Space Optimization and Utilization
What to do when your distribution center is out of space

By: Mike Kasperski, Managing Partner, Design Solutions
Introduction

Facility design involves more than just warehouse configuration. It also calls for strategic thinking that identifies long-term goals and sales strategies and a significant amount of cooperation among all parties involved. Despite all of that cooperation, space is a finite resource and creating more space is one of the most valuable things an organization can do. “Finding” new space and better utilizing it is a much cheaper option than expanding a facility or even building a new one entirely.

When is a distribution center out of space?

Technically, a distribution center is out of space when it hits about 85 percent of its occupancy. That does not only account for the storage area; it includes receiving, shipping and all other process areas.

Why are you already “out of space” at only 85 percent of capacity? The biggest problem companies have to deal with at that point is congestion. When a distribution center becomes congested there is a lot of extra work as a result. More often than not, at that 85 percent level, inventory is starting to get stored in places that it was not intended. Sometimes inventory must be moved in order to reach inventory stored near or behind it; some of the aisle space has been converted to storage space or area that is typically open has been converted to a “staging area” for incoming material.

Think of this problem like a three-car garage. If there are three cars parked inside, there probably is not enough room for your lawn mower, snow blower, yard tools and anything else that might be stored in the garage. If there is room for all of that, one of the cars likely has to be moved out before the lawnmower is removed, and then the car is moved back. While this may not have that great an impact to someone mowing their lawn once per week, if this problem is applied to a million square foot distribution center, it wastes valuable time and labor at each interaction with a SKU and provides a huge opportunity for improvement.

Why do distribution centers run out of space?

Distribution centers usually run out of space for a few different reasons. One is usually really good – and others are not. The good reason is that business is booming. Products are hot and selling fast so naturally the distribution center is well stocked with inventory ready to go. That is not always the case. A distribution center might have been designed to keep two months-worth of inventory on hand. This can make overbuying an issue which might happen when the Purchasing Department gets a great deal on a widget and now six months-worth of inventory is on the way. Where is it going to go? The other issue which comes up for distribution centers is that of obsolete or dead inventory. This includes inventory that is just not moving like it was planned to or inventory that has been around more than several seasons and there is not really much hope in selling it.

The easiest test to do when conducting a distribution center space assessment is the “dust test.” As the assessor is surveying the distribution center, he runs his finger over the
product; if it is full of dust, that means the product has been sitting there a while. If that is the case, the product needs to be moved somewhere else to a less congested spot or a more effective picking area – or even destroyed and/or moved out of the building.

Where should you look for more space?
The best place to find more space in an at-capacity distribution center is “up!” When a distribution center has reached capacity, it has already spread across the floor, and all useable space is typically accounted for. Shipping and receiving are typically floor level processes, but when it comes to the racking, ask if it can extend all the way up to the ceiling.

What are common ways to create more space in your distribution center?
There are two primary ways that people choose to create more space in their distribution centers:
- Extend racking area upward
- Decrease aisle width in racking area

**Extend Racking Area**
The first thing that people think about is extending their racks. Typically, new buildings have an early suppression fast response (ESFR) fire suppression system. Racking is allowed to be within 18 inches of that area. If the rack has not been extended to that upper limit, that would be the first suggestion to do so.

There are some roadblocks to that approach, however. The existing rack uprights may not be sized properly for that or the base plates on the rack may not be sized as well. This is when it is opportune to engage a structural engineer to make sure that is a viable option for the distribution center. Another way to expand upward is to add a mezzanine level. That is a common feature in a distribution center when you look at space that is not being fully utilized. Adding a mezzanine level will essentially double the floor space available.
Much like expanding the racking upward, there are pitfalls to adding a mezzanine level as well. The first factor will be making sure the floor loading will be able to handle the secondary level. With a mezzanine you will have columns and base plates that now drop down to the floor, which could mean they will be in the way of the ongoing processes below. Adding a mezzanine level is a relatively quick and easy way to expand space in a distribution center that is obviously preferable to expanding the entire facility.

**Decrease Aisle Width**

The second option to better utilize space in the distribution center is to decrease the aisle width in the racking area. Typically, a wide aisle is anywhere from 10 to 12 feet. If that can be reduced by several feet, you can save 20 percent of the area, and in some cases, much more. The main consideration with this strategy is determining if this will impact your lift equipment. Will it be capable of working in those narrower aisles? With a narrow aisle, you will be most likely utilizing an order picker or perhaps a turret truck specializing in operating in very narrow aisles. Another potential issue with narrowing the aisle width is that there will be an added expense associated with wire guidance through the narrow aisles.

Another way to better utilize space would be to change the storage medium in the distribution center to a higher density type of equipment (e.g., going from a single-deep rack to a double-deep rack). A double-deep rack will likely require changing to a reach truck for order picking. You could also consider adding push-back rack or a drive-in rack. These options are tremendous for adding storage, but they will force the operation to use a “first in first out” (FIFO) fulfillment strategy because you are limiting accessibility to those back pallets.

What are the not so common ways to create more space in a distribution center?

There are a number of other creative ways that space can be optimized within your distribution center. One such option is to add half-pallet locations. Many distribution centers are simple one size fits all: all pallet locations are sized for the biggest pallet the distribution center will use. That way, no matter what comes in, it can fit in any of the locations. While this may make sense on its face, a lot of that space ends up being under-utilized because many distribution centers will also receive product that comes sized in half-pallet quantity. With a number of half-pallet locations that space can be saved. Many times, we look at that space as “fluid volume” rather than what is in the actual area. If you condense your pallet, you can actually put more pallets, and thus more product, in that same area without a lot of under-utilized space.

Directed put-away is a great way of creating or saving space in a warehouse as well. It is usually directed by a warehouse management system (WMS). Instead of the put-away rules being “put the pallet wherever you want to put it,” which might not optimize the space utilization, directed put-away knows what locations are best suited for what pallets.
This strategy also orders an associate to put a pallet in a specific location, in a specific way, as opposed to letting an associate just put it in whatever way is most convenient.

The other way is to use space that you thought you never had before. Typically, there is space above receiving doors or above shipping doors. You can put pallet rack there and create space to put supplies, slow moving materials, or create a miniature staging for inbound or outbound product that has not been processed yet.

Another trick that many people might not consider is if there is a conveyor down the center of a pick module, hang a shelf above that conveyor. That is an easy way to increase storage location for smaller items or items that are slower-moving because they obviously will not need to be replenished by hand by a fork truck but rather by hand or the conveyor system.

One final creative solution to increase space in a distribution center is to simply store product in trailers. It might sound crazy, but a lot of people will just bring on extra trailers, pay the demurrage charge and allow a temporary storage of product where an organization does not have to pay for a costly expansion of the building. By utilizing a temporary solution, you can eliminate the need to expand the facility because of a peak period which may only last a month or two. The trucks are only needed for several months, and it allows the organization to get past a peak season where space is particularly tight.

Is there a one size fits all solution to solving your space issues?

There really is not one right answer. The answer is usually a combination of a lot of things. Free up space, add equipment, maybe add the trucks into the yard for a temporary solution. There is usually more than one answer, and those answers will be dependent on the details of each individual situation. There is not a “home run” answer that will solve all or your spatial needs. Remember the 85% rule. A distribution center is technically “out of space” well before it reaches 100 percent capacity. The biggest piece of advice to consider is to remember to garage analogy: you still want to get the lawn mower out when you need to cut your grass without having to juggle cars around.

Space Utilization and Optimization Checklist:

- Extend racking area upward
- Decrease racking aisle width
- Utilize a number of half-pallet locations rather than only full-pallet locations
- Use directed put-away through a WMS
- “Find” new space, such as above doors or conveyors
- Look into creative short-term solutions such as storing excess product or material in temporary space, like trailers
- Evaluate current slotting strategy
How enVista Can Help

enVista Facility Design Build Services offer a single point of responsibility, from facility concept to beneficial use of the system, significantly reducing project timelines, internal resource requirements, and overall investment.

enVista's Design Build practice provides:

- Proven, detailed MHE designs that focus on optimizing people, process, space and technology
- Unbiased MHE technology and software selection
- Strong engineering expertise
- Highly capable installation services that focus on implementation speed without sacrificing quality
- Unparalleled program and project management that provides a single point of responsibility for systems integration
- Dependable post-implementation service and support

Our collaborative approach to developing material handling solutions addresses every facet of your operation: people, processes, space and technology. These four cornerstones of facility design ensure that your business will decrease operating costs, increase quality, increase service to your customer and ultimately: increase profitability.

During the Design Build process, enVista's deliverables encompass all aspects of systems integration including:

- Automated MHE systems (AS/RS integrated systems, sortation and conveyance)
- Storage media, structures and mezzanines
- WCS and WES Software
- Process optimization
- Testing, Commissioning and User Acceptance Testing
- Training
- Transition management from systems integration to beneficial use

enVista’s engineers have developed comprehensive tools for developing efficient, state-of-the-art distribution centers. Our flexible, proprietary facility modeling solution in combination with the use of simulation is used in multiple verticals including: business-to-business (B2B), direct-to-consumer (D2C) and retail.

enVista is not solely a material handling equipment (MHE) vendor providing equipment recommendations alone. Rather, our mechanical, systems and industrial engineering teams analyze your distribution center operations and develop process improvements to support your long-term business goals.

We use powerful KPI and labor productivity dashboards which provide real-time business intelligence into your operation. Our team will take ownership of the project from design into selection and through implementation. enVista is a partner that will be a single point of responsibility throughout the project cycle.

The end result is a balanced, efficient distribution center design that meets your company’s individual requirements.

Mike Kasperski, Managing Partner, leads enVista’s Facility Design practice and brings more than 30 years of experience in the material handling industry, including system design and implementation. Throughout his career, Mike has provided material handling solutions for companies such as The Sports Authority, Random House, McGraw Hill, Staples, Kohl’s, Anheuser-Busch, Kimberly Clark, FedEx and many more.

Prior to joining enVista, Mike spent 16 years at Automotion, Inc. performing roles from national Account Sales to President of the Automotion Systems Group where he focused on retail and direct to consumer fulfillment.