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RESPONDING TO COVID-19 IN VIRGINIA: SAVING LIVES THROUGH TECHNOLOGY

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RESPONDING TO COVID-19 IN VIRGINIA: SAVING LIVES THROUGH TECHNOLOGY

Executive Summary

State technologists are called to connect, protect and innovate for their customers. As soon as the first COVID-19 case was reported in the Commonwealth of Virginia on March 7, 2020, technologists across the state workforce received perhaps their highest callings yet: use technology to save Virginian lives and transition the state workforce to remote work to the fullest extent possible to keep current government services available and deploy new ones. Their charge was to ensure not just continuity of operations, but full-scale logistical and technical support for lifesaving movement of services and goods for Virginia constituents.

While Virginia experienced various outbreaks, loss of life and economic challenges over the past year, the Commonwealth has now reached a tipping point in its fight with the Coronavirus through creative advances in technology, new levels of resilience and innovation and a dedicated, partner-focused workforce. As of mid-May 2021, Virginia has seen the lowest levels of deaths in over a full calendar year, and vaccine availability is widespread to all Virginians 12 and older, with most clinics operating in a walk-up capacity. At [publication](#) time, over 8 million vaccines have been administered, and more than 66% of Virginians ages 18 and over have received at least one shot. [Governor Ralph Northam lifted restrictions associated with COVID-19 on May 28, 2021](#), signifying the end of major impacts and risks posed by the pandemic. [President Joe Biden joined Gov. Northam in Virginia to recognize and share in the Commonwealth's success on this same day](#).

To achieve this level of progress, Virginia has transitioned its state workforce to nearly full telework, developed technology infrastructure to accommodate the growing needs for conducting business remotely across the diverse population, ensured continuous movement of critical goods and services, procured application solutions to trace positive cases of COVID-19 and built web solutions for critical access to lifesaving information and data about virus testing, vaccine eligibility, vaccination appointment pre-registration and volunteer recruitment.

Project Narrative

Idea:

The onset: save lives, enable logistics and movement of critical goods and services, and support the government's continuity of operations through digital access and telework.

The best ideas are born out of necessity. As COVID-19 cases spread rapidly across Virginia in March 2020, Governor Ralph Northam and his team committed to prioritizing safety and keeping the business of the Virginia government open. Due to the nature of the pandemic and the person-to-person transmission of the virus, almost all business and interactions needed to transition to virtual conduction through technology. Gov. Northam and State Health Commissioner Dr. Norman Oliver issued several states of emergency and a stay-at-home order to protect the citizens in the Commonwealth, enable access to necessary emergency services, transition state-supported education to virtual learning and mandate that nonessential workplaces move to remote work to the fullest extent possible to avoid risk of exposure. While nearly every state agency would play a critical role, several agencies led the charge of technological advancement and enablement. The Virginia Information Technologies Agency, the Virginia Department of Emergency Management, the Virginia Department of Health, the Department of Motor Vehicles, and the Office of the Chief Data Officer all collaborated to save lives and keeping services accessible under the leadership and support of Gov. Northam, Cabinet members and other critical state leaders and stakeholders.

Implementation:

A coordinated, multi-agency response powered by technology

The Virginia Information Technologies Agency equipped and empowered partners' technological response

Virginia state agencies moved quickly to leverage existing technologies and supplement with new ones. In order to equip and empower the Commonwealth's lifesaving response, the Virginia Information Technologies Agency (VITA),

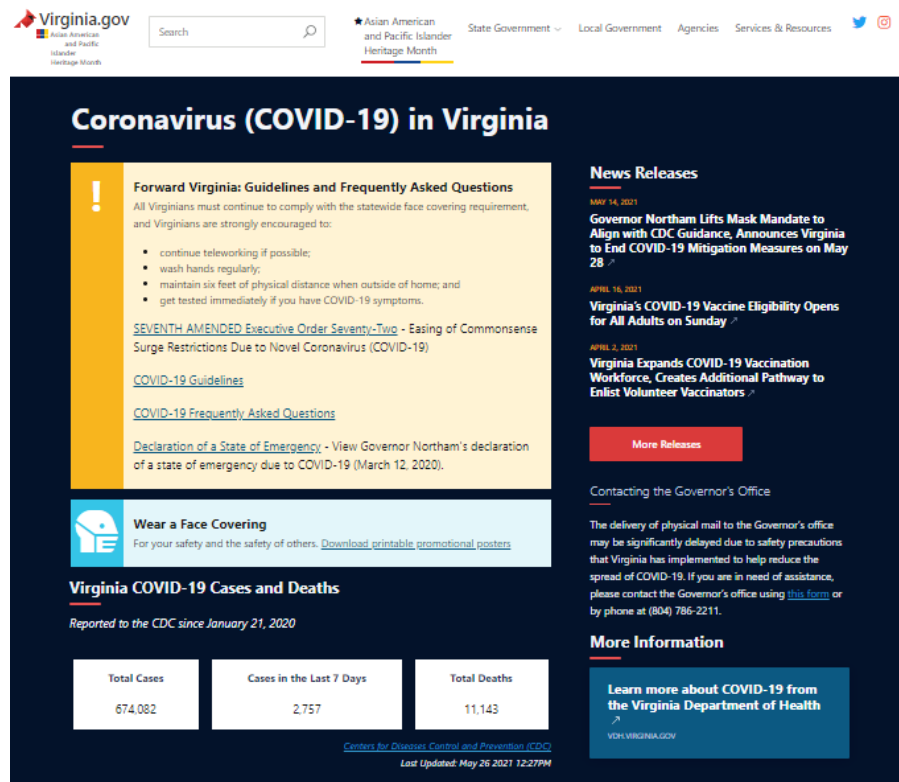


Messaging provided by the Virginia Emergency Support Team, made up of multiple state agency and Cabinet representatives, was shared on digital platforms

as one of three multisuppliers in the country, ensured access to a technology portfolio that was nimble and cohesive. With 65 state agency partners and more than 55,000 state employees under the multisupplier model, VITA was well-positioned to make the necessary and rapid technological adjustments imperative to transition state employees to remote work. As leaders of Virginia's digital response, VITA expanded its virtual private network (VPN) capacity by 700% in several weeks' time and implemented virtual desktop infrastructure as a VPN alternative to ensure that work continued effectively and securely. The team administered an emergency procurement and deployment of 5,000 laptops, even as the rest of the globe competed for the same equipment. To accommodate growing demand for connectivity, the team upgraded internet capacity to a rate of 10 gigabytes per second, and scaled up support staff to respond to customer service needs.

As part of the emergency response, the VITA team played an integral role in the governor's declaration of emergency and activation of the Virginia Emergency Support Team (VEST), partnering with various telecommunications vendors to supply and deploy technologies customized for agency needs across the enterprise and the Commonwealth. The VITA team stood up state agencies' necessary accesses to critical services as the pandemic evolved, from supporting community vaccination sites to rolling out a vaccination management inventory system to track and distribute doses around the Commonwealth.

In addition to satisfying hardware and software needs, VITA relaunched Virginia's constituent access portal, Virginia.gov, to ensure that government services and lifesaving information could be accessed by Virginians simply and equitably. The portal, which was redesigned to present information to citizens in a data-driven, service-oriented way, saw skyrocketing web traffic throughout the pandemic, with desktop visits to the website topping over 1.5 million visits per month and mobile site visits growing to approximately 300,000 visits per month.



Virginia.gov's redesign and data-driven information attracted over 1.8 million visitors per month

The Virginia Department of Emergency Management and Virginia Emergency Support Team broke new response ground through technology

The Virginia Emergency Support Team (VEST) coordinates the response and recovery from natural and human-caused disasters. With more than 300 credential members, staff is drawn from other state agencies, non-profits and private sector partners. The Virginia Department of Emergency Management (VDEM) provides administrative and coordination oversight to the VEST and recognized early on in the rapidly evolving COVID-19 pandemic that the move to a virtual team and Microsoft (MS) Teams was a critical component of virtual operations.

At the beginning of the pandemic, the scale and fluidity of events required rapid and secure access to files and communication between VEST working groups. To enable a virtual joint information center (JIC), the agency reached out to Veoci® software to host and generate workflows for consolidation and tracking of information requests from the public. At the same time the virtual JIC was operationalized, VITA recommended MS Teams for secure and rapid sharing of data for the VEST. Due to the scale of the response and rapid changes to staffing, the solution enables swift onboarding of new members to a team with centralized, secure file sharing customized to the team's workflows. Along with the file sharing, collaboration and real-time communication capability was at the time not a primary consideration. However, this has been readily adopted to support video conferencing and chat for everything from a small workgroup impromptu

gathering to a scheduled meeting of up to 250 connections. To access a team site, partners can choose from a web browser, desktop or mobile applications for greater flexibility. VDEM continues to expand capabilities as the virtual JIC has been transitioned to MS Teams during vaccination efforts. Recently, to assist staff with limited bandwidth, this solution has been enhanced with a call-in capability for participants. The MS Teams implementation encompasses over 40 teams and 400 customers. It has become a primary communication and data-sharing platform for partners internal and external to the Commonwealth.

With the groundwork laid and access to services available, partner agencies critical to the COVID-19 response could focus on the complex work at hand.

The Virginia Department of Health led the nation in technology to keep Virginians safe.

The Virginia Department of Health (VDH) is led by the Virginia State Health Commissioner, Dr. Norman Oliver, who declared COVID-19 a disease of public health threat on February 7, 2020. Following the declaration, VDH sprang into action by preparing, researching and providing innovative technology solutions to the Commonwealth.

Keeping the Commonwealth of Virginia Informed through data and reporting

To understand the COVID-19 pandemic, its impacts need to first be measured and reported. VDH provides a consistent and up-to-date dashboard view of COVID-19 cases based on a vast array of data points enabled and accessible via technology. Armed with this information, constituents, businesses, government, and other entities have been able to make informed decisions on how to approach, contain, and prevent COVID-19 cases and support vaccination efforts. Additionally, the Framework for Addiction Analysis (FAACT), a 2020 NASCIO award-winning framework infrastructure and Virginia's cross-agency, cloud-based, data sharing and analytics platform, was also leveraged for the COVID-19 response. The Commonwealth Chief Data Officer worked with Qlarion, Inc. to expand the platform in a matter of days to guide leaders using a statewide lens of data with almost [real-time analytics delivered to Governor Ralph Northam and his team](#). The dashboard data allowed the Commonwealth to identify which hospitals needed supplies, which hospitals had surge capacity, and locations with the largest outbreaks of COVID-19. In addition, the dashboard provided local health district directors with the intelligence they needed to inform their testing efforts, providing metrics on which localities are meeting the testing requirements and goals set forth by the Governor.

The COVID-19 Case and Vaccine dashboards are powered by Tableau - reporting information from multiple sources - and is one of the main portals of accurate, reliable data in the Commonwealth. The dashboard includes information on COVID-19 cases by geographical location, as well as many other factors such as age, hospitalizations, mortality and other key areas of interest that can help guide decisions and plans. Site visitors can directly interact with the reports to visualize, deep dive and understand data from various perspectives. VDH also publishes data that supports the dashboard to the [Virginia Open Data Portal](#) for direct access via API as well as manual downloads, custom visualizations, and exploration by constituents.

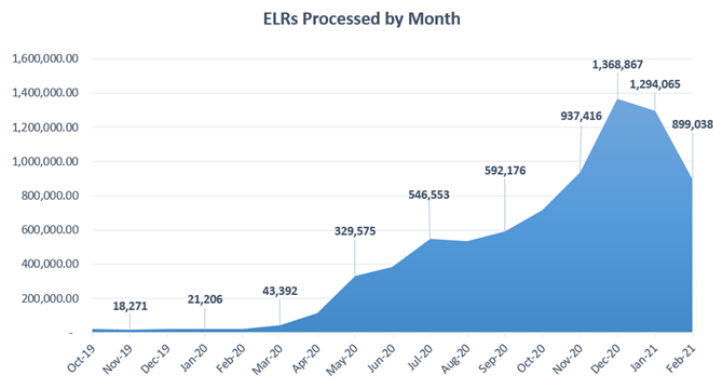
After the COVID-19 vaccination effort began, the CDO and his team leveraged the FAACT platform and Virginia's Health District Dashboards to provide health district directors with intelligence products to help administer the vaccine efficiently and equitably in their respective localities. The VDH dashboards reported vaccine distribution and administration and helped track the Commonwealth's progress towards the Governor's vaccination goals. Data from a variety of sources was consolidated to the CDO's secure, cloud-based platform to facilitate data sharing amongst stakeholders including VDH, VDEM, the VEST Unified Command, Governor's office, Health Equity Taskforce, Deloitte, several major Virginia universities and others.

This data has provided necessary transparency and awareness for both constituents and decision-makers within the Commonwealth, helping to determine critical resource allocation - including where to increase equitable access and distribution of vaccine doses. The [Commonwealth Data Trust](#) played a critical role in bringing data assets together from a variety of sources, including private organizations, by inspiring confidence that trust data assets were only going to be shared securely and appropriately amongst authorized data trust users. This data, together with subject-matter expertise, research and analysis, will determine how decision makers proceed with new health guidance.

Tech advances lifesaving capabilities across the Commonwealth: robotic process automation, COVIDWISE, VASE+ and accessible communications were tools essential to rapid and impactful response

As COVID-19 cases increased in frequency, VDH was charged with the responsibilities of sound virus case management and tracking exposures to the virus through contact tracing. The VDH technology team utilized a point-of-care (POC) application to allow healthcare providers and facilities with the ability to enter COVID-19 test results remotely, and used scanning and robotic process automation to digitize laboratory reports across the state, helping to increase overall electronic lab reports access by nearly 7,000% from Dec. 2019 to Dec. 2020. These efforts more fully built on digital transformation capabilities and saved hours of time, innumerable resources and bandwidth in replacing paper processes with this digitization, even as staffing levels for the technology team remained largely the same.

COVID Impact - Electronic Lab Reports (ELR)



VEDSS is the single largest data source for agency COVID-19 reporting, it feeds the agency COVID-19 dashboard

- From December 2019 to December 2020, there was 6,773% increase in the amount of ELRs processed. In Feb. 2021 the increase has dipped to 4,514%.
- The VEDSS data footprint was 370 GB in April 2020, compared to 1900 GB as of Feb. 2021. This is a 513% increase in the size of the data footprint.
- The number of active users averaged between 230-300 prior to the pandemic. The number of active users as of Feb. 2021 is about 1700, an ~ 568% increase

Electronic lab reports across Virginia were digitized through robotic process automation, allowing for a nearly 7,000% increase in number of reports processed and accessible

To supplement immediate and critical staffing needs for more contact tracers in the field, VDH developed its own hiring surge document application to allow interested candidates to upload resumes for consideration and implemented electronic signatures to further expedite the process. The team procured more than 2,000 accounts, nearly 2,000 computing devices, 1,305 mobile voice devices and 862 mobile tablets to assist with the work. Technology was embraced not just in implementation, but in solutioning as response needs to the pandemic evolved. One challenge the team faced was in reaching those identified as having been exposed to the virus. In the age of spam calls to personal mobile devices, not many called actually picked up to receive the proper notification. VDH partnered with Neustar to ensure that exposure notification calls were branded through caller identification for better call pickup rates. The team saw exponential improvement in call pickup, and thus notification of exposure for appropriate preventative action.

While successful in improving contact tracing measures, VDH continued to innovate for Virginia. VDH launched COVIDWISE, the nation's first exposure notifications app, on Aug. 5, 2020. COVIDWISE is a free app for smartphones that uses Bluetooth Low Energy (BLE) technology and completely protects user privacy. Developed through partnership with SpringML, Inc., and using Google/Apple Exposure Notifications (GAEN) configuration files, the BLE technology generates anonymous tokens every 10-20 minutes for each individual mobile device that cannot be linked to a specific person or geographic location. BLE constantly works in the background, exchanging anonymous tokens with other COVIDWISE mobile device users. COVIDWISE users who test positive for COVID-19 can submit their anonymous keys/tokens to a positive reports server. All COVIDWISE user devices check the positive reports server twice daily. Users are notified if a match is located and the established risk parameters are met that would lead to a likely exposure. The app also contains a Virtual VDH bot system, with easy access to additional information such as vaccine locations, the call center number and other COVID-related information. In fall 2020, VDH connected COVIDWISE to the National Key Server, which allowed anyone using COVIDWISE to receive an exposure notification if a GAEN user from another state had been in close contact and was positive. The National Key Server was not previously available when VDH initially launched COVIDWISE. VDH added COVIDWISE Express in early February 2021, allowing iPhone users, without the

Use Your Phone to Fight COVID-19

To help lead the way in the fight against COVID-19, the Virginia Department of Health (VDH) is pleased to announce that COVIDWISE, Virginia's official COVID-19 Exposure Notifications mobile app, which launched on August 5, 2020. Virginia was the first state in the United States to deploy an Exposure Notifications app using the Apple/Google Bluetooth Low Energy framework.

What is COVIDWISE?

COVIDWISE is the official Virginia Exposure Notifications System (ENS) app created by the Virginia Department of Health in partnership with Google and Apple. This free smartphone app is available to all Virginians on Google Play and in the App Store. After downloading the app, you will be able to use your phone in the fight against COVID-19, without compromising your privacy or personal information. COVIDWISE uses Bluetooth Low Energy (BLE) technology to quickly notify users who have likely been exposed so you can reduce the risk for your friends and family and help Virginia stop the spread.

Who should use COVIDWISE?

Everyone with an Android or Apple phone is strongly encouraged to download and use COVIDWISE. By working together and using every tool at our disposal, we can protect ourselves and our communities. Minors should request permission to download and use COVIDWISE from a parent or guardian.

Download COVIDWISE

The FREE app is available for download via the App Store and Google Play Store.

Learn more at COVIDWISE.ORG

A fact sheet shares how COVIDWISE, the nation's first exposure notifications application, preserves personal privacy through technology

app installed, even easier access to the COVIDWISE GAEN technology. The app has been downloaded by about 1.1 million Virginians and COVIDWISE Express has been activated by approximately 1 million more. With 2.1 million users, roughly 25% of Virginians have incorporated exposure notifications into their COVID-19 prevention toolkit, which makes COVIDWISE one of the most successful exposure notification systems in the country, with incalculable benefits in preventative measures, including lives saved.

As vaccinations were successfully tested and produced, VDH continued to chart new paths for technology in fighting impacts from the pandemic. Following release of the vaccine to members of the public, VDH stood up a separate website, Vaccinate Virginia, and virtual call center to provide customer service capabilities through new content, infrastructure upgrades (doubling the number of processors and quadrupling the amount of RAM). The team also developed a custom application called the Vaccine Appointment Scheduling Engine (VASE+) to perform outreach and enable Virginia residents to self-schedule COVID-19 vaccine appointments. VASE+ was used to successfully target priority registrants in targeted, at-risk populations. The end-to-end system not only allowed for self-scheduling of appointments, but also allowed the user to pre-populate responses to a health questionnaire to expedite the vaccination process. As of mid-May, the Commonwealth of Virginia has successfully scheduled millions of appointments and administered nearly eight million vaccinations to approximately 66% of Virginians ages 18 and over, and 54% of the full population.

Vase+ Testimonials

"VASE+ is the silent hero from an operational standpoint. What I truly appreciate about the system is how straightforward it is. This makes training staff on the new system quick and easy while still being suitable for individuals that aren't as tech savvy."
— Prince William Health Department

"VASE+ has provided us with a more user-friendly registration and documentation system. The ease of getting patients into second dose clinics was a game changer! It has also given us the opportunity to text residents of RCAHD with vaccine clinic information. We are glad we made the switch."
— Roanoke City & Alleghany Health Districts

In addition to the innovative apps developed, the governor's office, VEST team and partner agencies worked to ensure that communications about all of these new services were accessible to Virginians across personal demographics and geographic locations. Most communications materials were translated into multiple languages for optimal accessibility, and all materials met [American with Disabilities Act Standards for Accessible Design](#) and [Section 508 \(Rehabilitation Act of 1973\)](#)

Federal-level compliance for accessibility standards. The VDH team deployed multiple other technologies to ensure optimal information-sharing opportunities, including: a COVID symptom checker, powered by Buoy.com, a chatbot on their website, an online polling application to determine phased vaccine eligibility (a Jebbit questionnaire that reached over two million people), a pre-registration application, powered by SpringML, to allow constituents to pre-register for vaccines, and frequent updates to all their digital platforms. The tech-heavy approach proved successful; traffic to the VDH website increased over 1,000% from February 2020 to February 2021 as the pandemic progressed and lifesaving information became more accessible and available.



The Virginia Department of Health website saw a 1,000% increase in site traffic

The Department of Motor Vehicles kept critical goods and services moving through technology

A key component of Virginia's success in achieving optimal health, wellness and continuity of operations throughout the pandemic was the Commonwealth's digital transformation of services in the Department of Motor Vehicles (DMV). Following the onset of the pandemic in Virginia, all DMV branch offices were completely closed to the public for two months, which required quick work to keep business moving and Virginia's 7.2 million drivers on the road.

DMV leveraged its technological foundation to rapidly migrate needed transactions to other service channels, including mail and Internet. As the first in the world to offer online vehicle registration and driver's license renewals, DMV expanded its web offerings to include a two-year driver's license renewal option for customers to delay the need for in-person service during the public health emergency. The team was able to innovatively, efficiently and cost-effectively use its .NET framework software, which avoided costly investments in a time of statewide fiscal austerity. Nearly 200,000 Virginians have taken advantage of the safe service alternative.

DMV's online service portfolio now includes 52 transactions. Its website, dmvNOW.com, is experiencing robust activity. The average number of daily visits to the DMV site pre-COVID were approximately 309,000. In early May 2021, the numbers topped more than 372,000 visits. The agency is processing 38% more transactions through the web than pre-pandemic.

Once health guidelines allowed for in-person appointments to return, DMV continued to build on its growing portfolio and benefits of digital transformation. The team developed a user-friendly online appointment scheduling tool that, based on early survey results, customers would prefer to use even after the impacts of the pandemic have diminished.

DMV also digitized the process for commercial drivers' license (CDL) renewal so that CDL holders in good standing, many of whom provide necessary truck and freight driving services, could continue uninterrupted the business of delivering personal protective equipment, critical supplies, food and other materials moving along Virginia's roads.

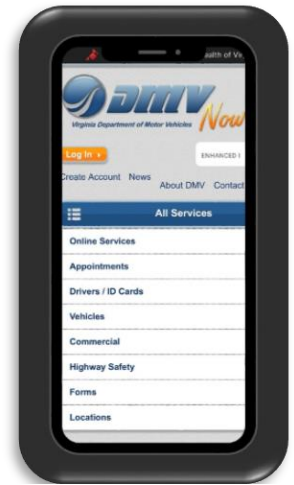
Digital efficiencies were developed for processing car titles, as well. By leveraging its already-innovative technological advances, the team was able to digitize and consolidate a process that spanned 75 brick and mortar locations, which further increased efficiencies and allowed what was previously an exclusively in-person process into one that could be supported by telework. The process streamlined resource needs and enhanced customer service, cutting the normal processing time of five to six weeks down to two.

Through creativity and tenacity, the DMV used new technologies, leveraged existing advances, and built new tech processes to keep critical, lifesaving goods and services available to Virginians in multiple ways.

Impact:

The pinnacle of government services - saving lives today while leveraging technological advances for the future

Aligned with multiple Top Ten Chief Information Officer Priorities, federal guidance from the Centers for Disease Control and Prevention and together with the dedicated partnership of Virginia leaders, many state agencies and VITA's suppliers' assistance, Virginia quickly rose to national leadership in its response capabilities. Focused on digital services to citizens, the workforce, and with a keen eye toward sound fiscal management, data analytics and customer relationship management, the Commonwealth empowered Virginian families and communities with the information they needed to best make lifesaving decisions. Through implementing appropriate technology-based, government-to-citizen services, the Commonwealth of Virginia saved lives, kept the business of government open and accessible, and enabled continuous movement of critical goods and services. The intense work to minimize impacts of the Coronavirus will prove beneficial in short- and long-terms for all 8.6 million Virginians. In the short-term, lives have been saved, severe impacts were mitigated to the extent possible, economic challenges weren't felt as steeply in Virginia as they could have been ([a \\$730 million windfall has been reported in Virginia, despite the pandemic's effects](#)), and technology infrastructure and demand has continued to explode across the state. For the long-term, the massive acceleration of digital transformation will continue to pay compounding, exponential dividends over time.



DMV's website, responsive to desktop and mobile design, has over 370,000 visits per day, a 38% increase during the pandemic