Improving Cross-Docking Efficiency in Four Key Areas

Retailers can extend their cross-docking capabilities by integrating advanced shipment notifications, barcodes, warehouse management systems and material-handling systems in a more holistic way.

Executive Summary

Cross-docking — the process of moving material from the receiving dock to the shipping dock and bypassing intermediate storage — is a simple warehousing practice. Yet it is core to a highly functioning supply chain — a critical component for retailers pursuing a distribution strategy that pivots on lean concepts and fuels just in time (JIT) inventory control. It requires a tight partnership among supply chain members. The advantages of cross-docking have been well documented, and it’s safe to say that it has been embraced by retailers of all kinds. By moving goods through distribution centers (DCs) with minimal storage, companies that effectively utilize cross-docking have been able to increase inventory turns, improve throughput and lower operational costs.

The 2011 Cross-Docking Trends Report by Saddle Creek Logistics Services indicates that the use of cross-docking has grown significantly over the years — from 16.5% of the 219 retailers surveyed in 2008 to 68.5% in 2011. Still, challenges persist for retailers attempting to implement a perfect cross-docking process amid tough economic times. These issues — labor costs, accuracy and throughput — pertain to:

• Supplier reliability.
• Achieving ROI by minimizing touches.

This paper uncovers inefficiencies in cross-docking, and explores opportunities for increasing effectiveness through actionable process improvements and technology-based solutions. We will also discuss how to properly position cross-docking strategies in the supply chain, and detail the areas where retailers need to sharpen their focus, including:

• Advanced shipment notifications (ASNs).
• Logistical unit barcodes.
• The warehouse management system (WMS), which must be integrated into the operations of the material handling system (MHS).

Cross-Docking: Key Focus Areas

To improve cross-docking, retailers and suppliers must build or extend capabilities in the following four areas:

• **ASN (Advanced system notification)**: ASN is among the definitive “best practices” of an integrated supply chain and a cornerstone of automated retail warehouse management processes. The ASN tells the retailer when an
order will be shipped, what items are being shipped and how much of each item is being shipped, along with carrier details. Notably, this valuable information is sent electronically by the supplier via electronic data interchange (EDI), e-mail or other channels in advance of the retailer receiving the goods. This allows the retailer to automate the receiving process in the distribution center according to the ASNs sent by the supplier.

We believe that retail organizations – even industry leaders – face hindrances in implementing a clean and accurate ASN business process. This can have major financial and operational impacts on both the retailer and the supplier. Among our recommendations and observations:

- **ASN accuracy is critical.** In a blind receiving environment, a significant amount of concealed differences exists between the physical merchandise received and the ASN. This has an enormous effect on inventory, invoices, the accuracy of reorders, sales and, of course, customer service. It impacts both the retailer and the supplier.

- **Meeting the ASN accuracy targets of 100% is important, but has been a daunting task for suppliers.** Given that retailers recognize the importance of ASNs, we recommend that they devote resources and efforts to pursuing the following three-step process for improving suppliers’ ASN performance:
  - **Collaborate with suppliers:** For an ASN business process to succeed, it’s essential that supply chain partners develop close relationships and work as a team. The inability to establish a good working relationship can lead to failure in an ASN endeavor. Sharing warehousing and distribution processes, clear communication and confidence in quality are a few of the characteristics that shape an effective ASN process. Retailers should meet with their suppliers and make sure they understand the importance of timely and accurate ASN information in relation to their future business relationship.
  - **Define ASN errors:** Retailers need to improve and clearly define “ASN warnings and errors.” It is important for companies to identify the cause of data errors and eradicate the issue. If a retailer can process the ASN but wants to alert the supplier about the ASN transaction, the retailer’s systems should send a “warning” message back to the supplier’s system. An example of a warning would be if a supplier includes an item in the ASN that was not on the P.O. If there is an error (i.e., an inability to find the item or the P.O. number sent in the ASN within the retailer’s systems), then the ASN should be rejected. Suppliers’ systems should have the capability to send replacement ASNs and retailers’ systems should have the capability to re-process the ASNs.
  - **Remedial action to close the loop:** We advise retailers to develop a formal audit process to incorporate the following three requirements as they apply to the perfect ASN: timely, complete, and error-free. More specifically, to assist suppliers in managing their ASN compliance, retailers should provide a timely ASN compliance report to suppliers. This should include an overall view of suppliers’ ASN performance (missing ASNs, quantity discrepancy, ill-timed ASNs, ASN errors, for example). Using this reporting solution, suppliers can ensure ASN transactional integrity and prevent delays in moving product through retailers’ distribution network. Retailers should implement the right processes (chargebacks, inclusion in supplier scorecards, direct discussions, supplier training, etc.) to create a closed-loop system. These actions can have a big impact on ASN accuracy over time.

- **Maximize supplier participation:** A study by Gibson and Williams, ASNs in Retail Benchmark Report 2011, reveals that 78% of 100 retail respondents receive ASNs but only 30% of retailers receive ASNs from 100% of suppliers. Retailers can make the most of cross-docking efficiencies by enabling 100% of their suppliers to initiate timely, complete and accurate ASNs.

More visibility into inbound shipments offers retailers unparalleled benefits, including the ability to cross-dock merchandise, reduce distribution center costs and improve order cycle times. The benefits to the supplier are also significant: faster and more timely flow of goods through the supply chain, and more cognizant 20-20 insights
accurate invoices, which lead to more accurate payments.

Figure 1 highlights the adoption of ASN, barcodes and automated sortation systems by suppliers and retailers.³

- Barcodes: There are countless reasons to use barcoded labels on cartons, but the most compelling is for moving products through the process of shipping and receiving in the retailer’s distribution center. Across the supply chain, trading partners are leveraging the power of barcoded labels by using GS1 standards as the basis of their business processes. Using an integrated GS1-128 barcoded label and ASNs, along with a proven warehouse management methodology, companies can optimize supply chain performance. Simply stated, the GS1-128 number links every logistical unit back to the purchase order for the items in the logistical unit. To implement the ASN at the carton level, the GS1-128 barcode label should be printed and applied to each carton, and the information communicated in the ASN. The ASNs, along with the barcoded cartons in a GS1-128 standard, can drive important supply-chain and logistics benefits, including accurate and timely receiving in the retailer’s distribution centers, increased productivity and accuracy, and lower labor costs.⁴

We believe the following strategic enablers can help suppliers navigate the challenge of increasing labeling and automation complexity.

- Adhere to barcode standards: Global standards allow for tighter systems integration; improve processes by supporting automation; help reduce costs; eliminate errors; attenuate the risk of system incompatibility; protect technology investments; enable the optimization of supply chain management practices, and eliminate supply chain barriers.

- Realize the benefit to trading partners: It is a common misconception among suppliers that the addition of the ASN and GS1-128 label will only be of benefit to trading partners, at an additional cost to the supplier’s organization. We believe that retailers and suppliers should implement the ASN and GS1-128 labels to attain the following benefits for suppliers:
  » Track and validate shipping processes.
  » Help assure timely delivery of shipments.
  » Streamline the payment process, which benefits the retailer by improving receiving and shipping processes — reducing audits and shortening order cycle times.

- Warehouse Management System (WMS): ASNs should be driven by a concrete business process inside the distribution center. Retailers should not embark on a full-blown ASN initiative until they have equipped their distribution centers to automate receiving and information-reconciling processes. There is little value in having suppliers implement the ASN when the information cannot be utilized at the distribution center and downstream supply chain.

It is critical to speed the flow of goods through the distribution center. Given that receiving is one of the most labor-intensive, low-value,
processes in the distribution center, it makes sense to take any opportunity to make it as efficient as possible.

According to a recent study conducted by the Grocery Manufacturers of America (GMA), ASNs can expedite the delivery process and slash receiving time by as much as 60%. This can represent a savings of 65,000 receiving hours per year for a 250-store, large-format chain if just one-quarter of its deliveries are preceded by ASNs.5 Global logistic players can reduce the time and cost of inbound processing by assisting their suppliers in sending accurate ASNs and goods with barcodes. Radio frequency (RF)-based and automated ASN receiving are more accurate and efficient than manual cross-docking, and should be widely practiced by retailers.

Figure 2 highlights the key benefits of accurate and timely ASNs and barcoded goods.

Simply receiving barcoded goods and ASN information is only half the battle. We believe that retailers would be wise to adopt the following strategies to build an enhanced cross-docking process to drive more efficiency in warehousing:

- **ASN accuracy and quality:** ASN accuracy requires a focused effort. Retailers must dig into the data to understand the source of problems and take appropriate actions to improve accuracy. Retailers’ systems should automatically validate ASNs for accuracy against predefined business rules – enabling errors to be identified and corrected with minimal manual effort before they infest the WMS and delay delivery to customers. The ASNs in the Retail Benchmark Report 2011 points to “widespread agreement regarding accuracy standards.” In fact, the report states that near-perfection is the goal for 60% of the retailers that believe an error rate greater than 1% is unacceptable. An additional 38% indicated that “an error rate greater than 2% is intolerable.” Hence, retailers must regularly audit ASNs and involve suppliers in the initiative to achieve >99% ASN accuracy.

- **Pre-receiving based on the ASN:** Poor carrier scheduling can create insufficient labor allocation, unproductive loading/unloading and avoidable lead times. In the current supply chain environment, the inbound appointment scheduling process is either manual or semi-automated, with appointment schedulers. The WMS, upon receipt of the ASN, should automatically use the information to schedule appointments for carriers to deliver the products, and schedule the labor and equipment needed to unload and process deliveries. By implementing an automated appointment-scheduling system, a retailer’s ROI can be significant – reducing the average payroll cost of US$22,000 for a warehouse associate.7 Automated appointments also lessen the amount of time needed to schedule appointments at the DC. Based on our experience in automating the appointment-scheduling process for retailers, a DC scheduling 200 appointments daily can save an average of 23 hours per week, assuming that on average it takes one minute to create an appointment.

- **Building containers with RF-based cross-dock receiving** can be achieved through barcode scanning. Retailers should develop a receiving process in their distribution center using an ASN with barcode information to plan for goods receipt. Upon arrival of the goods, the retailer can then scan the barcodes on the multi PO/SKU cartons – enabling the system to compare the contents with the ASN to confirm accuracy. Labels should not be printed at distribution centers with the receipt of individual cartons; instead, DCs should build the capability to con-

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**Key Benefits of ASN and Barcodes**

![Figure 2](image-url)

Visibility to appointments
Accurate and faster receiving
Faster order fulfillment
solidate merchandise with receiving, rather than building the containers after receiving, which requires an additional scan of the cartons. The pre-printed generic container labels help in consolidating the cartons received at the DC. The generic label does not contain item, quantity or destination information. Once cartons are added to a generic container during receiving, any movement of that container through the system will move all associated cartons. The consolidation of cartons will eliminate the need to scan a carton again after receiving it to load into an outbound shipment. This will also remove the need to print and apply a barcoded carton label to move the merchandise from receiving dock to shipping dock. Based on our experience in implementing an RF-based cross-dock receiving and container-building process with receiving, the operational cost savings can reach US$2.1 million a year, while the cost of labels can be reduced by US$0.29 million a year — resulting in a total of US$2.39 million in savings annually for a distribution center scheduling 200 appointments daily with 1000 cartons in an appointment.

Conduct regular audits to compare the ASN data to the actual shipment, and compare what was ordered to what was shipped. Quantity overage, shortage and item mismatch are the most common shipment errors. Retailers should find solutions to issues found during the audit to ensure that suppliers’ ASNs are accurate and timely. Effective audit options include targeting problem suppliers, as well as new suppliers, for frequent audits.

Material Handling Systems (MHS): Automated material handling systems are essential to a cross-docking operation. The conveyor system plays a crucial role in getting product in and out of the DC quickly. Distribution centers should integrate the warehouse management system and automated conveyor systems to implement automated receiving in order to improve efficiency and cut costs. As the cross-dock merchandise arrives at the distribution centers, the freight should be directly unloaded to the conveyor. As the cartons are thrown on the conveyors, barcode scanners should have the capability to read their barcoded labels. These contain supplier, P.O., item and destination-specific information for receiving cartons and diverting them to the correct lane for consolidation and shipping. The receiving process in a typical distribution center involves employees scanning the cartons to perform receiving, print and apply a routing label, and scan to load the cartons on the conveyor. We believe that retailers should implement the following strategies to plan and design a fast, flexible, accurate, automated cross-docking process.

Conveyor-based receiving and sorting involves cross-docking sortation systems, which are ideal for zero-inventory DCs. Automated receiving conveyors can significantly reduce operating costs, increase throughput and streamline the entire distribution process. Cartons are thrown on the conveyors; their barcoded labels are read by fixed readers on automated conveyors systems to receive the freight into the distribution center. This new process increases labor productivity by eliminating the time to manually scan cartons. Based on our experience in implementing conveyor-based receiving, the operational cost savings can be US$3.14 million a year for a DC scheduling 200 appointments daily with 1000 cartons in an appointment.

Label-free receiving eliminates the need to print and apply a new routing label on the cartons received — reducing the cost of printing labels and manually applying labels to each carton. Based on our experience in implementing conveyor-based receiving, a distribution center scheduling 200 appointments daily with 1000 cartons in an appointment can save US$0.29 million a year in labeling — resulting in a total of US$3.43 million in savings annually.

Automated conveyor-based receiving minimizes touches by moving cartons directly from the inbound truck to the automated conveyor systems — lowering processing costs.

An automated cross-docking system based on automated sortation can result in a number of benefits: less manual labor; store-friendly delivery (which makes it easier and more efficient to fill store shelves); lower costs from eliminating the need to print carton-level labels; and significantly higher accuracy. Furthermore, 100% correct deliveries are ensured and the supply chain is made visible by built-in tracking and tracing. Figure 3 (see next page) highlights the ROI with the level of maturity in cross-docking processes.
Looking Ahead

Relieving the challenges of product warehousing and distribution is a key benefit of integrating the ASNs, barcodes, WMS and MHS systems. In today’s distribution centers, inefficiencies abound regarding labor, accuracy and throughput. Integrating systems can provide a powerful remedy for each of these critical areas:

**Labor expense:** Reduce the amount of labor and time necessary to complete inbound freight processing. Over 30% of labor is tied up in receiving. Reducing touches in receiving is a big win. By implementing the process explained in this paper, our clients have been able to lower their labor expenses by as much as 65%.

**Accuracy:** Lessen the need to check, audit or verify that the correct product and quantity is received. Therefore, retailers with challenging receiving environments that include multiple suppliers with multiple PO/SKU cartons should spend a significant amount of time on ASN audits to achieve >99% accuracy. With the process defined in this paper, we assume a near 100% accuracy is achievable.

**Throughput:** Improve throughput to decrease order turnaround time and support on-time delivery. Retailers should use ASNs, barcoded freight and automated sortation systems to expedite the receiving process in their DCs. By implementing the process explained in this paper, our clients have been able to increase throughput by 2.9 times when compared with the traditional cross-dock receiving process.

It has been said that the best warehousing is no warehousing at all. While that sentiment is unrealistic, cross-docking in the world of integrated ASNs, barcodes, WMSs and MHSs can provide an acceptable alternative to the utopian vision. When properly executed and monitored, it can serve as a tool for synchronizing the supply chain and generating substantial space, labor and inventory savings.
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Footnotes


7 http://www.indeed.com/salary/Warehouse-Associate.html.

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