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**NASCIO Awards 2014**

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**Title of Nomination: NG911 over NetTN**

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**Project Name:**

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## Executive Summary

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When an emergency, disaster or accident strikes, everyone knows to dial 9-1-1. While dialing an emergency line certainly means help is on its way, the speed with which help comes and the information first responders have when they arrive has traditionally been impacted by the limitations of technology. Tennessee is working to change that. By combining a healthy appetite for innovation with effective central oversight, the state is charging ahead of the 9-1-1 curve.

Traditionally, 9-1-1 networks were created for hardwired, landline phones with only voice capabilities. Today, as citizens rely more and more on digital devices, they expect 9-1-1 to have the same capabilities and technology that they do. Meeting that expectation demands a digital network for 9-1-1.

The state of Tennessee is deploying a project to update its legacy, analog 9-1-1 system to a digital, IP- based platform. The old infrastructure developed piecemeal, over time with many owners – phone service providers and other parties with varying interests, levels of expertise and resources. Tennessee’s project sets the stage for 911 to deploy all the digital capabilities that our public expects, like texting to 911 or sending photos and videos to 911. But even more importantly, it enhances the way the State’s 911 system actually functions, connecting 911 to a uniform statewide system, creating a much more resilient and redundant platform, that is monitored and assessed constantly and vastly improving call transfer and rerouting capabilities. Because the network is IP based, it will be easier to collaborate with neighboring states once they have deployed.

In some states, technical upgrades to public safety systems are deployed locally – only in areas with the tax base to afford them. Tennessee took a different route. It is one of the first states to deploy a statewide digital network, fulfilling a comprehensive plan that benefits all of the state’s citizens, whether in big cities or rural communities. In a mobile society, a policy of uniform, statewide 911 service makes sense.

Tennessee’s network significantly enhances 911’s functionality. When technical issues arise, no time is wasted determining the party responsible. Its uniformity simplifies efforts to maintain, upgrade and expand its capabilities. A statewide network operations center provides local 911 operators with a single clearinghouse devoted to responding to their technical concerns. A single governing body collaboratively establishes the “rules of the road” for all participants on the network. The Tennessee Emergency Communication Board has shown clear leadership in moving this project, moving forward in a way that engaged various agencies and the public in fulfilling the statutory mandate of uniform statewide 911 service.

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## Description of the Business Problem and Solution

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Society is increasingly relying on digital technology, as more people switch to mobile and Voice over Internet Protocol (VoIP) phones exclusively. While the public expects phones to operate with digital capability, most 911 systems remain analog. Tennessee is deploying a project to upgrade the State's analog 911 infrastructure with a digital network.

As citizens rely more and more on digital devices, they expect 9-1-1 to have the same capabilities and technology that they do. While meeting their expectation is important, that is not the driving force behind Tennessee's effort to modernize its 911 infrastructure. Improved functionality for public safety drives this project.

Tennessee's existing 911 infrastructure, like most other states', was developed for landline service and then reconfigured for cell phones and other devices. This legacy network developed piecemeal over the years. In Tennessee, as in many other states, many different telecommunications carriers controlled portions of the legacy 911 infrastructure. Separate companies that provide certain aspects of service such as automatic location information or call routing also operated on the legacy network. In the event of an outage or other problem with 911 service, simply determining the responsible party could take precious time in an emergency – sometimes even days. Lengthy, late night conference calls involving 911 officials, carriers and others were sometimes necessary to identify the cause and get 911 service restored.

In addition to difficulties resolving technical issues arising on the legacy infrastructure, regulations related to the federal effort to break up the original AT&T system created problems for 911. As part of divestiture, Tennessee (like most other states) was broken up into geographical areas called Local Access and Transportation Areas or LATAs. As a result of tariffs and technical limitations, 911 calls could not be transferred across LATA boundaries.

In 1999, an F3 tornado touched down in Clarksville, Tennessee. Although it was on the ground for only five minutes, it was 880 yards wide and extensively damaged the courthouse and 911 call center. For months after the storm, 911 dispatching in Clarksville was conducted out of a truck converted into a mobile 911 call center by a neighboring county.

The new, digital 911 network in Tennessee provides solutions to these situations. The network utilizes the State's secure, private, outsourced Multiprotocol Label Switching (MPLS) network called "NetTN," as well as additional core infrastructure, managed by the Office of Information Resources (OIR) in the Tennessee Department of Finance and Administration. The project is governed and operated under the auspices of the Tennessee Emergency Communications Board. Participants in the project work closely with the Board to assure service and security. The network is constantly monitored. Technical standards, service level agreements and well-defined responsibilities assure that the cause of technical problems are identified and resolved. A network operation

center available twenty-four hours a day assists the team and local 911 operators with technical issues and outages. Because the Board operates this network, LATA boundaries will become irrelevant when transferring 911 calls. Further, all calls from a 911 call center can be automatically transferred to another call center. In call centers serving large populations, their 911 calls could be transferred to a number of other nearby call centers so a single, smaller center would not be overwhelmed.

Deployment of technical innovations is often accomplished on the local level by communities with the tax base to afford it. There are locations in this country that lack basic 911 service and others that have not yet deployed Phase 2 technology that receives location information from cell phones calling 911. In a mobile society, the impact of having islands of good 911 service in oceans without it create avoidable risks.

Tennessee's efforts will provide uniform 911 service across the entire state once a 911 hits the new network.

Once deployed, the new network will provide 911 with the technical capabilities our public expects from modern telecommunications service. The network will be capable of carrying texts to 911, which will greatly assist our Deaf and hard of hearing community. Sending photos and videos to 911 may be of great assistance to emergency responders, allowing more granular preparation during emergencies.

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## **Significance of the Project to the Improvement of the Operation of Government**

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The Tennessee Emergency Communications Board has been planning and saving for this project since 2006. Absent its efforts, Tennessee's adoption of an IP-based system might not have been possible, and certainly would not have been possible at this time. The Board, which consists predominately of 9-1-1 experts working in the field, is responsible by law for deploying a uniform statewide 9-1-1 network for emerging communications technologies, including but not limited to IP-enabled service. The Board's leadership in centralizing Tennessee's 9-1-1 system and emergency communications has put Tennessee in the forefront of 9-1-1 technology and innovation. Instead of multiple 9-1-1 initiatives across the state in various counties or districts, this statewide initiative has drawn together all jurisdictions and stakeholders to ensure all share in the project's short and long term benefits. Economies of scale have been realized in the deployment because the State's NetTN Office was able to negotiate a statewide contract encompassing many other IP projects in addition to 911 which guaranteed favorable pricing. In addition to the pricing, statewide uniformity of equipment in the network simplifies maintenance and troubleshooting.

Further, government operations will improve as Tennesseans calling 9-1-1 will have better and more accurate location information sent along with their calls to aid responders in providing lifesaving assistance faster. 9-1-1 call centers will also be able to receive additional information through data such as text, photos and video in response to calls for emergency assistance, and 9-1-1 jurisdictions will be able to seamlessly transfer 9-1-1 calls across the state.

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## **. Benefits of the Project**

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The long and short term benefits of this project impact everyone from the citizen calling 9-1-1, to the dispatcher sending help and the first responders on the scene. Our citizens' lives and property may be better protected by a more robust and redundant 911 system. The foundation for integrating IP-based technical innovations into Tennessee's 911 system is being laid in what we hope is the most responsible, efficient and cost effective way possible

From a technical standpoint, the Tennessee 9-1-1 network is now constantly monitored and a much more responsive, cohesive and permanent team is in place to respond to problems. The network itself is 100% redundant in two separate locations with modern, IP-based components.

The new IP system encourages collaboration and cooperation between local jurisdictions. 9-1-1 calls intended for a call center that is experiencing an interruption of

service through a natural disaster or technical malfunction will automatically be re-routed to a back-up or secondary call center. Based on local preferences, 9-1-1 calls in one jurisdiction can also be re-routed and spread out based on the location of the callers to multiple back-up locations and other jurisdictions. The new network enhances local 911 centers' ability to implement contingency plans with the assistance of neighboring 911 centers.

The new IP network will also alleviate some of the local costs associated with providing 9-1-1 service. Under Tennessee's system, local jurisdictions will no longer have to pay service providers for 9-1-1 direct connections to their communications networks. Additionally, the new system will alleviate the costs of receiving automatic location information from third parties because the project includes development and deployment of the State's own database for automatic location information (ALI).

For citizens, the 9-1-1 services they rely on are more accurate and able to respond faster. The deaf, hard of hearing and mute citizens of Tennessee will now have the ability to contact 9-1-1 from mobile devices, a capability not previously available to them through the traditional 9-1-1 network. Tennesseans will also receive the same excellent 9-1-1 service across the state, no matter if they are calling from rural or urban areas.

For the state, the initiative has long term resource savings and a continued path to innovation. As new technologies and standards become available, the state of Tennessee stands ready to continue to innovate based on this foundational project.