

White Paper

Calculating the Cost of Storage Space



Space – the next savings frontier

Regardless of where in the U.S. your manufacturing or distribution operations are located, square footage is a significant cost. By implementing automated storage and retrieval systems, you can maximize your inventory density and reduce storage space costs.

While industrial square footage used by manufacturing and distribution operations throughout the U.S. may be a bit easier to come by, the cost of rent depends on where the facility is located. The Cushman and Wakefield Marketbeat Report reveals the U.S. industrial vacancy rate fell 26% YoY to 3.2% in Q2 2022 – an all-time low. Further, vacancy rates are expected to remain under 4% through the end of 2022 before seeing some relief in 2023.

Aggressive competition for industrial space continues to increase rents – in Q2 2022 industrial asking rent increased 19% YoY – the most significant increase ever reported. Rental growth is projected to continue for the next few quarters and will remain high for the foreseeable future.

Looking at the industrial construction pipeline, construction has ticked up since last year. The industrial construction pipeline reached 699 million square foot (msf) in Q2 2022, another high for the market with the South accounting for 46% of the total industrial construction pipeline. The size of the pipeline alone reveals the possibility of oversupply, but low vacancy rates across the country demonstrate how desperate the market is for space.

This puts warehouse and distribution centers in a bind – not only is there limited industrial space available, but it's more expensive than ever.

Table 1: U.S. industrial space by region vacancy & asking rent year over year¹

Location	Overall Vacancy Rate Q2 2021	Overall Vacancy Rate Q2 2022	Average Asking Rent PSF Q2 2021	Average Asking Rent PSF Q2 2022
Northeast	3.9%	2.9%	\$ 8.22	\$ 10.74
Midwest	4.3%	3.5%	\$ 5.33	\$ 5.96
South	5.1%	3.7%	\$ 5.96	\$ 6.98
West	3.3%	2.4%	\$ 10.16	\$ 12.74
US Average	4.3%	3.2 %	\$ 7.03	\$8.36

As shown in Table 2, average asking rents per sq ft vary slightly depending on the type of space. Costs differ whether the space is in a manufacturing facility – holding work-in-process (WIP), components or spare parts to support equipment repairs in a maintenance and repair operation (MRO) – or in a distribution center (DC), holding inventory for shipment to customers.

The outlook details rents will continue to increase, growing at a modest pace. Although most operations have a clear grasp of how much each of their facilities' square footage costs annually, very few have taken the time to calculate the true cost of space in terms of storage density – and how those costs impact the bottom line.

Table 2: Average asking rent per square foot (PSF), manufacturing vs. distribution²

Location	Manufacturing Q2 2022	Distribution Q2 2022
Northeast	\$ 7.27	\$ 11.25
Midwest	\$ 5.83	\$ 5.40
South	\$ 5.77	\$ 6.21
West	\$ 13.87	\$ 11.10
US Average	\$ 7.70	\$ 7.47

Typically, manufacturing and distribution facilities store non-palletized inventory (cases and eaches) in one of two ways:

- On traditional, static commercial or industrial shelving³ made of upright posts, with formed steel sheet panels as horizontal shelves, and end and back braces or sheet steel back and side panels for support.
- On pallet rack⁴ with bases, posts and decking material provide larger format storage of unit-loads of bulk materials.

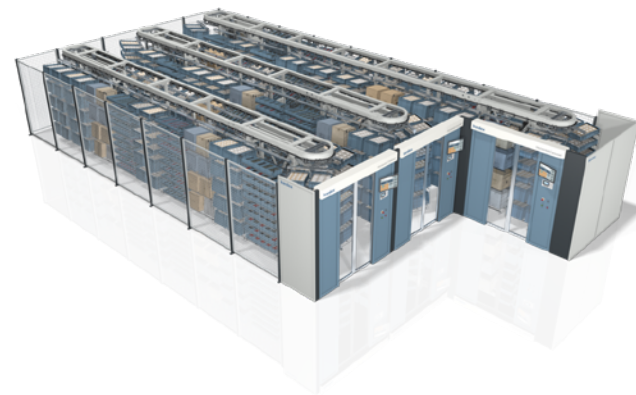
Automate to save space

To minimize square footage expenses, regardless of the type of facility in operation or its location within the U.S., it makes sense companies would want to do more with the space they currently possess. Fortunately, when it comes to maximizing storage density in cases and eaches item handling, another option exists: self-contained, automated storage and retrieval systems (ASRS). These systems offer higher density storage in a more compact footprint than manual equipment can provide. They include:

Horizontal Carousel Module (HCM)

Consisting of bins mounted on an oval track that rotate horizontally to deliver stored items to an operator. These automated storage and retrieval systems save up to 60% of floor space when compared to standard shelving and rack.

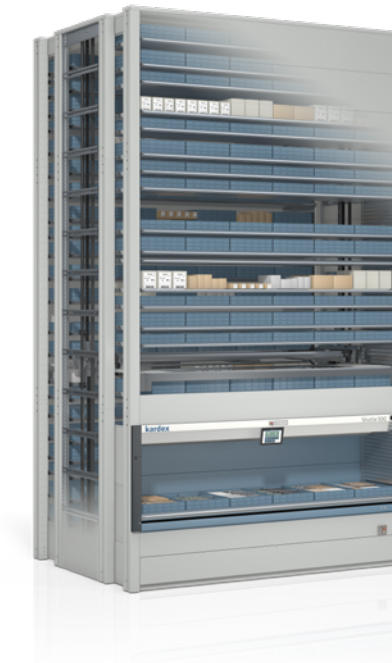
[Learn more about HCMs.](#)



Vertical Carousel Module (VCM)

Comprised of a series of shelves that rotate around a track – similar to a Ferris wheel – these automated storage and retrieval systems quickly deliver stored items to an ergonomically positioned work counter at the operator's command. When compared to static shelving and rack, they save up to 75% of floor space.

[Learn more about VCMs.](#)



Vertical Lift Module (VLM)

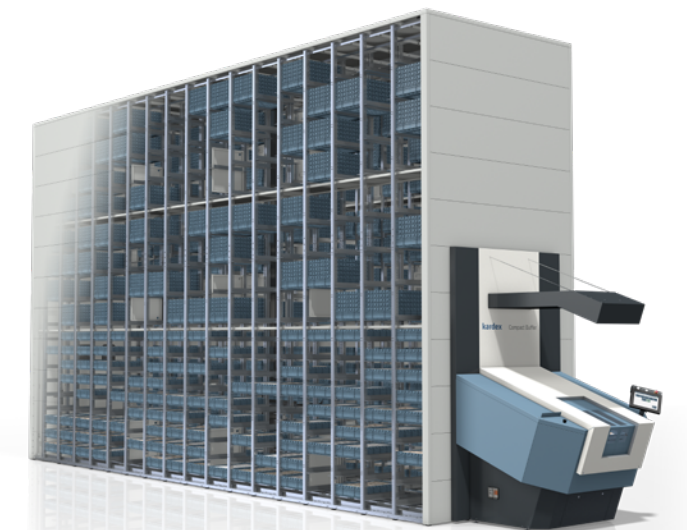
An enclosed automated storage and retrieval system that incorporates two columns of trays with a central inserter/extractor that automatically locates and retrieves stored trays from both columns, then presents them to the operator at a waist-high pick window. These systems save up to 85% of floor space compared to static shelving and rack.

[Learn more about VLMs.](#)

Vertical Buffer Module (VBM)

In the middle of a multi-segment shelving system is an aisle, where a moveable mast with a telescopic gripper operates. The control unit sets the gripper in motion picking a bin and transporting it to a picking station.

[Learn more about VBMs.](#)



Investing in automation

Implementing one of the four types of high-density ASRS immediately reduces the amount of square footage required to store items within static shelving and pallet rack in two ways: one, by utilizing previously unused overhead space, and two, by compressing items stored within the technology for greater storage capacity.

An investment in ASRS enables much more highly compressed storage of the same number of stock keeping units (SKUs) previously held in static shelving, but within a smaller footprint. The resulting increase in available floor space can then be leveraged in one of two ways:

1. By storing a greater quantity of existing SKUs, or an expansion in the number of different SKUs, within the same amount of existing facility space.
2. Through repurposing the space via an internal expansion, such as the adding other revenue-generating activities.



Do the math:
how much does storage space cost?

Depending on the type of ASRS selected, the resulting space savings will range from 65 % to 85%. To determine the potential cost savings associated with replacing static storage shelving or rack used within a manufacturing facility’s parts, stockroom, warehouse or toolcrib area or within a distribution warehouse with ASRS, reduce the current cost of total square footage by a sample 80%.

This figure represents the amount of square footage saved from implementing an auto-mated storage system. To determine the actual cost of the space, multiply the amount by your current rent per sq ft. For example, a manufacturing facility in the Northeast recovering 5,000 sq ft could save over \$36,350 to the bottom line.

5,000 sq. ft. Space Savings × \$ 7.27 Cost per sq. Ft. = **\$ 36,350 Potential Savings**

Do the math:
consider the value of added revenue.

Because an investment in an ASRS will free up anywhere from 65% to 85% of existing square footage currently used by static shelving or rack in a manufacturing parts, stock-room, warehouse or toolcrib area or within a distribution warehouse, the recovered space can be repurposed for other value added—and revenue generating—activities.

 Calculate your potential space savings with ASRS

Adding VLMs and HCMs saves 73% floor space
in DC Dental’s Baltimore Warehouse

Based in Baltimore, MD, DC Dental is the fastest growing, full service dental supplier in the country, delivering competitively priced supplies to dental professionals in the mid-atlantic region. Within their warehouse, the company stores more than 20,000 of the most commonly used dental products – from burs to bibs to curing lights.

The company increased its warehousing volumes by 54% with an acquisition, filling its existing 30,000 square foot facility to near capacity. To accommodate this uptick in inventory, DC Dental moved to a three-zone, pick-and-pass fulfillment strategy that incorporates two, 21-foot-tall Vertical Lift Modules Kardex Shuttle and four 56-foot-long Horizontal Carousel Modules.

By using these ASRS, roughly 13,000 sq ft of shelving was consolidated into 3,500 sq ft – a 73% space savings. This recovered floor space actually allowed DC Dental to reduce the overall footprint of the facility from 30,000 sq ft to 20,000 sq ft.

Further, the company resigned its lease, saving nearly \$1 million dollars in rent and utilities over the next 10 years and further justifying the investment in automated storage and retrieval equipment.



About Kardex

Kardex is a global industry partner for intralogistics solutions and a leading supplier of automated storage solutions and material handling systems. The Group consists of two entrepreneurially managed divisions, Kardex Remstar and Kardex Mlog.

Kardex Remstar develops, produces, and maintains dynamic storage and retrieval systems and Kardex Mlog offers integrated materials handling systems and automated high-bay warehouses.

The two divisions are partners for their customers over the entire life cycle of a product or solution. This begins with the assessment of customer requirements and continues through planning, realization, and maintenance of customer-specific systems. It ensures a high level of availability combined with low total cost of ownership and operation.

Bibliographical references

1. Cushman & Wakefield, "U.S. Industrial MarketBeat Report, Q2 2022" Accessed August 12, 2022 <https://www.cushmanwakefield.com/en/united-states/insights/us-marketbeats/us-industrial-marketbeat>
2. Ibid.
3. MHI, "Glossary>Shelving." accessed August 12, 2022. <http://www.mhi.org/glossary?q=shelving>
4. MHI, "Glossary>Rack." accessed August 12, 2022. <http://www.mhi.org/glossary?q=rack>