



Distribution logistics

Five ways to enhance delivery operations





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Navigating a dynamic sector

Because the ever-evolving landscape of distribution demands more than just keeping pace with change, this eBook explores five strategies to transform your delivery operations to make them more agile, efficient, and customer-focused.

The challenges and opportunities

Increased competition, evolving legislation, labor shortages, rising costs, and supply chain disruptions are reshaping the sector. Customers now expect the same convenience they experience in consumer transactions, including fast shipping, real-time tracking, and easy returns. While you can't influence all external factors, adopting new technologies can empower you to control what matters most—building operations that are efficient, compliant, and customer-centric.

The value of visibility

Visibility is the heartbeat of efficient operations. When you can see where every item is, it is much easier to coordinate accurate, speedy, and on-time, in-full deliveries.

The best way to gain visibility is to give each item a digital voice. Beyond barcode labels, radio frequency identification (RFID), smart sensors, and Bluetooth® beacons make it easier to capture data from nearly any asset—such as the consignments you are moving, your vehicles, warehouse racks, and even people—to build a detailed and close-to-real-time picture of what is happening. The mobile devices carried by your team are advancing too. They help drivers deliver on-time and in-full, monitor their hours, seamlessly gather audit trails, and share real-time data via high-speed wireless networks. Below, we look at five areas to drive performance gains, from your sites to your teams, delivery services, and beyond.



1. Enhance site efficiency

Embed automation into operations

Automation accelerates, eases, and optimizes workflows in warehouses and distribution centers. Options to think about include:

RFID at the dock door

By using fixed RFID readers, you can auto-register pallets and roll cages (both incoming and outgoing) into your warehouse and transport management systems. This not only saves time but also increases read accuracy. Alerts for missing items help prevent costly truck re-rolls. Tracking reusable transport items like roll cages with RFID provides visibility within your site, reducing losses significantly.

Scanning and machine vision

For high item throughput environments, manual scanning can be replaced by overhead fixed industrial scanners. Machine vision cameras on workbenches ensure tasks, like packing goods to retailer specifications, are completed accurately and efficiently, freeing staff for higher-value tasks.

Augmenting your teams

Intuitive wearable devices, such as wrist-mounted computers, allow people to keep their hands free to pick, put away, and pack with speed and ease. You can also direct them using voice commands through headphones connected to mobile devices, with the smart orchestration of tasks helping people do more in less time. And with Bluetooth™ location beacons you can guide them to racks to reduce walk times. Additionally, heads-up displays enhance efficiency by projecting workflow instructions directly into the user's immediate vision, minimizing distraction and streamlining operations.



Tracking and tracing

RFID transforms data capture speed and accuracy.

97%

of dock door scanning can be automated¹

98%

track and trace accuracy²

Team augmentation

Modular technologies, including wearables and voice picking, help teams accelerate through tasks.

24%

increase in picking speed³

99%

picking accuracy⁴

2. Empower drivers

With insight and powerful applications

The mobile devices and apps used by your drivers help them work more efficiently. And because life on the road is tough, we test ours to destruction, to ensure they can be docked and undocked thousands of times, to cope with knocks and drops, weather all weathers, and work all day, every day. They are robust, with touchscreens which are usable with gloves on, and visible in direct sunlight, and batteries which last the full shift and are swappable. Built to run any application, the tablets and mobile computers are both powerful electronic devices and intuitive productivity partners. With them, you can:

- **Enhance safety:** Easily connected to vehicles' data ports, devices can collect and transmit telemetry data, ensuring compliance with driver hour regulations. Where you have solutions in place to check driver alertness, these can be linked to devices, too, to warn drivers if they are becoming tired. The high-definition screens can be used for route guidance and to view camera feeds enhancing situational awareness and safety.
- **Streamline workflows:** Digitize driver tasks to enhance speed and efficiency, from scanning items and viewing manifests to obtaining proof-of-delivery, processing returns, and managing timesheets. Drivers can also complete pre-journey safety checklists, photograph items to show that they are secured (e.g., with load straps), and view a range of task guidance. With voice calling and instant messaging, drivers can seamlessly communicate with dispatch and customers, addressing issues promptly, to minimize delays. Equipped with real-time data and powerful apps at hand, drivers have the insight to make informed decisions.
- **Accelerate innovation:** We collaborate with partners, like Google™ Gemini and Qualcomm™, to ensure our devices can support fast-advancing AI applications. Soon, drivers will be able to interact with large language models, which learn from user interactions, significantly reducing the time to achieve proficiency. For example, drivers can ask for the best route, or verify task requirements. On-device augmented reality (AR) solutions are also becoming available, such as overlays of street-level graphics displayed on devices to pinpoint pick-up or drop-off addresses.



Invest for superior total cost of ownership

While consumer devices may seem cost-effective at first, they are not built for the rigors of constant use or life on the road. For example, they support fewer charging cycles than enterprise devices and fail at three times the rate. As a result they incur significantly higher annual operating costs—\$4,887.50 compared to \$2,320.64*. Indeed, buying purpose-built technology ensures durability, reliability and a better total cost of ownership.

*All stats sourced from VDC, 2022.



3. Improve service and reduce costs

Share real-time status

There's nothing worse than a driver being delayed without the customer's knowledge. They may lose their delivery slot and receive fines for breaching turnaround times. The good news is the stream of data collected from your drivers' mobile devices provides real-time insight into the location of vehicles. With this, you can:

- **Coordinate offloading:** Send alerts to receiving teams to prepare for truck arrivals. You can include consignment details and handling instructions to expedite offloading. Over time, the collection of vehicle data can be used to pinpoint customer locations where repeated delays occur so you can then address these margin-eroding issues.
- **Dynamically amend schedules:** With a clear view of what's happening across the network, you can amend or swap planned stops if you can see that a delay may impact customers further down the line. AI-driven transport management systems can suggest new schedules and share those with drivers once you have approved them.

4. Seamlessly manage compliance and audit

Delivery through data

With new legislation such as the U.S. Food Safety Modernization Act and Europe's Digital Product Passport (DPP), staying compliant can be challenging. These regulations require a range of data to be captured during a product's lifecycle, including across the supply chain (e.g., its origin and journey details). While staying ahead of these changes can feel onerous, technology removes much of the worry:

- **Monitor temperatures and location:** Low-cost, easy-to-use, and compact electronic temperature sensors and data bridges can be attached to items like pallets, cages, or the inside of your trucks. They stream data to drivers' devices, and to the cloud, including last-known locations and temperature status. You can be alerted to temperature excursions so you can take immediate action to avoid any spoilage. The insights are streamed at intervals you define and all records are retained. You can produce an audit trail at the push of a button and securely share data with your customers. In retail, for example, the data can be used with perishable food items to inform use-by and sell-by dates.
- **Easily capture shipment data:** Drivers' devices can constantly capture data, including location and journey times, to meet legislation requirements. You can augment this by drivers scanning items across their journey. The data can be securely shared across the cloud and made instantly available, helping to build the detailed data picture required by DPPs.





5. Optimize loads

Dynamic planning for better margin

Although less-than-truckload (LTL) shipping poses challenges, new strategies can maximize efficiency and profitability for each trip.

- **A new dimension in shipping:** Smart spatial computing applications enable optimal truck loading by modeling the physical space of your trucks and analyzing the manifest for each delivery. Aside from the obvious financial benefits, the solutions improve carbon footprint by allowing fewer trucks to carry more cargo.
- **Sharing shipping:** Using AI, advanced processors, cloud computing, and enhanced wireless networks makes it easier to collect, share, and maximize operational efficiency. A major industry challenge is trucks returning empty between locations. By sharing your truck's locations and load status in advance, you can offer this space to third parties. Algorithms can then suggest routes which efficiently combine drop-offs and pick-ups, minimizing unnecessary detours.

The benefits of modular technology

Technology has more potential than at any other time to help you build agile distribution operations that are more cost-effective, customer-centric, and successful in achieving on-time and in-full deliveries. However, the fast pace of change often raises concerns about technology obsolescence.

We understand these concerns. That's why we design our solutions to be modular, to work with your existing technology, and to last for years. For example, we have customers using our mobile devices for a decade or more. These solutions are developed to support a lengthy lifecycle and seamlessly accommodate new applications, including AI apps.

Working together: why Zebra?

For over 50 years we've intelligently connected people, assets, and data to help businesses make smarter and more informed decisions. Our people create powerful partnerships built on trust, to give you the confidence you need to get the big calls round technology right. To further reduce risk, we have developed a true enterprise-class mobile platform, comprising development tools, ready-to-go applications, and comprehensive service and support to help you:

- **Accelerate deployment:** Easily roll out mobile devices and develop custom apps and solutions for them.
- **Secure your devices:** Benefit from robust security and extend operating system (OS) patches and updates over multiple years.
- **Optimize performance:** Avoid performance degradation, with devices which evolve and can be augmented as they age (e.g., with battery replacement). We also provide real-time device analysis tools which provide proactive recommendations to help your teams use their devices in the optimum way to get the most value from them.
- **De-risk investments:** We have teams based across the globe, including professional and managed service experts. They help you create innovative solutions and manage them, in their entirety, to meet KPIs, at a fixed fee, over an agreed period.
- **Retire responsibly:** Our circular economy initiatives have repurposed or recycled over one million devices. And, when it comes to the end of life of your technology, we offer a range of services that will support your sustainability goals.

We never rest

The average cost of a cyber breach in the U.S. was \$4.45 million in 2023,* while U.K. businesses suffered 181,000 monthly online attacks in the first quarter of 2024 alone**. Because cyber criminals never rest, neither do we. With our LifeGuard for Android™ solution we provide extended security patches and updates way beyond the standard three years provided by Android. Extensive security protection is built into our devices, and you have a range of options to customize security to your needs. With all device vendors, we urge you to assess their security packages, their commitment to regular penetration testing, and to check, too, if your device data is shared with jurisdictions outside of your operating region.

*IBM
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