BURIED BY E-COMMERCE? EXPAND SORTATION CAPACITY TO KEEP UP.

Handle Explosive E-commerce Order Growth by Maximizing Sortation Capacity

Honeywell Intelligrated®

TABLE OF CONTENTS

2 Introduction

3 Market Shifts Drive Demand for Automated Sortation

4 Reduce Carrier Costs With Zone Skipping

5 Matching Automated Sortation to Operational Requirements

5 Gather Key Information About the Orders

7 Determine the Intended Outcome of the Sort

7 Line or Loop? Know Your Sortation Options

8 Consider the Desired Throughput Rate of the System

9 Considerations for New Facilities

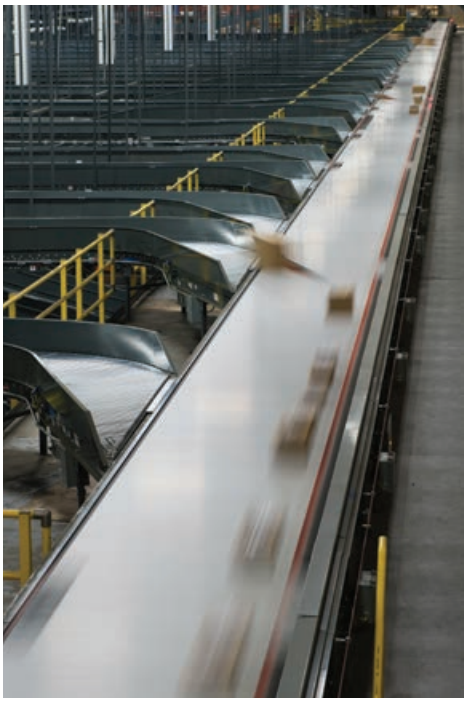
9 Considerations for Existing Facilities

9 Strategies to Get Systems Online Quickly

10 Conclusion

INTRODUCTION

E-commerce and its consistent, explosive growth — already stretching distribution centers (DCs) to the max — show no signs of slowing anytime soon. Internet retailing is no longer simply a trend; it's a lasting shift in the way consumers research, purchase and procure all kinds of goods. Internet Retailer reports that American consumers spent more than $517 billion online in 2018, 15 percent more than 2017. Further, e-commerce as a percentage of total retail sales for 2018 was 14.3 percent, an uptick from 2017's 12.9 percent. In addition, online sales were more than half (nearly 52 percent) of all 2018 retail sales growth.



Despite all that growth, competition for consumers' online dollars is fierce, particularly as shoppers can quickly compare prices and customer service levels in a matter of a few mouse clicks. Consumers want access to a broad range of product, delivered as soon as possible (and preferably free), with no errors. Distribution operations play a critical role in this competitive landscape, as their ability to support an expanding, diverse inventory and fast, free delivery options can mean the difference between winning repeat business or frustrating customers into looking elsewhere.

With so much of the e-commerce customer experience depending on accurate, efficient order fulfillment and fast, free delivery, businesses must invest in DC operations to keep up — while remaining both competitive and profitable. Whereas before, operations' conveyors and sorters transported items individually in a line, the dramatic increase in orders means handling them in bulk is much more efficient.

As a result, demand for automated sortation solutions to help consolidate, separate and route the proliferation of individual orders to their unique destinations at maximum throughput rates is booming — and the market offers plenty of choices. Although these systems all merge, identify, induct, divert and convey products to specific destinations, finding the best-fit automated sortation solution to deliver the accuracy, efficiency and flexibility necessary to remain competitive requires a thorough review of operational requirements and automated sortation system options on the market.

This white paper overviews the industry conditions causing such high demand for automated sortation and the various system application approaches currently available for both new and existing facilities.

MARKET SHIFTS DRIVE DEMAND FOR AUTOMATED SORTATION

1

To understand the challenges e-commerce DCs face today, it helps to reflect on how quickly the fulfillment market has changed. It wasn't too long ago that brick-and-mortar stores dominated the retail landscape, attracting flocks of shoppers for everything from apparel and cosmetics to electronics and hardware. The journey of products from warehouse, through the supply chain, and ultimately to consumers at the traditional storefront resulted in a fairly straightforward process. For example:



1. A retail store running low on staplers places a replenishment order with the corporate DC.
2. The DC ships a full case of staplers to the retail store.
3. Store personnel put the staplers on the shelf.
4. A customer arrives at the store, walks to the appropriate aisle, and selects a stapler from the shelf.
5. The customer purchases the item and departs with it.

Fast-forward to today. The shopping process that the customer used to perform at the retail store — walking the aisles, selecting their item of choice, and delivering it home — now falls to the supply chain. This also means a significant increase in the number of handling processes (including automated sorts) required at the DC. Instead of shipping an entire case to a retail store, the DC must ship orders for single units — often referred to as *eaches* — individually to each consumer. This new fulfillment process takes place in the following steps:

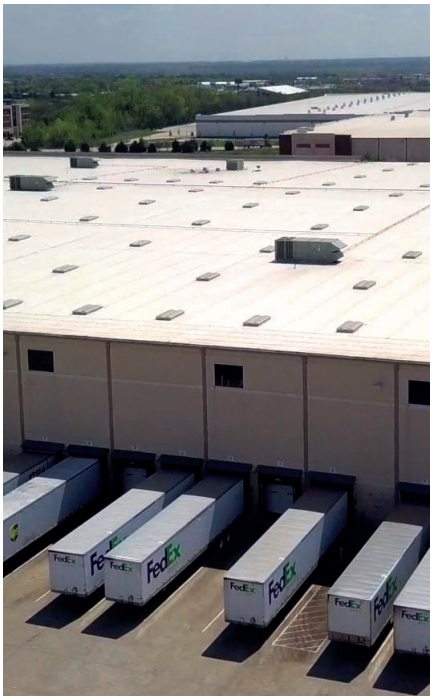
1. An order for a stapler (likely one of multiple brands, styles, colors and options) is received by an online retailer.
2. An associate at the DC picks the stapler as required by the order and places it for transfer from the pick zone via conveyor.
3. The stapler — along with hundreds of thousands of other individual picks across multiple product categories — arrives at a sortation point, where it is transported and diverted to the proper order consolidation or pack-out area.

Note: Assuming a quantity of 24 staplers per case, this multiplies the number of automated sorts per case by 24 — an extreme spike in automated sortation requirement.

4. Once packed, the ordered stapler is sorted again, this time to the proper outbound destination to leave the facility.

   Note: As just one of 24 staplers in a case, 23 still remain, likely representing 23 additional sorts more than a DC replenishing a retail store with a single case of staplers.

5. After leaving the facility of origin, the order may go through several more sorts at local carrier hubs and regional destination hubs through the last-mile carrier.



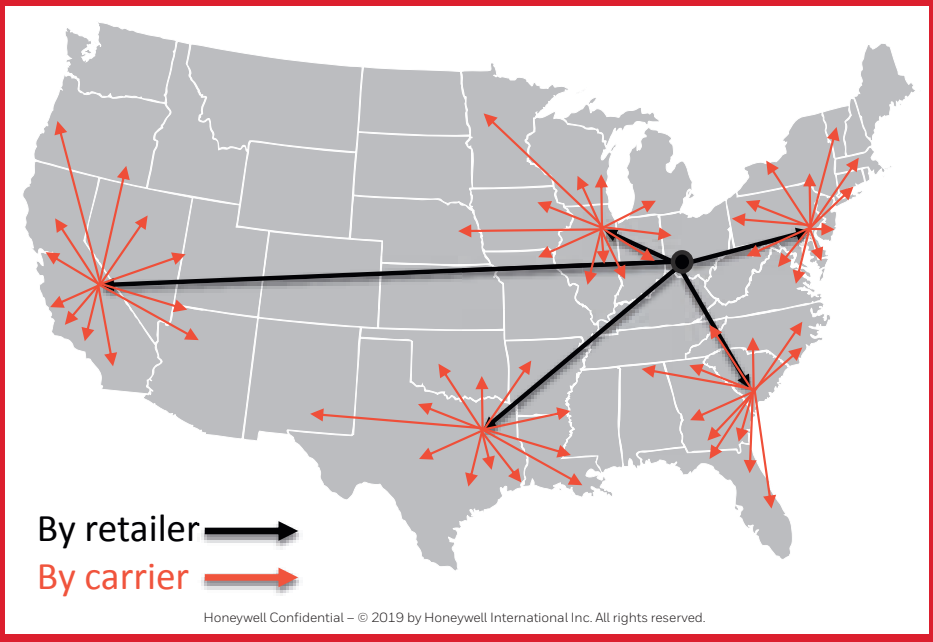
This proliferation of orders and the need to sort them quickly and accurately have dramatically increased the market demand for automated sortation technologies. Previously, DCs sorted a case just once; in an e-commerce world defined by individual, direct-to-consumer orders, this sortation burden can multiply into more than 100 sorts. Further complicating the situation are the limited available labor to manually handle e-commerce's increased order volumes, sharply increasing transportation and freight costs, and pressures to accommodate customers' desires for free shipping.

Add in the need for DCs to store a broader assortment of products than ever before to satisfy the expectations of customers, and it becomes evident that available DC floor space is at a premium. DC operators must find ways to maximize the number of chutes in a fixed amount of space in order to increase both their order consolidation and outbound sortation potential. The end game of sortation in the DC changes, too, as the smaller order quantities of e-commerce dictate a greater focus on sorting items to containers, rather than dock doors, to accommodate zone-skipping strategies.

REDUCE CARRIER COSTS WITH ZONE SKIPPING

The emergence of new sortation strategies like zone skipping enables DCs to more efficiently balance sortation burdens and shipping costs. Zone skipping requires the fulfillment operation to take on the regional and local geographic sortation steps which were traditionally handled by the parcel carrier as the package traveled from the DC to a customer.

And what are the benefits of this additional work to pre-sort orders by geographic destination at the DC? Both faster delivery and a reduction in carrier shipping rates (significant enough to quickly pay back the capital equipment investment in the sortation technology), as shipments no longer need to be sorted at parcel carrier origin hubs.



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Zone skipping delivery flow example

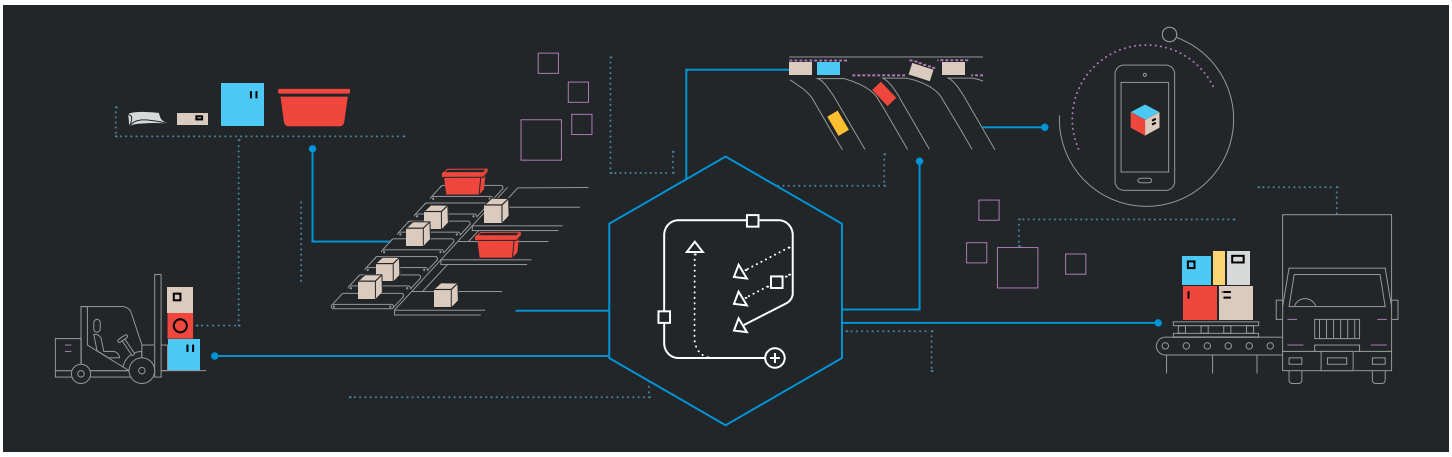
MATCHING AUTOMATED SORTATION TO OPERATIONAL REQUIREMENTS

2

Whether housed in a new greenfield site or an existing facility, e-commerce fulfillment operations face the universal mandate to scale up sortation capacity appropriately. This leads to a matchmaking game, in which success depends on finding the optimal automated sortation solution to meet operational requirements. The decision-making process should include these three key steps:

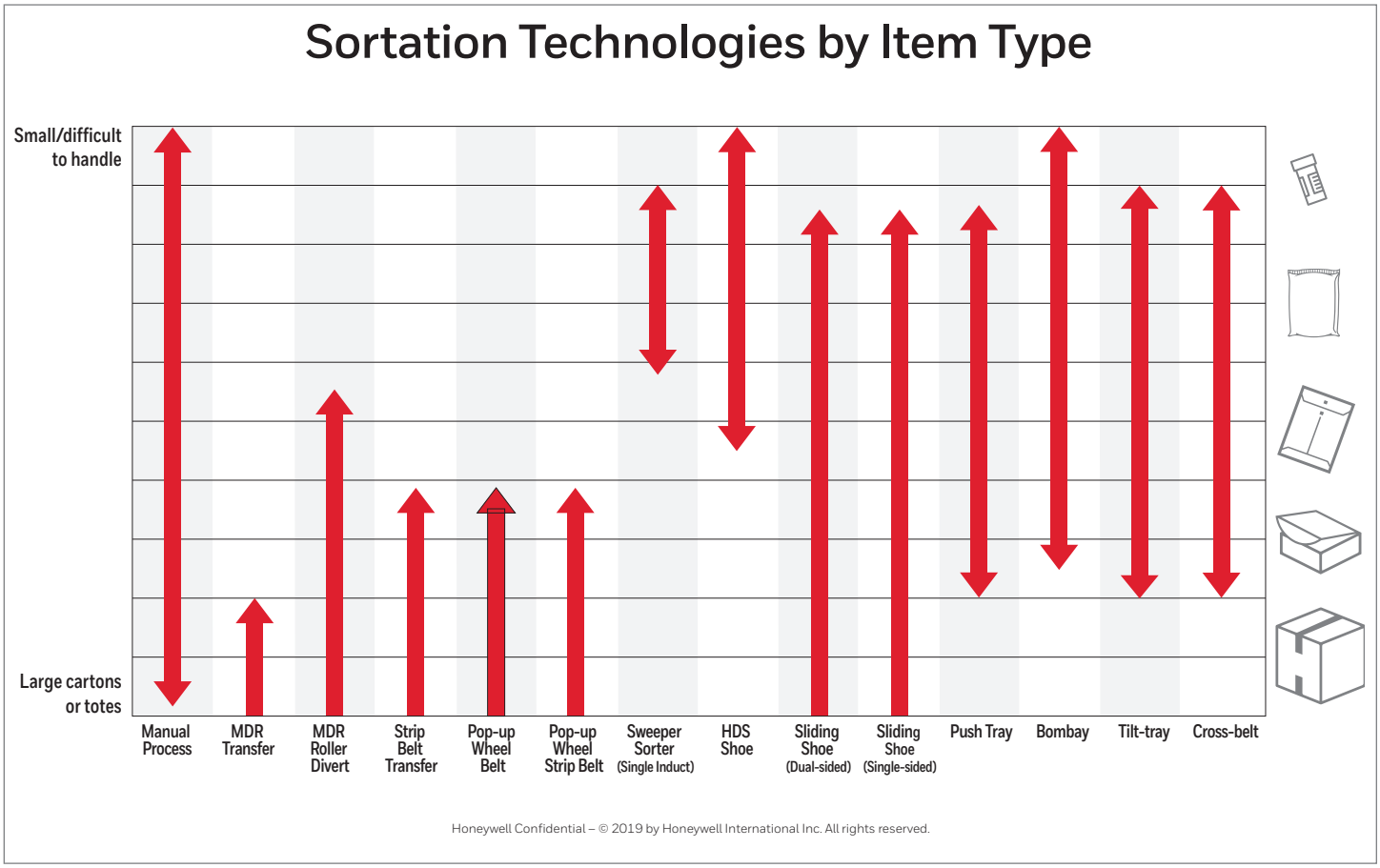
1. GATHER KEY INFORMATION ABOUT THE ORDERS

- Number of orders handled per day
- The breakdown of multi- and single-line orders
- Packaging types used and their degree of dimensional consistency (or inconsistency) among outbound orders



One of the biggest considerations among collected order data involves the wider adoption of smaller, more malleable packaging types (such as envelopes, polybags and bubble mailers) used for direct-to-consumer shipments. Implemented in response to the introduction of widespread dimensional weight pricing by carriers, these lighter-weight packages cost less to ship, yet create additional catch points that increase the chances of sortation conveyor jams or sortation loop recirculation.

Their extent of use varies by operation, but modern fulfillment centers should consider the degree to which they currently (or will increasingly) handle a mix of malleable polybags, rigid corrugated cases and flexible bubble mailers. This means deploying a sortation system capable of reliably handling the unique challenges of all packaging types.



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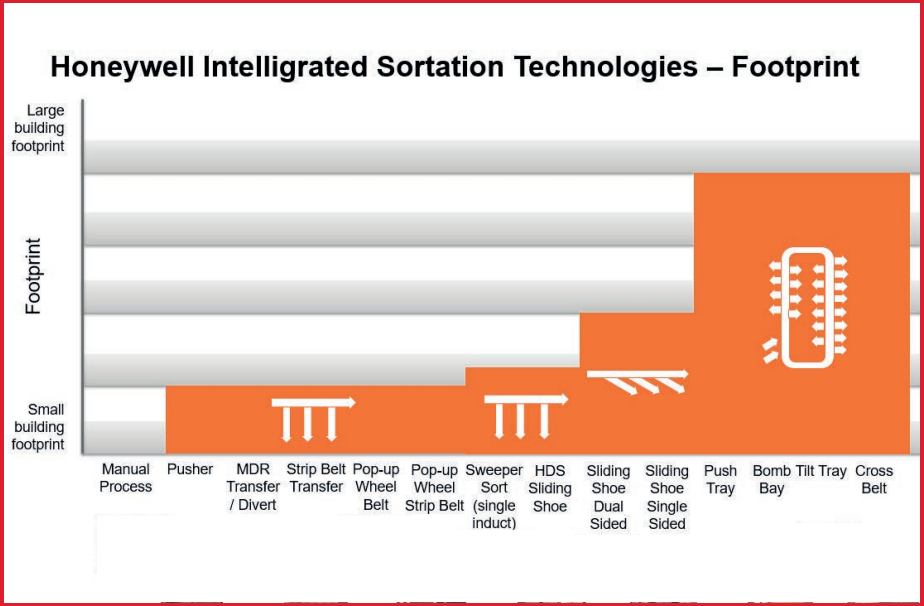
2. DETERMINE THE INTENDED OUTCOME OF THE SORT

- Is the sortation process intended to facilitate more effective order consolidation? This common order fulfillment process drives greater picking efficiency yet requires a system with a large number of sort destinations in a limited space. This plays to the strengths of loop sortation technology, such as a cross-belt sorter, which allows items to travel around the loop while awaiting other picks required by the same order to arrive prior to pack-out.
- Is the intention to sort items to the proper shipping trailer as they leave the facility? This type of workflow transports packed items from pack-out to outbound shipping and diverts the items to different destinations at the outbound dock. To efficiently accommodate a high number of destination locations, outbound sortation is commonly addressed with line sortation technology such as a sliding shoe sorter.

LINE OR LOOP? KNOW YOUR SORTATION OPTIONS

There are two basic categories of automated sortation systems: ***line*** and ***loop***. The terms refer to the installation configuration of the sorter.

A ***line sorter*** runs in a straight line with a single induction point. As directed by an automatic identification technology, such as a barcode scanner or imager, items are pushed, diverted or deflected off the sorter's path at appropriate points along the line by means of a mechanical arm or other in-line device. Common types include motor-driven roller (MDR), strip belt transfer, pop-up wheel belt, pop-up wheel strip belt, sweeper sorters or sliding shoe.

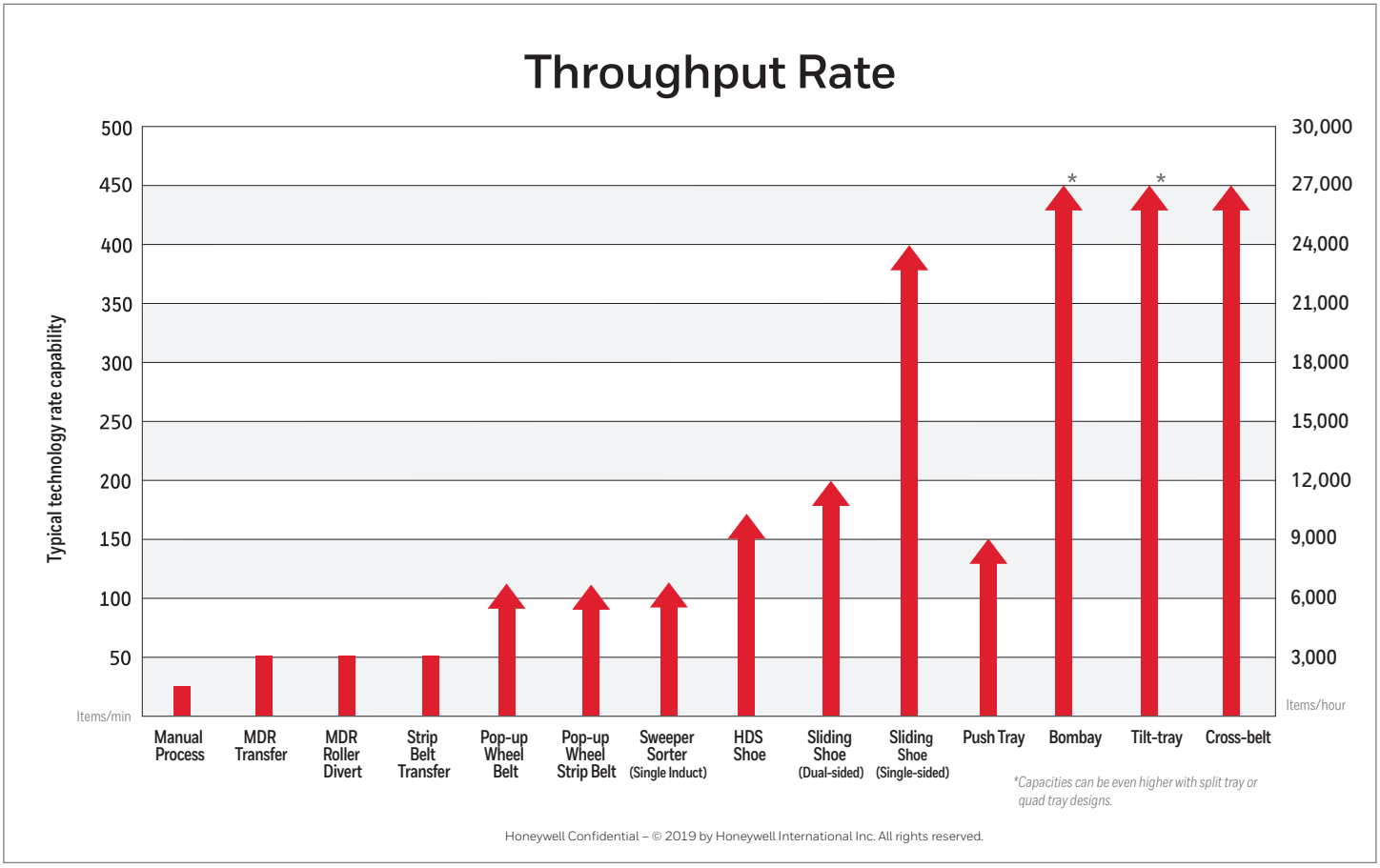


A ***loop sorter*** often has more than one induction point and features built-in item recirculation, since it runs in a continuous loop. These types of sorters consist of individual carriers that handle one item each, rather than continuous runs of roller or belting. To discharge a load, each of the carrier's two surface halves drop open from below (bomb bay), tilts (tilt-tray), has a mechanism that pushes the load off its surface (push-tray), or has a short section of motorized belt conveyor oriented perpendicularly to the conveyor that propels the item off to the side (cross-belt).

3. CONSIDER THE DESIRED THROUGHPUT RATE OF THE SYSTEM

With the high order volumes of e-commerce putting stress on the capacity of existing systems, throughput rates at both standard and peak periods are critical considerations when selecting the most optimal automated sortation technology. Throughput rates can fuel return on investment calculations, as well as provide room for operations to scale for the future — a critical consideration for maximizing long-term value.

Be careful not to equate throughput to speed; rate of travel alone means nothing without proper product gapping, gentle handling and accuracy. Ensuring that the system accommodates appropriate spacing between parcels to facilitate data capture during transport and handing so that items are sorted to the correct destination is key. Recent innovations in these types of sortation functions enable higher throughput without a corresponding increase in equipment speed — which ultimately reduces wear, energy usage and noise for a better long-term investment. Of course, as with most equipment purchases, the more complex the technology, the greater the cost.



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Considerations for New Facilities

Starting fresh in a new greenfield site gives operations the freedom to make the best sortation decisions for current and anticipated requirements without being limited by existing facility or process constraints. Operations can design other handling processes and areas around the desired sortation technology, rather than designing sortation around existing systems. This freedom, coupled with e-commerce sortation demands, may dictate the selection of an appropriate loop sorter.

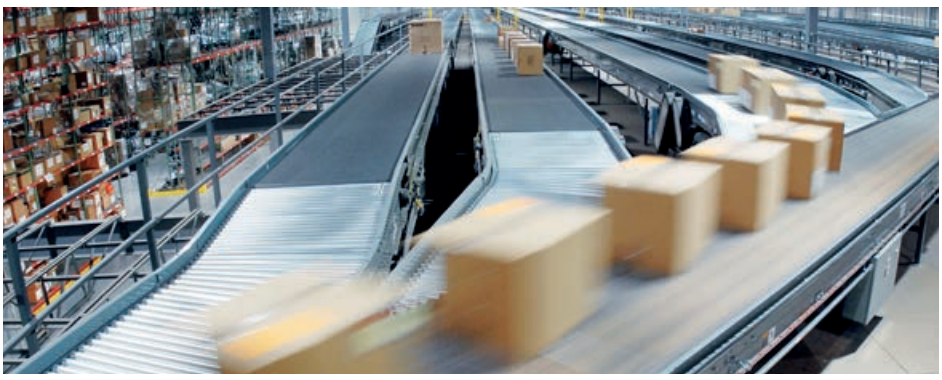
Loop sorters typically have a larger footprint than line sorters but provide a high concentration of divert destinations. Often installed overhead (instead of at floor level), operations can easily modify the space underneath a loop sorter for maximum floor space utilization, including adding pods of put walls for expanded handling capacity and/or allotting space for secondary sortation. A trade-off, however, may be the time it takes for the system to be designed, built, installed and commissioned. Unlike a line sorter — such as a sliding shoe system, which might take four to six months to go live from the receipt of a purchase order — a bomb bay sorter can take six to eight months; a cross-belt sorter can take eight months to more than a year.

Considerations for Existing Facilities

Many existing systems were designed to support traditional retail store distribution, so retrofitting them to accommodate exploding e-commerce volumes will require additional sortation capacity. A frequent challenge faced by operators is how to make the best use of limited space while introducing technology and workflow adjustments that accommodate existing systems — all while limiting disruptions to the live operation.

Operations with limited space can benefit from the minimal footprint of a line sorter, such as a sliding shoe or sweeper sorter. A dual-sided sliding shoe sorter supports divert destinations on either side to match the high chute density required by e-commerce fulfillment. A sweeper sorter is a relatively low-cost option to increase sortation capacity, with a fast implementation timeline that can take as little as two months. These solutions can be combined with a secondary sortation system such as a put wall or a voice-directed system where operators move items to specific pallets following automated sorts.

Additionally, today's sorter designs feature more compact construction of divert chutes, allowing more destinations to be integrated in a given amount of space. This is important for operations transitioning from diverts to specific dock doors to zone skipping sorts into bulk containers that are spaced together more closely. Alternately, existing facilities may find opportunities to take advantage of existing infrastructures — such as conveyor lines — to add new sortation points. For example, instead of a single conveyor divert headed to a dock door, an operation could add motor-driven, roller-conveyor, right-angle transfers to transform a single sort point into a configuration with eight to 10 separate destinations to support zone-skipping strategies.



STRATEGIES TO GET SYSTEMS ONLINE QUICKLY

The pace of modern retail is faster than ever, and operations need to quickly scale up capacities to meet their e-commerce fulfillment sortation requirements. But getting a system online quickly depends on a variety of factors, some of which can be controlled by the end user and some of which cannot.

- **Sortation vendor pipeline:** Leading systems suppliers typically have a deeper manufacturing and engineering bench for capacity fluctuations.
- **System complexity:** Custom engineering and integration take time, so less customization means faster deployment schedules.
- **Vendor consolidation:** Working with a single-source provider (instead of multiple outside consultants and equipment vendors) offers significant speed advantages.

CONCLUSION: COMPLEX CHALLENGES REQUIRE AN EXPERIENCED PERSPECTIVE

Today's e-commerce driven supply chains have little margin for error. In a DC, the relentless pace of order fulfillment and intense competition pressures are mandating operations to squeeze out as much sortation capacity as possible. Selecting a best-fit sortation solution requires considering the unique characteristics of both the operation and available sortation technologies. To ensure the successful design and implementation of an innovative sortation package that meets your specific operational goals, partner with an experienced provider who has access to — and experience with — integrating a full lineup of sortation technologies.

To dive deeper into the world of sortation technology, read the Sorting out Your Sortation Options and Zone Skipping Strategies to Reduce e-Commerce Shipping Costs white papers. For information on secondary sort points in order fulfillment operations, read The Put Wall: Versatile Facilitator of Omnichannel Distribution white paper.



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