

Case Study

Virtual Mobile Cloud in Action: Fast Deployment, Reliable Coverage, and Future-Ready Connectivity for Electrical Equipment Manufacturer

Client Overview:

Customer: Electrical Equipment Manufacturer

Industry: Manufacturing

Location: United States

Project Type: Virtual Mobile Cloud powered Private 5G Wireless Network

Background

A leading manufacturer and supplier of electrical equipment, operates a large-scale production and storage facility for managing raw materials and finished product inventories. The facility is spread across expansive indoor and outdoor areas. To support their growing automation and digital transformation goals, they recognized an urgent need for robust and reliable wireless connectivity across both indoor and outdoor environments. The existing Wi-Fi infrastructure was inadequate for ensuring seamless connectivity in large storage yards and production floors, especially where connectivity is critical for real-time tracking and smooth operational flows.

Challenge

Customer's facility, serving as a central hub for manufacturing and distribution, faced several critical challenges related to connectivity due to its heavy reliance on Wi-Fi networks:

Outdoor Coverage in Complex Environments: Customer's extensive outdoor storage areas faced persistent connectivity issues with traditional Wi-Fi networks. The radio frequency (RF) environment was challenging due to long distances, obstructions, and interference, leading to dropped connections and unreliable data transmission between devices and centralized systems. Wi-Fi proved inadequate for maintaining connectivity in these outdoor spaces, leading to inconsistent coverage and connectivity drops for devices, especially for forklift-mounted tablets and other mobile equipment. Additionally, deploying a dense network of Wi-Fi access points for outdoor areas proved costly due to the extensive trenching and infrastructure needs.

Connectivity for Indoor and Outdoor Mobility: Maintaining reliable connectivity for devices moving between indoor manufacturing floors and outdoor storage sites was critical. Workers and automated systems require constant access to inventory data and operational applications without losing connectivity, but Wi-Fi in outdoor or hard-to-penetrate areas proved insufficient. With the constant movement and dynamic nature of these automated systems, even minor delays could disrupt operations, particularly for automated material handling and real-time inventory tracking.

Addressing Deployment Complexity: The Shift from Wi-Fi to Cellular Solutions: They faced significant challenges stemming from the limitations of its existing Wi-Fi network, particularly as the company expands its automation initiatives and Internet of Things (IoT) deployments. The company identified that private mobile technology, using fewer radios, can deliver broader and more reliable coverage across both indoor and outdoor facilities. In contrast, dense Wi-Fi deployments often necessitate costly infrastructure upgrades, including trenching and the installation of multiple access points.

Recognizing the need for a more streamlined approach, customer sought a solution that permits centralized deployment of core network elements at the data center while enabling local teams to efficiently roll out new sites. This flexibility allows for rapid expansion without heavy reliance on external resources, ultimately addressing operational inefficiencies and enhancing connectivity across all locations. A focus on fast and easy deployment was essential as they continue to evolve in a complex and dynamic operational landscape.



Solution & Key Benefits

To address these challenges, the customer partnered with Highway 9 to deploy a private mobile network leveraging the Highway 9 Mobile Cloud, specifically designed for their unique operational needs.

Private, Virtual Mobile Cloud (VMC):

The solution provided a secure, private mobile network ensuring reliable, high-performance connectivity exclusive to customer operations. The VMC architecture with centralized core network functions, simplified management while supporting distributed site deployments.

Comprehensive Indoor and Outdoor Coverage:

The private mobile network delivered seamless connectivity from storage yards and raw material inventory areas to indoor production floors. This coverage solved the persistent outdoor Wi-Fi coverage gaps and supported mobile workflows and IoT operations across the entire facility.

Rapid Time to Value and Low Total Cost of Ownership:

With fewer radios and infrastructure needs compared to Wi-Fi, the solution achieved faster deployments and lowered operational costs. Customer's team was able to deploy new sites independently, accelerating scale-up and reducing reliance on third-party resources.

Future-Proof and Scalable Network:

The network architecture was designed with growth in mind, easily accommodating additional devices, automation technologies, and expansions as they continue to modernize operations.

Deployment Architecture

The network core was deployed centrally in data center, creating a virtual mobile cloud environment. Base stations and radios were strategically placed to maximize coverage both indoors and outdoors, optimized to handle the challenging RF environment of production and storage areas.

Deployment steps included:

Site Survey & Network Design: Conducting a thorough site survey to assess facility needs and creating a customized network design for optimal coverage.

Deployment of Infrastructure: Installing the private mobile network infrastructure, including base stations and antennas, to provide high-speed connectivity.

Device Integration and Testing: Integrating critical automated systems and IoT into the new network and conducting extensive testing for performance reliability.

Staff Training & Ongoing Support: Providing network management training for staff, along with ongoing troubleshooting and optimization support.

Ongoing Monitoring: Implementing continuous network monitoring to ensure sustained performance and proactively address emerging issues.

Business Outcomes

Reduced Connectivity Complaints: Reliable connectivity led to measurable gains in operational throughput and reductions in connectivity-related complaints from floor staff. With robust coverage in previously problematic outdoor spaces, device connectivity issues dropped significantly.

Enhanced Inventory Accuracy: With better network coverage and robust support for real-time tracking systems, inventory inaccuracies have been significantly reduced, helping to streamline order fulfillment and production scheduling.



Scalable & Cost-Effective Deployment: The simplified infrastructure reduced deployment time and ongoing maintenance costs compared to traditional Wi-Fi solutions. This solution offers a "rapid time to value" and "low total cost of ownership". The Highway 9 Mobile Cloud has provided the scalability to expand operations, add more IoT devices, and integrate additional automation technologies without concerns about network limitations.

Better Security Posture: Operating a private network ensured sensitive operational data remained protected against external threats, strengthening cybersecurity stance.

Customer Quote

"Highway 9's private mobile network has transformed our connectivity challenges. The seamless indoor-outdoor coverage, ease of deployment, and system reliability have empowered our teams and automation systems to operate efficiently without interruption. Their virtual mobile cloud solution aligns perfectly with our goals of rapid time to value and low cost of ownership. We now have a scalable, future-ready network foundation to support our continued growth."

— IT Director, Electrical Equipment Manufacturer

Conclusion

The successful deployment of a private mobile network has not only addressed prior connectivity and reliability challenges but also delivered rapid time to value through its streamlined, low-touch implementation. With minimal disruption and no need for extensive infrastructure changes, the solution was quickly rolled out across key sites. This secure, high-performance, and scalable network now empowers them to fully capitalize on its automation and IoT initiatives—unlocking greater operational efficiency, reducing deployment overhead, and setting a strong foundation for future innovation and growth.

About Highway 9 Networks

Highway 9 Networks delivers private mobile network implementations for enterprises across manufacturing and logistics industries. Mobile Cloud architecture combines high-performance wireless networking with simplified deployment and management to help businesses meet evolving connectivity demands.

Get started today

Unlock operational efficiency and seamless connectivity across your industrial facilities. Contact Highway 9 Networks to learn how private mobile networks can revolutionize your operations.

Get a Demo

Contact Us: info@highway9.com