# BELDEN

# Boosting Labor Productivity in Your Warehouse

Belden's Labor Productivity Solution for material handlers addresses the most critical challenge on the path to automation – the slow, error-prone human tasks that create inefficiencies and waste.
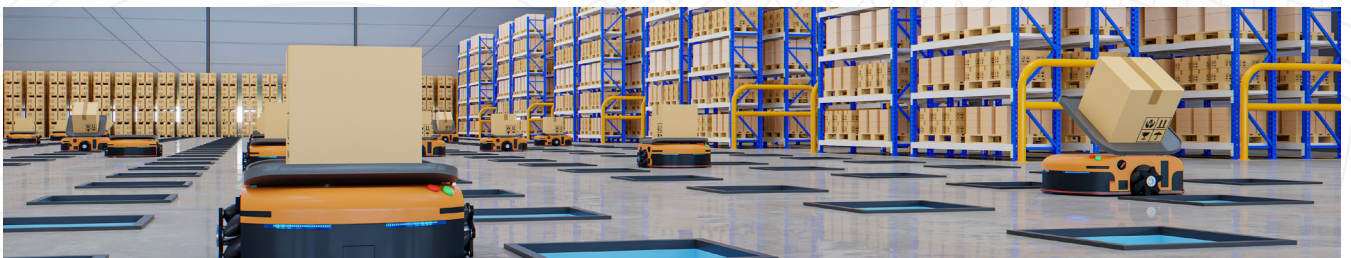
## Unique Warehousing Complexity Hinder the Full Automation Journey

The operational complexity of a warehouse results in a unique set of inefficiencies across manual, semi-automated, and automated equipment. Manual scanning and slow transport times lead to inventory receiving, storage, and tracking discrepancies. Picking location and scanning errors, as well as packing mistakes and complex loading procedures increase shipping inefficiencies. All these issues can be directly traced to manual human interaction with systems and assets.

## Lack of Labor Automation Creates Waste

The reliance on manual tasks within a material handling environment creates significant waste across several dimensions. The result is product waste from inaccurate picking and packing; time waste from slow inventory counting; labor waste from inefficient transportation and labor-intensive security; as well as wasted overhead from poor storage and energy usage.

## Automation Knowledge Gaps Brings Uncertainty and Risk

While Industry 4.0 is necessary to eliminate labor inefficiencies, uncertainty around the required technologies and potential capital expenditures slows the pace of achieving that goal. Potential for unknown unknowns increases the hesitancy in adopting automation, and anticipated problems in data aggregation, high-bandwidth networking, and cyber-security derail project momentum.

# Create a Reliable, Future-Proof Material Handling Network

## Produce Data

Machine control systems can collect a host of real-time data that gives tremendous insights into your operations and can be easily augmented with additional sensors to fill in gaps.

## Aggregate and Analyze

Feed connected systems through your OT network's aggregation layer to establish zones and conduits for data flow - and integrate converged IT/OT cyber-security strategies to provide resilience.

## Monitor and Optimize

Use live performance dashboards and conduct root cause analyses to inform management decisions and activities.

## What a Labor-Efficient Warehouse Looks Like

- Improved scanning and sensor technology to automate inventory/asset tracking, counting, and management

- Consolidated and optimized warehouse storage solutions

- Automated tools and equipment to assist workers on the warehouse floor and reduce reliance on labor

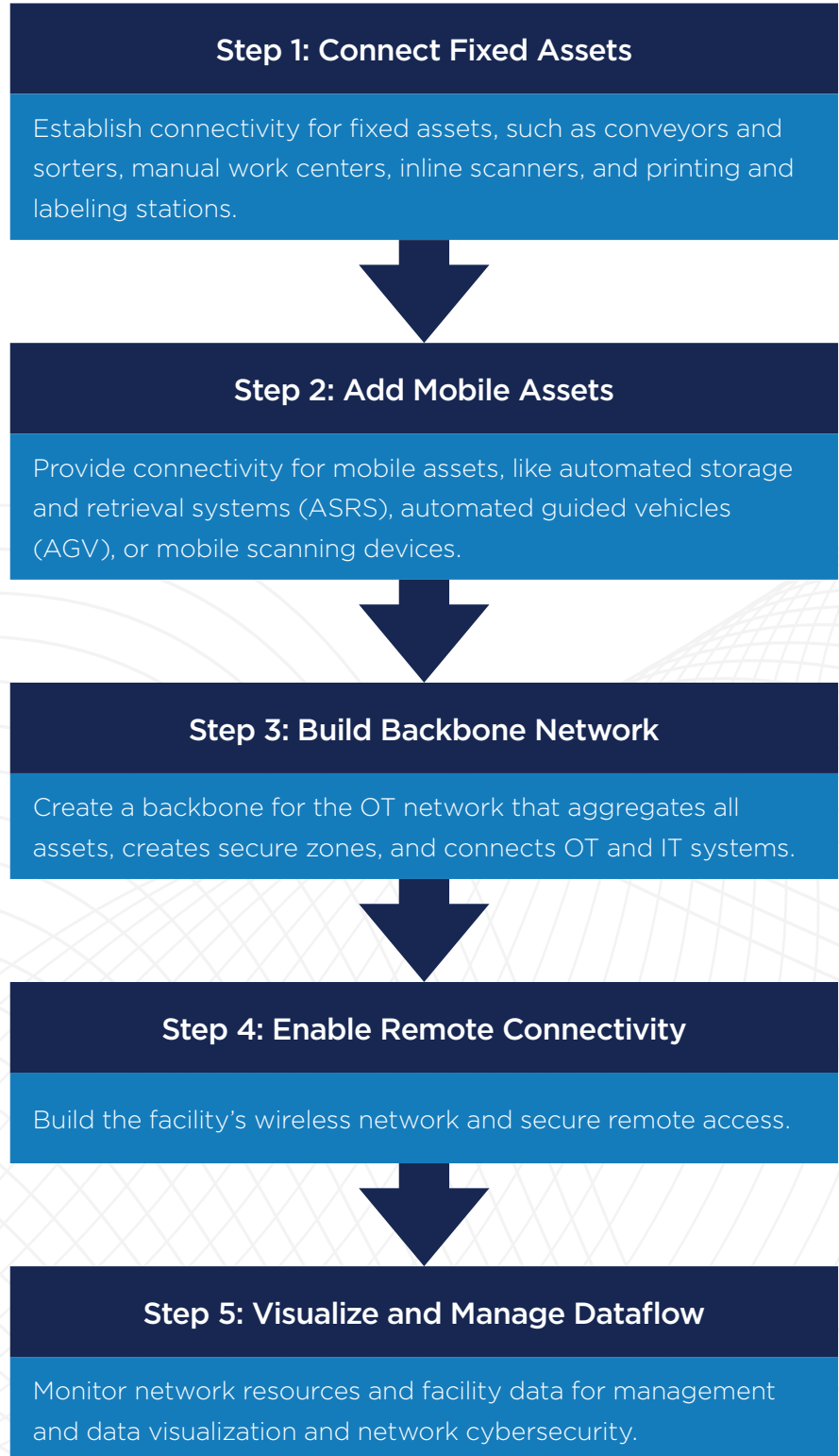- Comprehensive warehouse facility monitoring by security equipment

## Belden Addresses Material Handling Challenges

Labor typically accounts for 55% of material handling factory costs and Belden can unlock:
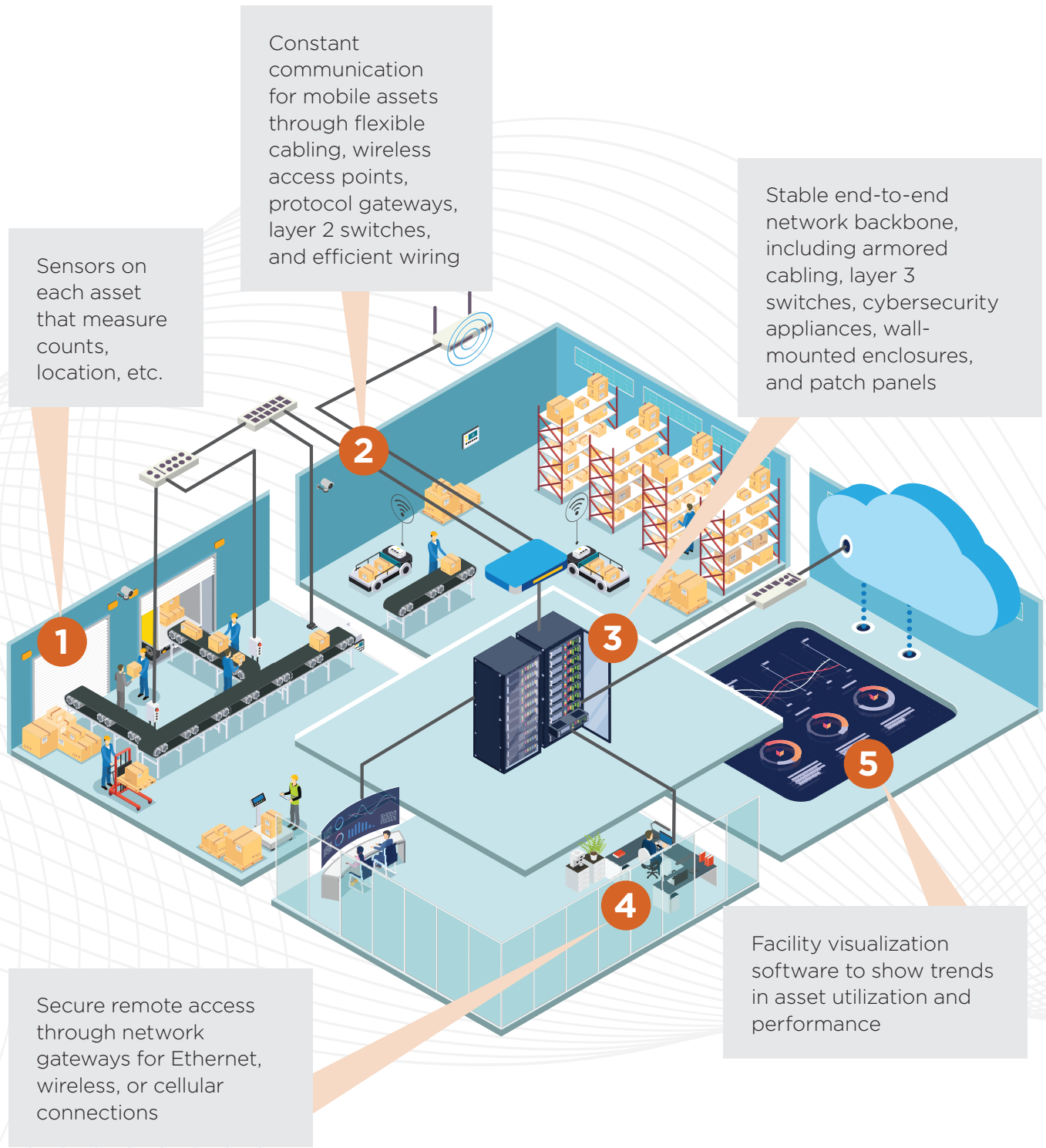
- 35% improvement in operational costs
- 10-25% improvement in order fulfillment

## The Pathway to an Automated Warehouse

For maximum efficiency and value, Belden has mapped out five major design steps that are crucial to successfully connect warehouse assets and workers:

### Step 1: Connect Fixed Assets

Establish connectivity for fixed assets, such as conveyors and sorters, manual work centers, inline scanners, and printing and labeling stations.

### Step 2: Add Mobile Assets

Provide connectivity for mobile assets, like automated storage and retrieval systems (ASRS), automated guided vehicles (AGV), or mobile scanning devices.

### Step 3: Build Backbone Network

Create a backbone for the OT network that aggregates all assets, creates secure zones, and connects OT and IT systems.

### Step 4: Enable Remote Connectivity

Build the facility's wireless network and secure remote access.

### Step 5: Visualize and Manage Dataflow

Monitor network resources and facility data for management and data visualization and network cybersecurity.

# Components of the Solution

Constant communication for mobile assets through flexible cabling, wireless access points, protocol gateways, layer 2 switches, and efficient wiring

Sensors on each asset that measure counts, location, etc.

Stable end-to-end network backbone, including armored cabling, layer 3 switches, cybersecurity appliances, wall-mounted enclosures, and patch panels

Secure remote access through network gateways for Ethernet, wireless, or cellular connections

Facility visualization software to show trends in asset utilization and performance

# How Belden Can Help

As a comprehensive networking solution provider, Belden enables material handlers to access the solutions, services and tools needed to take major steps in their automation journey.

## Our Experts at Your Side

Selecting the right solution for your business needs is not an easy task. These Belden experts will be your trusted advisors along the way.

### Solution Architect

- Deep knowledge of network architectures
- Design solutions and networks of the future

### Digital Automation Consultant

- Lead workflow and data assessment
- Identify opportunities for digital transformation
- Calculate projected ROI

### Solution Consultant

- Deep technical knowledge of applications and verticals
- Conduct industrial network audits

### Service Engineer

- Deep knowledge of products and technologies
- Test and commission networks
- Deliver pre- and post-sale technical support

# End-to-End Solution Portfolio

Belden offers the most comprehensive networking portfolio for your warehouse automation solution. This includes:

## Cable

- Fiber
- Copper

## Connectivity

- Field Terminators
- Connectivity Tools
- Pre-terminated Cord-Set
- Active & Passive I/O Blocks
- Racks, Enclosures, & Patch Panels

## Networking

- Wireless
- Gateways
- Switches
- Routers

## Software & Services

- Network Management Software
- Firewalls
- Software Configuration Management & Virtual Machine
- Network Access Control

## Worry-Free and Future-Ready

The need to digitize is certain, but the road there is full of uncertainty. With Belden's experts guiding you and drawing from our extensive solutions portfolio, we can give you the confidence and peace of mind to bring your automation plans to life. Get in touch with Belden's experts at **belden.com/material-handling** to find out how we can custom tailor your roadmap.

## About Belden

Belden Inc., a global leader in high quality, end-to-end signal transmission solutions, delivers a comprehensive product portfolio designed to meet the mission-critical network infrastructure needs of industrial, enterprise and broadcast markets. With innovative solutions targeted at reliable and secure transmission of rapidly growing amounts of data, audio and video needed for today's applications, Belden is at the center of the global transformation to a connected world. Founded in 1902, the company is headquartered in St. Louis, USA, and has manufacturing capabilities in North and South America, Europe and Asia.

## Learn More

Visit belden.com/material-handling for additional information and to contact our Material Handling solution experts.