Meet demands for better access to public transportation services at a lower cost. Citrix Government Solutions replace aging, labor-intensive IT infrastructure with an efficient, centralized model. These solutions deliver secure, reliable, mobile access to applications and resources – including public-facing websites – for citizens and field staff. Citrix can help streamline cloud adoption for smooth scalability and predictable costs.

Accelerate Transportation Services with Citrix Mobile Access, High Availability and Centralized IT
Concerns about transportation infrastructure usually focus on roads, bridges, tunnels, railways and airports. But another part of the infrastructure may also need urgent attention—the legacy IT systems that support state and local transportation departments.

Aging Department of Transportation (DOT) computing environments face internal and external challenges. Internally, government IT teams are often stretched to the limit by costly, time-consuming management of distributed PCs and traditional datacenters, implementation of back-end automation technology, and collection and processing of data from connected devices and sensors such as red-light cameras and toll road transponders.

To support growing communities, IT departments are under pressure to ensure high availability and performance of critical DOT web resources such as public transit sites—especially during bad weather. To make DMV licensing, bus pass purchases, and other transactions more convenient, your agency may be looking at deploying self-service kiosks and mobile apps. Another external challenge is mobilizing field employees by delivering apps to their smartphones and tablets, so they can be more responsive and productive.

IT modernization with Citrix virtualization, networking, mobility and cloud technologies is a smart, unified strategy that covers all these issues. Citrix solutions provide cost-efficient, centralized management of apps, desktops, and servers; mobile and remote access on any device; network and web app optimization; and a streamlined path to cloud computing for easier scalability and lower capital investment.

Centralizing IT Management for Efficiency and Cost Savings

Centralizing IT management can optimize staff efficiency and reduce costs. Instead of visiting individual PCs to troubleshoot and maintain software, your IT staff can remotely handle these jobs. And instead of manually installing a new app across your enterprise network, or on each device—one at a time—they can provision each one automatically and consistently from a single “golden image.”

The benefits? Handling more work with less administrative impact to your staff, automating or streamlining repetitive tasks to free up time for strategic projects, and cutting travel costs. Using virtualization technologies saves countless hours that would be spent supporting a vast number of branch sites. Centralization also makes it faster and easier to migrate to a new platform, such as Windows 10 or Windows Server 2016. Plus, virtual delivery of apps and desktops means you can replace aging PCs with inexpensive thin-client devices that are “plug and play” ready for use with BYO devices.
Citrix virtualization technology, including XenApp and XenDesktop, centralizes app, desktop and server management in the datacenter. Tools such as Provisioning Services and the Citrix Studio and Citrix Director consoles simplify and automate many common tasks, including software rollouts, device monitoring, user support, and access control. For example, DOT training labs for employees can be centrally rebooted from the master golden image to refresh the session for a new lab or user.

NetScaler Management and Analytics System (MAS) is a centralized network management, analytics and orchestration solution. From a single platform, administrators can view, automate, and manage network services for scale-out application architectures.

Delivering Access to Apps and Data in the Field

Mobile information access is important to many types of DOT field employees, from dispatchers, bus drivers, and snow plow operators to construction workers and civil engineers. Fast, reliable access is particularly critical to accelerate response and keep both management and the public updated during a disruption such as a weather event or traffic accident.

Self-service is another use case for application access in the field. Instead of standing in line, people can use mobile apps – or apps delivered to a nearby kiosk – to purchase transit passes, renew licenses, track train or bus locations, or make appointments.

One key to success in mobile working is high application performance over the network.

Many complex transportation projects require advanced engineering design software such as AutoCAD or SolidWorks, or the interactive mapping platform ArcGIS for visualizing large amounts of data. Using these apps in field locations, along with any data-heavy app that requires communication with a backend database, can prove difficult due to network latency.

Citrix virtualization and networking solutions give your staff and constituents fast, high-performance access to data on any device – whether it’s a toughbook, tablet, phone, or kiosk. XenApp and XenDesktop deliver apps and desktops over the network with high performance and a consistent user experience.

CAD/CAM and GIS applications that need access to a graphical processing unit (GPU) also benefit from Citrix technology.

GPUs can be virtualized and used within XenApp/XenDesktop sessions to optimize performance. Further, moving GPU processing to the datacenter avoids the need to purchase expensive endpoint devices.

Maintaining High Availability of Public Websites

The IT services provided by transportation departments must be able to handle planned and unplanned events. During a transportation crisis, such as a snow emergency or bridge closure, public-facing websites – including sites showing live feeds from traffic cameras – may be inundated with citizens looking for answers. To protect public safety, the site needs to remain available and responsive, but unexpectedly heavy network traffic can lead to system slowdowns or even shutdowns.

Network optimization technology, including server load balancing, caching, and compression, can smoothly handle spikes in web traffic to maintain consistent availability and performance. But that’s just the beginning. Other important networking functionality to consider includes strong security for online transactions, a secure...
gateway for remote application access, and WAN optimization to support branch and mobile users.

NetScaler application delivery controller (ADC) and load balancer solutions combine all this functionality and more.

- Front-end optimization shortens load time and render time for web pages, including Flash videos and graphics-rich images.
- Level 4-7 load balancing and global server load balancing distribute traffic to ensure the best app performance and reliability, even when site visits surge.
- NetScaler includes an application gateway for secure access and a web application firewall for threat protection against both known and unknown attacks.

Moving to the Cloud

Transitioning from a traditional, in-house IT infrastructure to the cloud can provide government agencies with a wide range of benefits. Instead of purchasing new datacenter and network infrastructure, choosing a hosted subscription service will provide predictable costs, regular updates and maintenance, and built-in security and redundancy. Cloud services enable agencies to adopt a CapEx model over an OpEx model, which can sharply reduce upfront investment – as well as the burden on IT staff. Cloud computing also allows you to quickly scale up capacity when demands for your services increase.

Cloud options include private and public models, but most government organizations prefer a hybrid approach. Hybrid means certain services are moved to the cloud – either permanently or for peak periods – while others are retained on premises for security and control reasons.

Citrix offers DOT agencies exceptional flexibility in moving to the cloud. For example:

- If scalability during peak usage periods such as winter or hurricane season is a concern, an on-premises XenApp/XenDesktop environment can support resources located in a public cloud, such as Microsoft Azure or Amazon Web Services (AWS). Azure and AWS both offer government cloud options as well.
- If keeping current on XenApp/XenDesktop upgrades and maintenance is challenging, Citrix Cloud can help by offloading the control plane into the cloud and allowing Citrix to manage update cycles for you.
- If aging infrastructure is driving a strategy of moving everything possible to the cloud, a model combining Citrix Cloud and resource locations in Azure or AWS may be the right fit.

Citrix is helping a growing number of DOT agencies extend their datacenter to include cloud-based components and services, whether it is an application workload or the full Citrix stack.

Supporting Digital Transformation for Government

A state or local DOT's mandate may encompass safety, efficiency, economic opportunity, and quality of life. To support your objectives, Citrix Government Solutions can help improve
access to services while optimizing staff resources and budget.

- **Broader access.** Flexible information access — independent of location, device or Internet connection — is a huge advantage for field workers or remote employees who support multiple branch offices. Benefits include faster response times and better-informed decisions.

- **Increased efficiency.** Centralizing management of apps, desktops, servers and networking components enables your IT team to focus on strategic initiatives — such as Smart Cities technology — and professional development instead of routine, repetitive work.

- **Higher availability.** By implementing IT modernization, including optimizing networking capability, your agency can improve the secure availability of apps, data, and services for mobile and remote employees and the public, even during periods of high demand.

Learn more about the advantages of Citrix solutions for transportation by visiting www.citrix.com/government

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**Washington State DOT’s Story**

Washington State residents depend on the DOT’s public-facing website for travel information, especially when it occasionally snows in Seattle. But the web infrastructure's older Cisco load balancing equipment could not handle huge volume spikes of up to a million visitors per day. Webmaster Aaron Hutchinson looked at products from Cisco and F5 but found they did not offer the capacity, breadth of features and simplified licensing delivered by NetScaler.

“While load balancing was our primary need, NetScaler offered so much more,” said Hutchinson. “With the other solutions, you had to add separate modules—at extra cost—to gain additional functionality.” NetScaler Platinum Edition includes load balancing, NetScaler Gateway to securely access the XenApp and XenDesktop environments and AppFirewall to secure online transactions for ferry reservations.

After implementing NetScaler and boosting capacity, WSDOT faced a new challenge — its Internet connection had become a bottleneck. But the Citrix technology solved that problem too. “When we turned on compression in NetScaler, we immediately achieved 40 percent savings in bandwidth—which meant we were able to handle a huge number of additional site visitors without filling up that bottleneck.”

With NetScaler, “our public website just doesn’t go down anymore,” explained Hutchinson. “With the traveling public quick to communicate their anger when something doesn’t work, the net effect of the improved availability has been felt by everyone, from our constituents to our communications office and our server infrastructure team.”