XCOM RAN™ by Globalstar

# The Rise of Micro-Fulfillment Centers

## Why Automation Demands Private 5G

### The Micro-Fulfillment Boom

Retail and logistics are transforming rapidly under the weight of e-commerce demands and consumer expectations for same-day or even same-hour delivery. To keep up, companies are shifting from large, centralized distribution centers toward micro-fulfillment centers (MFCs) located closer to urban populations. These smaller, highly automated facilities reduce delivery costs and time while improving customer satisfaction.

### The Role of Automation in MFC Operations

**MFCs thrive on automation and efficiency, powered by a dense layer of IoT devices:**

- Automated mobile robots (AMRs) and automated guided vehicles (AGVs) moving goods with precision
- AI-powered vision systems for real-time inventory checks, quality assurance, and order accuracy
- Connected conveyors, sensors, and sortation systems that manage product flow
- Environmental and energy monitoring devices that optimize storage conditions and reduce costs

Together, these systems create a fast, highly orchestrated ecosystem where downtime or connectivity failures can disrupt entire operations.

## Why Wi-Fi and Public Cellular Fall Short

**Traditional wireless options are hitting their limits inside MFC environments:**

- Wi-Fi struggles with interference, limited coverage in dense layouts and handoff failures for mobile robotics
- Public cellular provides broader coverage but introduces spectrum congestion, lack of in-building signal penetration, unpredictable performance, and higher latency that jeopardize mission-critical applications

In short, neither can reliably scale to the dense, mobile, and low-latency requirements of modern MFCs.

## The Case for Private 5G Networks

**Private 5G is emerging as the vital infrastructure for next-generation fulfillment operations:**

- Dedicated, interference-free spectrum ensures predictable performance
- Low-latency connectivity enables real-time robot coordination and safety-critical processes
- Seamless mobility supports fast-moving devices without drops or delays
- Strong security and data sovereignty protect sensitive operational and customer data
- Scalable bandwidth grows with facility automation and evolving IoT needs

## Network Optimization with XCOM RAN by Globalstar

Even private 5G isn't without challenges in high-density industrial settings. That's where optimized solutions like XCOM RAN™ come in. XCOM RAN dynamically manages interference, RF noise, and device coordination, while increasing data throughput and ensuring consistent performance in complex environments like warehouses and MFCs.