

# ***SOLVE FOR X.***

## Sortation – Directing Product Traffic

Presented by:

**Boyce Bonham, Chief Engineer**

**Satyen Pathak, Senior Product Manager**



## Boyce Bonham

*Chief Engineer, Hytrol Conveyor Company*

- BS in Engineering from Arkansas State University
- Over 30 years of experience in the conveyor industry and specializes in providing technical solutions to the company's integration partners and end users. Boyce's knowledge spans the entire process from conveyor product design to complete conveyor system design and application.
- Boyce led in the development of Hytrol's ProSort® line of sorters as well as other industry leading technologies such as EZLogic®, Hytrol's accumulation control, and E24®, Hytrol's 24 volt conveyor product line.

### Hytrol:

- Largest network of industry experts with over 100 locations around the world
- 70 years of experience, which helps us have the most recognized brand in the industry
- Unmatched lead times
- Comprehensive product line including:
  - E24™ (24-volt product line)
  - ProSort® 100 & 400 (High-speed sortation)
  - EZLogic® (zero pressure accumulation)
  - Connex™ (plastic chain conveyor)
  - Pivot™ (warehouse control system)
- 24x7 customer care
- Technology Center dedicated to innovation



## Satyen Pathak

*Senior product manager, Intelligrated*

- Responsible for Intelligrated's tilt-tray and cross-belt sortation product lines. He provides strategic oversight and technical guidance to ensure solution sets address market requirements for challenging distribution applications, including e-commerce and omnichannel operations. Satyen has more than 18 years of experience in industrial product management, engineering and business development, including stops at Cirrus Logic and Siemens prior to joining Intelligrated. He is involved with MHI and holds an MBA from Ashford University.
- Satyen led the development of Intelligrated's dynamic discharge compensation technology for cross-belt sortation systems – a 2016 MHI Innovation Award winner. His input has been featured in several material handling and logistics trade articles.

Intelligrated:

- Single-source provider of intelligent automated material handling solutions
  - Conveyor
  - IntelliSort® sortation
  - Alvey® palletizers and robotics
  - Automated storage and retrieval systems
  - Machine controls and software
- Broad portfolio of automation equipment, software and 24X7 lifecycle support
- Intelligrated Software
  - Warehouse execution systems
  - Warehouse management systems
  - Labor management systems
  - Order fulfillment



## Agenda

- Speaker Introductions
- Linear Sorter
  - Technology Overview
  - Sample Applications
- Loop Sorter
  - Technology Overview
  - Sample Applications

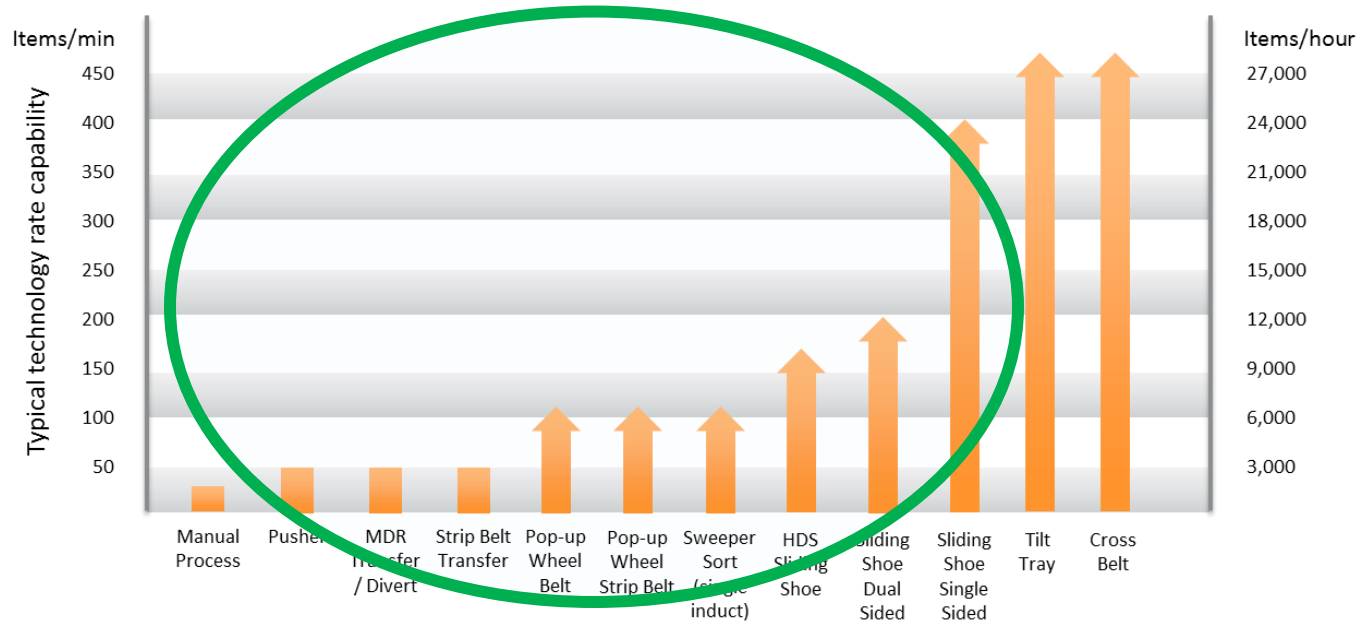
# SOLVE FOR X.

## LINEAR SORTATION

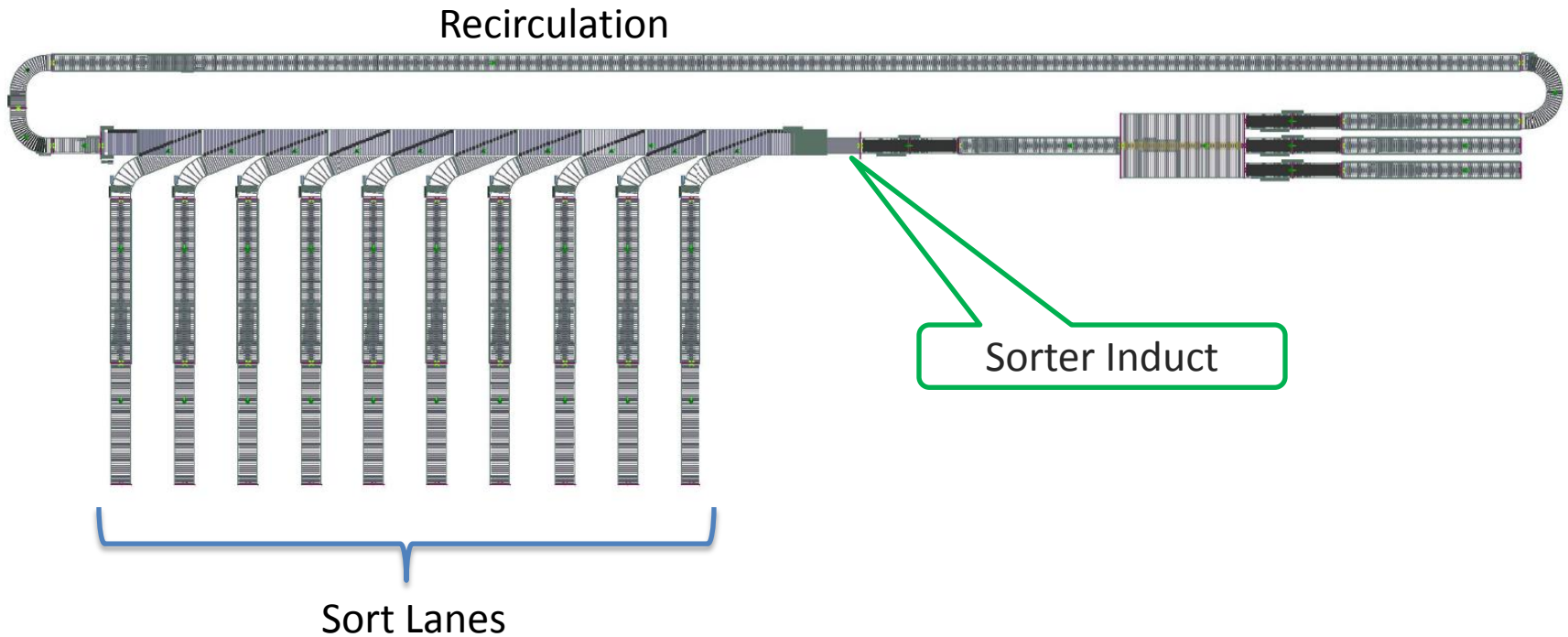
# SOLVE FOR X.

## Throughput: low – medium - high

- Wide array of products to meet specific throughput demands
- Requirements to sort a wide variety of product SKU's
- Applications:
  - DC receiving & shipping
  - Order picking
  - e-commerce

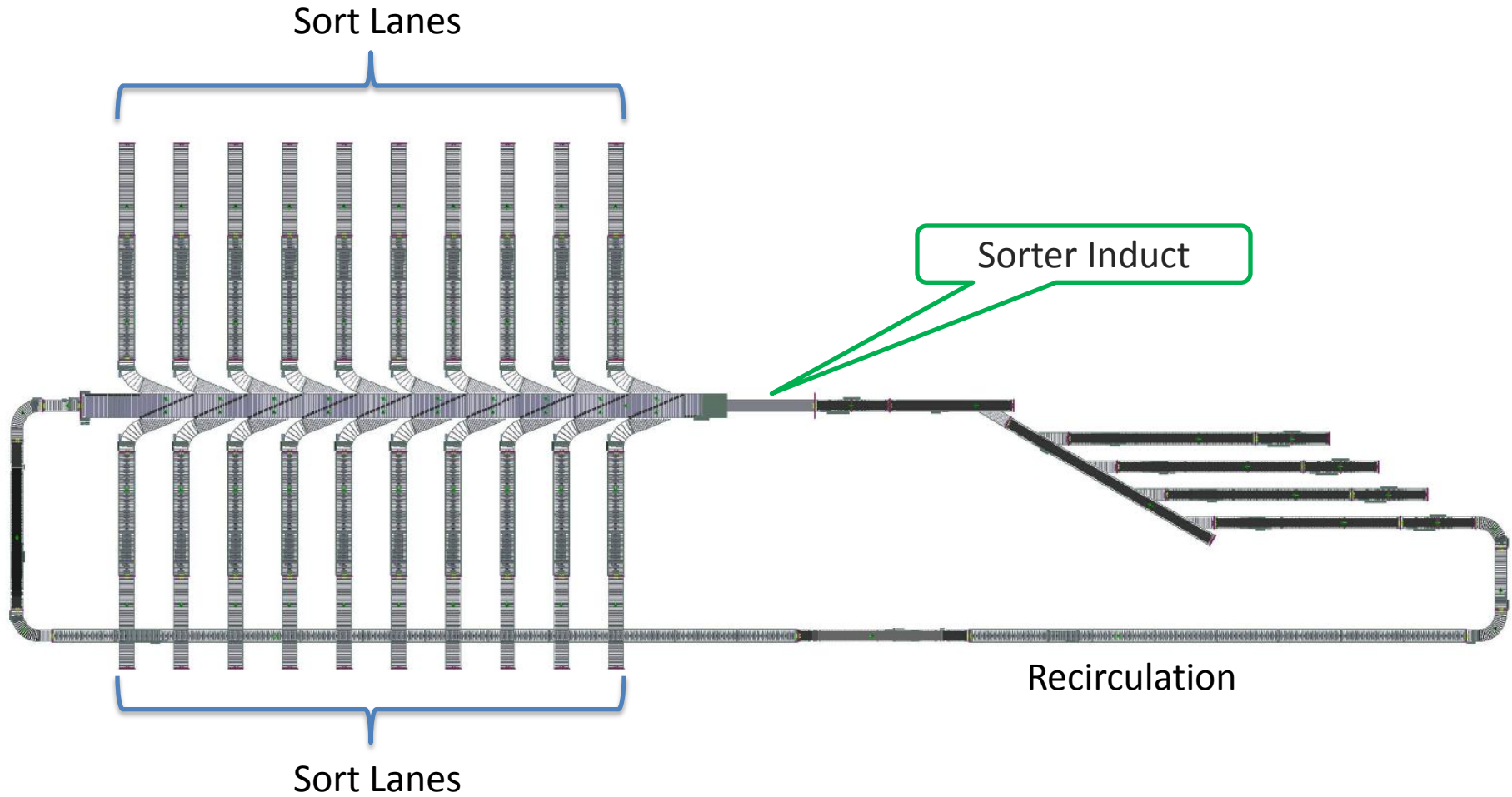


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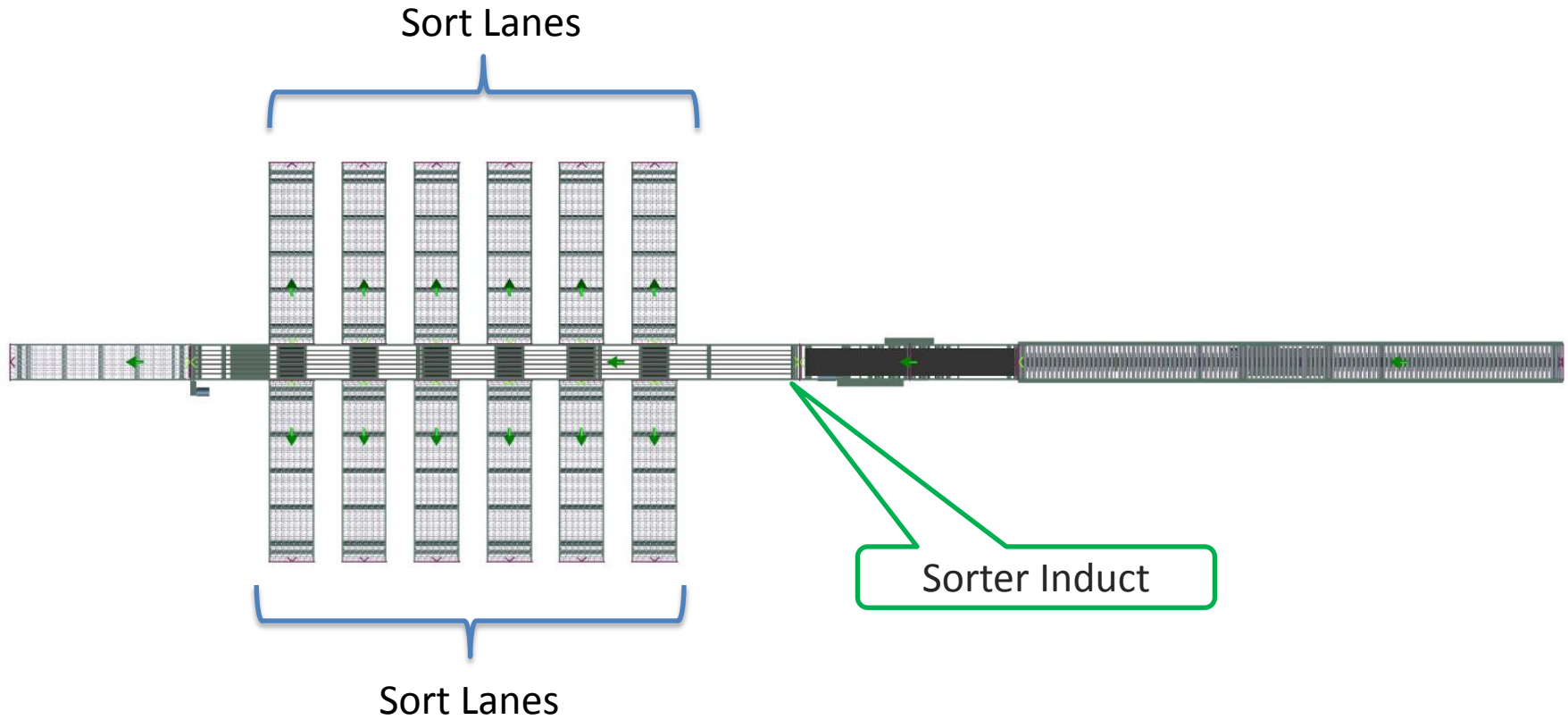


# SOLVE FOR X.





# SOLVE FOR X.



## Linear Sortation Technologies

- Transfers & diverts
- Pushers
- Belt Sorter – pop up or pivot wheel
- Narrow Belt – perpendicular or angled
- Sliding Shoe Sorter – single or dual sided

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## Transfers – 24 volt



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## Pivot Divert – 24 volt



## Transfers & Diverts

- Low throughput rates
- Single side or dual sided diverts
- Product justification not required
- Pneumatic or Electric operation
- Requires good carton bottom



# SOLVE FOR X.

## Pushers



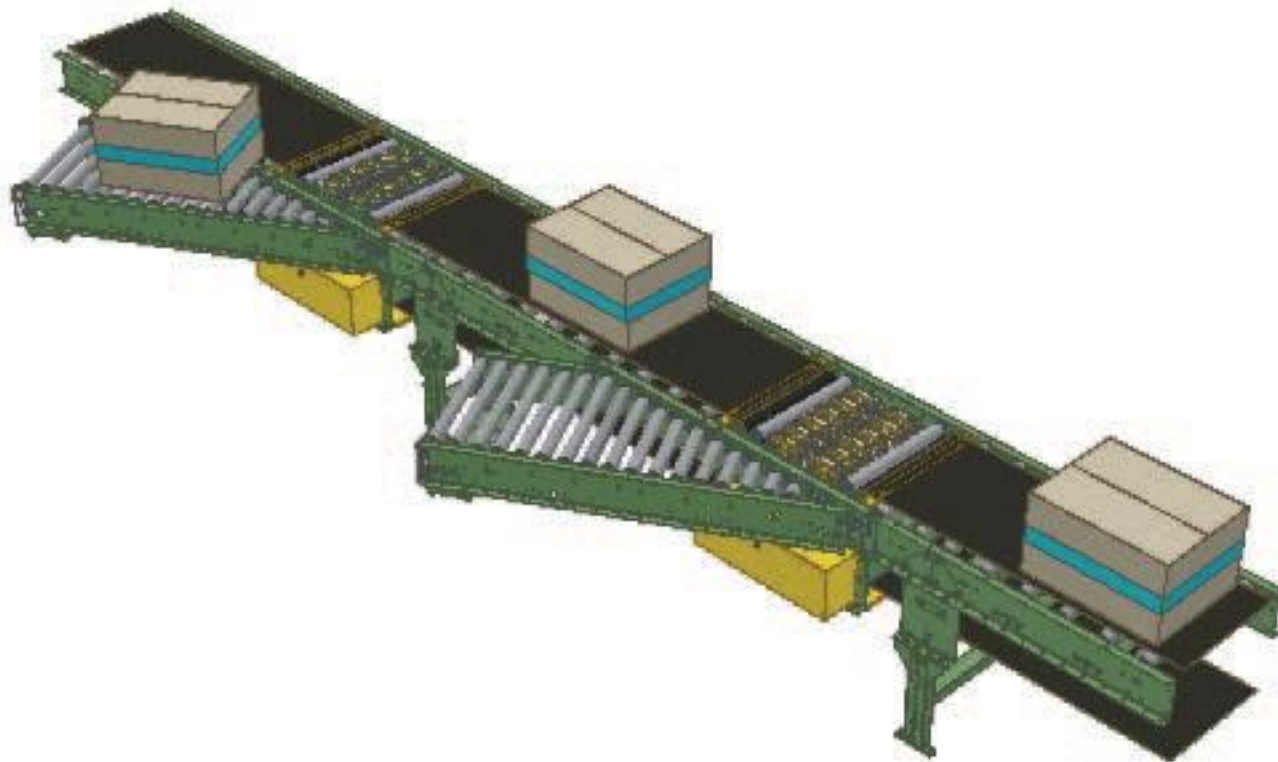


## Pushers & Sweepers

- Low to Medium throughput rates
- Typically single sided divert
- Products may need to be justified
- Operation
  - Compressed air
  - Electric
- Creates some impact to carton

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## Belt Sorter



# SOLVE FOR X.

## Belt Sorter



## Belt Sorter

- Medium throughput rates
- Single side or dual sided diverts
- Products need to be justified
- Requires good carton bottom

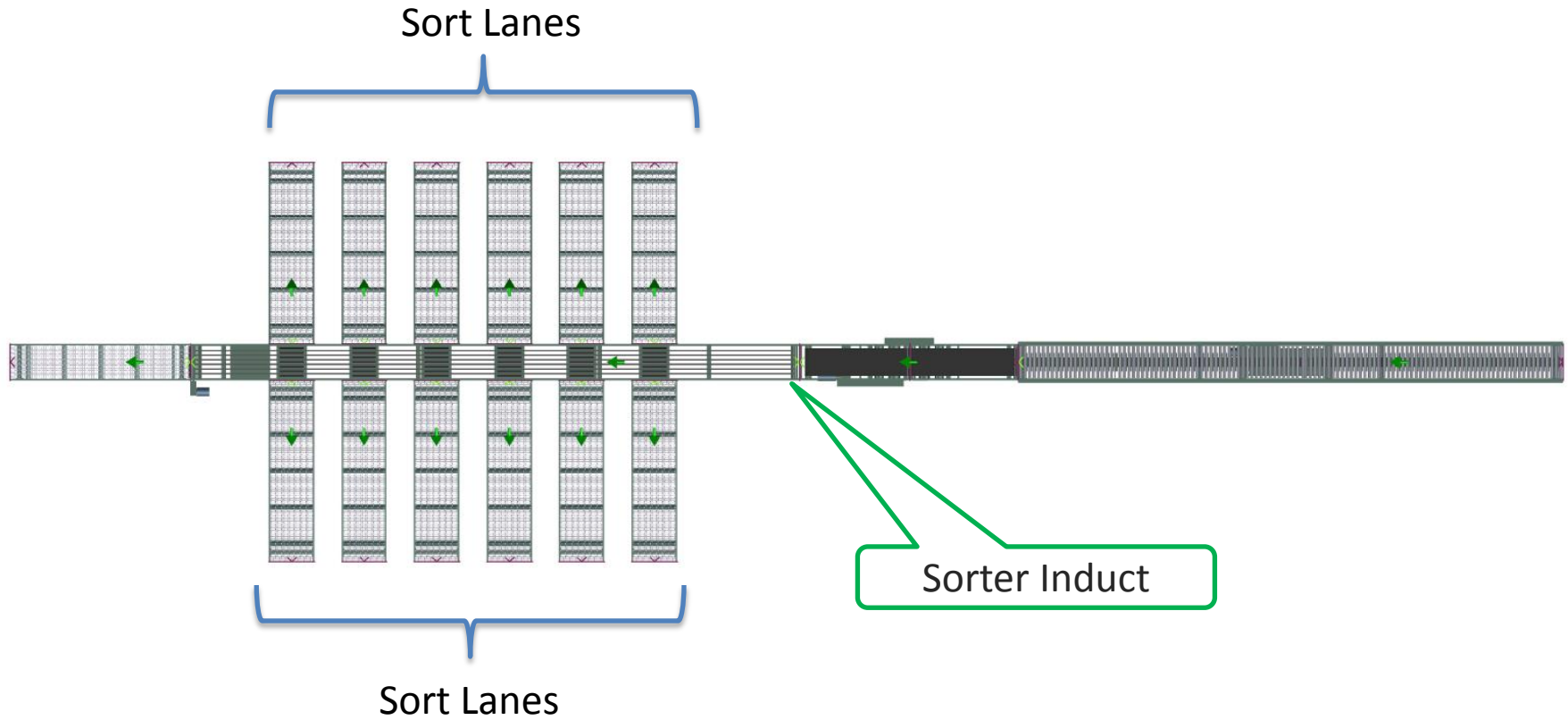


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## Narrow Belt Sorter – perpendicular take-away



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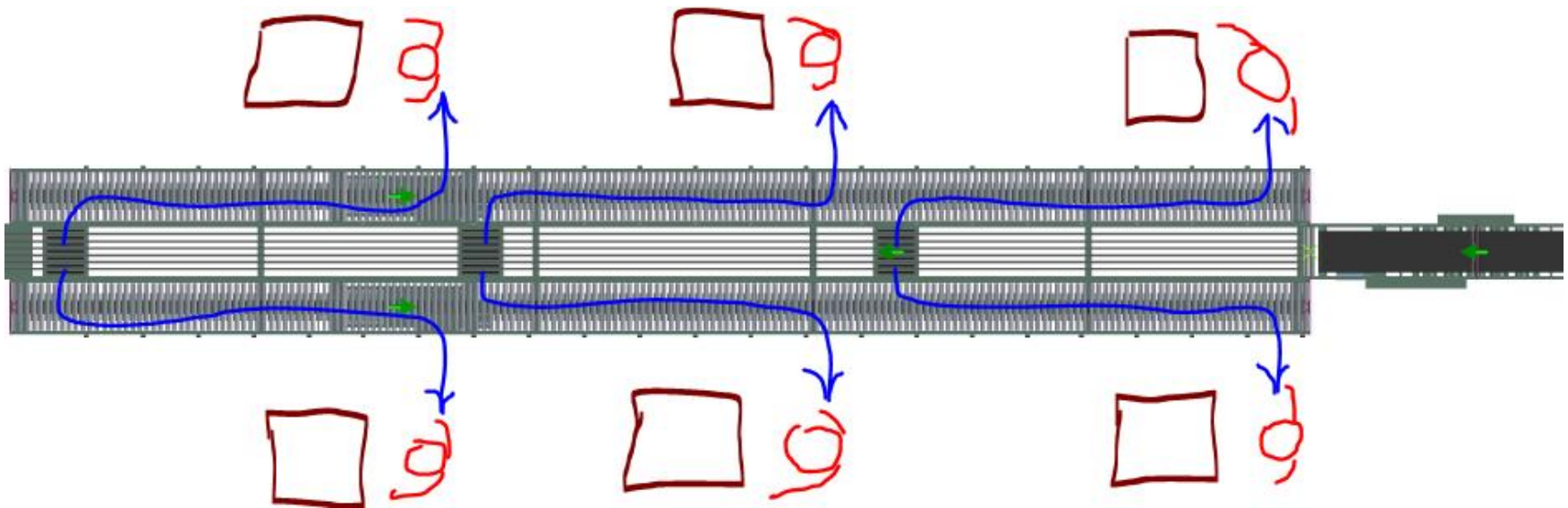
# SOLVE FOR X.

## Narrow Belt Sorter – parallel take-away



# SOLVE FOR X.

## Narrow Belt Sorter – parallel take-away



# SOLVE FOR X.

## Narrow Belt Sorter – angled take-away



## Narrow Belt Sorter

- Medium throughput rates
- Easy to track products
- 90 degree or 30 degree diverts (even in same conveyor)
- Maintain or change carton orientation
- Bi-directional diverting with 90 degree divert



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## Sliding Shoe Sorter



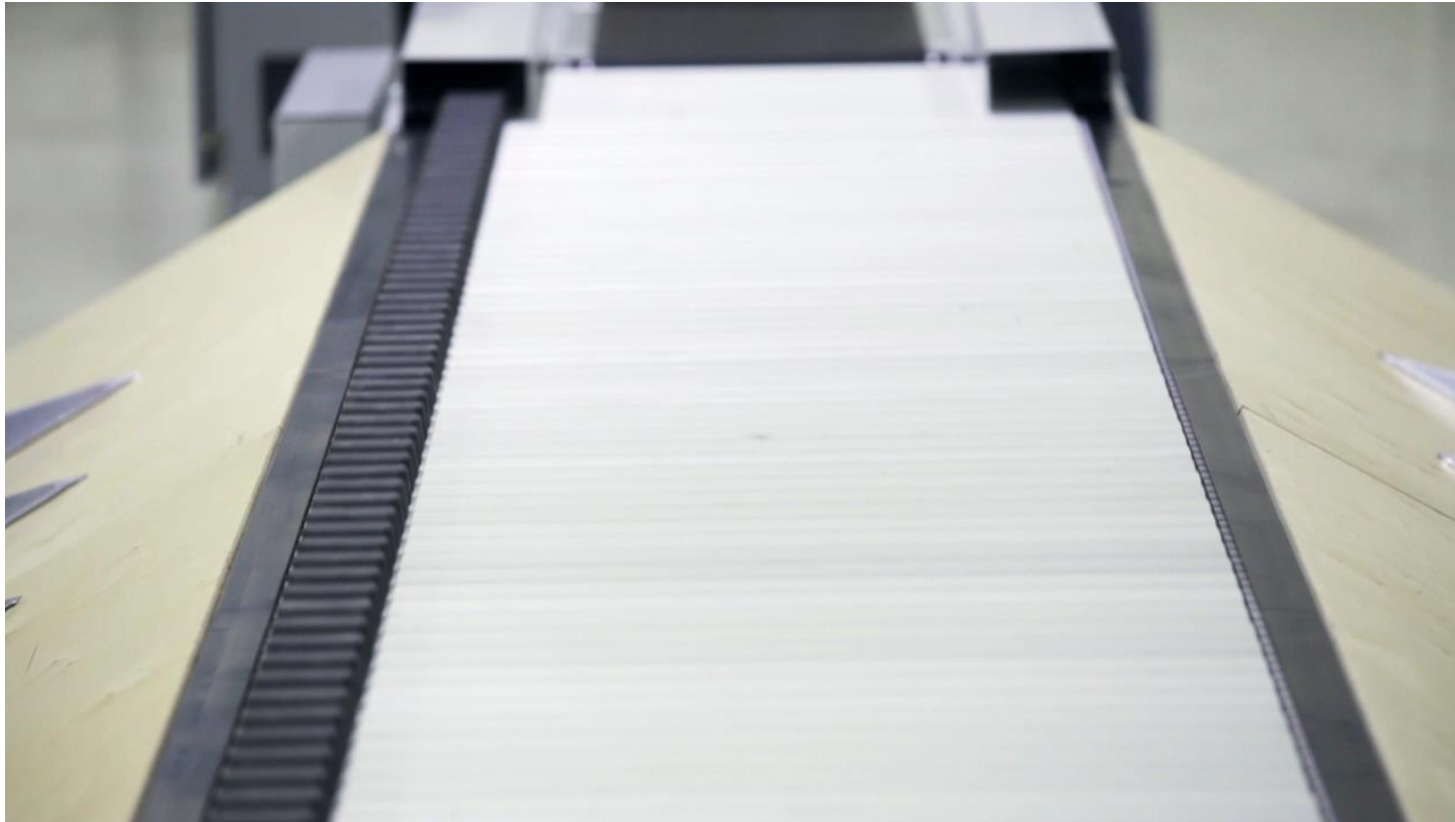
## Sliding Shoe Sorter

- High throughputs
- Gentle on carton
- Positive sort
- Sorts wide product mix (size and weight)
- Long lengths and many sorts with single conveyor
- Products do not have to be justified
- Easy to track products over long distances with many divert points



# SOLVE FOR X.

## Sliding Shoe Sorter

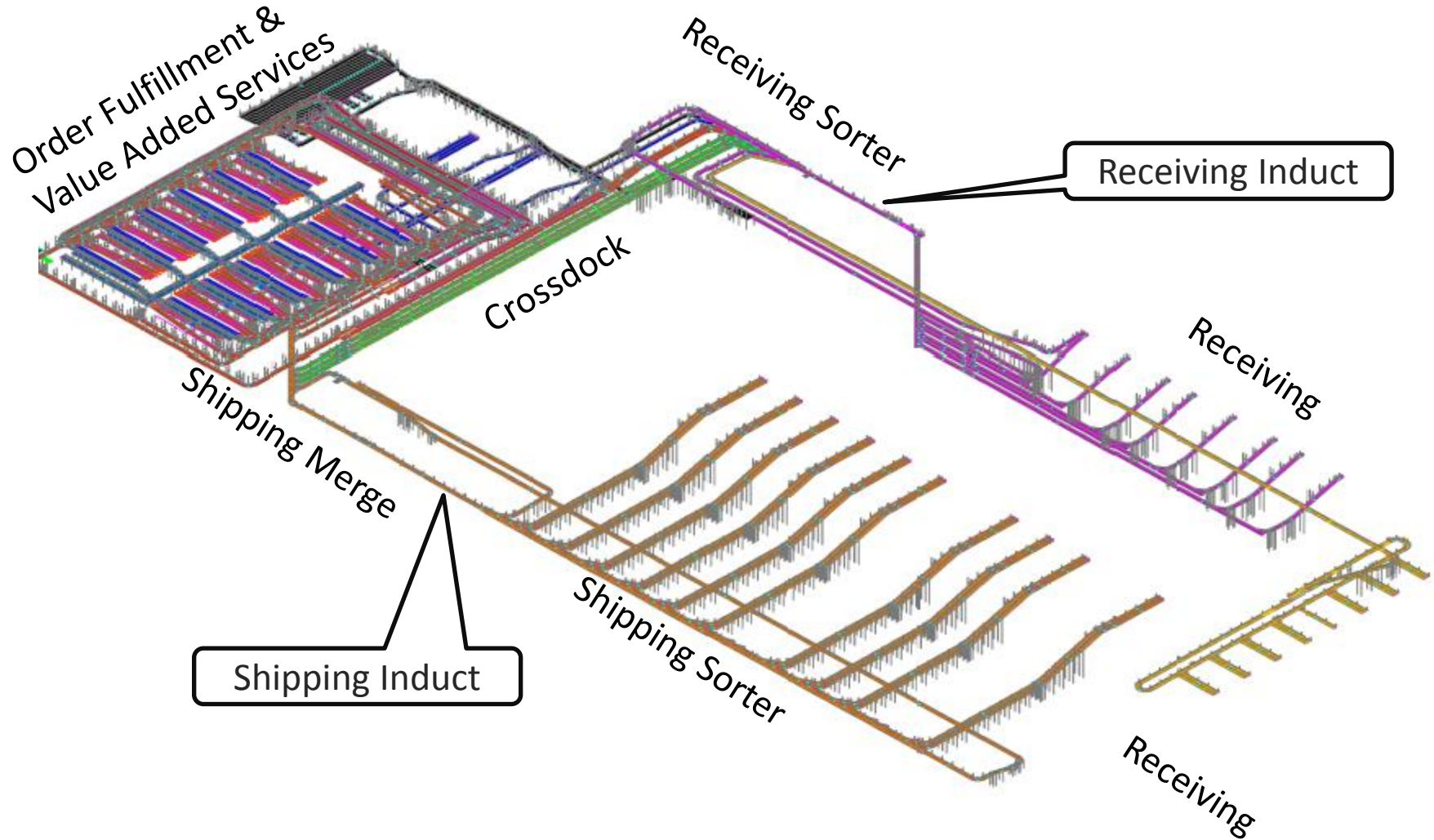


# SOLVE FOR X.

## Sliding Shoe Sorter



# SOLVE FOR X.



# SOLVE FOR X.

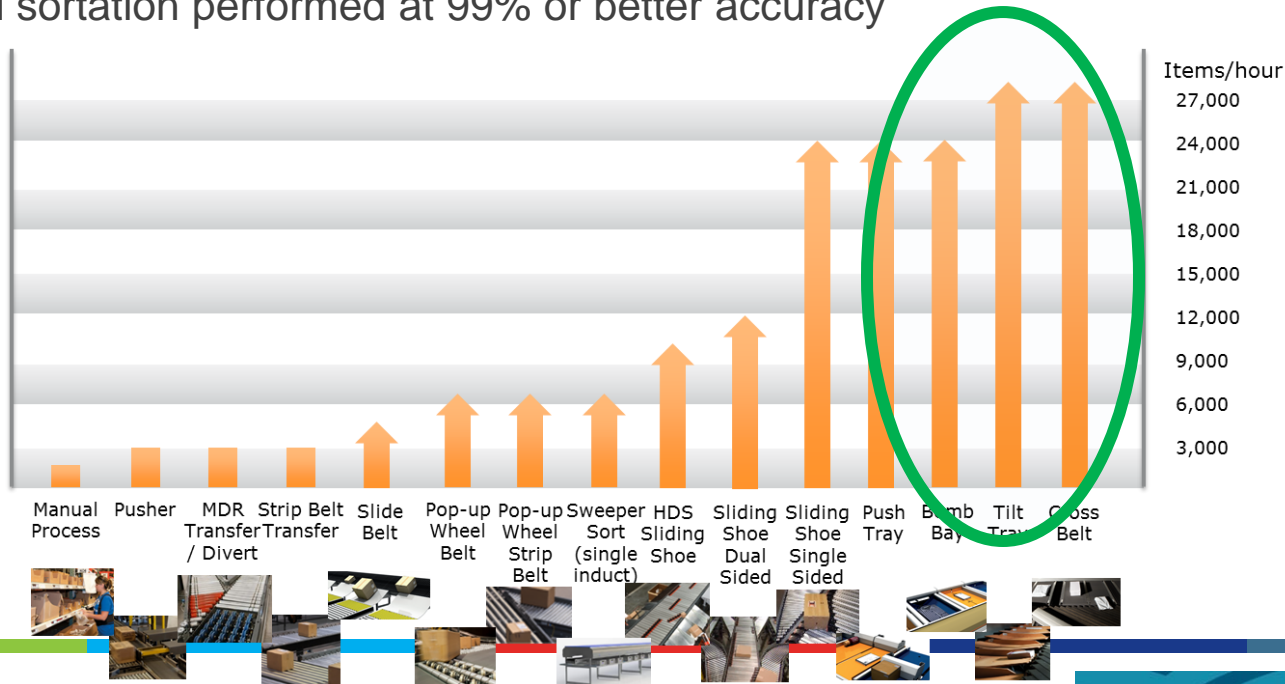
## LOOP SORTATION



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## High volume high throughput

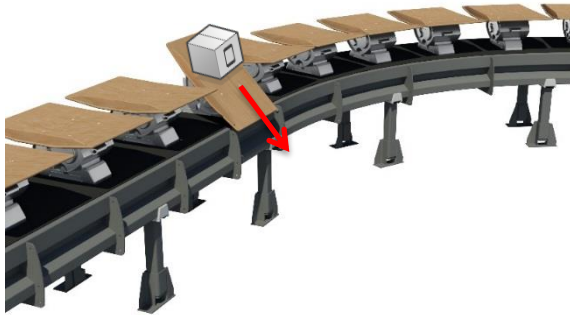
- Requirements to sort a wide variety of product SKU's
- 25,000+ units per hour
- Meet e-commerce demands
- Omnichannel distribution supply chain
- D2C operations
- High speed sortation performed at 99% or better accuracy



## Most common configurations

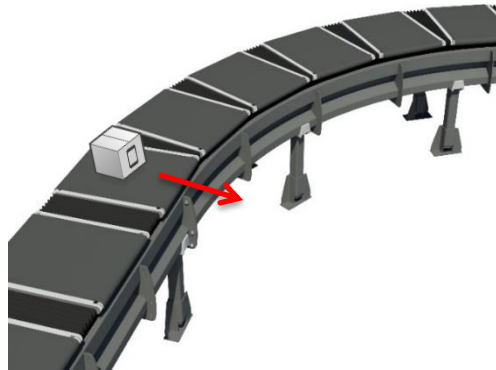
### Tilt Tray

A high-speed, continuous-loop sortation track that uses a technique of tilting a tray to slide the object into the chute or varying containers



### Cross Belt

A high-speed, continuous-loop sortation track that uses a belted carrier carrying product and discharges the product via a motor that engages at the proper moment at a chute or varying container types to convey the object in



### Bomb Bay

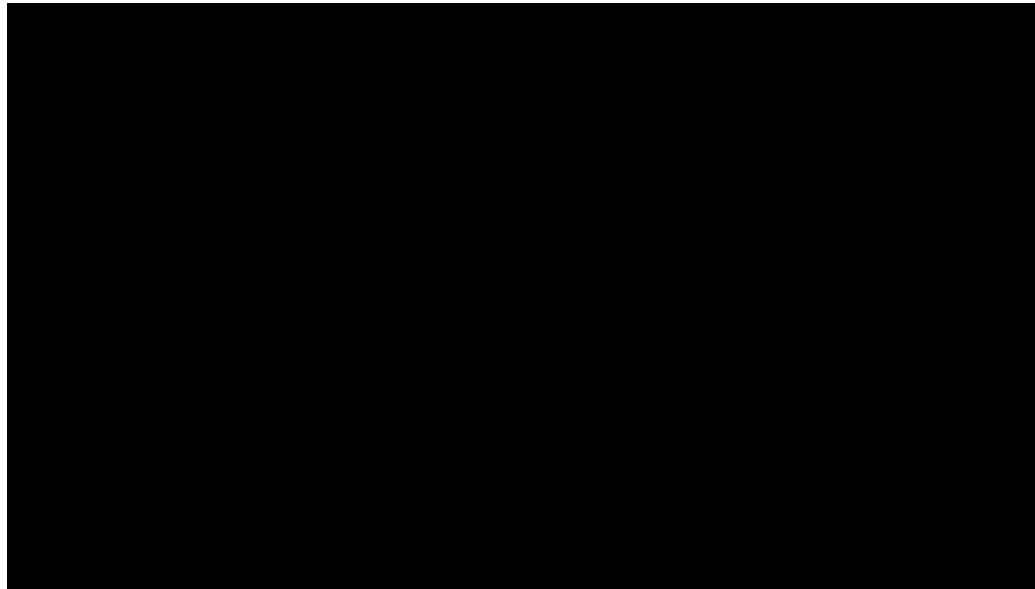
A medium speed, continuous-loop sortation track that release items by engaging trap doors to open facing down so as to drop the product into its destination





## How a loop sorter operates

- A high-rate bi-directional sorting device capable of handling not only cartons and totes, but also soft goods and other products difficult to convey on other types of sorters
- Basic design of a sorter consists of a carriage with a tray device (or belted carrier) mounted on top that is pulled through an enclosed track
- Once the product is on the carrier, it passes through an identification device where it is then coupled with that exact carrier and assigned a divert location
- Once the product reaches its divert location, it will discharge either left or right into its correct destination

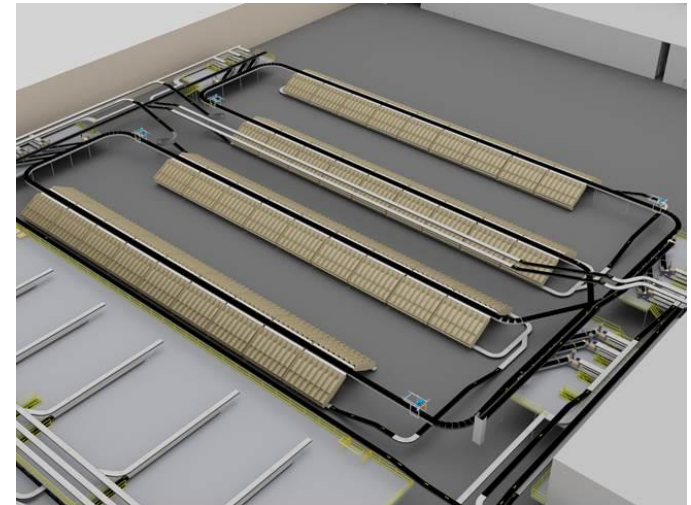


## General loop sorter notables

- Cross belt and Tilt tray sorters are very effective at high speed sorting of a wide variety of products including items not typically conveyable on other sorters
- They are gentle on the products being sorted and provide a very positive reliable sort

### *Basic considerations when applying a loop sorter*

- Exemplary when many diverts with close centers are required
- Multiple induction points possible
- High sort rates possible
- Bi-directional sorting capabilities
- Wide variety of product mixes
- Highly reliable



## Inductions

### Induction:

The process or method of introducing product/items on a sorter for disposition

### Types of Inductions:

- Manual
- Semi-automatic
- Automatic inductions

### Styles include

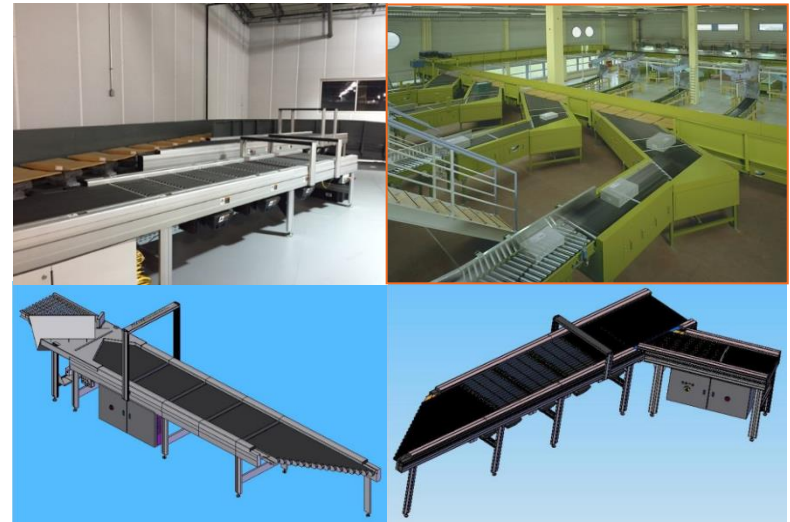
- Parallel
- Cross loading

Normally designed for high speed continuous flow applications

Can be dynamically integrated

- Scales
- Barcode scanners
- Volume scanners

### Automatic Induction



## Chutes

### Discharge:

The process or method of removing products/items off the sorter into a destination

### Types of Chutes

- Spiral Chutes
- Cascade Chute
- Accumulation Chute
- Discharge for Mailbags
- Discharge for Containers
- Discharge to shipping (auto pack)

### Designed to fit items, footprint, and operation

- Packing Chute
- Shipping Chute
- Transfer Chute



### Types of discharge containers may include:

- Gaylords
- Totes
- Mail bags
- Generic containers

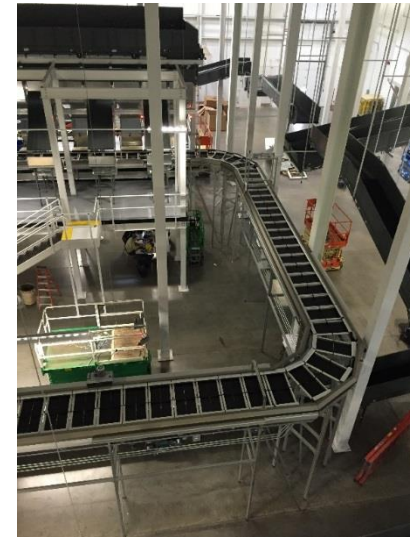
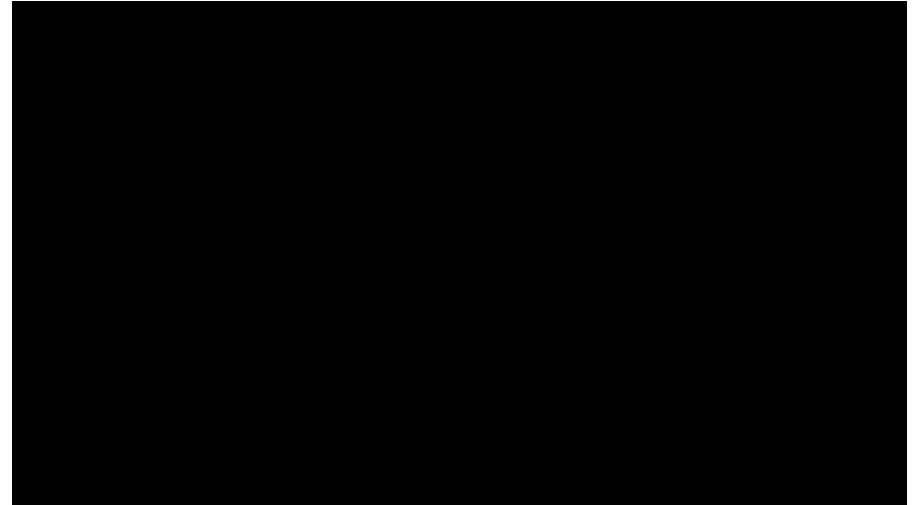
## Bomb Bay sorter

Bomb Bay sorter industries:

- Pharma/Healthcare
- Accessories
- Post/Parcel

Bomb Bay sorter applications:

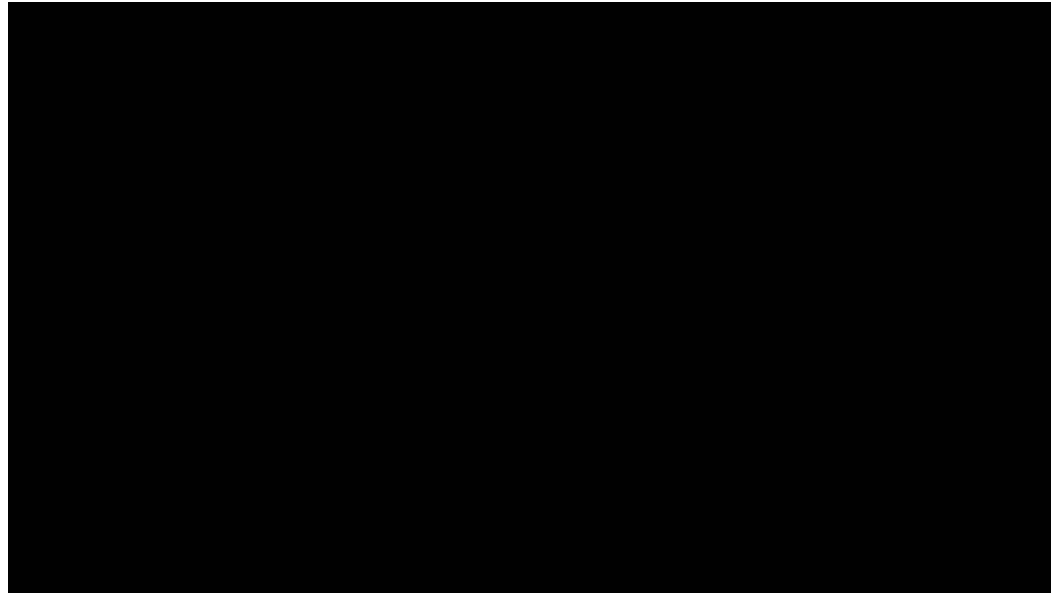
- eComm order consolidation
- Returns processing
- Rounds
- Compact footprint requirements





## Push tray sorter

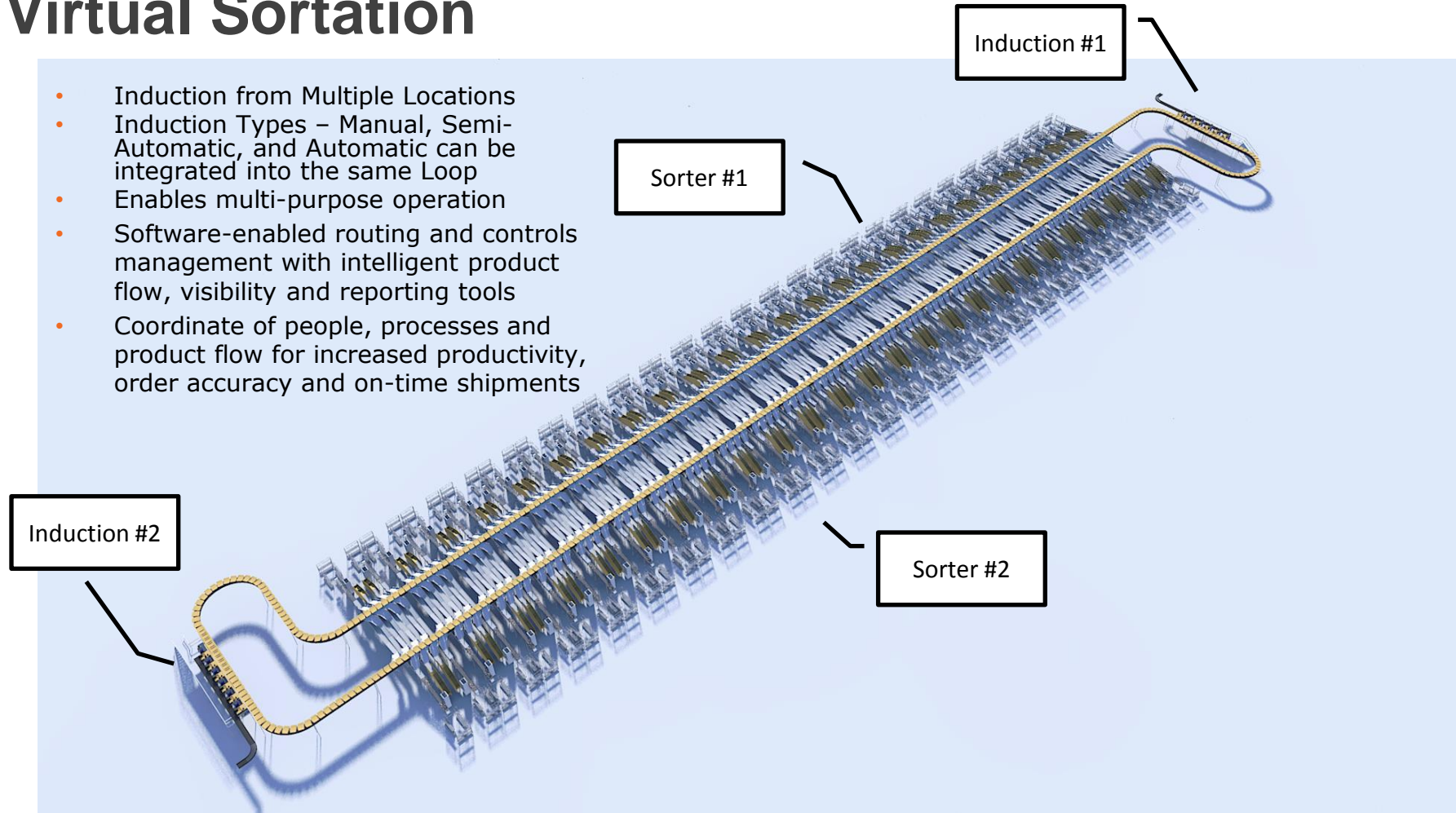
- A unit sorter for sorting the combination of products in one machine such as cartons, polybags and all other odd-sized articles
- Products range from small polybags to medium cartons
- An efficient way of sorting when you are in need of a capacity with a small footprint



- ## Ideal system solution

## Virtual Sortation

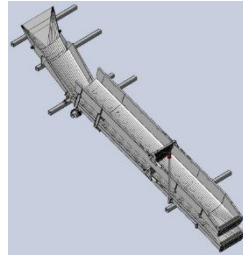
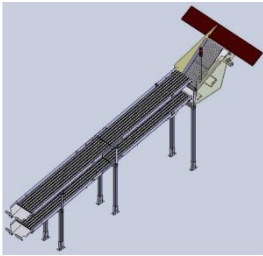
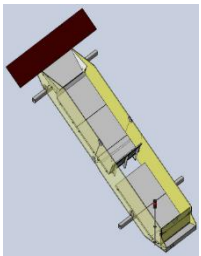
- Induction from Multiple Locations
- Induction Types – Manual, Semi-Automatic, and Automatic can be integrated into the same Loop
- Enables multi-purpose operation
- Software-enabled routing and controls management with intelligent product flow, visibility and reporting tools
- Coordinate of people, processes and product flow for increased productivity, order accuracy and on-time shipments



## Loop sorters as eCommerce solution

### *Packing Sorter Application*

- Purpose
  - To consolidate individual items/pieces into a specific location in which the items will be packed into a carton, container, or bag for predetermined end users and/or stores
  - Once packed the carton, bag, and or container could be merged with additional portions of the entire order and then transported to a shipping sortation system



Packout

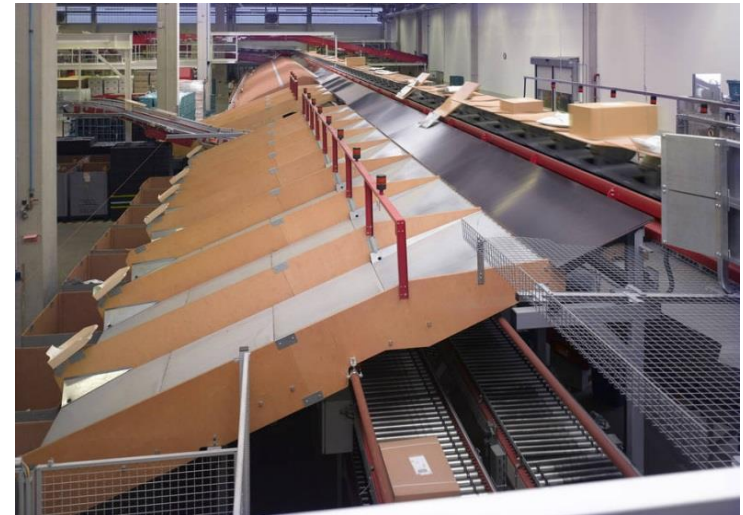
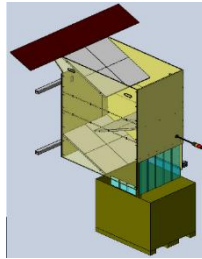
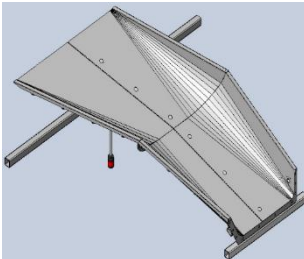
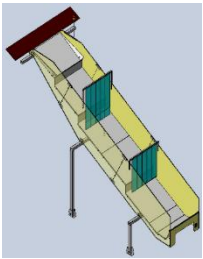
### Suitable applications

- Order Consolidation
- Order Fulfillment
- Store replenishment
- Regional distribution

## Loop sorters as eCommerce solution

### *Shipping Sorter Application*

- Purpose:
  - A shipping Sorter receives and processes items, cartons, bags, etc. from numerous picking/packing locations within the distribution center
  - To consolidate orders that do not require any additional processing other than consolidation within a chute, Gaylord, and/or pallet
- In most cases, considered the last sort prior to truck loading of product to the final destination whether it is an individual, store, or another Company owned Distribution Facility located in another geographic area for additional processing





## Loop sorters as eCommerce solution

### *Returns Sorter Application*

- Purpose:
  - In most case a Returns Sorter is associated with items that have been returned by individual end users or stores for credit based on an array of issues
  - Once processed and evaluated , the items are transported to specific destinations that have been pre-determined based on categories that have been pre-established



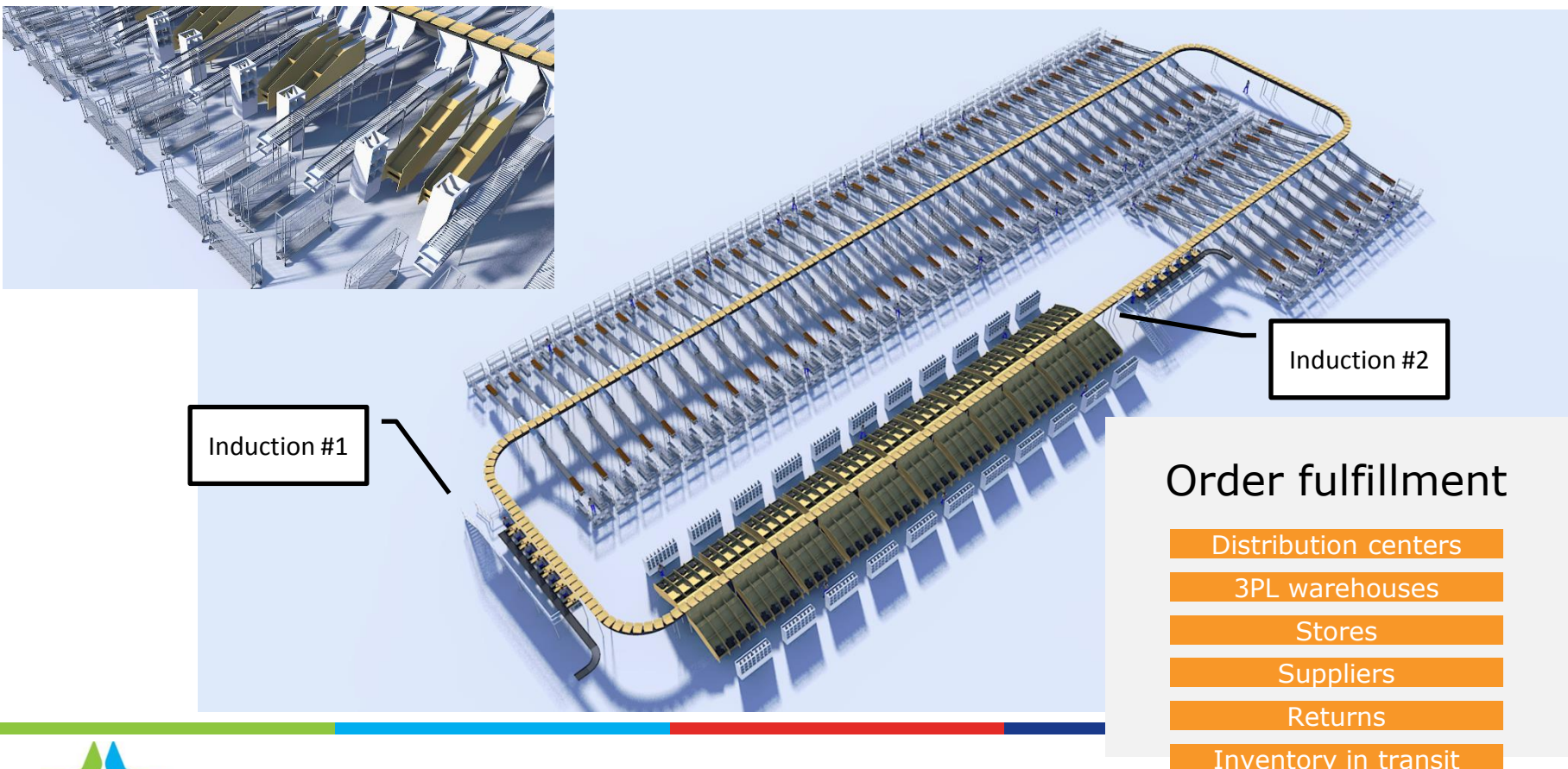
#### Possible dispositions

- Potential for re-sale
- Damaged/destroyed
- Return to stock
- Re-introduce at a later date

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## Omni-Channel Sorter

Shoe and Apparel



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## Thank You for Attending !

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## ***For More Information:***

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