legislation requirements:

Scholarship Amount – $557,200 (exceeded 15% legislative requirement, additional scholarships awarded through additional funding sources)
- UCCS was awarded funding from NSA for DoD Scholarship for Service (SFS) program- four cybersecurity students (2 bachelor's and 2 master's degrees) – $135,000
- The NCC, based on additional funds leveraged as a result of state money, offered non-academic scholarship funds in FY 2020
    - Cybersecurity Classes/Certifications – $106,800
    - Student Cyber Camps – $30,400

Total Students Scholarships Awarded – 221
- UCCS undergraduate and graduate students (69)
- The NCC, based on additional funds leveraged as a result of state money, offered 152 additional scholarships to adult and high school students participating in cyber security camps

Faculty Hires – 5
- **College of Business**
    - Full-time professor with over 10 years of cybersecurity teaching, research and program development expertise
    - Three part-time Cybersecurity Fellows in: Digital Strategy and Marketing; Strategy; and Finance & Information
- **College of Engineering and Applied Science (EAS) hired the endowed Gallogly Cybersecurity Chair with 20 years of research and educational leadership in cybersecurity, with extensive connection with DOD and Federal Agencies.**
    - EAS also continues to employ the six faculty listed on the 2019 annual report – two of the full-time faculty hired are working cybersecurity operations and security in intelligent transportation and privacy and anonymous networks
- **The NCC, based on additional funds leveraged as a result of state money, were able to hire six new employees working cybersecurity projects**

Student Internships Created – 28
- **UCCS EAS Blockchain research project supports 10 part-time interns and directly executes the legislative SB18-086 requirement to conduct research and development on encryption and data integrity techniques**
- **The NCC hosted 10 high school cybersecurity students during the summer and five college students to help with student cyber camps and one summer intern supported the Elections Program**

- The Space Information Sharing and Analysis Center (ISAC) hosted three cybersecurity college interns for Summer 2020, two undergraduate students and one graduate fellow that conducted strategic planning and evaluation of the cybersecurity threat intelligence platform

<u>Degrees and Certificates Awarded</u>
- **UCCS degrees – 229**
    - Bachelor Degree in Innovation – 41
    - Bachelors of Science – 116
    - Masters Degree in Engineering – 10
    - Masters Degree in Science – 12
    - Doctor of Philosophy Degree – 10
    - Minor - 40
- **UCCS certificates - 5**
    - Network System Security – 2
    - Engineering Secure Software Certificate – 2
    - Undergrad Applied Cybersecurity Cert - 1
- **UCCS EAS is launching a Bachelor of Arts in Computer Science (BACS) with an emphasis in Cybersecurity Fall 2020**
    - This offering will significantly expand the articulation opportunities for Community College cybersecurity AAS students to compete a cybersecurity bachelor's degree at UCCS
- **UCCS COB is launching following programs in Fall 2020:**
    - **MBA Emphasis in Cybersecurity Management** (12 credits) – Security technologies, achieving regulatory compliance, and implementing cybersecurity programs to mitigate risks and secure information assets
    - **BS in Business Emphasis Area in Cybersecurity Management** (24 credits) – Designed to meet the increasing employer demand for cybersecurity professionals to protect corporate IT assets. The courses focus on entry-level and mid-level cybersecurity roles of cybersecurity analyst, risk analyst, cybersecurity consultant, and IT Auditor
    - **Graduate Certificate in Cybersecurity Management** (12 credits) – Online UCCS Graduate Certificate in Cybersecurity Management focused on the roles of cybersecurity consultant, IT Auditor, and Cybersecurity Manager
    - **Undergraduate Certificate in Cybersecurity Management** (12 credits) – Students will be trained for High Wage High Demand cybersecurity occupations cybersecurity roles of cybersecurity analyst, risk analyst, cybersecurity policy consultant, or IT Auditor
    - **Doctor of Business Administration in Cybersecurity Management (EDBA-Cyber)** – The interdisciplinary EDBA-Cyber program aims to develop ethical security leaders who can improve security practice globally through applied, evidence-based analysis and rigorous evaluation of complex issues in play. The EDBA-Cyber is a 60 credits three-year, part-time program designed for working executives. **This is the first doctoral program in COB. The admissions will begin Fall 2020 with first classes scheduled for Fall 2021**
- Three NCC cybersecurity non-credit programs were offered during this past FY. Many of the students and adults who completed the cybersecurity courses earned nationally recognized certifications in areas such as IT Fundamentals (86) and Security+ (3)
    - Cyber camps – 152 participants
    - NCC Student Alliance (NCCSA) in Cybersecurity (CTSO) – 63 participants

- o Cybersecurity training – Adults – 26 participants
- UCCS raised over $5M from the Economic Development Council and local matching foundation funds to further develop the UCCS cybersecurity building that will house the cybersecurity programs, anticipated completion Jan 2022

Seminars, Publications and Presentations on Cybersecurity – 55

- **School of Engineering and Applied Sciences** – Sang-Yoon Chang, Younghee Park, Nikhil Vijayakumar Kengalahalli, and Xiaobo Zhou. (2019) "Query-Crafting DoS Threats Against Internet DNS." Proceedings of IEEE International Conference on Communications and Network Security (CNS), 2020, Avignon, France
- **School of Business** – Tejay, G., and Mohammed, Z. (2019). "Identifying factors of Information Security Culture: An Exploratory Study." Proceedings of the Dewald Roode Workshop on Information Systems Security Research IFIP WG8.11/WG11.13, Shreveport/Bossier, LA, USA, October 4-5, 2019
- **Scholarship for Service students** – 2 publications, 4 conference
  - o Arijet Sarker, SangHyun Byun, Wenjun Fan, **Maria Psarakis**, and **Sang-Yoon Chang.** (2019) "Voting Credential Management System for Electronic Voting Privacy" Proceedings of IFIP Networking Conference (Networking), 2020, Virtual
  - o Li-e Wang, Shan Lin, **Yan Bai, Sang-Yoon Chang,** Xianxian Li, and Peng Liu. (2019) "A Privacy Preserving Method for Publishing Set-Valued Data and Its Correlative Social Network" Proceedings of IEEE International Conference on Communications (ICC), 2020, Dublin, Ireland
- **National Cybersecurity Center**, based on a combination of state and additional funds, participated in cybersecurity presentations (25) and seminars (23)
- **Space ISAC**, based on a combination of state and additional funds, attended and presented at three national and international conferences

Matching/additional grants – over $19.5 million

- **US Department of Labor Grant** $6 million
  - o 4-year grant to College of Business
  - o Train 5000+ Cybersecurity Apprentices (mid-level skills)
  - o 800+ Employers needed
    Paid work for apprentices while going through 1.5-year program
  - o Implement grant in 10 states: Colorado, Arizona, Nevada, Nebraska, California, Texas, Florida, Virginia, North Carolina, Oregon
- **Economic Development Administration** $2.75M – develop UCCS Cybersecurity education operation (classrooms, labs, faculty offices, conference rooms
- **Economic Development Administration-XI** $750K – grow the later stage programs-Amplify and Ascend and Job Creation
- **The Anschutz Foundation** $1.3M
  - o Buildout of UCCS Cybersecurity Building (matching to above EDA grant)
- **El Pomar Foundation** $1.25M
  - o Buildout of UCCS Cybersecurity Building (matching to above EDA grant)
- **The Lane Foundation** $200,000
  - o Buildout of UCCS Cybersecurity Building (matching to above EDA grant)

- NSA $95,000 – Five GenCyber Middle School Summer weeklong cybersecurity camps
- **Deloitte $50,000** – Cybersecurity Boot Camps and Open to Local businesses who were developing cyber departments, members of all arms of the military who deal with cyber issues and students
- **UCCS Engineering/Cybersecurity Grants** – $2,804,501 total
    - NSF $97,000 Enforcing Security and Privacy Policies to Protect Research
    - NSF $36,620 BREAKTHROUGH in CYBERSECURITY
    - NSA $135,100 2019 DOD CYBER SCHOLARSHIP
    - NSF $692,500 REAL-TIME OPERATING SYSTEM
    - NSF $1,132,100 COLORADO-WASHINGTON SECURITY
    - NSF $20,620 Investigate and enhance cybersecurity of automotive systems
    - NSF $708,581 Cybersecurity hardening for scientific industrial control systems
- NCC leveraged state funds to obtain $2,657,659 from multiple funding sources in FY 2020
- **Space Information Sharing and Analysis Center (ISAC)** leveraged state funds to obtain $803,000 from multiple funding sources in FY 2020
- **BlockChain Development Community:** Volunteer Members and Companies provided 85.1% of 13,808 hours contributed to the effort from 2017-2020. In comparison to the $140,000 invested by the State this provides an equivalent in-kind community sponsored effort of $939,597.
- **BlockFrame Incorporated:** provided in-kind sponsorship providing media outreach services, refreshments and prizes, venue cost, and professional services for weekly meetings. These in-kind services and sponsorship over a three (3) year period provided matching support of approximately $30,000.

In addition to the University specific requirements, UCCS has undertaken significant work on legislation specific technical requirements:
- **UCCS School of Public Affairs - Public Safety Initiative (PSI)** – In support of SB 18-086 Section 4 24-33.5-1904 paragraph 2f, " Support state and federal law enforcement agencies with their responsibilities for investigating and collecting information related to cyber-based criminal and national security threats" has continued to facilitate professional development education and training for 16 area law enforcement agencies across Colorado.
    - Twenty-six Digital Forensic Investigators received cybercrime training, and two agencies received hardware and software to enhance their cybercrime investigative abilities.
    - One of the agencies that received support is the Colorado Springs Police Department (CSPD) Technical Investigations Section. This office investigates financial crimes, criminal transactions, and Internet Crimes Against Children (ICAC). The CSPD Digital Forensics Unit examines data from computers, cell phones, video surveillance systems, and many other digital storage devices.
    - PSI Support to Law Enforcement delivered $72,091 in cybercrime training and equipment to 16 area LE agencies sponsoring nine cybercrime investigation courses for 26 law enforcement Investigators
    - PSI delivers cybersecurity capability and expertise in an increasingly critical area of law enforcement
    - PSI offers insight and advice necessary to adapt and contend with a rapidly evolving cybersecurity threat
- UCCS funded "Blockchain Research Program in Support of Colorado Senate Bill SB18-086," in support of the SB18-086 section two requirements. The largest efforts were in applied research evaluation and testing which led to several key developments:

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- o The testing of performance and base operations of Project Philos™ distributed ledgers
- o the publication of the operations of the Synchronous Trust Consensus Model for peer review
- o the establishment of the International Alliance of Trust Chains (IATC) organization
- o the establishment of a for-profit organization to support the sales of tokens necessary to operate the Philos™ distributed ledger
    - *Distributed Ledger Project Philos™ has incorporated the needs for several other Colorado Legislation with the ability to support multiple state programs. Technology application implement provide for the a modular framework to include requirement from Colorado legislation including: SB13-246 Criminal Discovery Task Force, SB14-190 Statewide Discovery Sharing System, HB16-1377 Digital Task Force, HB16-1453 CO Cyber Security Initiative, HB18-1128 Personal Identifying Information, HB19-1247 Study Agricultural Applications for Blockchain, SB19-184 Colorado Water Institute blockchain, HB18-1220 Currency Exemption Money Transmitters Act*
- o the expansion of the BlockChain Development Community (BCDC) to multiple university chapters and engagement with a future alliance to expand worldwide dispersal
    - *Communities for Blockchain Development founded in partnership with UCCS, and other local Colorado Universities have engage 285+ persons who actively engage to volunteer time towards making Distributed Ledger a reality in Colorado. This has resulted in Interstate coalition with chapters at UCCS, Denver University, and Arizona State University. Discussion for additional chapters are in progress with Colorado State University, University of Wyoming, Tennessee Tech, University of Notre Dame and University of Arkansas. Expanded relationships with International Electrical and Electronic Engineers (IEEE) will result in this becoming a global footprint.*
- o engagement for a proof-of-concept prototype with an initial state-wide program with a partnership to implement for CDE.
- o Founding community of developers in three chapters, UCCS, Denver University, Arizona State University.
- o Alliances with Colorado Department of Higher Education C-Labs project, International Electrical and Electronic Engineers IEEE, and Denver University Transactive Energy
- **Space Information Sharing and Analysis Center (ISAC), executing the direction in HB16-1453 "consider establishing relationships with the existing Mitre national cybersecurity federally funded research and development center; the Aerospace Corporation federally funded research and development center" Mitre and Aerospace Corporation are founding members of the Space ISAC.**

Other Significant Cybersecurity Accomplishments Resulting from this Funding
- **Formation of the Space Information Sharing and Analysis Center (ISAC) – November 2019**
    - o Space Information Sharing and Analysis Center (ISAC) was formed in response to the White House announcement in April
    - o The Space ISAC is a public-private partnership which collaborates across the global industrial base to enhance the Nation's ability to prepare for and respond to vulnerabilities, incidents, and threats to its space infrastructure
    - o The NCC has been designated as the executive, operational, and administrative arm of the Space ISAC and as such, conducts all day-to-day business for the organization
- **National Cybersecurity Symposium – September 2019**
    - o 350 participants during the symposium and they attended over 20 different seminars/presentations providing cybersecurity awareness. Many of the attendees were local and state government officials who have a direct line to public policy
- **Cybersecurity workforce development – NCC Student Alliance (NCCSA)**

- A large part of the Cyber Education program is the NCCSA which helps middle and high schools to either reinforce already existing cyber education programs or build programs where none exist. In FY20, the NCC helped over 35 different schools enhance or create cybersecurity education programs. The program continues to expand across the state and nation
  - NCCSA provided cyber summer camps to middle and high school students. 152 students attended cyber camps hosted by the NCC in FY20.

Impacts of COVID
- **Many of the PSI law enforcement training sessions supporting SB18-086 were postponed/rescheduled**
  - Colorado ICAC to conduct undercover chat class
  - Regional ICAC conference in Colorado Springs
  - FLETC Wi-Fi Tools for Analysis and GEO-Locating (WTAG)
  - Cellebrite Certified Operator (CCO) Training
- **UCCS/NCC in person conference and seminar travel and presentations eliminated/suspended but virtual participation continued**
- **NCC National Cybersecurity Symposium planned for June 2020 was cancelled**
- **Exponential Impact (XI)** is a partner in the cybersecurity ecosystem and offers two signature programs that help with job creation. The program for this past year was postponed due to COVID-19 and is scheduled to start this fall
  - Launch Camp is an annual event in the spring before the kickoff of the XI Accelerator program. It gives entrepreneurs a chance to meet the XI team and familiarize themselves with the XI Accelerator program as they spend time with mentors and other entrepreneurs
  - The Accelerator program provides a holistic approach to entrepreneurship focusing on mentorship and developing meaningful connections with other teams working on tech startups. Participants receive a network of mentors, exposure to investors, exclusive founder discounts and perks, a demo day, seed funding up to $35,000, plus access to a vast alumni network of XI and other accelerators

COLORADO COMMUNITY COLLEGE SYSTEM

	SB 18-086 Appropriation Expenditure Report		
<1>	**Governing Board Name**	Colorado Community College System	
<2>	Total SB 18-086 Appropriation		$ 300,000
<3>	Actual Amount Spent on Scholarships		$ 30,000
	Total number of scholarships awarded - **(see note 5)**		12
<4>	Required Allotted Amount Earmarked for Scholarships	$ 30,000	
<5>	**At or above allotted amount of scholarship earmark**	Yes	
<6>	Number of faculty/adjuncts hired as a result of funding - **(see note 1)**	2	
<7>	Number of student internships created - **(see note 2)**	10	
<8>	Number of degrees/certificates awarded in connection with SB 086 funding - **(see note 3)**	45	
<9>	Number of presentations/seminars given on cybersecurity - **(see note 4)**	6	
<10>	**Amount of all other money raised to match state investment - (see note 5)**	15,000	
<11>			
	Total Amount Expended **(see note 6)**	Colorado Community College System	$ 300,000
<12>			
<13>	**Please discuss any additional ways in which SB 086 money was spent, which may not be captured in lines 6-9 and fundraising efforts as reported in F19 and any other information you would like to be included in the report.**		

Note 1: SB 18-086 funds have been utilized to pay (salary and benefits) for 2 full-time cyber security faculty members (2.0 FTE). Personnel related expenses represent approximately two-thirds (66.28%) of all non-scholarship earmarked funds.

Note 2: Grant funds have been utilized to facilitate student connections with internship sites by funding hiring events, community partner gatherings, and travel related to building community partnerships. Stemming from the utilization of funds to pay for job fair expenses (July 2019 – December 2019), the Cyber Security program saw the largest cohort of internship students in the Spring 2020 semester (10 students total). Though modest, the number represents students from the first cohort of students to enter the fully realized Cyber Security program started just as initial SB 18-086 funds were appropriated – internship students are typically year-2/ final-semester students.

Note 3: FY20 completers for the cybersecurity degree and certificates nearly tripled from FY19. Whereas FY19 saw 16 total completers (15 degree awards and 1 certificate award) – FY20's mix of completers included 35 degree and 10 certificate awards in cyber security. The increased capacity in full-time personnel and equipment provided for with the SB 18-086 appropriation is directly related to this year-to-year increase in completions. Current enrollment trends indicate that completions in the program are primed to increase – annualized full-time equivalent (AFTE) numbers in the program rose by 18% from 2018 to 2019; while 2019 to 2020 saw a 70% rise in AFTE.

Note 4: SB 18-086 has allowed for students in their final year of the Cyber Security program to participate in state cyber security competitions (Fall 2019). Though representing approximately 2% of overall non-scholarship-earmarked funds, monies used to facilitate in-state travel at events have paid huge dividends – with PPCC students consistently placing and excelling in CyberMaryland, Cyber Capture the Flag (CTF), and the Rocky Mountain Collegiate Cyber Defense (RMCCD) competitions.

Note 5: In addition to the $30,000 apportionment of scholarship monies from SB 18-086, the PPCC Foundation raised $15,000 additional dollars for cyber security related grants. In total, the PPCC Foundation was able to award (18 total) $2,500 grants to Cyber Security students. Additional monies raised by the Foundation allowed for 6 additional scholarship than what would have otherwise been awarded using SB 18-086 scholarship monies alone.

Note 6: Excluding scholarships, personnel, and travel related expenses – remining SB 18-086 funds (approx. 32% of the overall award) were utilized to purchase technology infrastructure upgrades; to include collaborative classroom furniture; Information Technology (IT) equipment and services; secure networking modules; audio visual control units; and the programming and installation of said technologies and items within the newly established Cyber War Room/ Network Operations Center at PPCC's Rampart Range campus (Room E204).

Additional Information Narrative: Expenses outlines in note 6 represent the last of the expected spending to complete the Rampart Cyber War Room project. Because of the availability and lead time for capital equipment and final installation timing, the expenditures for FY20 should be seen as those made to complete a multi-fiscal-year project (purchase, installation, and optimization of the Cyber War Room/ Network-Operations-Center was completed in calendar year 2019 – spanning FY19 and FY20). Future SB 18-086 (excluding personnel expenses and scholarships) are expected to support expansion of technologies and support of the cyber activities – as funding allows.

Failure to Meet Financial Aid Requirements

C.R.S. 24-33.5-1905 (4)(b) reads:

The governing board of each institution of higher education participating in activities related to cybersecurity and distributed ledger technologies shall ensure that at least the following percentages of the money allocated to the institution pursuant to subsection (4)(a) of this section is used to provide scholarships to students at the institution who are doing work in connection with cybersecurity and distributed ledger technologies:

    (I)   For an institution of higher education receiving one million dollars or more pursuant to subsection (4)(a) of this section, for the first three years that the institution receives said money, the institution must ensure that at least fifteen percent of the money received is used to provide said scholarships. For the fourth and subsequent years of funding, the institution shall ensure that at least twenty percent of the money received is used to provide said scholarships; except that, for the five percent increase from years three to four, the institution may use private donations to account for the increase.

    (II)   For an institution receiving less than one million dollars pursuant to subsection (4)(a) of this section, the institution must ensure that at least ten percent of the money received is used to provide said scholarships.

Two institutions failed to meet the statutory requirements around the percentage of financial aid they were required to award based on the amount of funding received. In the next fiscal year, both governing boards fully expect to be able to award the full amount in required scholarship funds. Below are their responses as to why they were unable to offer the required amount of scholarship funding in FY 2019-20.

Colorado Mesa University received a total appropriation of $300,000, resulting in a scholarship requirement of $30,000. The university did not award any scholarships in FY 2019-20. Per the institution, they were unable to award scholarships because "in addition to the Cybersecurity center being closed from mid-March to August due to COVID-19 restrictions, the director of the center resigned in December of 2019 and an initial search for a new director failed to find an appropriate candidate. The search has since been re-started and the duties of the director have been temporarily reassigned across various faculty members. The resignation also affected the approvals necessary to disburse scholarships and so we are currently "catching up" of scholarship reimbursements in Fall 2020. We are on track to award all scholarships designated in the allocation. The Center's work toward NSA-CAE designation is ongoing but was interrupted by the NSA during the COVID crisis."

Metropolitan State University of Denver received a total appropriation of $300,000, resulting in a scholarship requirement of $30,000. The university provided $17,500 in scholarships in FY 2019-20. Per the institution, the scholarship amount was lower than required because "the COVID-19 pandemic struck the country and few applicants applied or were awarded money in the Spring 2020 semester due to a national pandemic. However, in FY21 the University will award above the

required 10% to catch-up. As of Fall 2020, $52,500 has been awarded to 35 students to make up for lack of applicants in the Spring 2020 semester."

Conclusion

Because FY 2019-20 was the second year of additional funding for cybersecurity and distributed ledger technologies, and because of the significant interruption caused by the COVID-19 pandemic, institutions were limited in the 18-086 activities they were able to carry out in the second half of the fiscal year. However, institutions remain committed to fully implementing the goals of the legislation.

Outside of offering scholarships to students pursuing degrees and credentials related to cybersecurity, and the hiring of faculty and staff, institutions focused funding on improving their cyber facilities and offering outreach events through cyber centers. With ongoing investment in cybersecurity and ledger technology, institutions will be well equipped to continue to invest in these programs and the students enrolled in them.