

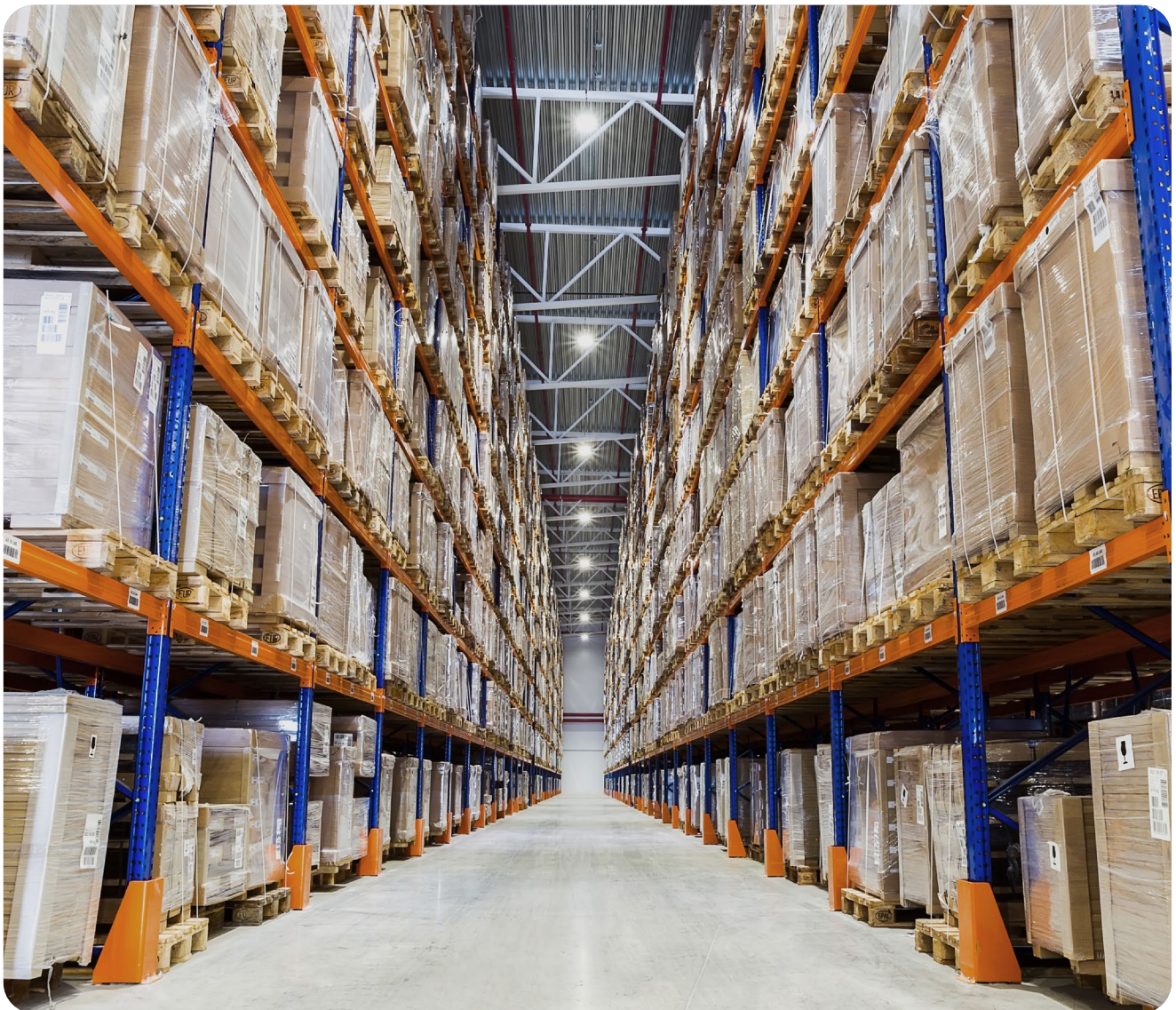


The modern warehouse

Maximizing productivity and capacity

In today's always-on, e-commerce-driven world, customer expectations for a robust product selection and faster delivery times are pressuring warehouses to hit entirely new levels of efficiency.

From average capacity used to on-time shipments, warehouses are continuously challenged to achieve gold standard performance in order to remain competitive, even as they face extreme cost pressures and labor challenges. This means maximizing operator productivity, optimizing workflows to get more orders out the door on time – or else risk losing repeat business – and dense storage configurations to boost capacity. This white paper examines the opportunities and strategies for warehouses to realize the most impactful efficiency gains, based on operational requirements and available technology.



Optimize operator performance

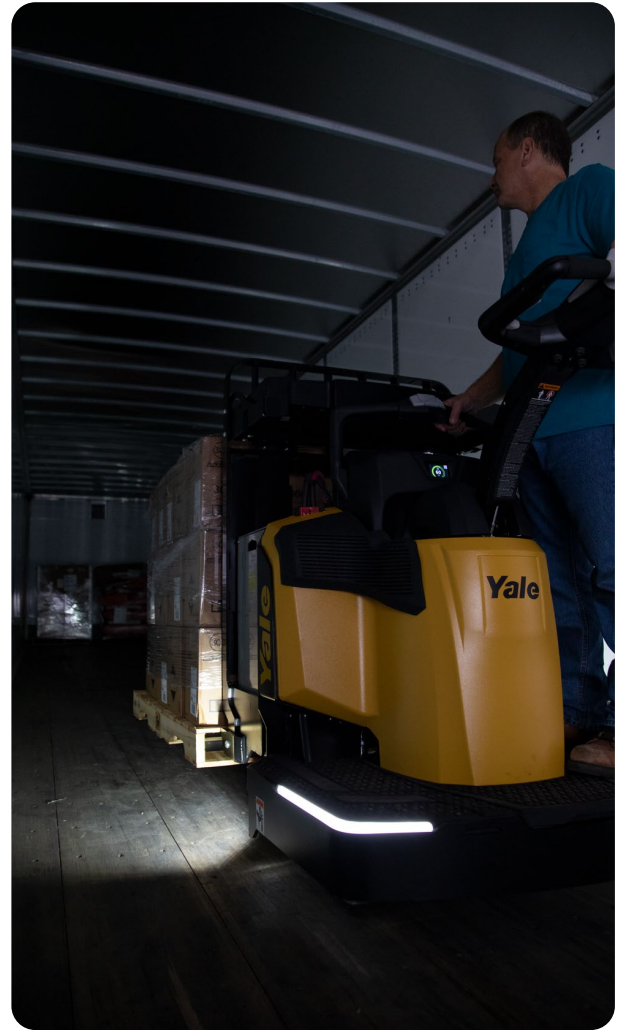
Whether loading and unloading trucks or putting away pallets, best-in-class performance requires labor working to its fullest potential. Optimizing conditions for peak labor productivity is two-fold. For one, environmental factors, such as the inventory crowding, along with the amount of light and room to maneuver, can affect efficiency. Then, factors closely tied to operator comfort and energy can heavily impact performance.

AN EFFECTIVE WORK ENVIRONMENT

To set up environmental factors to enable rather than hinder performance, workspace and equipment must be properly outfitted for productivity. Trailers, for example, can be dark inside, making it challenging for operators to move efficiently and avoid causing damage. Equipment with LED lights installed at their base and forks can provide illumination in poorly lit environments, helping reduce the risk of damage and improve pedestrian and operator awareness. Likewise, equipment characteristics such as a small turning radius and easy maneuverability are essential to maximizing performance.

FIGHTING FATIGUE

The natural enemies of operator productivity are fatigue and discomfort, and their impact can be dramatic. Over the course of a shift, operator productivity can decrease by as much as 30 percent. Operations cannot afford that decline — labor makes up 65 percent of a warehouse's operating costs, so maximizing the productivity of available labor is critical.



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Equipment can help fight fatigue and discomfort, empowering operators to remain focused and efficient all shift long. Look for product characteristics that promote comfort, such as:

- Large operator platform with room to comfortably adjust stance
- Power assisted steering for smoother control and reduced effort
- Cushioning that provides shock absorption and minimizes vibration
- Automotive-style steering for a more natural, familiar feel
- Design structure that provides ample head clearance and line-of-sight
- Adjustable armrest, backrest and steer tiller for comfortable, tailored operating position

Optimize order picking

With labor difficult to find and retain, counting on increased headcount to keep up with growing order volumes is unreliable at best. Instead, warehouses need to do more with available resources and prime their workforce for maximum productivity – especially for the labor-intensive task of order picking.

Picking orders is the foundational process that enables logistics operations to deliver the service levels consumers expect. But picking can be prone to inefficiencies, including significant time spent traveling between pick locations, too many product touches, aisle congestion and time spent lowering goods from storage locations. To combat these inefficiencies, warehouses can deploy select workflow strategies and equipment capabilities.



Suspended floor with pedal-free operator sensing system



Automotive-style steering/ample line-of-sight and head clearance



Adjustable armrest, backrest and steer tiller



LEVERAGE THE GOLDEN ZONE

A full 80 percent of high-velocity, fast-paced order picking movement typically comes from just 20 percent of SKUs, making slotting strategy an important opportunity for optimization. Organize storage based on product movement so that the items that need to be picked most frequently are in the most convenient pick locations, also known as the ergonomic golden zone. Arranging slower-moving SKUs above medium and faster-moving ones can enable pickers to most efficiently use time and energy and minimize reaching and straining to access goods.

PICK THE RIGHT PATH

Best-in-class operations minimize travel time for pickers, both on foot and on lift trucks, so that they can spend more of their time actually picking orders. Minimizing travel time and complex picking paths by limiting the range of aisles a picker covers and other tactics can help save time and minimize product touches, damage and aisle congestion. Equipment features can also help, such as the ability to move pallet trucks between pick locations without requiring operators to climb back on.

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Optimize storage

Two key trends work together to produce surging demand for warehouse space. The introduction of more players in the e-commerce space and consumer demand for greater product selection leading to SKU proliferation presses those e-commerce players to store and move larger inventories. But even though there are historic levels of warehouse space available, warehouse rent keeps rising and vacancy rates aren't budging.

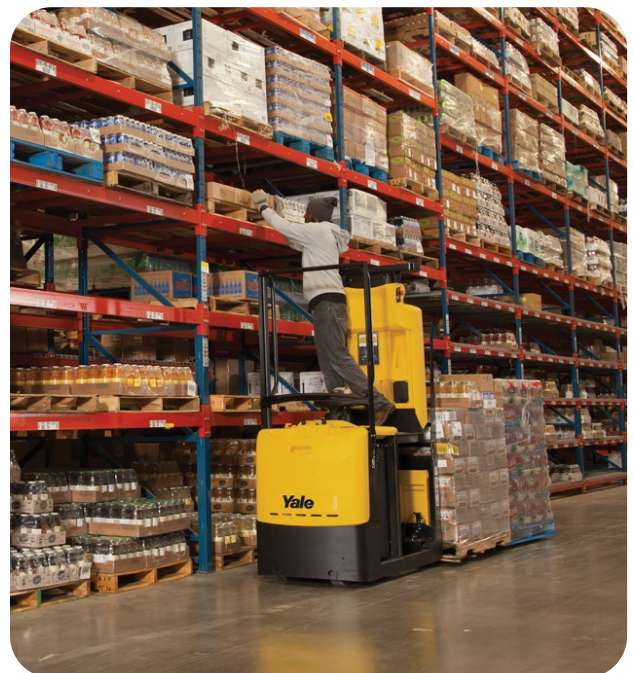
Unfortunately, operations can't afford to overlook space challenges – capacity has become a critical measurement for high-performing warehouses. In fact, average warehouse capacity used was identified as the single most popular benchmarking metric in the 2020 Warehousing Education and Research Council DC Measures Report. Space constraints impose limitations on the inventory warehouses can store, and consequently, the customers they can serve. Warehouses with insufficient storage and overflowing inventory may unintentionally result in inefficient slotting and storage methods, which can lead to disorganized picking practices and longer travel paths.

What are operations to do? With capacity constraints and pressure to do more with less, the logical step for a warehouse is to increase storage density. The good news is there are multiple effective tactics that can increase density, including vertical and double-deep storage configurations, narrower aisles and smaller, more maneuverable equipment.

RECLAIM SPACE

By definition, a warehouse is a place to house goods, but not all space within is reserved for storage. Space is consumed by a number of other things, including lead-acid battery charging, maintenance and storage rooms.

In addition to productivity and sustainability benefits, advanced lift truck power sources such as hydrogen fuel cells or lithium-ion batteries are not as space-intensive, in part because they allow operations to reduce to a ratio of one power source per lift truck, whereas they would typically need to stock two to three lead-acid batteries per lift truck due to lead-acid battery charging cycles. This helps reduce the need for significant designated indoor room and provides an opportunity to recover and repurpose that space for added capacity.



SAME SPACE, MORE STORAGE

Much like skyscrapers maximize usable space in cities, warehouses capitalize on their existing footprint by building up, rather than out to take advantage of unused cubic volume. Equipment such as reach trucks, designed to lift loads at height, are essential tools for operations to take advantage of higher-level storage locations.



To make this strategy effective, characteristics that support operator comfort, speed and precision such as ergonomics, lift speed and operator visibility must be evaluated to ensure that the increased storage capacity does not come at the cost of significantly more time and energy required to service elevated locations. For instance, an operator may lack the necessary confidence and precision to reach productivity targets if the design of the equipment does not provide sufficient visibility to see forks and load when picking or placing pallets at height. Similarly, an ergonomic design helps fend off fatigue and discomfort to keep operators fresh and productive all shift, even while maneuvering in tight spaces and servicing elevated locations.

Warehouses can also store two pallets at a single location to increase storage density. Equipment with double-deep reach capabilities that efficiently service storage positions two pallet loads deep can enable up to 50 percent more capacity than single selective racking, without compromising fast storage and retrieval. Faster lift and lower speeds can quickly add up when servicing higher-level and double-deep storage— just one additional pallet move per hour can amount to seven percent greater productivity.

How else can warehouses squeeze more storage capacity from the same footprint? Consider a standard, 12-foot-wide warehouse aisle. An operation with 4-foot loads could save 40 feet by narrowing the widths of their aisles to 8 feet and utilizing reach trucks, which are capable of operating in those narrower aisle widths. In that saved space, they could set up two additional aisles and still have additional freed space left over, available for use.

Optimize, then re-optimize

The forces pushing warehouse operations to innovate are not slowing down, in fact, many are accelerating. For today's warehouses, there's a fine line between struggling and thriving, and the extent to which they are able to optimize their operation can be the deciding force.

Performing at a high level requires constantly re-evaluating strategies, workflows and technologies. A partner that has the breadth and depth of solutions to identify the most effective options for top performance throughout an operation can better position a business to get the most out of what they have.



To learn more about comprehensive warehouse solutions by Yale, visit www.yale.com.