

Appendix B: Best Practices

Best Practice: Cross-Docking

SCOR Process Number: D1.8 / D1.11 / D1.12 / ER.6

SCOR Process Name: Receive Product from Source or Make /

Load Product & Generate Shipping Docs / Ship Product / Manage Return Transportation

Unique Best Practice Title: Cross-Docking

BEST PRACTICE Need Indicators:

- Need to consolidate and reduce safety stock and inventory cost, while meeting the economics of large shipment sizes
- Constrained distribution center capacity
- Perishability of products
- Excessive inventory and cost
- Need for improved inventory velocity
- Need to bundle pallets and shipments
- Need to improve carrier utilization
- Transportation costs
- Operating costs

BEST PRACTICE Definition/Description:

Cross-docking is a practice used in many distribution centers (DC) as a strategy to reduce inventory levels by increasing inventory velocity while maintaining shipping efficiency. In a traditional DC, the receiving process is disjointed from the shipping process; storage acts as an intermediary between the two processes. Cross-docking actively links the receiving and shipping processes. Cross-docking is also an intermediate step between the storage and shipping processes to improve load efficiency. In a DC, both cross-docking (no storage) and traditional (with storage) operations might take place. Both can be considered best practices.

Many types of cross-docking exist, most based on the time it takes to move the inventory through the facility. However, all intend to either minimize or totally eliminate the need to put incoming inventory into storage. Also, all intend to minimize the number of “touches” for each order. The key to accomplish this is to link the receiving activity with open order status. Cross-docking is a planned activity where an inbound shipment has a planned outbound already scheduled. When an item is received and electronically scanned, the system will look to the open order file to find its outgoing order. The item is then moved from receiving directly to the order staging area, order pick area, or into an outbound vehicle. In some cases, shippers will send an Advance Ship Notice (ASN) via EDI to alert the receiving facility that the material is coming. This will allow the receiving facility to more productively schedule order picking and outbound deliveries.

Three of the more common types of cross-docking are:

Transshipment – the order received at the DC is already packaged for delivery to the customer;

Flow-through – some sortation or break bulk is needed when the order is received;

Merge-in-transit – current inventory in storage at the DC is added to the incoming order; many times some type of value-adding activities are performed on the order; this will be discussed under a separate Best Practice.

Cross-docking has some potential benefits for the DC. First, it helps reduce average inventory levels allowing the DC to better utilize its capacity. Second, it can speed delivery of orders to the customers. Third, it can speed cash flow since most billings are done on ship date. Fourth, it can help save transportation costs and improve efficiency of transportation assets. Fifth, it can reduce the total working capital invested in inventory.

Suppliers usually need to make some type of investment to participate in cross-docking with their customers. Customized bar codes, special overpacks, or unique pallet patterns might be required at the suppliers facility to speed the movement of their products through their customer's DC's. However, suppliers that comply with these requirements many times are rewarded with more volume from their customers.

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Affected Supply Chain Performance Attributes/Metrics:

Attribute	Experienced Impact
Reliability	Delivery performance (cycle time) can be reduced for most customers. Might improve based on the ability to avoid some stockouts. Will improve with better on-time delivery
Flexibility	Can improve delivery times. DC flexibility; gives the DC more options for order picking.
Responsiveness	Should go down but also should become more consistent.
Costs	DC inventories will be reduced; labor will become more productive; suppliers might incur an initial investment. Storage costs will be reduced, while handling costs might increase. This increase will be partly offset by a reduction in transportation costs. Will be reduced because of the reduced inventory levels in the DC. DC labor becomes more productive at receiving, put-away, and picking.
Asset Management	Will improve with increased velocity through the DC. Will decrease. Will increase for inventories and possibly for transportation vehicles.

Comments:

These are customer measures.

Cross-docking might also be able to reduce DC storage space requirements.

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Key BEST PRACTICE Success Factors/Implementation Issues:

KSF	Comments
Technology	This application requires the use of some type of Warehouse Management System (WMS) in use at the DC. Preferably, bar codes and RF scanners will allow the receiving function at the DC to become more productive. The WMS needs to interface with the order management system in the DC. Suppliers will be more valuable if they have EDI capabilities as well as bar code generation capabilities. The WMS also needs the ability to pass all final destination information to the cross-docking operation in order to create accurate, multi-stage movements that would route the order from the point of receipt to the customer. The use of ASN's is highly beneficial. An ASN is an electronic (EDI) message called an Advance Ship Notice. The shipper sends it to the receiver as a notice that a shipment has been sent.
Policies/Procedures	A strong relationship with the supplier is necessary. Agreements between the supplier and DC would be necessary on the following: <ul style="list-style-type: none"> • which products • documentation/labeling (e.g., bar code structure) • packaging • pallet patterns
Training/Education	Training at both the supplier and DC locations will be necessary. For the supplier, training on the specific requirements (as noted in policies/procedures) of a customer must be developed. For the DC, training on how to handle cross-dock product versus standard receipt-to-storage product will be necessary.
Sponsors	Upper management at both the supplier and DC locations is a requirement since some investment on the part of both parties might be necessary. Plus, the supplier might see an initial increase in operating costs.
Shared Vision	Since this is a collaborative agreement between a supplier and its customers, a shared vision of the following is required: <ul style="list-style-type: none"> • goals • types of information sharing • understanding of roles and responsibilities • risk-reward results • review periods
Measures/Milestones/Feedback	An analysis needs to be undertaken to understand the impacts of cross-docking at the DC for: inventory levels, speed through facility, put-away productivity, and pick productivity before and after implementation. The supplier needs to monitor implementation and operating costs. Usually, the DC will also generate supplier compliance reports on a quarterly basis.
Rewards/Recognition	Continued compliance by the supplier should result in preferred supplier status from the customer. DC productivity improvements are major KPIs in most organizations.
Guidance Structure and Process	A detailed plan for implementation should be developed. Many retail organizations have Centers of Excellence for best practices that help implement new processes at DC's.
Quick Wins/Local Innovations	Most implementations begin with one or a few selected suppliers across a limited number of products. This works best with high, stable volume products.

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Comments:

Possible implementation difficulties are outlined below:

Hurdles surrounding the packaging of products in quantities/ sizes required for cross-docking: Usually there is not much of a value proposition (that a company planning to cross-dock) that can be offered to the suppliers. It puts the onus of extra handling of products on the supplier, for the benefit that the cross docking company can reap.

Efficient management of dock doors: Generally dock door availability (and staging space around the doors) is the bottleneck in many warehouses. Cross-docking calls for very efficient management of these resources. This again could mean limited and predefined time windows for vehicles to be at the dock.

Cross-docking requires sound transportation planning. Inbound loads must have a corresponding outbound door. In order to meet operational efficiency targets, the outbound loads have to have significant mass (preferably heavy LTL or Truckload). Finally, goods must transition of the outbound dock as quickly as possible without disrupting operations or requiring storage.

In a situation where rainbow (mixed product) pallets are received into a DC for cross-docking, inbound transportation costs per pound would be higher than for the movement of straight (single product) pallets. This occurs because rainbow pallets cannot be stacked on top of one another in a transportation vehicle. However, rainbow pallets highly maximize DC efficiency because there is no need to break down the pallet. Outbound transportation costs will not be affected.

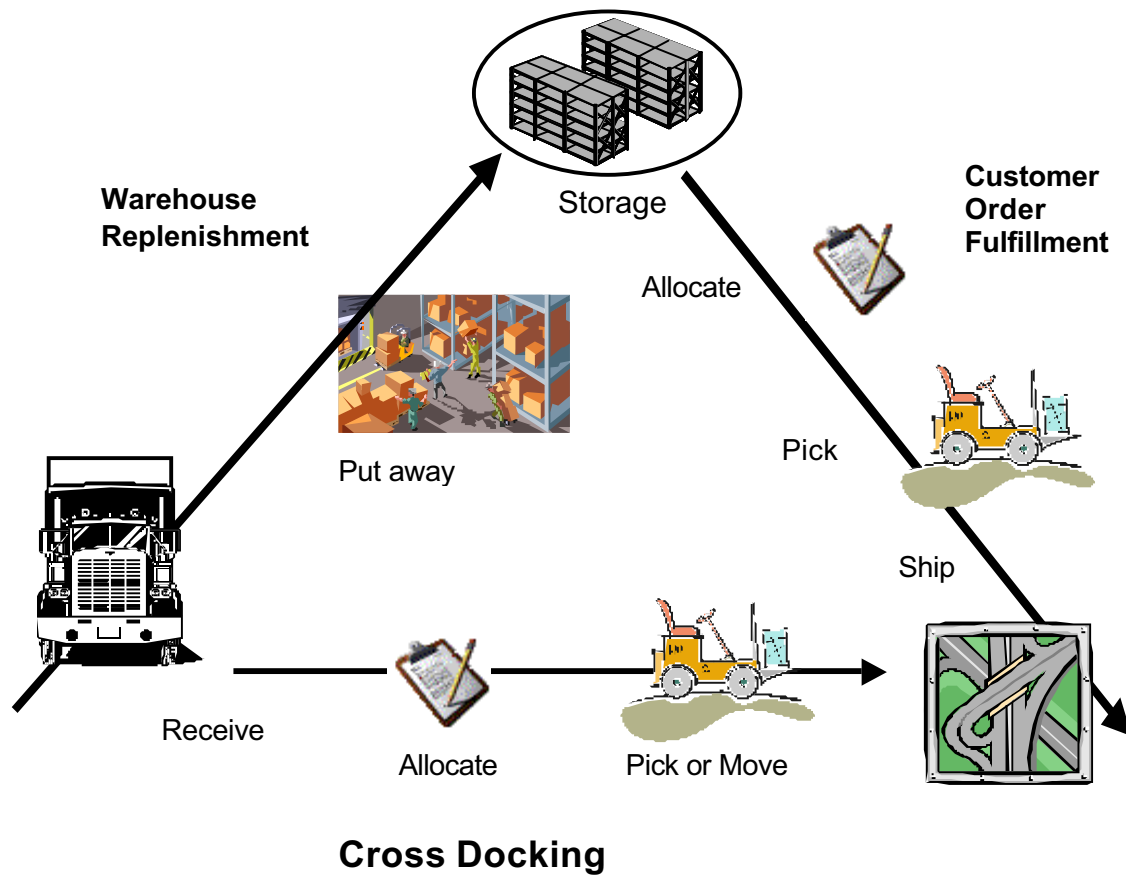
Discussion of Relative Costs of Implementation:

Both the supplier and customer will require investment in technology, if it does not already exist. This would include, but not be limited to: WMS systems, bar code capabilities, RF scanners. Increased labor costs at the supplier locations might occur. Training costs and lost productivity during initial phases of the implementation are likely to occur.

Profile of Company where this BEST PRACTICE is most applicable:

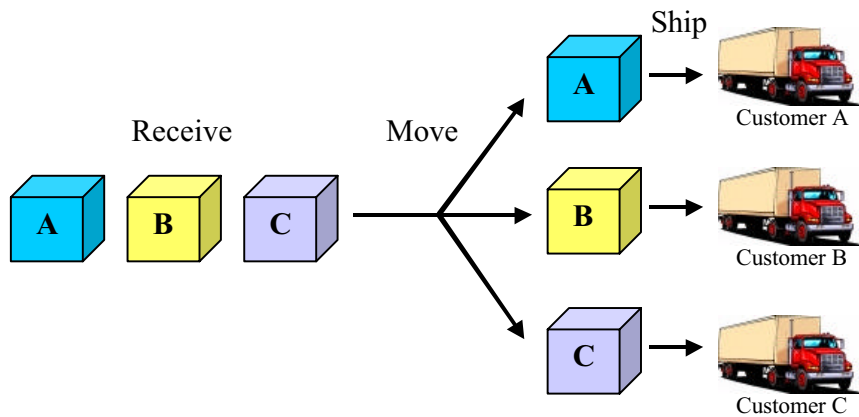
Mostly seen in environments where demand is high and fairly stable for items in a DC. This also works well for seasonal or highly perishable items. Most orders received by the DC are multiple line. This is a very scaleable process across many industries. This practice would probably not be applicable to the distribution of chemicals in bulk. Also works well when minimum pick quantities in the DC are at the case level and where some types of conveyor systems are in place. Frequently seen in the retail sector. Can increase the benefits to transportation consolidation efforts of less-than-truckload into truckload shipments.

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Courtesy: Robert Novack, Penn State University, University Park

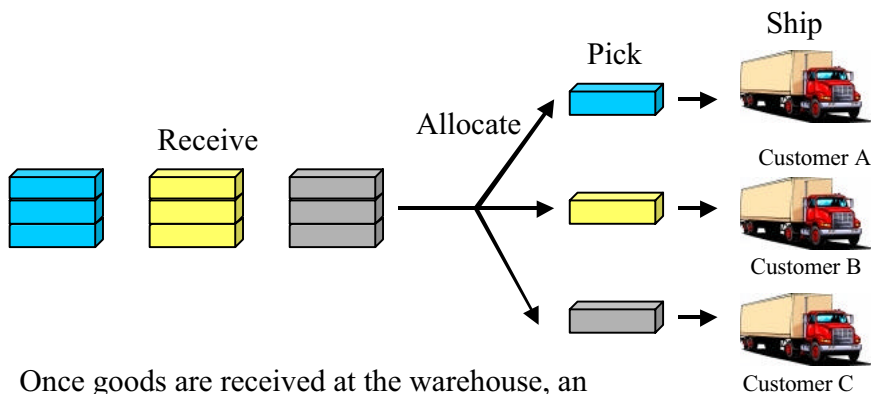
Transshipment



Inbound loads are packaged and designated for a specific customer before they arrive in the warehouse

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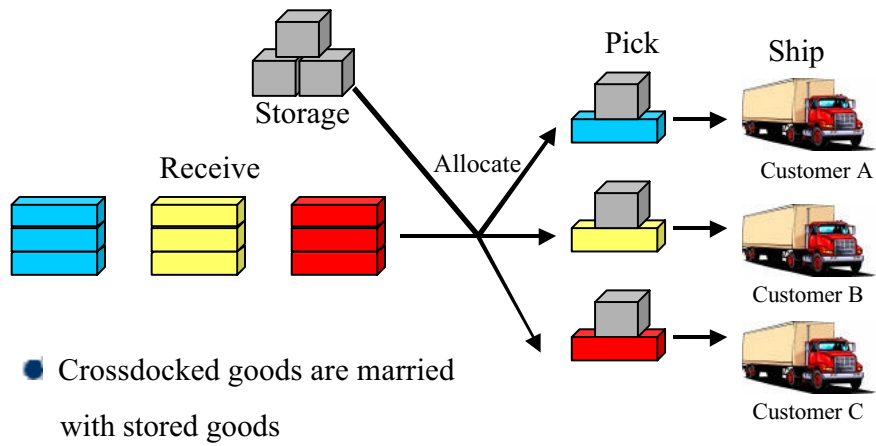
Flow Thru



Once goods are received at the warehouse, an allocation process determines where *components* of the load are destined

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Merge-In-Transit



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