In accordance with Item 428.O of the 2016 Appropriations Act, the Center for Innovative Technology is pleased to submit the following report on behalf of Innovation and Entrepreneurship Investment Authority (IEIA). This item requires that information be reported annually on three of CIT's programs designed to grow the innovation and entrepreneurship sectors of Virginia's economy.

1. Activities associated with providing localities with broadband assistance
2. Activities associated with the Growth Accelerator Program (GAP)
3. Activities associated with the cyber security accelerator
4. Reports should include prior fiscal year outcomes, program since inception, and changes anticipated in subsequent fiscal year

1. Broadband

During FY2016 CIT's Broadband program was funded through Commonwealth's appropriation of $500,000 for FY2016 in addition to $269,508 rollover from funds not used during the short period (March through June) in FY2015 that CIT's Broadband was not under federal funding. The state funded program is designed to accelerate the socio-economic growth of Virginia's rural and underserved areas through the application and use of broadband telecommunications.

CIT's Broadband program is responsible for developing a statewide broadband strategy and working with communities and local governments to expand access and improve adoption and utilization. CIT coordinates with other state entities including; Department of Housing and Community Development (DHCD), Virginia Resources Authority (VRA), Virginia Information Technologies Agency (VITA), Virginia Tech, Virginia Geographic Information Network (VGIN), Virginia Planning District Commissions and others to further assist localities in defining their broadband requirements and forming public-private partnerships to meet those goals. Additionally, CIT works with service providers in the Commonwealth to collect data and map assets and coverage. This information is critical in developing public policy and strategic plans that facilitate broadband deployments to adequately support economic development, education, healthcare, public safety and overall quality of life. CIT is very focused in their work with the Broadband Advisory Council to identify and prepare the council to introduce legislation that will expedite broadband infrastructure investments to expand service and capacity across the Commonwealth.

The FY2016 activity summarized below in response to Section 428.O.1 of the Appropriation Act was state funded activity.

I. The number of localities assisted by the state and other broadband funding sources:

a) CIT assisted 20 localities and 1 state agency (DCR) in broadband assessment and planning in addition to fielding 61+ citizen inquiries to the Governor's office related to broadband. Additionally CIT coordinated 4 regional Broadband Advisory Council meetings during the year and presented broadband information at 8 local, regional and state events.

b) CIT Developed the Commonwealth's broadband map to identify and assist localities in underserved areas based on data collected from broadband providers. CIT and partners at VGIN have continued updating the state map using the Federal Communications Commission "477" data that all broadband providers are required to submit biannually.

c) CIT continues to maintain the Office of Telework Promotion and Broadband Assistance website (wired.virginia.gov), resources and tools used in assessing needs, planning broadband deployments, and raising awareness to increase adoption and utilization.

d) CIT and partners at Virginia Tech's Center for Geospatial Information Technology (CGIT) developed and launched the statewide campaign (RUOnlineVa) to crowd-source unmet demand for Internet service directly from the citizens. This data will be analyzed against current providers' coverage areas and available infrastructure to identify ways the state may facilitate expanding broadband access to meet demand with a report due to the Secretary of Technology in the fall of 2016.

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

a) Based on June 2015 data Virginia has 42 localities with 30% (or more) households that have no fixed broadband access based on the FCC's new definition of broadband (as of January 2015) of 25Mbps download speed and 3Mbps upload speed. A map of these localities is available at https://citorg.box.com/s/xj4trrsj894ob1vl5caxlwz0n6y7n560. Over 7% of Virginia citizens have no access to even basic (at least 10Mbps) fixed Internet service.

b) The number of households and population with fixed broadband access increased over last year's due to expansions of Internet service by the providers as well as a significant increase in the coverage data available as all providers must now submit their data to the FCC. Prior to 2015, the mapping and statistics were dependent on the providers voluntarily sharing their data with the Virginia mapping team.

2. The 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 3,900 companies and has invested $20.6M in 160[i] seed and early stage technology, life science, and energy companies across the Commonwealth of Virginia.

Over the 12-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 FY16 and inception-to-date, the GAP Fund Program achieved the following leverage cash totals:

- FY16 – During FY16, CIT GAP Funds invested $2.6M. In FY16, CIT attracted $92.4M in angel and venture dollars – inclusive of FY16 new investments, FY16 follow-on investments and pre-existing investments in which CIT did not invest in FY16, for an annual leverage factor of 40.1.

- Inception-to-Date – Since inception, CIT GAP Funds has invested $20.6M. CIT has attracted $424.9M in angel and venture dollars, for an inception-to-date leverage factor of 20.6.

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 withdraw 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 FY16, CIT had secured and invested a total of $20,556,287, program inception-to-date and had a projected capital return of $26,800,459 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 FY13, CIT revisited this policy and added redemption language to address all equity agreements. In FY14, 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, than 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.

All 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 months 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 FY2016 activity below is provided in response to Section 428.O.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. Thirteen of these companies were formed during FY16 to participate in MACH37 Cyber Security Accelerator.

I. The number of companies receiving investment from the fund:
   a. FY16: 30 companies
   b. Inception-to-date: 160[ii] companies

II. The state investment and amount of privately leveraged investments per company:
   a. FY16: CIT invested $2.6M and leveraged $19.3M in angel and venture dollars on FY16 investments. During FY16, CIT's inception-to-date investments leveraged $92.4M.
   b. Inception-to-date: CIT has invested $20.6M and has leveraged $425.8M in angel and venture dollars, $92.4M of which was leveraged during FY16.

III. The estimated number of jobs created or preserved in Virginia during FY16:
   a. FY16: 109 jobs in companies invested in by CIT in FY16
   b. Inception-to-date: In FY16, companies reported that 1,313 jobs were created or preserved in FY16 by companies invested in by CIT in FY16 or before[iii]

IV. The estimated tax revenue generated during FY16:
   a. FY16 investments:
      i. Estimated 2016 corporate income tax: $188,545.73[iv]
      ii. Estimated 2016 personal income tax on jobs: $840,937.50[v]
   b. Inception-to-date:
      i. Estimated 2016 corporate income tax: $3,074,467.81[vi]
      ii. Estimated 2016 personal income tax on jobs: $9,437,187.50[vii]

V. The number of companies who have received investments from the GAP fund still operating in Virginia
   a. FY16 investments: 24 out of 30
      i. 1 has been acquired
      ii. 5 are part of Mach37 and have returned to their place of origin and are working to establish a Virginia presence within their required two year time horizon
   b. Inception-to-date: 108 out of 160
      i. 12 have moved from the Commonwealth

1. 1 moved from Virginia to Connecticut. This company had received a $100K convertible note from CIT - $50K from Commonwealth-appropriated funds and $50K resulting from a grant to CIT by Johnson & Johnson. In June of 2009, CIT elected to be paid back the $50,000 Commonwealth-appropriated funds plus interest and to convert Johnson & Johnson grant-sourced $50,000 principal and interest at a 50% discount.
2. 11 are part of Mach37
    a. 7 are part of Mach37 and have returned to their place of origin and are working to establish a Virginia presence within their required two year time horizon. 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. 4 are part of Mach37 and have moved from Virginia and have not established a Virginia presence within their required two year time horizon and CIT has initiated administrative action to rectify contracted obligations to establish a presence in Virginia.

ii. 15 have failed

iii. 25 have been acquired or paid back CIT

VI. Return on investment
- a. FY16 investments: $61,488
- b. Inception-to-date: $3,121,035

VII. The number of state investment that failed:
- a. FY16 investments: 0
- b. Inception-to-date: 15 failures, $2,026,100 invested

VIII. Number of companies created or expanded and the number of patents filed during FY16:
- a. FY16:
    - i. Companies created or expanded: 30 companies
    - ii. Number of Patents filed: 18
- b. Inception-to-date:
    - i. Companies created or expanded: 160
    - ii. Number of Patents filed during FY16 by 160 companies: 64[viii]

Program Changes Anticipated in FY17

The combination of the GAP Funds, MACH37 Seed Fund, and Commonwealth Energy Fund will produce a projected 20 to 30 new investment transactions for Fiscal Year 2017. CIT will continue its work in examining how best to establish one or more private sector regionally-based or sector specific funds to augment financing obtained from the Commonwealth of Virginia for the purpose of investing in early stage companies.

MACH37 will enter its fourth year of accelerator operations in Fiscal Year 2017. The program will continue to conduct two annual cohort sessions, one in the spring and one in the fall. Each cohort session will contain between 5 and 8 companies. In FY17, MACH37 operations and seed funding capacity will become self-sustaining through private sector participation.

Portfolio Companies

Attached is a listing of GAP portfolio companies for the prior year and program since inception. CIT's loan and equity covenants contain confidentiality provisions that strictly govern the disposition of company-sensitive information obtained thereunder. CIT obtains information on third-party, private investment from its portfolio companies under the constraints of this confidentiality language. Release of that private information by CIT, and subsequent availability to a third party under the Freedom of Information Act, could be construed as a breach of the confidentiality provisions, exposing CIT and the Commonwealth of Virginia to legal action by an investee company, its shareholders or other investors. This exclusion is also discussed in § 2.2-3705.6 (3) of Virginia's Freedom of Information Act.

3. MACH37

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 2016 cohort class, the list of successful graduates included 35 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 Herndon-based accelerator from 24 countries beyond the United States and Canada.

The FY2016 activity below is provided in response to Section 428.O.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.

III. The number of companies assisted with the cyber accelerator program in:
   a. FY16: 13 companies
   b. Inception-to-date: 35

IV. The number of companies operating in Virginia as a result of the program in:
   a. FY16: 8 of the 13
   b. Inception-to-date: 24 of the 35

V. The estimated number of jobs created or preserved in Virginia during FY16:
   a. FY16: 19 jobs in companies invested in by MACH37 in FY16
   b. Inception-to-date: 73

VI. The value of proceeds from the sale of equity in companies that received capital support from the program:
   a. No MACH37 graduate company has been acquired or become publicly traded since inception of this program.

VII. The number of state investments that failed and the state investment associated with failed investments:
   a. No MACH37 graduate companies have failed since inception of this program

VIII. Number of companies created or expanded and the number of patents filed:
   a. FY16:
      i. Companies created or expanded: 13
      ii. Number of Patents filed: 4
   b. Inception-to-date:
      i. Companies created or expanded: 35
      ii. Number of Patents filed by inception-to-date by FY16 portfolio: 25

[i] CIT has invested in 161 companies, two of which merged together, making the total number of companies invested in 160

[ii] CIT has invested in a total of 161 companies, two of which merged. This results in a total current number of companies of 160.

[iii] Data collection began FY16.

[iv] Based on company actual revenue in CY2016 Q1 and Q2 and estimated revenue in Q3 and Q4, assumes a 25% profit

[v] Assumes an average salary of $125K per Virginia employee.

[vi] Based on company actual revenue in CY2016 Q1 and Q2 and estimated revenue in Q3 and Q4, assumes a 25% profit. Data collection began FY16.

[vii] Assumes an average salary of $125K per Virginia employee. Data collection began FY16.

[viii] Data collection began FY16.