

Chicago Transit Authority

Tropos Wi-Fi mesh network supports mobile maintenance management in train yards



Photo credit: Basil D Soufi

Customer Highlights

Challenges

- Reliable wireless communications in an extremely unfavorable RF environment for supporting CTA's new handheld Maintenance Management Information System devices
- A wireless network solution replicable across CTA's ten rail yards

Solution

- A reliable private and secure wireless broadband network supporting communications for mobile handheld computers used by rail yard maintenance workers
- Tropos mesh network solution was easily and consistently deployed at all ten rail yards

Results

- Test results showed Tropos wireless mesh routers reliably penetrated eight metal CTA cars
- Tropos PWRP intelligently selected the best RF path to achieve the highest throughput
- With new MMIS devices operations, productivity has increased, maintenance cycles have been shortened, and customer service improved

Systems and Services

- Tropos
 - Tropos 5210 Mesh Routers
 - Tropos Control wireless network management system
- System Development Integration (SD-I)
 - Tropos network system design, system integration and installation

Tropos Networks, in conjunction with System Development Integration (SD-I), has successfully deployed a Wi-Fi mesh network in rail yards used by the Chicago Transit Authority (CTA), the second largest public transit system in the nation. The CTA installed the network to cover ten of its rail yards, with the largest storing up to 282 railcars. The system enables the CTA to move its rail yard maintenance inspector's transactions from paper to high speed Wi-Fi networks.

Until this project, CTA rail car inspectors had conducted manual inspections of train cars in the rail yards, reporting defects, taking mileage readings and making repairs. As part of its system-wide Maintenance Management Information System (MMIS) initiative, the CTA decided to automate these maintenance procedures using hand-held computers and state-of-the art Wi-Fi mesh networks in order to improve the quality and efficiency of train maintenance. The new process reduces the time from inspection to repair.

The CTA rail environment is extremely unfavorable for wireless communications because the metal rail cars typically reflect radio signals rather than allowing them to penetrate. This can lead to signal distortion and a reduction in overall throughput. The Tropos mesh solution uniquely handles this issue in two ways. In field testing, the RF signals from Tropos routers were able to reliably penetrate eight CTA rail cars. This is attributable to Tropos' use of high quality radios that provide high power, sensitivity, and fidelity.

In addition, Tropos' patented Predictive Wireless Routing Protocol (PWRP) intelligently routes the wireless signal, selecting the path that provides the highest throughput, routing around obstacles and thereby reducing data loss.

The network provides the CTA's MMIS's handheld devices with reliable connectivity. The CTA is now able to increase the speed of reporting details from the inspection of its rail vehicles, giving the maintenance managers real-time information of items requiring maintenance and easy access to detailed defect information first thing in the morning.

"The CTA recognized the need to design a solution that addressed its unique environment, yard by yard," said Brian Diver, executive vice president, SD-I. "Our experience with operations in non-traditional settings along with the performance and reliability of the Tropos mesh network has resulted in a highly utilized and well-performing system."

Because defect descriptions are programmed in the handheld devices, information is now presented in a concise, consistent manner to each manager, making it easier to determine the maintenance status of all rail cars. CTA inspectors also scan each rail car number into the system before an inspection, improving accuracy. The mesh network helps increase the quality of the CTA's maintenance programs and workers.

The bottom line benefits of the Wi-Fi network to the Chicago Transit Authority: increased productivity, shorter maintenance cycles and improved customer service.

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