

Center for Innovative Technology FY2019 Annual Report

Driving Innovation and Entrepreneurship
Investing in Commonwealth Growth

In accordance with Code of Virginia Section 2.2-2221.1(D), the Center for Innovative Technology is pleased to submit the following annual report describing key programs and their economic performance for the Commonwealth of Virginia.

September 30, 2019



Driving Innovation and Entrepreneurship Investing in Commonwealth Growth

The Center for Innovative Technology (CIT) is Virginia’s leading resource for innovation-based economic growth strategies and programs. CIT creates technology-based economic development strategies to accelerate innovation, imagination and the next generation of technology and technology companies at the earliest stages of the Innovation Continuum – commercialization and seed funding – as it helps entrepreneurs launch and grow high-growth technology companies that create high-paying jobs for the future.

CIT builds public-private initiatives that bring government, industry and universities together to help entrepreneurs create new companies, government improve performance, and community leaders lay the foundations for their innovation economies. CIT has long been known as a source of ideas, programs, and capital for Virginia’s innovation ecosystem. To build on that foundation, CIT has become an integral part of economic development policy formation and execution with public and private stakeholders across the Commonwealth that include the Commonwealth government, Virginia universities and community colleges, businesses, and investors. Working closely with Virginia Economic Development Partnership (VEDP), GO Virginia, Virginia Biosciences Health Research Corporation/Virginia Catalyst (VBHRC), the Tobacco Commission, Virginia Research Investment Committee (VRIC), Department of Housing and Community Development (DHCD), the emerging Virginia Innovation Ecosystem and others, we share our expertise, craft strategies and design complementary programs to fulfill our mission of economic growth and diversity across Virginia and to make the best use of public and private funds entrusted to our organizations.

CIT, a not-for-profit corporation, carries out its mission through five service lines: CIT Entrepreneur, CIT R&D, CIT Strategic Initiatives, CIT Broadband, and CIT Regional and Policy Initiatives. Through these activities, CIT leverages public and private sector investments to drive innovation and entrepreneurship in the Commonwealth, creating new, high-growth companies and sustainable job growth.

CIT Community Engagement: Outreach to regions, localities and citizens

Three years ago, CIT set out on a strategic initiative to dramatically increase its engagement with communities all across Virginia. Engagement in this context means CIT staff meeting with citizens and elected officials in communities across Virginia to communicate our programs, support for innovation and entrepreneurship and solicit participation in our programs. FY19 set a new record for community engagement with over 200 community engagements of which over 150 were in communities outside of Northern Virginia. Our work on getting out to all regions led to more applications for our CRCF program, a record number of clients, over 300, trained on SBIR/STTR proposal preparation, more investment opportunities for our Virginia Founders Fund (described below), and feedback from communities that CIT is notably more seen and engaged across the Commonwealth. CIT intends to continue this emphasis on

community engagement in FY20.

CIT Entrepreneur: Access to Capital

Because the availability of early-stage capital is critical for many emerging technology companies, CIT offers the CIT GAP Funds and the new Virginia Founders Fund (VFF). The CIT GAP Funds makes seed-stage equity investments in Virginia-based technology, green technology and life science companies with a high growth potential. The GAP Funds are overseen by CIT with the advice of private sector experts – the Investment Advisory Board – who conduct thorough due diligence on the companies before making investments. Funded by proceeds of the GAP Funds portfolio, the Virginia Founders Fund is designed to support regionally based innovation initiatives and provide investment opportunities for entrepreneurs underrepresented in venture capital. The Fund is dedicated to investments in minorities, women, veterans, and founders in regions outside of Northern Virginia. CIT promotes the VFF and other innovation opportunities, through partnership with regional innovation initiatives to showcase regional entrepreneurs and attract investors and entrepreneurs, and to support existing regional programs to stimulate economic growth in these communities.

CIT R&D: Strategic Investments in Research Commercialization

The CIT R&D team facilitates the commercialization of research by public and private sector teams that develop and deploy innovative, marketable solutions. The CIT R&D team manages the Commonwealth Research Commercialization Fund (CRCF), which invests in research and commercialization at Virginia colleges and universities, companies, federal labs and other research institutions in their efforts to advance technology and drive economic growth in the Commonwealth. Aligned with the CRCF is the Roadmap, a strategic planning tool that identifies key industry sectors with commercial promise that are worthy of institutional focus and economic development for Virginia.

CIT Strategic Initiatives: Positioning the Commonwealth for Future Economic Growth

CIT Strategic Initiatives focus on identifying and advancing solutions and providing initial leadership for the Commonwealth around important emerging areas that impact future economic development. Key initiatives for FY2019 are Smart Communities, access to Broadband, and Autonomous Systems, with additional activities in conjunction with the Chief Data Officer (CDO), Chief Broadband Advisor (CBA), Department of Homeland Security and Public Safety (in conjunction with the Federal Department of Homeland Security), Virginia Department of Transportation (VDOT) and other Agencies.

Smart Communities can be defined as jurisdictions that use information and communication technologies to enhance the livability, workability, and sustainability of the community. Fast, extensible, and reliable broadband communications are central to such efforts, as are Data Governance, security and privacy controls and the increasing use of autonomous vehicles for transportation and public safety. The Smart Communities initiative works in conjunction with ongoing CIT efforts to expand Broadband connectivity throughout the Commonwealth and commercialize autonomous systems.

By integrating these efforts in a single conceptual framework CIT will have the capability to address the needs of widely varying communities throughout the Commonwealth and provide a focal point for maturing both commercial and university-developed technologies that are relevant to these communities. A major key to success in this area is the continued evolution of partnerships at the state and national level, and with communities and local governments, universities and private entities throughout the Commonwealth.

CIT | Broadband

Within this framework, the CIT Broadband team works to establish and expand broadband infrastructure, accelerating the socio-economic growth of Virginia. The primary focus, to aid regions and localities in establishing partnerships with broadband providers for implementation of services for their areas. Our Broadband team continues to support localities in the design and procurement of broadband services. New wireless technologies provide opportunities for underserved communities to finally realize the benefits of reliable, high speed broadband services. The Broadband team actively engages the Chief Broadband Advisor and an evolving set of Broadband stakeholders to shape strategy, policy, execution and legislative guidance to develop strategic and action plans to accelerate broadband deployment in the Commonwealth.

CIT | Virginia's Unmanned Systems Center (VUS@CIT)

In 2019, Business Facilities Magazine ranked Virginia as the top state for UAS. The Unmanned Systems Center at CIT serves as Virginia's primary information resource, a proponent and point-of-contact on global UMS technology, policy, and trends. The Center is a catalyst for growth of unmanned and autonomous systems vehicles and technologies in Virginia. The Center creates collaboration between businesses, investors, universities, entrepreneurs and government organizations to increase the Commonwealth's position as a leader of the Autonomous Systems community.

CIT and the Virginia Tech-led MAAP (Mid-Atlantic Aviation Partnership) FAA Unmanned Aviation Systems Integration Pilot Program (UAS IPP) is helping push the envelope for BVLOS (Beyond Visual Line of Sight) UAS operations, with valued industry partners like State Farm, Dominion Energy, Google's "Wing" and others.

The Center is working with several Virginia state agencies to develop pilot projects that enable use of unmanned systems to accomplish agency missions faster, cheaper and safer. As adoption increases and applications expand, Virginia's UMS community will benefit. In FY2020, CIT will host a multi-agency educational exchange conference to "Explore the art of the actual" later this year. The Center's Director is assisted by a 24-member advisory board that brings together expertise and leadership from across the Commonwealth to guide strategies and priorities. The Center has developed and maintains the Commonwealth's UMS website and Virginia's Unmanned Systems Directory.

MACH37 Cyber Accelerator™: Evolution

MACH37 Cyber Accelerator™ is America's premier market-centric cybersecurity accelerator designed to facilitate the creation of the next generation of cybersecurity product companies. MACH37's unique program design places heavy emphasis on the validation of product ideas, building entrepreneurs' ability to grow viable companies and the development of relationships that produce an initial customer base and investment capital. In FY2019, CIT entered into a two-year joint venture to complete the privatization of MACH37 at fiscal year end 2020. MACH37 successfully completed its first year of operation under private control and funding. It is on target to meet its mission in FY20 at the end of which MACH37 will transition to 100% private ownership and operation. However, CIT retains its right to invest in any MACH37 company.

CIT Regional and Policy Initiatives

CIT Regional and Policy Initiatives support regionally-based priorities and initiatives designed to expand opportunities and build on the strengths and resources that uniquely shape each region. Staff from all of CIT's services lines engage directly in organizations and initiatives as Board members, mentors, investors, trainers, advocates, and as partners in programs and proposals that seek additional funding sources. CIT supports the creation of a network of regional accelerators and funds – among the focus areas, best practices, resource sharing, and showcasing regional investment opportunities. To aid in achieving this goal, CIT created the Virginia Founders Fund dedicated to providing investment opportunities for underrepresented entrepreneurs in Virginia. In addition, CIT serves on the innovation and proposal review committees for all GO Virginia Regional Councils and on the evaluation committee for the State Council where it advocates funding for innovation programs. CIT also collaborates directly with regions on grants developed to grow innovation and entrepreneurship. And, in partnership with regional stakeholders, CIT develops and advocates for legislative and budget proposals that advance innovation and entrepreneurship in Virginia. CIT works to establish policies and specific programs that maximize intellectual property commercialization, entrepreneurship, and new company formation.

Primary regional partners include:

- All regional technology councils
- All Go Virginia Councils
- Lighthouse Labs, Startup Virginia, Activation Capital – Richmond
- 757 Angels/Accelerate, ODU Entrepreneur Center – Hampton Roads
- Launch Place and Launch Place Seed Fund – Danville
- RAMP Accelerator – Roanoke
- Valley Innovation Council (VIC)
- iLab – Charlottesville
- Virginia is for Entrepreneurs (VA4E)
- MACH37/UVA-Wise Cyber Partnership
- Virginia Chamber – Blueprint Virginia

CIT's Federal Funding Assistance Program identifies and accelerates opportunities for Virginia's small technology businesses to obtain SBIR, STTR, and other government contracts. As the leader of SBIR initiatives in Virginia, CIT provides guidance, direction, training, and valuable resources to enhance the competitiveness of SBIR/STTR proposal strategies.

CIT Supports Virginia's Phase I and Phase II SBIR/STTR Applicants:

- SBIR strategy consultation and mentoring
- Low cost Phase I and Phase II proposal training and review courses
- Discounts with proposal consultants (proposal prep & proposal review)
- Discounts on proposal preparation software
- Referral to law firm for free IP and patent consultation
- Discounts on federal cost accounting solutions and CPA services
- Commercialization plan assistance
- Intro to 3rd party capital
- VC/Angel Capital "Readiness" review
- Funding assistance to qualified first time Phase I and/or Phase II applicants to help pay for proposal development resources

Economic Performance of Key Areas

CIT Entrepreneur: Growth Accelerator Program (GAP)

The GAP Fund was established to meet the early stage capital demands challenging the Commonwealth's most promising science and technology-based start-ups whose funding requirements could not be met by traditional financing means. GAP Fund investments are governed by the goal of developing the next generation of Virginia's science and technology economy and the entrepreneurial ecosystem required to support that economy. To this end, the GAP Fund places equity and convertible debt investments in tech, clean-tech and life science companies at the earliest stages of company formation, in a manner conducive to stimulating significant private investment or "leverage cash" as a result of CIT's deployment of public dollars.

Fundamental to CIT's ability to successfully deliver private capital is that, unlike grant programs, CIT holds an ownership position in the investee company and maintains that ownership for a multi-year holding period of indeterminate length while the company grows in scope of operations and value. CIT recovers GAP Program investments only upon a liquidity event such as a public offering or change of control for the company.

Underwritten by an annual appropriation from the Virginia General Assembly, the GAP Fund Program functions as a double-bottom-line investment fund focused on creating significant economic outcomes for the Commonwealth, entrepreneurs and co-investors, with the goal of recovering investment capital for redeployment. Since inception, the GAP Fund Program has considered investing in over 6,000 companies and has invested \$28.1M in 219ⁱ seed and early stage technology, life science, and energy companies across the Commonwealth of Virginia.

Over the 15-year life of the program, CIT has found that the following metrics most closely align with program objectives:

- Venture and Angel Capital Attracted – Venture and angel capital dollars invested in the GAP Fund Program’s portfolio companies as a result of CIT investing dollars appropriated to IEIA and obtained from federal and private sources. CIT calculates its annual leverage factor by dividing the total of venture and angel capital by all GAP Fund Program portfolio companies in a given year by the dollars deployed in new investments in that year.
- GAP Fund Program Return – The ratio of capital returned and anticipated to return to CIT, as a result of portfolio companies being acquired, divided by total GAP Fund Program dollars deployed.

Venture and Angel Capital Attracted. For the period FY2019 and inception-to-date, the GAP Fund Program achieved the following leverage cash totals:

- FY2019 – During FY2019, CIT GAP Funds invested \$2.9M. In FY2019, CIT attracted \$143.5M in angel and venture dollars – inclusive of FY2019 new investments, FY2019 follow-on investments and pre-existing investments in which CIT did not invest in FY2019, for an annual leverage factor of 48.8.
- Inception-to-Date – Since inception, CIT GAP Funds has invested \$28.1M. CIT has attracted \$922.7M in angel and venture dollars, for an inception-to-date leverage factor of 32.8.

Important to note in these ratios is the impact of economic conditions with respect to the ability of GAP portfolio companies to attract leverage capital. Poor economic conditions may result in a lower capital attraction ratio due to investor withdrawal from the early stage asset class which is not a direct reflection of changes or performance in the GAP program structure and operations.

GAP Fund Program Return. By the end of FY2019, CIT had secured and invested a total of \$28,113,645 program inception-to-date and had a projected capital return of \$35,778,498 on invested funds, resulting in a capital return factor of 1.3. This number indicates that CIT is managing Virginia’s GAP Funds Program appropriation consistent with its goal to return funds to preserve the base of funds for future investment in Virginia’s early stage companies.

Company Residency Requirements – CIT GAP Funds requires that all companies be headquartered and have substantial business operations in Virginia at the time of investment and for a minimum three-year period thereafter. MACH37 requires that all companies establish a significant presence in the Commonwealth within a 24-month period of graduation from the MACH37 Accelerator. Significant economic penalties – discussed below – apply to companies in breach of these requirements.

CIT Enforcement of GAP Portfolio Company Residency – Over the life of the GAP Program, CIT’s policy and practice regarding remedies that invoked as a result of an investee company’s departure from the state has evolved, matured and become more specific:

In FY05, with the start of the GAP Fund program, CIT established its initial policy regarding company residency requirements. As at that time all CIT's investments were in the form of a convertible debenture, our loan covenants explicitly addressed this issue. Under that policy, if a portfolio company were to relocate to another state, CIT – at its option – could invoke one of two remedies: (1) CIT could demand the immediate payback of all principal and interest; or, (2) upon note conversion to equity, CIT could invoke a deeper discount percentage (50% v the 20% of the initial note).

In FY2013, CIT revisited this policy and added redemption language to address all equity agreements. In FY2014, CIT further refined this language. The current policy and practice, memorialized in CIT GAP Funds transaction covenants, is as follows:

- Equity Investments: If a company relocates its primary business from the Commonwealth within 36-months of CIT investment, CIT retains its equity position in the company and is repaid a penalty fee equal to two times CIT's investment. Also within 36-months of CIT's investment, if the Company accepts any direct or indirect funding from a publicly funded economic development or company attraction entity requiring temporary or permanent relocation of the Company's headquarters or any member of the Company's senior management outside of the Commonwealth of Virginia, Company shall be required to pay CIT a penalty equal to two times (2x) CIT's principal investment.
- Convertible Debt Investments: If a company relocates its primary business from the Commonwealth within 36-months of CIT investment, CIT can convert into common shares at a 50% discount or elect to be paid back principle plus interest. If the note has previously been converted, then CIT will be paid a penalty fee equal to CIT's principle investment. Also within 36-months of CIT's investment, if the Company accepts any direct or indirect funding from a publicly funded economic development or company attraction entity requiring temporary or permanent relocation of the Company's headquarters or any member of the Company's senior management outside of the Commonwealth of Virginia, Company shall be required to pay CIT a penalty equal to two times (2x) CIT's principal investment, regardless of whether CIT holds debt or equity in the Company.

MACH37 Accelerator investments are transacted as \$50K common stock equity investments designed to attract or retain cyber startups in Virginia. All companies receiving investments from MACH37 are located at CIT's offices in Herndon, VA for the three-month duration of their acceleration period and then have 24 months to establish a significant presence in Virginia. Covenants call for a full redemption of CIT's investment in the event that companies fail to establish a significant presence in Virginia. Also within 36-months of CIT's investment, if the company accepts any direct or indirect funding from a publicly funded economic development or company attraction entity requiring temporary or permanent relocation of the company's headquarters or any member of the company's senior management outside of the Commonwealth of Virginia, the company shall be required to pay CIT a penalty equal to two times (2x) CIT's principal investment.

The FY2019 activity below is provided in response to Section 126.10.N.2 of the Appropriation Act. Since GAP investments are, by design, seed stage and intended to leverage private investment and stimulate the next generation of new technology companies, job creation and tax revenue impact are longer term objectives. Four of these companies were formed during FY2019 to participate in MACH37 Cyber Security Accelerator.

- I. The number of companies receiving investment from the fund:
 - a. FY2019: 32 companies
 - b. Inception-to-date: 219 companies

- II. The state investment and amount of privately leveraged investments per company:
 - a. FY2019: CIT invested \$2.9M and leveraged \$53.9M in angel and venture dollars on FY2019 investments. During FY2019, CIT's inception-to-date investments leveraged \$143.5M.
 - b. Inception-to-date: CIT has invested \$28.1M and has leveraged \$922.7M in angel and venture dollars, \$143.5M of which was leveraged during FY2019.

- III. The estimated number of jobs created or preserved during FY2019:
 - a. FY2019: 468 jobs in companies invested in by CIT in FY2019
 - b. Inception-to-date: In FY2019, companies reported that 2,708 jobs were created or preserved in FY2019 by companies invested in by CIT in FY2019 or beforeⁱⁱ

- IV. The estimated tax revenue generated during FY2019:
 - a. FY2019 investments:
 - i. Estimated 2019 corporate income tax: \$453,058.91ⁱⁱⁱ
 - ii. Estimated 2019 personal income tax on jobs: \$3,363,750^{iv}
 - b. Inception-to-date:
 - i. Estimated 2019 corporate income tax: \$3,970,468.91^v
 - ii. Estimated 2019 personal income tax on jobs: \$18,198,750^{vi}

- V. The number of companies who have received investments from the GAP fund still operating in Virginia
 - a. FY2019 investments: 32 out of 32
 - b. Inception-to-date: 126 out of 219
 - i. 10 have moved from the Commonwealth
 1. 3 moved from Virginia to other states after the 3 year requirement to be headquartered in Virginia timed out.
 2. 7 are part of MACH37
 - a. 6 are part of MACH37 and have returned to their place of origin and are working to establish a Virginia presence. CIT maintains a high level of visibility into those companies, including frequent

interaction with the CEO and team, Board of Director observation rights and receipt of a required quarterly statue report.

- b. 1 is part of MACH37 and has returned to its place of origin and is past the required time horizon to establish a place of business in Virginia. The company has issued CIT a note for the amount of the penalty.
 - ii. 44 have failed
 - iii. 37 have been acquired or paid back CIT
 - iv. 2 additional companies have been acquired by companies not located in the Commonwealth and CIT had not sold its shares as of 6/30/2019.

VI. Return on investment

- a. FY2019 investments: \$0
- b. Inception-to-date: \$8,254,637.58

VII. The number of investment that failed:

- a. FY2019 investments: 0
- b. Inception-to-date: 44 failures, \$4,661,600 invested

VIII. Number of companies created or expanded and the number of patents filed during FY2019:

- a. FY2019:
 - i. Companies created or expanded: 32 companies
 - ii. Number of Patents filed: 93
- b. Inception-to-date:
 - i. Companies created or expanded: 219
 - ii. Number of Patents filed during FY2019: 281

CIT R&D: Commonwealth Research and Commercialization Fund (CRCF)

The CRCF accelerates innovation and drives economic development in the Commonwealth, while solving important state, national, and international problems through technology research, development, and commercialization. Since the inception of the CRCF program in FY2012, 1,031 applications were submitted from all of the Commonwealth's ten technology regions and nine GO Virginia regions and, from these submissions, 348 awarded projects were announced. These announced awards total nearly \$28 million, and are being leveraged with more than \$72 million in committed matching funds, including federal awards. CRCF projects have covered the following technology sectors: advanced manufacturing, aerospace, communications, cyber security, energy, environment, information technology – including data analytics, life sciences, modeling and simulation, nuclear physics, transportation, and unmanned systems.

One \$2.4 million solicitation was offered in FY2019 and included five programs: Commercialization, Eminent Researcher Recruitment, Matching Funds, SBIR Matching Funds, and STTR Matching Funds. Applications were invited from academia, federal labs, other nonprofit research institutions, university research consortia, and the private sector. Six technology sectors were eligible for funding in FY2019: clean energy, cyber security, data analytics, life sciences, and unmanned systems. In FY2019, CIT received 113 applications. Applicants

requested approximately \$7 million and spanned all programs, industry sectors, and eight of the Commonwealth's GO Virginia regions. Forty-one awards were announced for \$2.5 million. Awarded projects represented seven GO Virginia regions, three of the five programs, and all eligible and strategically important industry sectors. Additionally, awards leveraged the Commonwealth's investment with approximately \$6 million in matching funds. These CRCF projects are being performed by companies, universities, and research organizations across the state and align with Virginia's key strategic technology priorities as outlined in the Commonwealth Research and Technology Strategic Roadmap.

FY2019 CRCF awards, along with awards made since the program's inception, address a breadth of research areas with high potential for commercialization. Projects include technology to improve crop protection by increasing traditional pesticide efficacy; to capture and segment pollutants released during energy production in a way that allows the pollutants to be recycled; and a routing service to allow a single operator to operate multiple drones safely. Projects in life sciences range from novel biomaterials to cardiac care to treating cancer. Cyber security and data analytics technologies also will be validated through FY2019 projects.

CRCF awards were approved by the CIT Board of Directors following a multi-step review process that included funding recommendations made by the Research and Technology Investment Advisory Committee (RTIAC). The RTIAC is a legislatively-established body comprised of representatives drawn from higher education, economic development, research institutes, venture capital firms, and technology corporations.

CIT Strategic Initiatives

Smart City IoT Innovation (SCITI Labs) – In partnership with the US Department of Homeland Security Science and Technology Directorate, the SCITI Labs program has pioneered a new approach to R&D, Commercial First Innovation™ designed to speed delivery of innovative technologies to first responders. Commercial First encourages entrepreneurs already succeeding in related markets to innovate ideas that address the unique needs of the Homeland Security community. SCITI Labs is working in three major technology areas, smart buildings, indoor UAVs for search and rescue, and integrated information sharing (smart hub), with some products already commercially available to responders. SCITI Labs has strategically positioned the Commonwealth of Virginia to assume a national leadership role in the public safety domain as it evolves to face the new opportunities and challenges associated with Smart Communities. In recognition of this role, DHS is now preparing to award a new follow-on contract to continue this groundbreaking commercialization effort.

Smart Communities Initiative – Smart communities are anticipated to drive approximately \$1.5 trillion of economic activity globally over the next 15 years. The CIT Smart Communities initiative has evolved from several related, synergistic activities including the DHS SCITI Labs program, the Smart City Works Actuator, and the Virginia Smart Community Working Group. In FY2019 the initiative moved from studies to implementation, leading the effort to have Virginia named as the first “Smart State” by the Smart Cities Council, and having Virginia selected by the National Governors Association for a Living Lab leading to the Virginia State Action Plan for Smart Communities. Implementation projects are now under way with Fredericksburg, Stafford County, Fairfax County, Norfolk, and other locations throughout the Commonwealth. Associated technologies supporting the initiative include the UMS Center of Excellence, and CIT Broadband as a critical component technology for Smart Communities in addition to its role described below.

CIT Broadband: Planning and Assistance

CIT's Broadband program is charged with providing broadband technical assistance to underserved localities throughout the Commonwealth. CIT serves as Virginia's leading resource for broadband technical assistance and a repository for broadband-related information and tools. CIT works collaboratively with other state and federal entities including but not limited to: National Telecommunications and Information Administration (NTIA), Department of Housing and Community Development (DHCD), Virginia Tobacco Region Revitalization Commission (TRRC), Virginia Resources Authority (VRA), Virginia Department of Education (VDOE), Virginia Information Technologies Agency (VITA), Virginia Tech's Center for Geospatial Information Technology (CGIT), Virginia Municipal League (VML), Virginia Association of Counties (VACO), Virginia Planning District Commissions (VAPDC), Virginia Department of Transportation (VDOT), Go Virginia, Virginia Broadband Association (VCTA), Virginia Telecommunications Industry Association (VTIA), Virginia localities and others to help close the digital divide in the Commonwealth. CIT also staffs the Office of the Chief Broadband Advisor and the Broadband Advisory Council. CIT also leverages its methodology, *The Broadband Path*, to assist Virginia localities in conducting assessments and helps to facilitate public-private partnerships. CIT's Broadband Path has been nationally recognized and is distinctive because it produces tangible, goal-driven, fiscally achievable broadband solutions at no cost to the locality.

The FY2019 activity summarized below, in response to Section 126.1.N.1 of the Appropriation Act, was state funded activity.

- I. Broadband technical assistance provided:
 - a. Delivered four comprehensive assessments.
 - b. Provided assistance to 23 Virginia localities and many state and federal agencies, associations and legislators.
 - c. CIT continued to staff the Office of the Chief Broadband Advisor, as key members of the Commonwealth Broadband Team.
 - d. CIT continued to staff the Broadband Advisory Council.
 - e. CIT responsibilities have been expanded to support Go Virginia Broadband efforts and is a member of the Go Virginia Broadband Advisory Workgroup.
 - f. CIT continued to maintain Virginia's resources and tools used in assessing needs, planning broadband deployments, and raising awareness to increase adoption and utilization.
 - g. Based on a request from the Chief Broadband Advisor, CIT led the transition from the Office of Telework Promotion and Broadband Assistance website to the new Commonwealth Connect website, which required a technology overhaul and content refresh.
 - h. In partnership with the Chief Broadband Advisor, CIT adapted its existing planning resources to create new local planning assistance documents that are available on the new Commonwealth Connect website.
 - i. CIT is continually creating and updating local planning "toolkit" materials that are available on the new Commonwealth Connect website.
 - j. CIT continues to maintain and analyze Virginia broadband data. This includes new coverage mapping layers to help identify areas of need and to track progress in closing the digital divide.

- k. CIT partnered with the National Telecommunications and Information Administration (NTIA) to plan and implement the Virginia Broadband Summit, including participating on and moderating summit session panels.
- l. CIT supports ongoing digital equity efforts as a member of the Virginia Department of Education's KLIP Workgroup. Through that process, CIT assisted with the planning and implementation of the Virginia Digital Equity Summit, including participating on summit session panels.
- m. CIT continued to leverage its proven methodology – *The Broadband Path* – to assist localities by conducting a comprehensive assessment, identifying the locality's unique needs, and facilitating public-private partnerships.
- n. Assisted the Chief Broadband Advisor in writing and editing the annual Commonwealth Connect Broadband Report.
- o. Provided expertise on broadband-related bills during the 2019 Virginia General Assembly.

The estimated number of households and localities with populations lacking wired broadband access:

- a. Based on December 2017 data (the most recent FCC Form 477 data available), 24% of Virginia localities have 30% or more households that have no fixed broadband access based on the FCC's definition of broadband (25 Mbps download and 3 Mbps upload).
- b. 1.4% of households have no access to even basic fixed broadband (10 Mbps download and 1 Mbps upload).
- c. 24% of households (816,248) do not currently have a subscription to at least a basic fixed broadband connection (10 Mbps download and 1 Mbps upload).

MACH37 Cyber Accelerator™

MACH37 is the premier accelerator for cybersecurity entrepreneurs and startups nationally. This unique program goes beyond the traditional model of typical business accelerators by providing innovators with focused mentoring and support from an extensive network of visionaries, practitioners, and successful entrepreneurs in cybersecurity. The Spring and Fall sessions of MACH37's 90-day program are designed to propel graduating companies into the marketplace with validated cyber security concepts and pipelines for accelerated growth.

The program emphasizes the validation of cohort company product concepts and the development of relationships to attract an initial customer base and investment capital. MACH37 employs a tailored approach to address the priority needs of each company, based on their individual strengths and weaknesses.

MACH37 was championed by the Commonwealth's technology community and launched on September 12, 2013 and started its first cohort that same month. Companies selected for the program typically constitute a team of 2 to 4 entrepreneurs and a technical co-founder working to build alpha or prototype cyber security solutions that address the drivers of a demand for innovations in cybersecurity, including:

- New mainstream demand for advanced capabilities;
- Porous network perimeters that are making traditional solutions less relevant;
- Opportunities created from software defined networking; and
- Challenges of a hyper-connected world with an Internet-of-everything.

At the close of the Spring 2019 cohort class, the list of successful graduates included 63 new cyber companies that have been attracted from around the country to grow these critical businesses in Virginia. MACH37 has also attracted applications from companies desiring to launch from the Northern Virginia based accelerator from 11 countries beyond the United States and Canada.

The FY2019 activity below is provided in response to Section 126.10.N.3 of the Appropriation Act. As in the case of the GAP Fund, MACH37 companies are very early stage and the program is designed to leverage private investment and stimulate the growth of the cyber industry in Virginia. Therefore, there is not sufficient operating history to develop meaningful job creation data or to anticipate equity returns.

- I. The number of companies assisted with the cyber accelerator program in:
 - a. FY2019: 11 companies
 - b. Inception-to-date: 63

- II. The number of companies operating in Virginia as a result of the program in:
 - a. FY2019: 11 of the 11
 - b. Inception-to-date: 39 of the 63
 - i. Of the 24 companies that are not currently operating in Virginia:
 1. 14 of the companies have failed
 2. 3 have been acquired or paid back
 3. 7 are not currently operating in Virginia:
 - a. 6 have returned to their place of origin and are working to establish a Virginia presence. CIT maintains a high level of visibility into those companies, including frequent interaction with the CEO and team, Board of Director observation rights and receipt of a required quarterly statute report.
 - b. 1 has returned to its place of origin and is past the required time horizon to establish a place of business in Virginia. The company has issued CIT a note for the amount of the penalty.

- III. The estimated number of jobs created or preserved during FY2019:
 - a. FY2019: 30 jobs in companies invested in by MACH37 in FY2019
 - b. Inception-to-date: 296

- IV. The value of proceeds from the sale of equity in companies that received capital support from the program:
 - a. Two MACH37 graduate company has been acquired since inception of this program.
 - b. One MACH37 graduate company has paid back the investment since inception of this program.

- V. The number of state investments that failed and the state investment associated with failed investments:
 - a. 14 MACH37 graduate companies have failed since inception of this program; \$673,000 state investment

- VI. Number of companies created or expanded and the number of patents filed:
 - a. FY2019:
 - i. Companies created or expanded: 11
 - ii. Number of Patents filed: 0

- b. Inception-to-date:
 - i. Companies created or expanded: 63
 - ii. Number of Patents filed by inception-to-date portfolio: 22

Where Innovation Accelerates – Building the Innovation Economy

CIT programs stimulate economic growth for all Virginians. This is achieved by attracting private sector investment in Virginia companies, commercializing early stage university and private sector research, working with regionally-based initiatives to grow innovation, establishing footholds for new industry verticals such as Cyber Security, Unmanned Systems, Smart Cities, and working with localities to build public private partnerships, assess new technologies, and develop strategies for expanding broadband access.

Corporations and the federal government are shifting innovation strategies away from internal initiatives toward investment in startups through funds, incubators, and accelerators. CIT is focused on growing this critical sector of Virginia's economy through existing programs and sharing our staff expertise, mentor networks, investor networks, and access to markets with initiatives in every region of the Commonwealth. We are also working directly with GO Virginia regions to help them build successful innovation programs. FY2020 represents a transformative period for CIT that enhances our role as the Commonwealth's agent in the acceleration of innovation-based economic growth. CIT's priorities in FY2020 include:

1. Expand regional and underserved community engagement to develop ecosystems
2. Identify and fund innovators and entrepreneurs at a greater rate
3. Create strategies with universities to boost commercialization success
4. Position Virginia as a leader in Smart Communities and expand Broadband access
5. Champion the expansion of the Autonomous Systems industry in the Commonwealth

Please visit us at www.cit.org for help in advancing your technology initiative.

ⁱ CIT has placed initial investments in 219 companies. Two of these companies Xydina and Tau Therapeutics merged forming Cavion, resulting in net total of 218 companies. In 2016 CIT exited Invincea. As a result of the exit CIT received shares in 26Labs, a company spun-out of Invincea at the time of exit. This brought the net total back to 219.

ⁱⁱⁱ Based on company actual revenue in CY2017 Q1 and Q2 and estimated revenue in Q3 and Q4, assumes a 25% profit.

^{iv} Assumes an average salary of \$125K per Virginia employee.

^v Based on company actual revenue in CY2017 Q1 and Q2 and estimated revenue in Q3 and Q4, assumes a 25% profit.

^{vi} Assumes an average salary of \$125K per Virginia employee.