Report of the Government Technology and Innovation Transition Advisory Committee

Submitted to Governor-elect Phil Murphy and Lieutenant Governor-elect Sheila Oliver

January 1, 2018

EXECUTIVE SUMMARY

The Government Technology and Innovation Transition Advisory Committee proposes that the Governor-elect consider the following recommendations to accomplish these priorities:

I. Priority: Upgrade the government's technology infrastructure

i. Evaluate the state's Information Technology systems and develop RFPs for security and functionality upgrades within the first six months
ii. Review and improve upon Executive Order 225, which centralized IT operations and decentralized software functions

II. Priority: Improve e-government services for New Jerseyans

i. Require agencies to provide additional online service-delivery options for services that are currently offered in-person and via paper mail
ii. Create a user-friendly mobile app that allows New Jerseyans to interact seamlessly with multiple government agencies
iii. Examine converting state-operated 800 numbers to the NJ 211 platform
iv. Appoint a service delivery director and create a statewide e-government strategic plan
v. Improve access to government data to increase transparency and evidence-based decision-making

III. Priority: Strengthen links between our universities and innovative sectors

i. Publicize our universities' intellectual property assets and assist with their commercial distribution
ii. Create an innovation competition for faculty and students to generate solutions to statewide problems

IV. Priority: Attract and retain high-tech talent and investment in New Jersey

i. Create a fellowship program to boost New Jersey's government technology and attract talented professionals to work in state government
ii. Establish a STEM-specific student-loan forgiveness program
iii. Encourage all public schools to expand computer science programs
iv. Pursue strategies to jump-start the innovation economy

V. Priority: Foster tech hubs and incubators, and expand access to secure internet

i. Expand high-speed internet access to all of New Jersey's rural and urban communities
ii. Enforce a safe and equal internet for all residents
iii. Build tech incubators in vacant office space owned by government entities

REPORT

I. PRIORITY: UPGRADE THE GOVERNMENT'S TECHNOLOGY INFRASTRUCTURE

By investing in the infrastructure that underpins digital transactions made by residents, businesses, researchers, and governments, the State can enhance decision-making, spur creativity, and heighten efficiency. As the incoming administration seeks to elevate New Jersey's standing in the innovation economy, strengthening and upgrading the state's technological nervous system (i.e. internal hardware and software) should be a top priority.

In June 2017, Governor Christie signed Executive Order 225, which broadly aimed to centralize government IT, decentralize software, take stock of assets, and modernize legacy systems. One provision mandates a shift towards centralized information technology under the Office of Information Technology (OIT). This change will hopefully streamline departmental contracts, bolster the state's overall purchasing power, and improve overall system efficiency. OIT has since moved to centralize its technology procurement functions. As a result, multiple agencies no longer maintain separate licensing agreements with the same vendor. The executive order also prescribed the decentralization of software development. The functions of software development and maintenance—which have been housed in OIT—were ordered to be transferred to individual agencies.

i. Recommendation: Evaluate the state's Information Technology systems and develop RFPs for security and functionality upgrades within the first six months

New Jersey's government infrastructure is severely outdated, and the state struggles to coordinate services with town and county governments. Although the State recently attempted to switch some applications to public cloud technology, many of its applications still use mainframe storage and processing. Meanwhile, many other states—including Utah, Illinois, and Ohio—have adopted a cloud-first strategy, with Utah abandoning mainframes altogether.

This administration should immediately assess its biggest choke points and vulnerabilities, and determine its strategy to modernize state hardware systems.

The administration should also convene a cross-boundary task force among every level of government – state, county, and local – to identify opportunities for collaboration, specifically around voluntary pooled procurement.

ii. Recommendation: Review and improve upon Executive Order 225

OIT should convene representatives from departments, labor and the private sector to examine the timeline, progress, and impact of Executive Order 225.

The Governor should request, within the first 100 days, a formal recommendation on whether the State should continue or alter the centralization plan.

To complement the evaluation, all departments and agencies should provide comparative analyses of technology budgets and procurement timelines prior to and following centralization.

II. PRIORITY: IMPROVE E-GOVERNMENT SERVICES FOR NEW JERSEYANS

Effective e-government is essential to improving accountability and efficiency. With the State lagging in national assessments of e-government, the Governor should prioritize the enhancement of the State's offerings and frame our residents as customers in the context of their engagement with state agencies. Interactions between residents, businesses, and the government should be smooth, accessible, and secure.

The State should use an "outside-in" approach to service delivery by assuming the perspective of the resident, rather than that of the agency, when designing delivery mediums. One model for e-government is Utah. Utah has received an A grade in the Center for Digital Government's biennial Digital States Survey for each of the last four survey years. The key to Utah's success is its ability and willingness to adapt to changes in residents' preferences, including the shift from laptops to mobile devices. Utah has responded by employing a mobile-first strategy to reflect this change. Utahans can now interact with government from anywhere and at any time with the devices they are most comfortable using.

As the incoming administration has prioritized transparency, improved access to information would enable residents and organizations to monitor government operations and, in turn, hold departments and agencies accountable. By publishing data in a more user-friendly format, a state can support outside responses of impactful decisions. The New Jersey Open Data Initiative was enacted in 2016 to refine the state's data capabilities. The incoming administration should determine if and how it wishes to proceed with the current strategy, leaving open the possibility of expanding the scope to include information on the performance of education and workforce development programs.

i. Recommendation: Require agencies to provide online service-delivery options for services that are currently offered in-person and via paper mail

In some State agencies, the mediums used for services are limited to walk-up and paper mail delivery. Residents who wish to perform simple tasks online do not have that option. The Motor Vehicle Commission, for example, does not allow drivers to renew their licenses online. Drivers are required to either travel to their local MVC location or send their forms and payment (but not in cash) through paper mail.

The State should require agencies to offer an online service-delivery option for all services unless there is a compelling security justification. Residents should be able to apply for a permit, report an incident, or check a health record without having to travel to a government office.

ii. Recommendation: Create a user-friendly mobile app that allows residents to interact with multiple government agencies

Very few New Jersey agencies employ a mobile app to interact with residents. Those who do each have their own independent app.

The State should create a single, unified mobile application through which residents can interact with various agencies in one place. Such a mobile application could be modeled after Singapore's dynamic "OneService" app, which brings together the services of ten different government agencies. Residents can access important information and report concerns directly to agencies from any place and time through one easy-to-use application. The City of New York has a similar app called NYC 311, from which our developers could draw inspiration.

The required development skills already exist within New Jersey. Rutgers students have benefitted from the Rutgers University Official Mobile App since 2012. The application

allows students to interact with various school entities in one seamless portal. OIT could collaborate with Rutgers' Office of Information Technology to leverage software development capability and establish the State's own mobile application.

iii. Recommendation: Examine converting state-operated 800 numbers to the NJ 211 platform

NJ 211 is a 24/7 service line that connects New Jersey residents to a variety of services. The service is operated through a public-private partnership and is accessible by phone, online chat, email, and text. The line allows residents to report utility issues, access the State's addiction hotline (Reach NJ), report suspicious activity, and receive free income tax assistance.

The State currently operates over one hundred toll free 800 numbers. They cost money and many of them are available during business hours only. Many of these lines could be discontinued by transitioning to the 211 platform. This administration should assess if this transition would lead to cost savings and improve the customer experience of New Jersey residents.

Services could be further integrated if the 211 platform was merged with the multiple-agency mobile app described above.

iv. Recommendation: Appoint a service delivery director and create a statewide E-Government Strategic Plan

According to the 2016 Digital States Survey conducted by the Center for Digital Government, New Jersey is one of the eight worst-performing states with respect to its technology portfolio. Neighboring states (e.g., New York, Pennsylvania, Delaware) all scored higher. More concerning is that New Jersey's rating dropped from a B- in 2014 to a C+ in 2016.

Through Executive Order, the Governor should call for the creation of the New Jersey E-Government Strategic Plan, modeled primarily after Utah's initiatives. This plan will emerge after coordination with the private sector, academia and national experts.

During strategic plan development, departments and agencies would identify every point of resident interface (e.g., social-service engagement) to work towards synthesizing service delivery through a one-stop, online platform.

New Jersey should also immediately hire a service delivery director. This individual will spearhead state efforts to make New Jersey's online services world-class.

Within a brief period, cost savings from e-government should exceed the upfront investments. A study by the University of Utah estimated that e-government expansion saved the state $46 million over five years, with each online transaction costing $13.20 less (on average) than an offline transaction. Moreover, New Jersey could follow Utah's self-funded model, in which modest user fees for certain transactions cover costs to maintain operations, with other services supplied free of charge.

v. Recommendation: Facilitate and enhance access to government data

With respect to the availability of consequential datasets, New Jersey ranks 29th in the nation, according to a 2017 Center for Data Innovation report.

The Governor should instruct the incoming head of the Office of Information Technology to immediately review the December 2016 New Jersey Open Data Initiative. The review should focus on the initiative's adherence to best practices in (a) open-data policies, (b) open-data portals, and (c) machine-readability.

Additionally, the Governor should instruct the incoming Treasurer to publish state financial data in a more accessible format to promote resident engagement.

III. PRIORITY: STRENGTHEN LINKS BETWEEN OUR UNIVERSITIES AND INNOVATIVE SECTORS

A third priority is to promote collaboration between industry and the State's institutions of higher education. New Jersey's government should push its universities and businesses to be partners in growing New Jersey's economy and improving New Jersey's government. A coordinated effort will allow the State to return to its leadership of the innovation economy. The goal is to support university technology transfer offices across the state, and help academic institutions take the lead in commercializing new technologies. The State should also consider supporting application development for government and other nonprofits. Not only can strong apps be utilized to improve our E-government, they can potentially be commercialized and sold to other governments across the country.

This priority is well-aligned with the priorities of the Stronger and Fairer Economy transition committee.

i. Recommendation: Create a central tech transfer office to promote university intellectual property assets and assist with their commercial distribution

Across the State, universities are doing research that leads to new ideas and technological advances.

At the end of 2017, the Office of Higher Education and the Economic Development Authority held the initial meeting on the development of the New Jersey Research Asset Database (RAD). This database will serve as an online portal for businesses to view New Jersey's top researchers and facilities.

New Jersey should complete development of RAD. Afterwards, the State should take an active role in matching entrepreneurs with our research institutions and helping universities negotiate licensing deals. The State should also help research institutions with the identification of new inventions and securing patents.

One model for New Jersey might be the Massachusetts Technology Collaborative (MassTech). MassTech funds research and development grants, facilitates student internships at start-ups, and brings together representatives from government, business, and education to develop growth strategies.

ii. Recommendation: Create an innovation competition for faculty and students to generate solutions to statewide problems

The State should create an annual competition to generate creative solutions to statewide problems. The State of Florida's annual Healthcare Innovation Pitch Competition is a

successful healthcare-specific competition in which participants compete for prize money by proposing ideas for statewide healthcare issues. The competition's theme for 2017 focused on aging-in-place. Undergraduate and graduate students from universities across the state are eligible to compete.

A New Jersey competition could feature a new technology challenge each year. Potential themes could be tied to other technology objectives from this report, such as improving the government's delivery of services. This competition could be open to faculty and college students across the state and would foster an entrepreneurial spirit.

The State of Florida's program is funded primarily by Blue Cross Blue Shield of Florida and is managed by the University of South Florida's Center for Entrepreneurship at the Muma College of Business. This organizational model allows the State to reap the benefits of the competition while incurring few costs.

IV. PRIORITY: ATTRACT AND RETAIN HIGH-TECH TALENT AND INVESTMENT IN NEW JERSEY

New Jersey should be a rewarding state for innovators. During the campaign, the Governor-elect discussed loan forgiveness for STEM educators. Other committees—like Urban and Regional Growth, Housing, and Transportation—are discussing how to make our cities attractive to millennials. New Jersey must also be more attractive for entrepreneurs. New Jersey currently attracts less venture capital per capita than its peer states. New Jersey is losing the "talent war" as too many tech innovators decide to make other states their home base.

i. Recommendation: Create a fellowship program that aims to improve New Jersey's government technology and attract talented professionals to work in NJ State Government

The State should create a fellowship that is modeled after the federal government's Presidential Innovation Fellows program. This program brings technologists, executives, and innovators into federal government service, with the ultimate goal of administering programs to residents more effectively and efficiently. Fellows are paired with career public servants across various agencies to create a mutually-beneficial partnership. Fellows are able to learn about the inner-workings of the federal government and contribute to tackling some of our nation's greatest challenges. The federal government benefits from the program by tapping into private sector expertise and creativity to solve technology problems.

Creating such a program at the state level here in New Jersey will serve two purposes that are consistent with this report's objectives. First, it will attract entrepreneurial talent to work in New Jersey state government. Second, both the administration of services to residents and the overall IT capabilities of State government will improve markedly as a result of the arrangements.

In the case of the federal government's Presidential Innovation Fellows program, costs are spread across the individual agencies who take on fellows. Before instituting a fellowship program, the State should evaluate all possible funding mechanisms**.**

ii. Recommendation: Establish a STEM-specific student-loan forgiveness program

During the campaign, the Governor-elect proposed student loan forgiveness programs for STEM employees who moved to New Jersey.

The purpose is to counteract the erosion of New Jersey's STEM foundation. In 1980, New Jersey was home to 16 STEM industries with employment 1.5 times greater than the national average. Now it is home to only four. New Jersey is also only 32nd in the nation in terms of recent bachelor's degrees in science and engineering.

This proposal is, in part, modeled after North Dakota's program, which funds around 800 individuals at an annual cost of approximately $1.2 million.

iii. Recommendation: Encourage all public schools to expand computer science programs

Computer science is not widely offered in New Jersey's public high schools. It is even less common in elementary and middle schools. Those high schools that do offer computer science courses typically have modest programs that do not include computer science as a core requirement or include AP-level offerings.

One step the Governor-elect and the State Board of Education can take is to strongly encourage or require that all public schools make Computer Science a core graduation requirement. Exposing students to computer science will also generate further interest in the field. Studies show that students who learn computer science in high school are six times more likely to major in it. Computer science skills are in high demand in today's workforce, and requiring coursework in this area will help catalyze a new wave of young tech leaders.

Additionally, the Governor-elect and the state board of education should take steps to ensure that computer science is offered at the AP-level in all public high schools. Students who wish to pursue computer science more seriously or might consider it as part of career training should have access to AP-level instruction.

To fund these programs, the State should solicit help from large corporations who are challenged to identify and recruit sufficient talent to fill their tech jobs. A similar recommendation is in the Education, Access, and Opportunity transition report.

iv. Recommendation: Pursue strategies to jump-start the innovation economy

The State's current initiatives (e.g., the Angel Investor Tax Credit) are complex and many investors do not partake in them due to the extensive paperwork and low incentives. In order to reignite investment, we need to give NJ based investors a reason to invest and move their strongest companies to New Jersey.

The State should investigate new strategies aimed at jump-starting the innovation economy. These might include:

- *Creating a Capital Tax and Employee Stock Ownership Plan (ESOP) incentive program.* This strategy may help attract companies from New York and Pennsylvania, which would grow the State's tax base. This plan would be targeted at the founders and employees of high-tech companies that move to New Jersey or are started in the State. If companies have a liquidity event (e.g., an IPO, acquisition by another firm), the founders and employees (under their ESOP) would pay zero state taxes on the capital gains of their

income. By creating an effective "0% Capital Gains Tax" for exits, we could become a highly desirable location for startups.

- *Revising New Jersey's Angel Investor Tax Credit*. The current credit has been criticized as too weak to serve its purpose as an effective incentive. By increasing the Angel Investor Tax Credit from 10% to 25% for investment in emerging technology businesses that have 75% of employees in New Jersey, the State may be able to attract greater investment in innovative companies. The State should also emphasize that investors in venture funds are eligible to take advantage of this program.
- *Assist start-ups with funding R&D*. One suggestion is for the state to give rebates to start-ups on their payroll tax payments based on their R&D spending. Participating companies could then be asked to share research with our universities or offer New Jersey students paid internships.

V. PRIORITY: FOSTER TECH HUBS AND INCUBATORS, AND EXPAND ACCESS TO SECURE INTERNET

Access to high-speed internet is now a prerequisite for participation in our increasingly connected economy. Employers have turned to online job boards to post openings. Teachers consistently assign work to students that require internet use. Nevertheless, New Jersey has substantial gaps in broadband access—particularly in its rural areas where approximately 21% of residents lacked broadband access as of 2017. Sussex and Warren counties, and many parts of South Jersey, have the most residents without broadband access. The State's lower-income residents in our cities are also disproportionately unconnected. As the nation's most densely populated state, New Jersey should provide all its residents with broadband access.

New Jersey also lags behind other states in terms of creating interesting spaces for job creators to start and build their own companies. The State should prioritize creating incubators in our schools and cities, and making sure that tech hubs across the state have high-speed internet.

i. Recommendation: Expand high-speed internet access to all of New Jersey's rural and urban communities

New Jersey has reliably mapped its broadband capabilities throughout the state through funds granted by The National Telecommunications and Information Administration's (NTIA) State Broadband Data and Development Grant Program.

The State should move to create a middle-mile, fiber-optic cable network to connect New Jersey's rural and urban communities to high-speed internet. It should leverage its mapping progress to identify areas where such a network ought to extend.

The State of Massachusetts' "MassBroadband 123" program is a good model for New Jersey to follow. In 2011, MassTech (described above) built a middle-mile, fiber optic network across Western Massachusetts. This is a fiber-optic cable grid that extends to the edges of 123 of the state's rural communities—but does not weave in and out of neighborhoods to provide last-mile service connection. MassTech owns the grid, while a private contractor operates it. The contractor sells wholesale fiber-optic services to local internet service providers or municipalities, who then build the grid's last-mile connections and sell retail service.

To incentivize the development of last-mile broadband delivery, the State could learn from New York. Our neighbor employs a "reverse-auction" strategy to award grant money to the internet service provider who can provide broadband to underserved census tracts at the

lowest bid. The government should also assist banks in using federal Community Reinvestment Act (CRA) funds to support the expansion of digital access.

New Jersey should also incorporate internet access into its state planning, and seek to make its urban areas a testing site for future internet advances (e.g., 5G pilots).

ii. Recommendation: Enforce a safe and equal internet for all residents

In December, the Republican-led Federal Communications Commission (FCC) reversed the Obama-era rule on Net Neutrality. This opened the door for Internet Service Providers (ISPs) to discriminate against sites and services, ruining the promise of a free and open internet for all. Earlier in 2017 Republicans reversed an FCC rule in order to allow ISPs to sell consumer data without consumers' permission.

The Governor should work with the Attorney General so New Jersey joins the multi-state lawsuit against the FCC's Net Neutrality decision, and to prioritize litigation that enforces user privacy. The Governor should consider supporting legislation that imposes disclosure requirements when ISPs collect consumer data. The Governor should also consider legislation that maintains the goals of Net Neutrality, by prohibiting ISPs in New Jersey from blocking websites or paying for priority treatment.

iii. Recommendation: Build tech incubators in vacant office space owned by government entities

NJ does not have sufficient spaces for job creators to start and build their companies. Yet, in many cases across the state, government buildings are vacant and can be converted to simple work spaces for tech innovators to get their businesses going.

The State—potentially through the Division of Community Affairs—should work with towns and counties to convert vacant space to be accelerators or incubators. The State should collect rent and run the spaces, but share profits with the local townships. The State should also work with private companies to provide free internet. Every county should have at least one business incubator (potentially connected to its vocational-technical school or county college) by July 2019.

This recommendation is consistent with the priorities of the Stronger, Fairer Economy transition advisory committee.

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The Governor, Lieutenant Governor, and the entire senior transition team staff greatly appreciate the immense amount of work, participation and expertise that all our co-chairs, committee members and deputy directors who staffed each committee provided since the transition began in November. This hard work and positive energy about how New Jersey can once again become a national leader has resulted in a robust set of recommended priorities and actions for the incoming administration to consider. As with any collaborative endeavor, many recommendations and opinions were expressed and debated during the committee meetings and the drafting of the reports by co-chairs, committee members, and Deputy Directors. The final reports may contain recommendations that do not reflect the concurrence of all co-chairs or committee members, nor of the organizations they represent. These reports are purely advisory and do not reflect the positions of the Governor-elect or any other elected official.