

Distribution Center MANAGEMENT

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Managing people, materials and costs in the warehouse or DC

From the Golden Zone

Doing more with less – Automation is not always the best answer

By Robert Footlik

Recently a client who was using a conveyor system in his DC asked whether a cart picking system or a conveyor system would optimize his operation in a new space. It's true that a conveyor system can reap large returns in the right operation. Yet a careful analysis often shows that in many environments, a basic cart picking system offers increased productivity and flexibility.

Consider two basic layouts, one using a conveyor (Figure A) and the other set up for cart-based picking (Figure B). Both plans incorporate "hand stacking" of larger or super-fast moving products in pallet racks; smaller size fast-moving materials in a carton flow rack; much smaller, fast moving items in shelving row "end caps" (facing the pick aisle); and the remainder of the materials in shelving with 3-ft. wide aisles. The net area in each plan is identical (approximately 7,500 sq. ft.). But that's where the similarities end.

"Dead" travel and replenishment issues

Follow the picker's path in Figure A as shown by the arrows. Everything starts at the upper left, where the picker begins selecting the larger and more popular items from the pallet and carton flow racks. Following the conveyor, the picker then reverses his direction, picking from the shelving. Once he has traversed half of the shelving, he has the option of continuing down the second

part of the shelving or sending completed orders directly to packing. The minimum walk is 237 feet and the maximum path is 463 feet. Of this travel 54 feet, or 23 percent, is spent in nonproductive walking back to the starting point.

This assumes that only one or two pickers are stationed in this area. If more are added, the conveyor divides the space into two separate zones and each picker will travel in the direction of the conveyor as they pick, *and return to their starting point empty handed.* The maximum total travel is then over 720 feet, *with 50 percent of their time spent in nonproductive travel.*

Thus, adding more people or zones will not save any time or add more efficiency. In fact productivity may diminish because orders must be held between picking stations. (One way to reduce this problem is by adding "take away" conveyors that will fit between the picking conveyors.)

A larger problem is restocking. This will require more time because the central restocking aisle is located well away from the fastest moving items. The result is a substantial increase in travel, with only a small quantity of stock per trip. Certainly the conveyor can be used for stocking during non picking times, but the random nature of how materials arrive will result in sorting and "dead" walking to move the goods along the conveyor in storage sequence. There is also the extra handling involved with removing the goods from the pallets to load the conveyors.

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Carts offer flexibility, productive travel

In Figure B the pickers will be using a multi-shelf cart. This will allow them to pull multiple orders as one batch, bypass each other, and work independently to complete their orders. There is considerably more flexibility for both picking and restocking; and full accountability if one individual performs all the work on an order.

Under this scheme the minimum walking distance is reduced to 182 feet, which is a 23 percent saving over the minimum conveyor pick path. More importantly, *there is no dead walking*. Picking can take place anywhere along a route that begins and ends at the packing/order finishing area. Negotiating the full route requires 278 feet of walking, a reduction of 40 percent over the full conveyor path. Here too picking can be performed anywhere along the entire route.

The savings do not stop at this point. Since the short route incorporates over 1,600 SKUs in the shelving (with an additional 100+ items in the quick pick locations), “data mining” indicates that this can cover 60 to 70 percent of all the orders processed. The net travel saving is then approximately 42 percent of the shortest conveyor picking route on the majority of the orders.

There are also huge savings to be made in restocking. With wider aisles in front of the quick-pick locations, stocking from incoming pallets becomes a simple matter of rolling full pallets into position in the rack, or hand-stacking materials directly from mixed pallets onto the racks or shelving.

In the unlikely event that a conveyor is added at a later date, the layout in Figure B has been planned with an 11'-9" aisle initially and the conveyor can be added on this side of the room in a matter of hours. On the opposite side the carton flow racks in pallet racks will need to be moved back approximately 4 feet to accommodate the new conveyor. This work could easily be accomplished on a weekend.

On the other hand, if more storage becomes necessary under the cart system, the 11'-9" aisle can

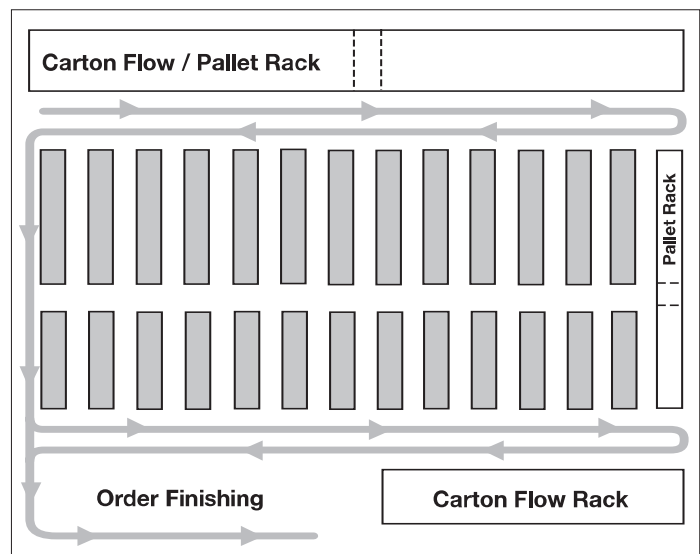


Figure A. Conveyorized picking path.
The shelving sections are denoted in gray.

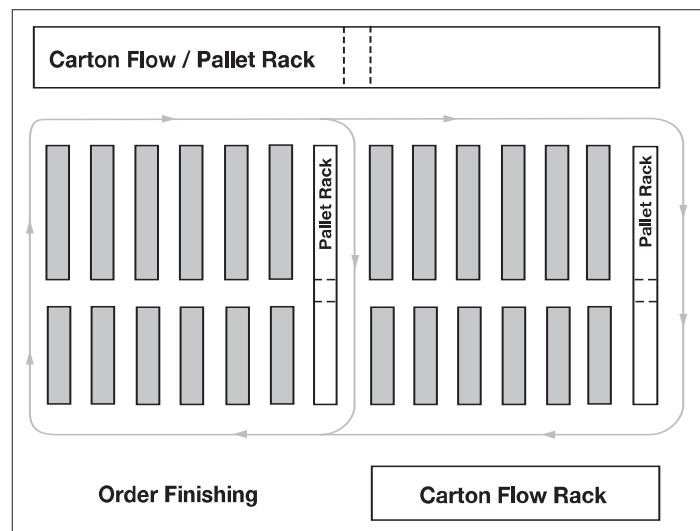


Figure B. Cart picking path.
The shelving sections are denoted in gray.

be reduced to 8'-9" with the addition of 28 more sections of shelving (10 percent more capacity).

Under these circumstances, making the change from conveyor to carts while reengineering the layout has a high probability of success, with little or no downside.

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