National Railway keeps rolling with private to public cellular wireless roaming

CUSTOMER

US-based Class 1 freight railroad operator

VERTICAL

Transportation

LOCATION

Eastern United States

CUSTOMER SIZE

Operates 19,500 route miles across 22 states

CHALLENGE

Augment spotty cellular coverage from public MNO service 4G private wireless network with seamless public to private roaming

OUTCOME

Faster certification of trains for secure operation

"

Combining Celona's private wireless with our dual SIM strategy, we've eliminated erratic wireless coverage and connectivity issues that have hampered rail yard staff from certifying trains for commercial operation."

Head of IT Operations
Leading national railway operator

celona

BUSINESS REQUIREMENTS

- Improve productivity of rail yard staff validating and certifying trains for commercial operation

- Ensure the operational functionality and integrity of trains hitting the tracks

- Reduced time for trains departing rail yard

- Maintain complete data privacy

- Eliminate potential reporting and testing issues from inadequate wireless connectivity

- Enable rail workers to seamlessly roam between public and private cellular networks

SOLUTION

- 4 outdoor Celona AP 11 access points (for this site)

- Celona Edge OS for advanced traffic management and core network services

- Celona Orchestrator for cloud-based network administration and SIM management

OUTCOME

- Up to a 20 dBm improvement in signal strength over existing public cellular service

- Elimination of wireless disconnects and session interruptions caused by poor wireless coverage

- Improved productivity of rail yard staff to more quickly certify trains for operation

- Complete wireless coverage and consistent connectivity across miles of railway

- Complete security and control over the private wireless network

"

Public cellular service coverage was pathetic for connecting essential rail yard systems.

Celona's private wireless system was the holy grail for us."

Head of IT Operations
Leading national railway operator

celona
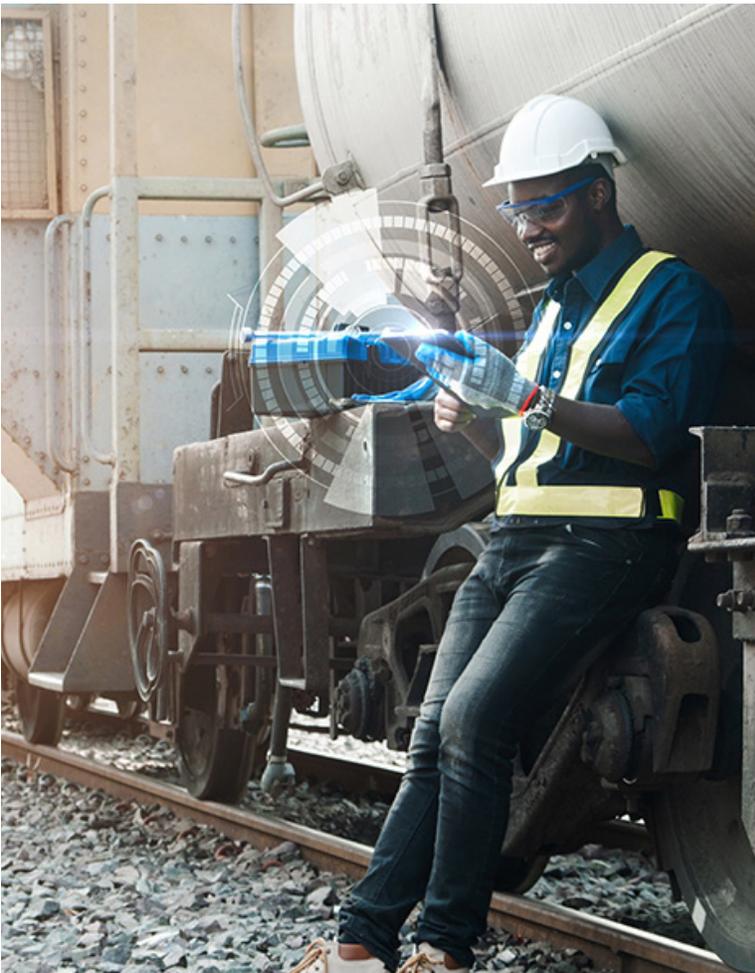
Committed to ensuring the highest levels of safety and reliable operations of its trains, one of the country's largest class 1 freight railroad operators needed help.

Lackluster wireless coverage and erratic connectivity across many of its massive outdoor rail switching facilities was preventing rail yard workers from properly certifying trains in a timely manner, resulting in delayed train dispatch.

A major transporter of industrial products, operating over 19,000 route miles across 22 states, the railroad was faced with how to deliver highly reliable and consistent wireless connectivity across miles of its rail yard switching modals – each littered with metal trains, obstacles and other unfriendly wireless materials that impeded signals, making consistent wireless connectivity nearly impossible.

Rail yard workers at each switching facility are responsible for validating the functional integrity of each rail car to assemble a full train before it can be put into production and sent on its way. Due to the sheer size of the trains, each switching yard typically covers miles of outdoor space in generally remote, rural areas.

To assemble a full train, workers must constantly walk up and down the massive yards, coupling or linking each car's brake lines together, while testing the lines to ensure the operational integrity of each connected rail car.

To do this, rail yard personnel are equipped with a small portable yard air controller or "YAC" used to automatically conduct and document Class One air brake tests. Each YAC supports the ability to connect to a cellular network to wirelessly transmit test results and monitoring information to a central database for documentation purposes.

celona
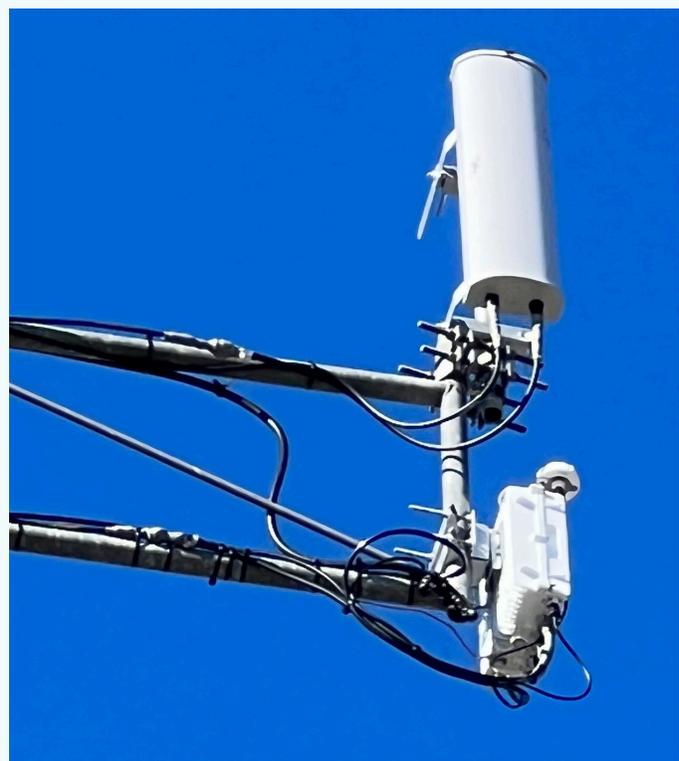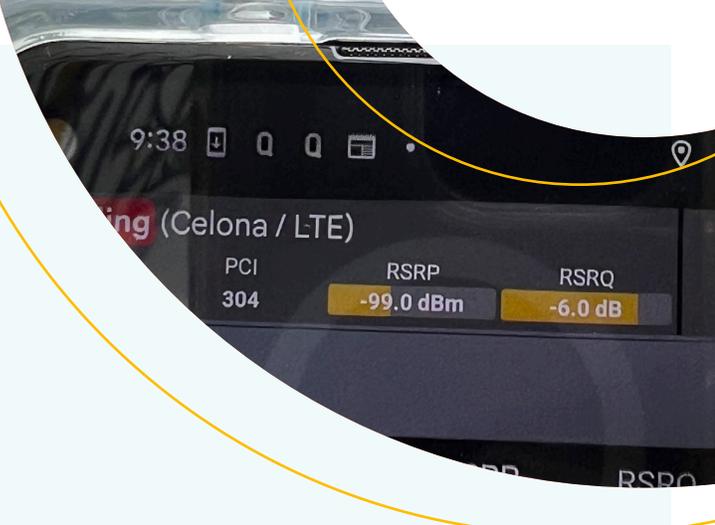
COVERAGE AND CONNECTIVITY CONCERNS

Yet in many of these locations, public cellular service coverage to connect these systems was, in the words of the company "pathetic." This created a major challenge for rail yard staff when trying to validate each train car's operational functionality.

At select locations along the train line, high pressure systems are used charge the brake lines. These systems must be tested, verified, and documented using the YAC.

Equipped with company-issued, dual SIM data-only smartphones, rail workers must walk the length of each train, wirelessly connecting to the yard air controller system, monitoring the YAC tests to identify any issues, such as a pressure leak or air bleed on a given rail car's brakes, that could be problematic, prohibiting the entire train from being certified for operation.

According to the head of IT operations for the rail transport operator: "These massive switching yards are often located in rural areas where cellular coverage simply isn't pervasive or reliable enough for us to perform the testing and validation essential to ensure the proper operations of our trains. We needed complete control of the network and private wireless was the answer."

ROAMING WILD

In addition, when workers leave the rail yard, they needed to be able to use that same device to connect to the network to access internal systems. "We wanted a IT-friendly private cellular system that could leverage the unlicensed spectrum now available to not only provide pervasive coverage and deterministic connectivity but also seamlessly support private-to-public cellular roaming without workers having to do anything," he said.

Rail worker smartphones were then equipped with a Celona SIM for the Celona private wireless LAN alongside a SIM for public cellular service from the preferred MNO with the requisite preferences configured for each network. Celona's cloud-based
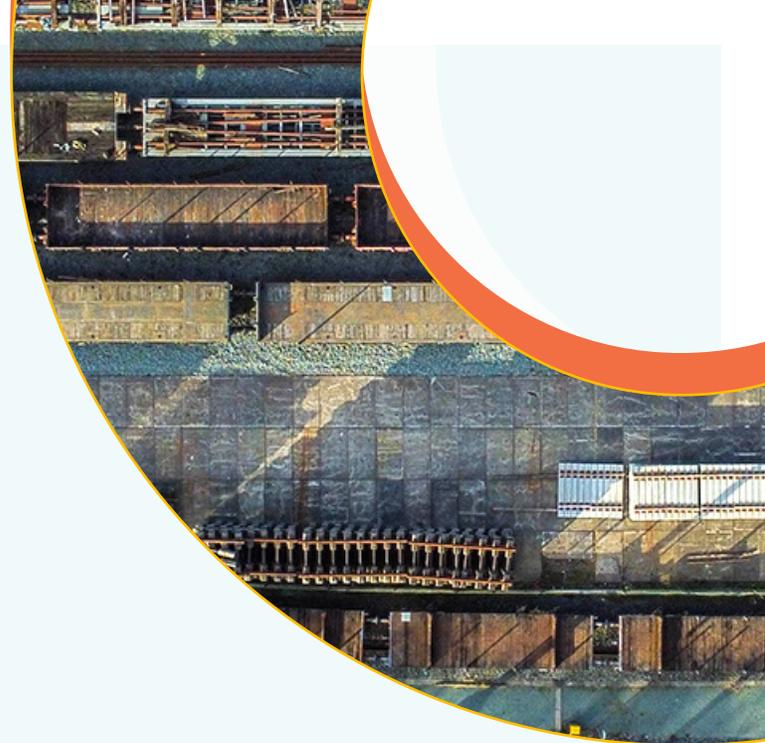
Orchestrator was used to for the central provisioning, management and security of user SIMs on the private wireless network.

WHAT NEXT?

To solve these problems, the railroad quickly deployed Celona's 4G private wireless LAN system.

For one, roughly two-mile rail yard location, only four Celona outdoor AP 11 access points, mounted on available rail yard poles where Ethernet connectivity and power was already available, were needed to completely blanket the entire facility.

Technicians immediately calculated an improved wireless signal strength, up to 20 dBm across the facility, helping to eliminate the frustrations experienced by rail yard workers.

By installing in their own Celona private wireless system dropped connections and session interruptions effectively disappeared, productivity increased, and safe trains hit the track faster.

And when rail yard train personnel leave the site or move to a different location, they were still able to remain fully connected.

celona

When in range to either the Celona 4G private wireless or MNO public cellular network, staff smartphones automatically connect. The dual-SIM solution has allowed rail staff device to seamlessly roam from the Celona private 4G network to the public MNO cellular service in a matter of seconds and without any human intervention.

Looking forward, the company will also begin migrating YAC connectivity to the Celona private wireless network to avoid any potential problem in connecting these essential systems.

Trains rolling safely, all on time, everyone and everything is now reliably connected everywhere, all the time.

" *With Celona's private wireless system now in place, we have secure, reliable and pervasive wireless connectivity essential to the successful operation of our business."*

Head of IT Operations
Leading national railway operator

celona

hello@celona.io | **celona.io**