



INSIGHTS | TECH BRIEF

Optimize Warehouse Efficiency: Advanced Private Network Solutions

Today's warehousing environment requires reliable and secure network connectivity to ensure operational efficiency and customer expectations are each satisfied. Whether managing inventory, utilizing IoT devices, or coordinating logistics, warehousing facilities face a unique set of challenges that demand robust network solutions. WEI, in collaboration with longtime partner Ericsson, offers tailored private network solutions, designed to provide high-performing and secure wireless coverage.

As an Elite Partner with Ericsson, WEI brings years of expertise in architecting, managing, and customizing private networks, especially within large, complicated environments like warehouses. Our specialized knowledge within Ericsson Enterprise Wireless Solutions allows us to address the unique networking challenges faced by warehouse operations—ensuring secure, uninterrupted coverage across vast areas while reducing costs and improving overall performance.

The Importance of Private Networks in Warehousing

Warehousing facilities often cover large geographic areas with complex layouts, requiring constant connectivity for mobile devices, automated guided vehicles (AGVs), and other business-critical systems. Traditional Wi-Fi networks struggle to meet the demands of modern warehouses due to limitations in range, reliability, and security. Three key challenges addressed by private networks include:

- 1. Coverage and Performance:** Warehousing environments are often characterized by dynamic layouts, moving equipment, and mobile workers. Maintaining uninterrupted connectivity with Wi-Fi is difficult due to limited range, client stickiness, and handoff issues between access points. Private LTE/5G networks, in contrast, provide stable, broad coverage with fewer access points, ensuring seamless connectivity for moving devices and personnel without signal drops or interruptions.
- 2. Cost Efficiency:** Deploying and maintaining Wi-Fi in a large warehouse can be cost-prohibitive. The extensive infrastructure required—multiple access points and fiber installations—leads to high setup and maintenance costs. A private network offers an economical alternative by reducing the number of access points required. It can also operate on shared spectrum, such as CBRS, further lowering operating costs while providing better control over bandwidth and traffic.

\$13M

reduction in annual labor payroll costs **since the inception of automated processes enabled by private cellular networks (based on 2023 national salary average).**¹





- 3. Network Scalability:** As warehouse operations grow and technologies like automation, IoT, and AI are implemented, a scalable network becomes crucial. Private networks provide flexibility for adding new devices and use cases without requiring significant reconfiguration or additional infrastructure investment. For example, new applications, such as real-time AI monitoring and advanced robotics, can be easily integrated into the existing private network.

Four Security Benefits of Private LTE vs. Public LTE in Warehouse Environments

When it comes to managing data and device security in warehouse operations, private LTE networks offer significant advantages over public LTE. Warehouses, by their nature, handle sensitive operational data and often integrate IoT devices, which makes security a top priority. Here are four key security benefits of private LTE:

- 1. Enhanced Control Over Network Access:** In a private LTE network, access control is much stricter and managed directly by the warehouse IT team. The network operator has full oversight of which devices, users, and applications can connect to the network. Unlike public LTE, where devices connect based on SIM cards provisioned by third-party carriers, a private LTE network uses SIM-based authentication and gives administrators granular control over who can access specific parts of the network. This significantly reduces the chances of unauthorized devices connecting to sensitive areas of the network.
- 2. Reduced Exposure to External Threats:** Since private LTE networks operate on a closed system, the network is isolated from the public internet. This isolation drastically reduces the attack surface and minimizes the risk of common internet-based threats such as Distributed Denial of Service (DDoS) attacks or man-in-the-middle interceptions. Public LTE networks, on the other hand, are open systems where a warehouse's data shares bandwidth with countless other users, increasing exposure to cyberattacks and network-based vulnerabilities.
- 3. Data Privacy and Encryption:** In private LTE, all traffic is typically managed within a local data center or on-premises infrastructure. This means that critical operational data remains within the warehouse's internal systems and does not traverse public networks, which could expose it to eavesdropping. Additionally, private LTE networks employ end-to-end encryption to ensure that sensitive data (such as inventory details, order management, and device communications) remains secure and protected from unauthorized access.
- 4. Customizable Security Protocols:** Private LTE offers the ability to tailor security measures to the specific needs of the warehouse. This includes setting custom encryption protocols, monitoring traffic patterns for anomalies, and integrating with advanced cybersecurity solutions like Zero Trust Architecture (ZTA). In public LTE, these options are far more limited as security protocols are dictated by the carrier, leaving businesses with less control over how their network traffic is handled.



Key Considerations When Expanding a Warehouse Private Network

As warehouse operations scale, expanding the underlying private network is essential for ensuring continued performance and reliability. Below are six key considerations that IT teams should keep in mind to effectively expand a private LTE or 5G network in a growing warehouse environment:

- 1. Network Scalability:** As the number of devices, applications, and processes within the warehouse grows, so must the capacity of the network. IT teams must ensure that additional Cellular Access Points (CAPs) and spectrum resources can be deployed without disrupting current operations. Planning for growth also involves implementing dynamic load balancing features, which automatically distribute network traffic across different segments, preventing congestion as more devices and applications come online.
- 2. Bandwidth Allocation:** As new technologies such as robotics, AI-driven automation, and high-definition video monitoring are integrated into warehouse operations, bandwidth requirements will increase. Private LTE allows IT teams to prioritize bandwidth-intensive applications like real-time analytics and automated guided vehicles (AGVs), ensuring that critical systems receive the bandwidth they need to function efficiently. Expanding the network requires careful planning to allocate bandwidth appropriately.
- 3. Spectrum Management:** One of the unique advantages of private LTE is the ability to operate on licensed, unlicensed, or shared spectrum. As the warehouse expands, it may be necessary to acquire additional spectrum to support higher capacity and broader coverage. In the U.S., for example, the CBRS (Citizens Broadband Radio Service) spectrum offers a flexible option for private LTE networks. IT teams must consider the availability of additional spectrum to ensure that expanded network requirements can be met without causing interference or reducing performance.
- 4. Device and Endpoint Integration:** As new devices, such as IoT sensors, security cameras, and mobile worker devices, are introduced into the warehouse, they need to be seamlessly integrated into the existing private network. IT teams should ensure that the network architecture supports a variety of devices, including those with varying data and security needs. Each device must be provisioned with private SIMs and authenticated to ensure secure access to the network. Expanding the private LTE network involves scaling device management and maintaining a centralized platform for managing Quality of Service (QoS) across all endpoints.
- 5. NetCloud™ Private Networks:** With a growing number of connected devices and expanding facilities, centralized network management becomes even more critical. IT teams must ensure they have the tools to monitor and manage network traffic, devices, and security policies from a single interface. This includes real-time monitoring for performance bottlenecks, identifying unauthorized access attempts, and managing user authentication.
- 6. Redundancy and Failover:** An expanding warehouse network must have built-in redundancy to ensure continuous operations, even during failures or disruptions. Adding redundant network elements, such as additional CAPs and Mobility Gateways, ensures that the network remains resilient as operations scale. Additionally, a failover strategy should be implemented to ensure that if one part of the network goes down, another part can immediately take over without interrupting operations.



WEI's Expertise in Warehouse Private Networks

At WEI, we excel at providing end-to-end private network solutions tailored to the specific needs of warehouses. Our experience in this vertical includes:

- **Customized network architecture:** We design private LTE and 5G networks optimized for large warehouse environments, ensuring uninterrupted coverage and peak performance.
- **Comprehensive management and support:** With our 24x365 support, we ensure your private network is always operational, while our engineers monitor and maintain the infrastructure.
- **Integration with existing IT environments:** Our experts work with your current systems and processes to ensure seamless integration of private networks, minimizing downtime and disruption.
- **Security-first approach:** Leveraging the latest in encryption and access management, we ensure that your warehouse operations remain secure from external threats.

Talk to WEI today

To explore how WEI can help your warehousing facility improve network performance, security, and operational efficiency through private networks, contact our private network experts today. Our team is ready to consult with you on building a network that meets your unique needs, using the latest in Ericsson's private network solutions.

Sources:

1. Ericsson Research and Report Paper - Private Cellular Networks: Enterprise ROI in an Evolving Marketplace - 2023

About WEI

WEI is an innovative, full service, customer centric IT solutions provider.

Why WEI? Because we care. We go further.

WEI is an expert in business technology improvement, helping clients optimize their technology environments and work efficiently. WEI works with clients to understand goals, integrate strategy with technology solutions, and leverage their current IT environment into one company-wide model to increase utilization and efficiencies around their unique business processes.