

2020 NASCIO State IT Award Submission

Information Communications Technology Innovations

Technology Enables THP Trooper Vehicles for the Future

Submitted on July 15th, on behalf of the State of Tennessee

by Strategic Technology Solutions, Department of Finance and Administration

in partnership with the TN Highway Patrol



From early 2018 through late 2019, Strategic Technology Solutions (STS) conducted a large initiative to modernize the technology used within the Tennessee Highway Patrol (THP) Trooper vehicles. The first objective of the project was to improve vehicle connectivity by replacing the unreliable ‘jet pack’ modems used in the vehicles. The troopers needed something more robust and reliable, that would support new technology with ever-increasing bandwidth demands.

Because Troopers have become more reliant on data to make informed decisions, connectivity in the vehicles is vital for maintaining both public and Trooper safety. Hands on feedback gathered during ride-alongs and in-person interviews provided information and requirements that were invaluable when it came time to start making recommendations about how STS could help modernize the vehicle platforms.

Before any technology was researched, the STS team embedded themselves into the day to day life of THP Troopers. Building rapport and understanding customer needs is important for obtaining a clear picture of the challenges to be solved. Beyond simply meeting with customers and interviewing them, the IT team went on several ride-alongs with THP Troopers to get a hands-on appreciation for the user-experience. They even flew in a helicopter to learn about the technology challenges unique to the THP Aviation unit. This led to the following considerations when evaluating and selecting products to implement:



FirstNet Ready

The router should work on Band14 when available

Dual Cellular Radio

The radio should have two cellular radios and the ability to automatically flip between carriers

FIPS Compliant Codebase

The router should be FIPS compliant in light of the fact that it handles CJIS data and creating the VPN link between the car and the State network

Dual Wi-Fi AC Radios

The router should have two radios to accommodate wireless devices (wireless bubble/wireless backhaul)

Multiple Gigabit Ethernet Ports

The ports must accommodate future peripherals/tools

Scalable

The solution must be able to easily incorporate new technology

Ruggedized

The solution must be able to survive in the trunk of a trooper vehicle (TN heat index, humidity, dust, impact, etc.)

Mobile Management

Devices must have the ability to be remotely monitored and managed

Keeping these considerations in mind, STS selected Sierra Wireless MG90 in-vehicle routers for implementation, which today leverage dual networks (ATT & Verizon) to ensure service availability across the state. The new technology provides the solid connectivity that the

Troopers need, greatly increased speed, more reliability, incredibly granular monitoring and reporting capabilities, and ease of use of connected tools in the vehicles. The monitoring and reporting capabilities have become especially useful in working with the State's cellular partners to identify and improve cellular coverage in underserved regions.

The STS team also is also utilizing Sierra Wireless ACM Servers to create a secure VPN connection back to the State network. This allows the router to make and manage the VPN connection rather than require the Trooper to jump through hoops with VPN software on his or her in-car computer. This allows the Trooper's vehicle to become an extension of their office.



With stable connectivity, STS was also able to replace and modernize THP in-car camera systems. The previous camera system was an antiquated system that was clunky, expensive to maintain, unreliable, and produce poor quality video by today's 'HD' standards. It had high maintenance and support costs associated with the unpredictable nature of hardware failures as well as the distributed 'store and forward' model that required servers at every THP district post. Troopers were spending significant amounts of time sitting at district posts waiting for video to offload, and THP wanted a new platform that would eliminate the need for Troopers to sit at district posts to wait for their video to offload. They also wanted a scalable platform that would easily allow them to add body worn camera footage, etc.

To meet these needs, STS implemented Axon in-car camera systems that work seamlessly with the new Sierra Wireless routers. The new camera system allows video to be stored in the same place where it is analyzed and redacted, which prevents unnecessary movement of large files. The video is sent directly to Axon's cloud storage in the Microsoft Azure Government Cloud which eliminates the burden of large video files clogging up the State's network. The system is infinitely scalable, and allows THP to grow usage or add new devices (i.e. body worn cameras) without needing to worry about purchasing more infrastructure.

Not only does the new camera system work better, it also has a lower cost than the previous premised-based storage system. The cloud model is subscription based and allows THP to have a fixed per user per month fee regardless of the video volume captured.

The platform can ingest video from other platforms/formats (THP helicopters, the legacy in-car camera system, cell phone videos, etc.). It utilizes a web-based interface (similar to YouTube) so special codecs, etc. are not necessary for users that may need to review a video. All video data is generated and stored in a non-proprietary format. This makes the web-based portal for sharing possible, so that videos do not need to get sent, downloaded, burned to disc, etc. Users now simply log in and view the video, creating a clean audit trail as all activity is tracked within the portal.

The increased productivity resulting from the new routers and camera systems allows Troopers to focus on their job duties and worry less about the technology that is required to support those duties. Ultimately, the success of this project translates very directly to public safety and officer safety, as the better connectivity allows for Troopers to spend more time doing their job rather than sitting in their vehicles waiting for data to download or a video

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“We are very pleased with the partnership that we've forged with STS on this project. After implementing the new in-car routers and cameras in our fleet of Tennessee Highway Patrol vehicles, the net result is increased productivity, enhanced public safety, and greater transparency. Our Troopers have expressed greater satisfaction with their vehicles' systems, and are pleased with the improved connectivity and stability. We're looking forward to continuing to modernize our other mobile office platforms.”

- TENNESSEE HIGHWAY PATROL
COLONEL DERECK STEWART

to offload, etc. During a traffic stop, the quicker a Trooper can get to the information they need, the safer it is for the public and the officer.

Ongoing vehicle related THP technology projects include: Replacement of the legacy ALPR (automated license plate reader) system as well as the replacement of the legacy CAD (computer aided dispatch) and phone system. The new CAD/phone system will allow THP to move toward NG911. Both the ALPR replacement and CAD/phone replacement have RPFs currently in process.

