

Optimizing Space and Supporting Automation with Elevated Flooring and Mezzanines

New survey reveals the role that elevated flooring and mezzanines are playing in today's warehouses and DCs and highlights the value of composite engineered wood flooring as a surface of choice for these structures.

Introduction

Under pressure to get as many shipments out the door as quickly and safely as possible, today's warehouses and distribution centers (DCs) need all the productivity and throughput that they can get. Short on labor, space, and other resources, these facilities are infusing more automation into their operations in order to do more with less. To maximize their investments in automated equipment, companies also need mezzanines and industrial work platforms that help preserve ground-level areas for time-sensitive activities.

Available in both single- and multi-tiered variations, mezzanines and industrial work platforms add a second or third level to an existing facility. By optimizing vertical space within a building, these elevated platforms help companies expand and accommodate large fulfillment volumes without the need for additional square footage or new facilities.

By keeping automated machinery overhead—versus on the ground floor, where employees are—these structures help companies maintain high levels of safety while also improving throughput and efficiencies.

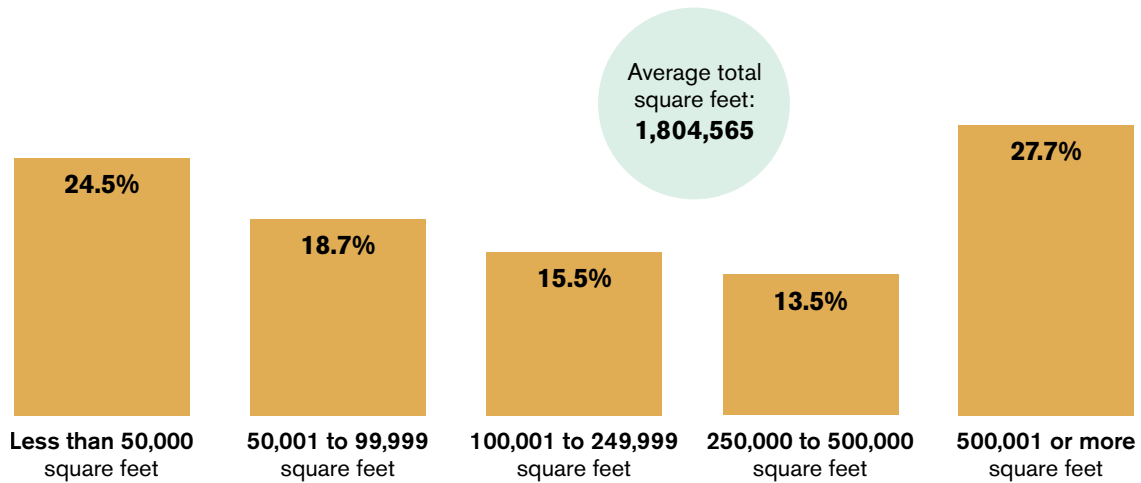
To learn more about how companies are selecting and installing flooring systems to use in their fulfillment facilities, Peerless Research Group conducted a reader survey on behalf of *Modern Materials Handling* for Cornerstone Specialty Wood Products. This study was executed in October 2020, and was

administered via e-mail among subscribers to *Modern Materials Handling*.

Survey respondents were prequalified by being personally involved in decisions related to their companies' warehouse and DC operations. The 227 respondents work in chemicals and pharmaceuticals, retail trade, warehousing and transportation, 3PLs, and automotive and transportation equipment. Their job functions included warehouse, distribution, logistics, or supply chain management, company management, engineering, purchasing, plant management, and IT.

Through this research, Peerless and Cornerstone learned more about the size of warehousing and distribution centers; types of elevated flooring being used in them; plans for elevated flooring; operational challenges and maintenance issues; and the key benefits of elevated flooring solutions.

FIGURE 1



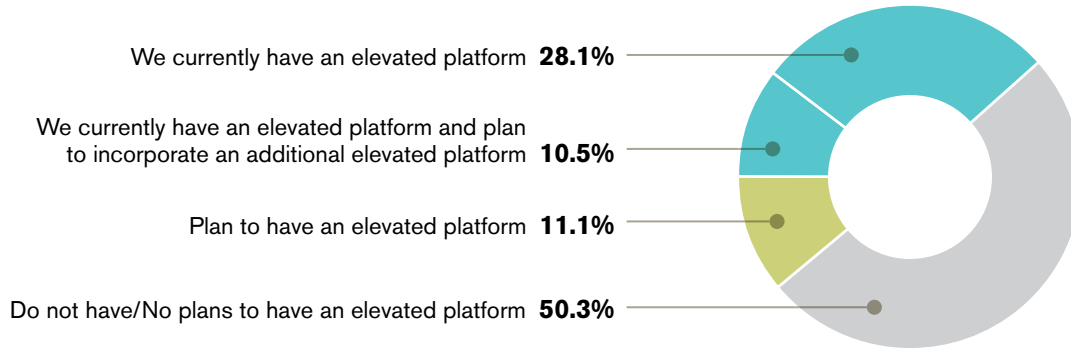
What the Modern Warehouse Looks Like

The modern warehouse is shaping up to be a highly efficient place that's focused on improving throughput while keeping employees safe and supporting their productivity levels.

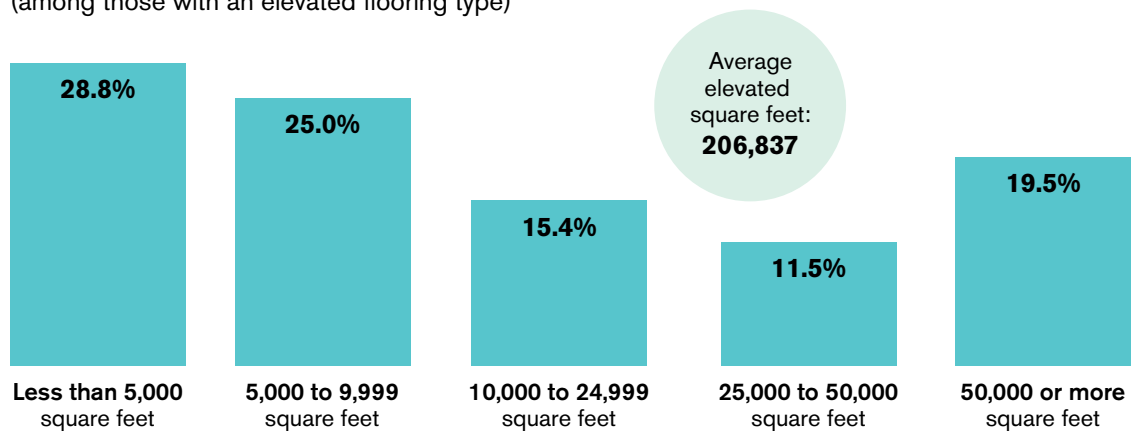
The average total square footage of these facilities is 1.8 million, with 27.7% of respondents working in facilities that are over 500,000 square feet and 24.5% operating warehouses that are under 50,000 square feet.

FIGURE 2

Does your warehouse or manufacturing facility currently have or plan to have an elevated platform, such as a mezzanine, pick module, or catwalk?



Approximately what is the size, in square feet, of your elevated platform?
(among those with an elevated flooring type)



When asked whether they're using mezzanines, pick modules, or catwalks, 28.1% of respondents say they currently use one of these platforms. Just over 10% of companies currently have an elevated platform in place and are now planning to incorporate more platforms into their operations. Another 11.1% say they plan to install one in the future.

FIGURE 3

What percent of the respondents use the three major types of elevated flooring at their facilities?

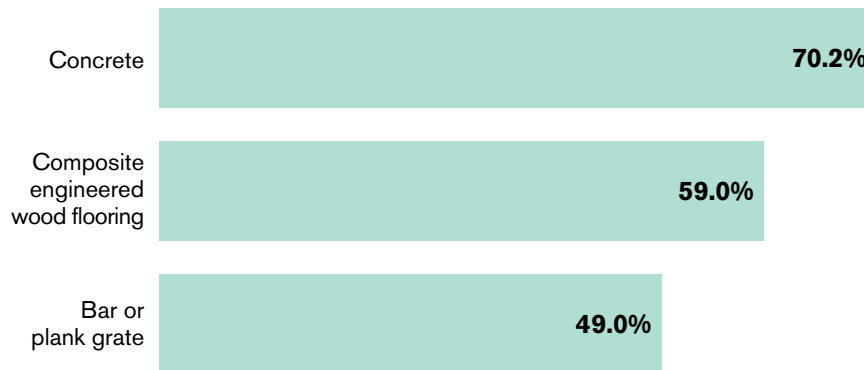
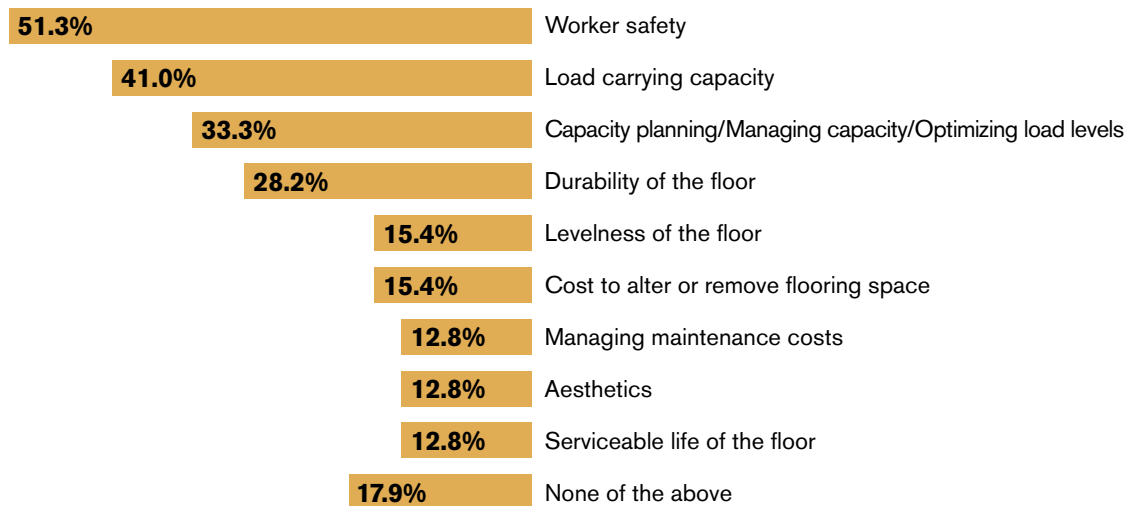


FIGURE 4

What are the main operation challenges with your elevated flooring surfaces?

(among those with an elevated flooring type)



Platform Sizes & Surfaces

Of the companies that are currently using elevated platforms, 28.8% say those structures are less than 5,000 square feet, while another 25% say theirs are 5,000 to 9,999 square feet. On average, the size of these elevated platforms is 206,837 square feet.

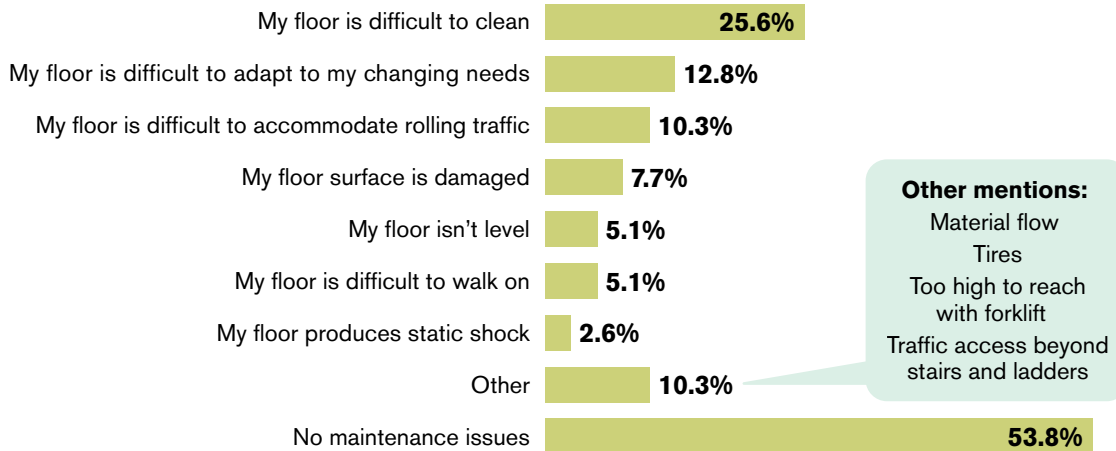
When selecting a flooring surface for their mezzanines, companies have a few different options to choose from. The top three options currently being used for elevated flooring were concrete, engineered wood flooring, and bar grate.

Over half of the companies surveyed (51.3%) says that worker safety is a key concern related to elevated flooring surfaces. Other areas of concern include load carrying capacity (41%), capacity planning and management (33.3%), floor durability (28.2%), floor levelness (15.4%), and the cost of altering or removing flooring space (15.4%).

FIGURE 5

What are the biggest issues in maintaining your elevated floors?

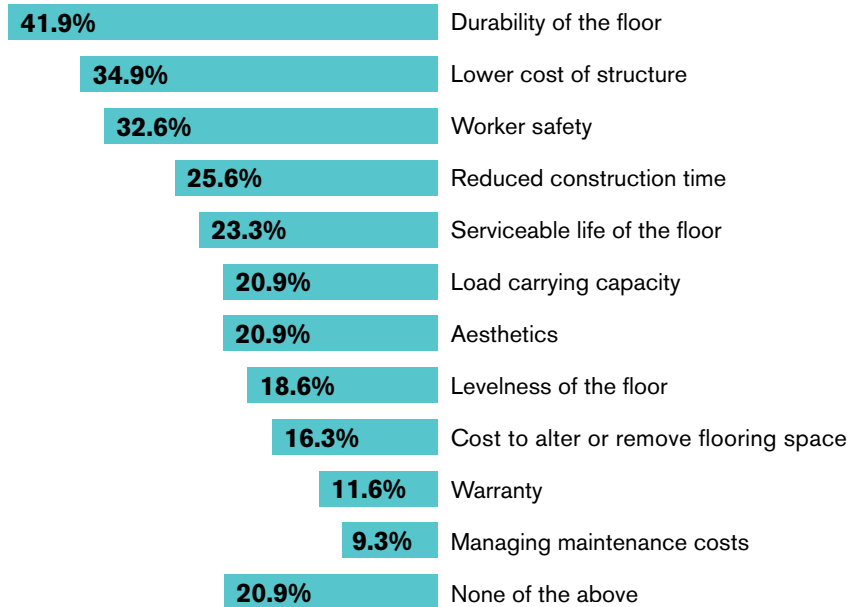
(among those with an elevated flooring type)



More than half (53.8%) of respondents that are using elevated platform flooring say maintenance is not a problem with these structures. However, 25.6% say they do have issues cleaning the floors, 12.8% say the floor is difficult to adapt to changing needs, and 10.3% say the flooring is difficult to accommodate rolling traffic. Others say their flooring surface is damaged (7.7%), isn't level (5.1%), or is difficult to walk on (5.1%).

FIGURE 6

What benefits do you believe can be realized as a result of a composite engineered wood flooring surface?



Composite Wood Flooring Stands Out

For facilities that use composite engineered wood flooring on their elevated platforms, the most prominent benefits are durability (41.9%), lower cost of structure (34.9%), and worker safety (32.6%). Additionally, 25.6% of respondents saw benefits like reduced construction time while 23.3% view the composite engineered wood flooring’s serviceable life as a major plus. Other key wins include high load carrying capacity (20.9%), aesthetics (20.9%), floor levelness (18.6%), and the low cost of altering or removing the floor (16.3%).

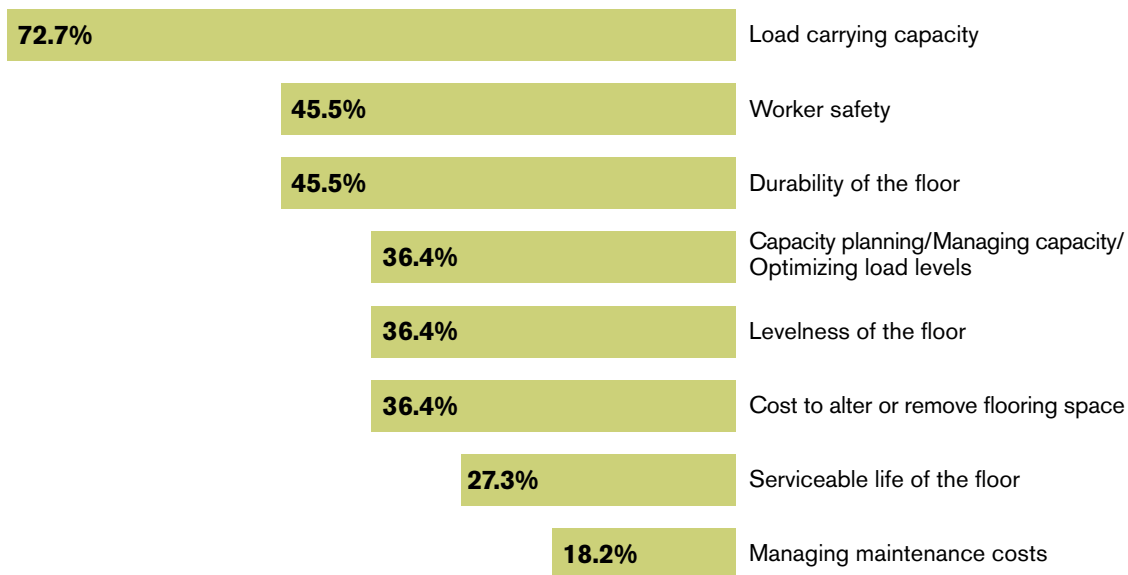
Boots on the Ground

To get a well-rounded view of how elevated platforms are being selected, implemented, and used in today's fulfillment facilities, Peerless and Cornerstone Specialty Wood Products reserved a select number of survey questions for individuals who sell, specify, and integrate these structures in the nation's warehouses and DCs.

An independent 2020 study comparing the cost of three different elevated platform structures, two with concrete decking and one with ResinDek® composite engineered wood decking, found the latter to be 31% to 34% less expensive than the two platforms with concrete. According to the Work Platform Deck Cost Comparison Study, the largest variables influencing these results were the lower installed deck cost and the lower steel cost for the ResinDek® panel platform.

FIGURE 7

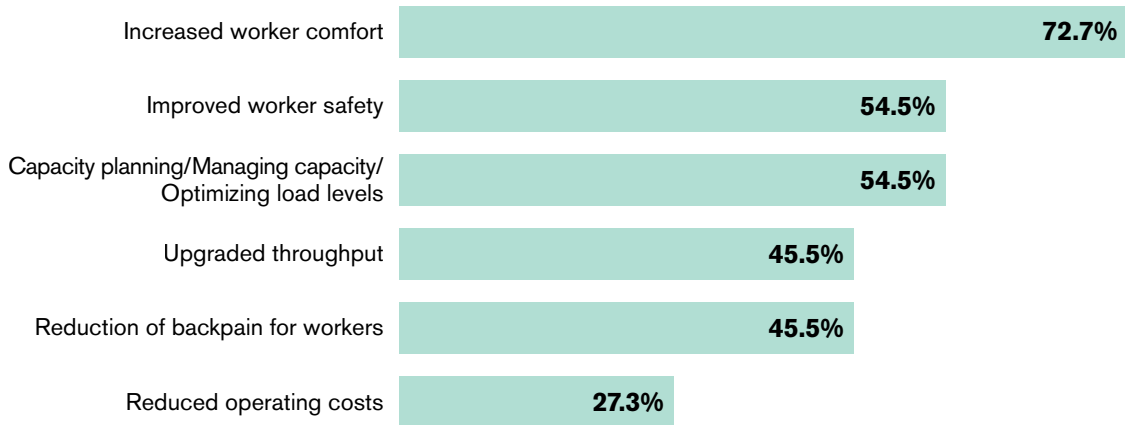
What are the main challenges your customer faces in managing elevated flooring surfaces?



Of the individuals involved with selling, specifying, or integrating elevated platforms in warehouses and DCs, 72.7% point to load carrying capacity as their customers' biggest pain point when managing elevated flooring surfaces. Others say that their customers are dealing with worker safety issues (45.5%) and are concerned about floor durability (45.5%).

FIGURE 8

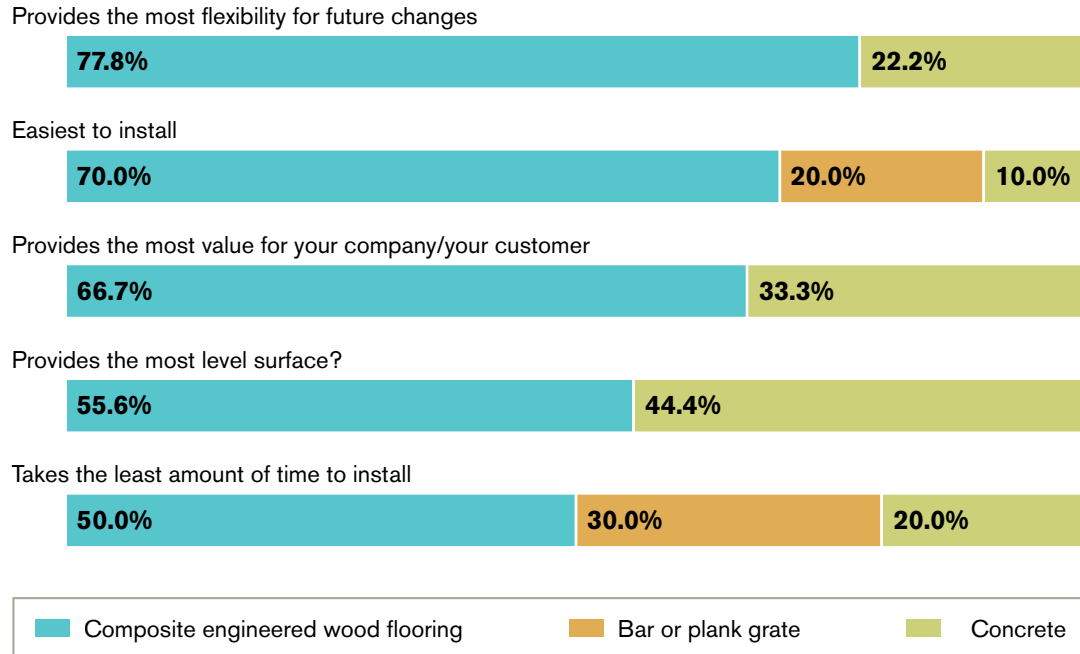
What benefits do you believe can be realized with an elevated platform?



Once in place, elevated flooring produces benefits like increased worker comfort (according to 72.7% of respondents), improved worker safety (54.4%), and improved capacity planning or capacity management (54.5%).

FIGURE 9

For each attribute listed below, which flooring solution do you believe works best...

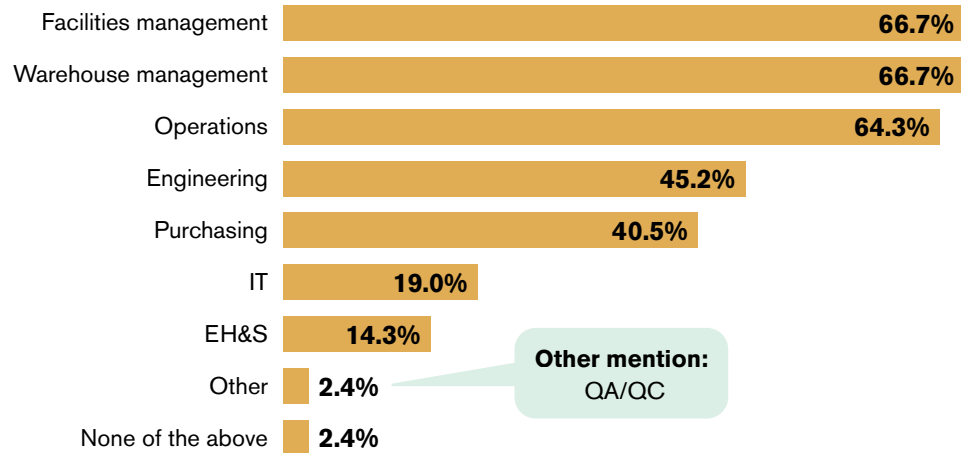


Asked which flooring surfaces work best for their customers, 77.8% of respondents identify composite engineered wood flooring as the surface that provides the most flexibility for future changes. According to 70% of respondents, composite engineered wood flooring is the easiest surface to install, and 66.7% believe composite provides the most value for customers.

Additionally, 55.6% believe composite engineered wood flooring provides the most level surface, 50% say it takes the least amount of time to install compared to other surfaces.

FIGURE 10

Which departments are involved in the identification, acquisition, implementation and maintenance of flooring system projects?

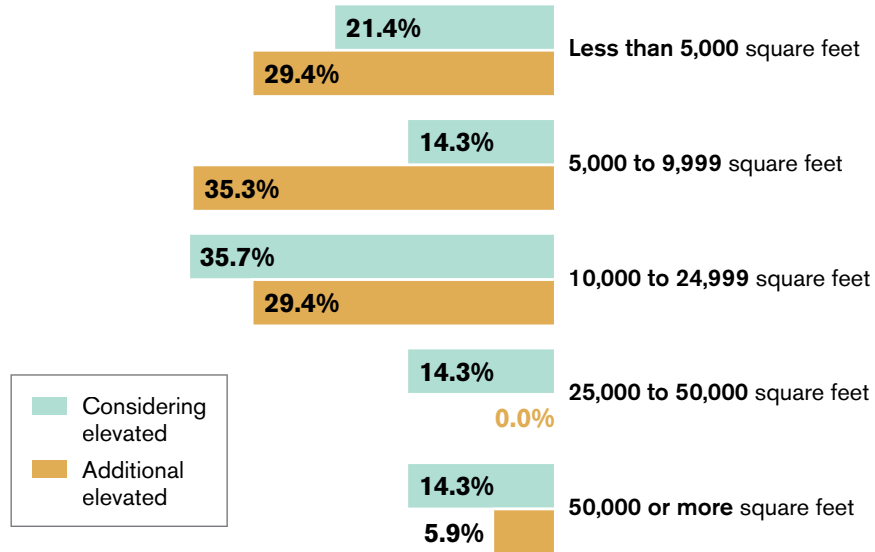


Evaluating the Options

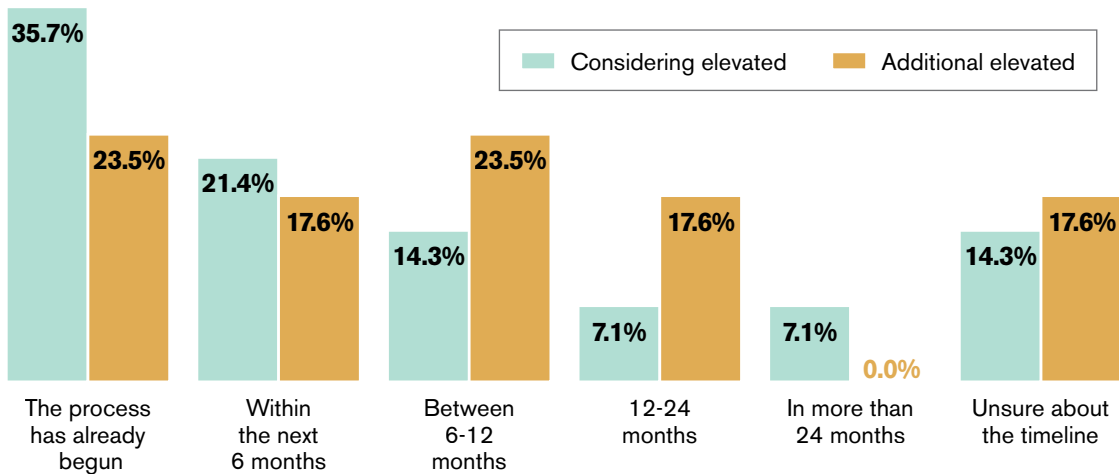
As more warehouse and DC operators adopt automation and seek out ways to eke more efficiencies from their current facilities, many of them are looking upward and taking advantage of unused vertical space. According to the survey, a handful of different personnel and departments are typically involved with the identification, acquisition, implementation, and maintenance of flooring system projects. The respondents pointed to facilities management (66.7%), warehouse management (66.7%), operations personnel (64.3%), engineering (45.2%), and the purchasing department (40.5%) as the key decision-makers for such investments.

FIGURE 11

Approximately what is the size, in square feet, are you considering for your new elevated platform?



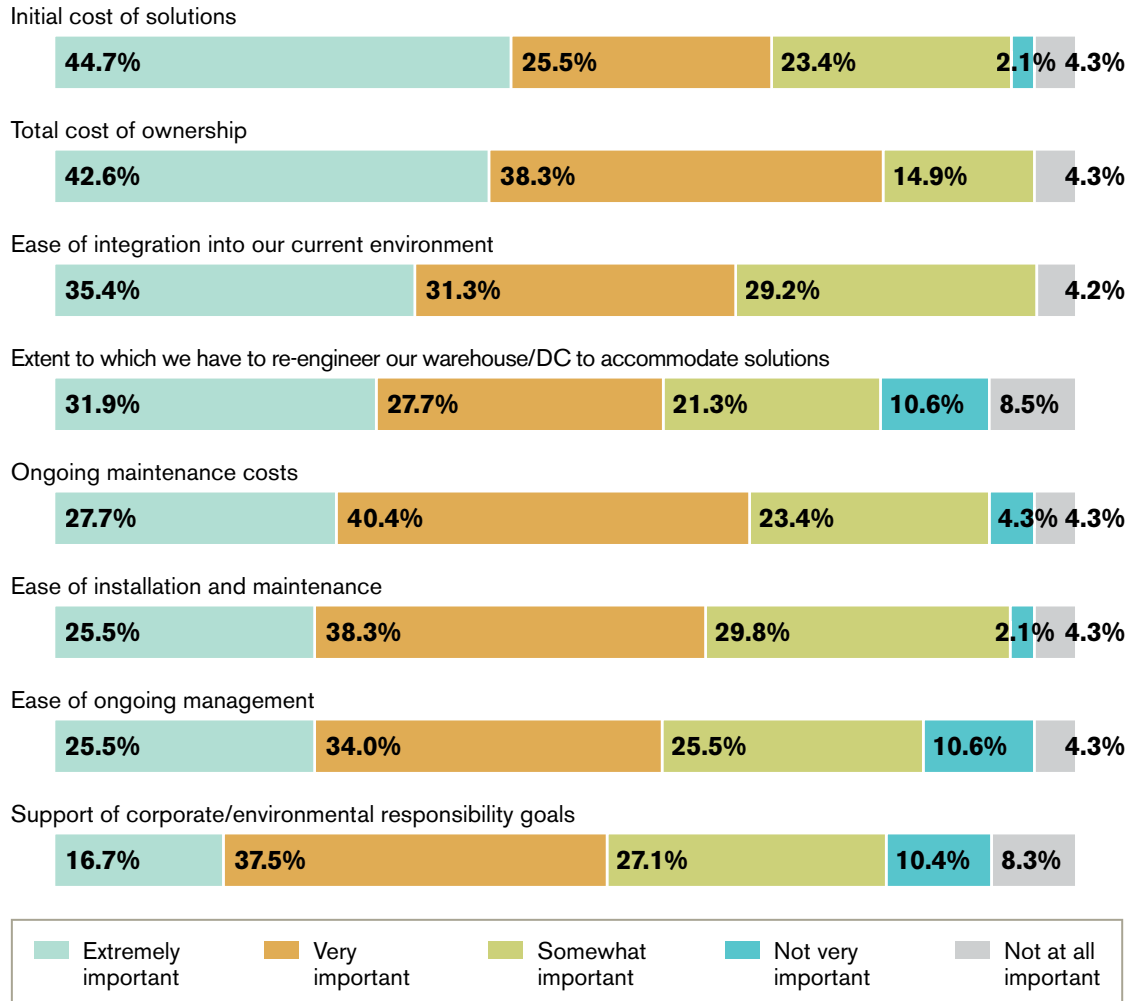
When will you begin the evaluation process for a flooring solution on your new elevated platform?



Of the companies that are currently considering elevated mezzanines and other elevated options, the majority (57.1%) have either started the evaluation process or plan to do so within the next six months. Another 14.3% of respondents will start evaluating their elevated flooring options within the next 6-12 months, with most of those companies (35.7%) looking to add structures that are 10,000-24,999 square feet in size. Another 21.4% plan to add platforms that are under 5,000 square feet, and 14.3% want elevated flooring that's more than 50,000 square feet in size.

FIGURE 12

How important are each of the following when considering elevated flooring solutions for your warehouse/DC?



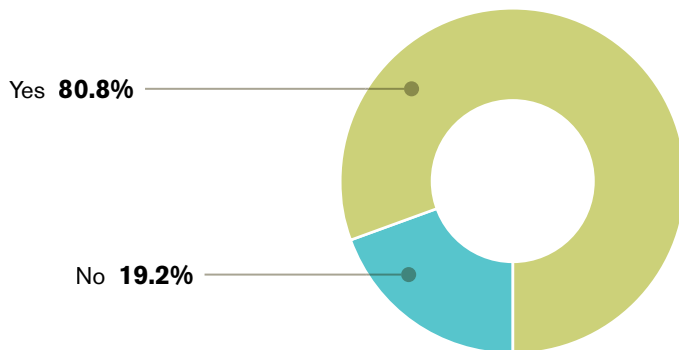
When evaluating their elevated flooring solutions, the majority of respondents (70.2%) say initial cost is either extremely or very important. Most companies (80.9%) see total cost of ownership (TCO) as either an extremely or important factor when selecting their elevated flooring options.

Integration is also important for the modern warehouse or DC, which uses myriad different systems to get products in and out of the facility quickly and efficiently. When evaluating elevated platforms, the majority (66.7%) of companies look for structures that can be easily integrated into their current environments. According to 33.4% of respondents, integration with other systems is either somewhat or not at all important.

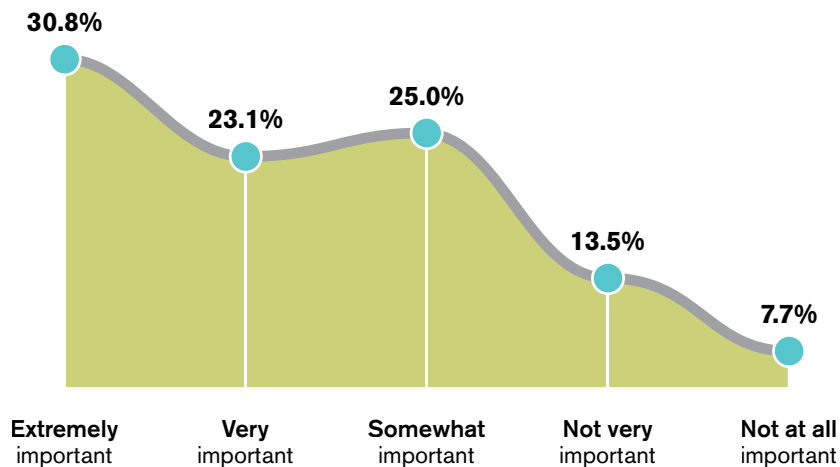
Most respondents (59.6%) factor the amount of facility reengineering required to accommodate a new elevated flooring solution into their decisions, while 19.1% don't see this as an important consideration. Finally, 54.2% of companies look for elevated solutions that support their corporate or environmental responsibility goals.

FIGURE 13

Do you monitor/track maintenance costs of your facility?



How important is the elevated flooring solution to the optimization and management of your facility operations?

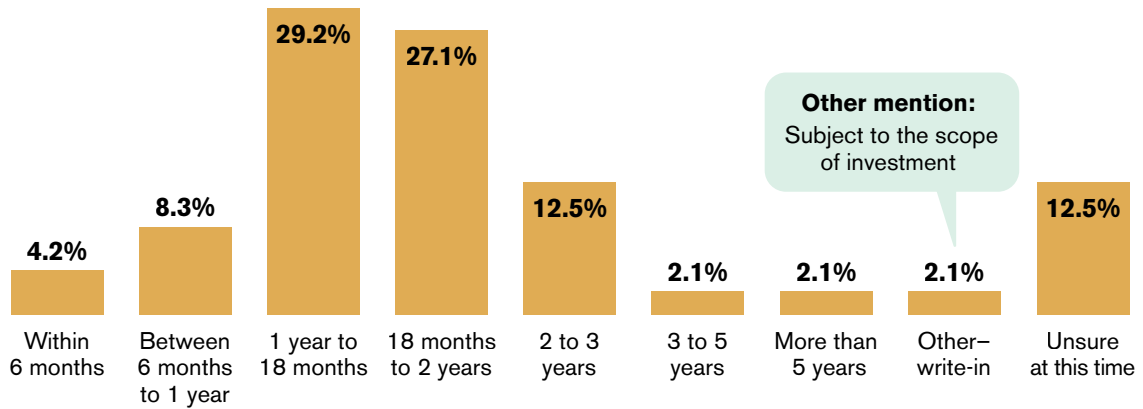


Measuring the Value

The majority of companies (80.8%) monitor or track maintenance costs in their facility, while 19.2% do not. Most respondents (53.9%) say their elevated flooring solution is either an extremely or very important aspect of overall facility optimization and management. Twenty-five percent see their elevated flooring as being somewhat important to their operations.

FIGURE 14

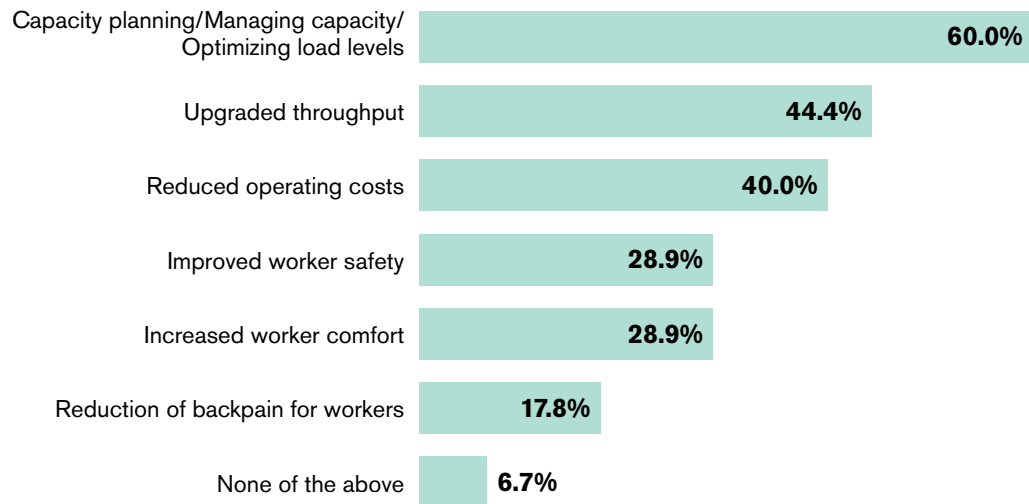
When making an investment in your facility, how long does it take for you to realize your return on investment?



Measuring return on investment (ROI) is an important step when making any significant facility investment. According to 29.2% of respondents, reaching that Holy Grail takes anywhere from 12-18 months, while 27.1% say they realize their return on investment in 18-24 months. About 4.2% see their ROI within six months of implementation, and 8.3% realize their return between six months and one year. At the other end of the spectrum, 12.5% don't realize their ROI for two to three years and another 2.1% don't usually realize their return for more than five years.

FIGURE 15

What benefits do you believe can be realized with an elevated platform?



In measuring the benefits of using elevated platforms in warehouse facilities, the majority of respondents (60%) say capacity planning, managing capacity, and optimizing load levels are the primary “wins.” Elevated platforms also help increase throughput (44.4%), reduce operational costs (40%), improve worker safety (28.9%), and increase worker comfort (28.9%).

Fulfilling a Growing Need

In the U.S., there is a notable shortage of sizable warehouses in superior condition. With the global pandemic continuing to boost e-commerce shipment volume, the need for warehouse space is growing exponentially. The problem is that many older warehouses simply don't provide the ample space that fulfillment operations need to be able to function properly.

Unfortunately, this can lead to warehouse overcrowding, which is a danger to workers and merchandise alike. Unorganized, overly-crowded warehouses can have big implications for your business. That's where mezzanine floor systems come in. By providing function, safety, and visual appeal to existing warehouse space, these systems increase workable space without the need for extensive, invasive construction.

Mezzanine floors also support the growing adoption of robotics and automation in today's warehouses and DCs. With more autonomous mobile robots (AMRs) and automated guided vehicles (AGVs) being deployed in a wide variety of fulfillment operations right now, the type of mezzanine flooring that those robots will be traveling on is becoming a key focus. That's because the durability and condition of the flooring can have an impact on the automation's efficiency levels and costs.

For example, mezzanine flooring that is worn out or has uneven surfaces can severely impact the speed and fluidity of the robots' motion and pathway. And, repairs can cause downtime—even among "robotic" employees.

Maintenance should also be factored into any flooring decision. Concrete floors tend to develop cracks due to normal wear and tear, as well as from the weight of heavy machinery. In addition, concrete floors that are not sealed will produce dust for several months after installation. Whereas ResinDek engineered wood flooring panels with either the Gray Diamond Seal[®] 2 finish or TriGard[®] finish does not produce dust and is easy to clean. In fact, ResinDek flooring panels with their proprietary finishes can be cleaned with a damp mop or cleaning solvents without fear of damage.

Wood surfaces are also worker-friendly and ergonomic—two important factors in today's labor-constrained warehousing environment. Where concrete floor systems can cause everything from bunions and ingrown toenails to shin splints, lumbar strain, and Achilles tendonitis, engineered wood surfaces are more comfortable to walk on. They also reduce the risk of injuries and are more durable overall.

According to research field data collected by The Ohio State University's Institute for Ergonomics,

workers experienced significantly less tibial shock with a ResinDek engineered wood floor at work rate walking speed (defined as 15% faster than average walking pace), while concrete increased the tibial shock by 5.4% and bar grate drove tibial shock rates up by 10.6 percent.

Engineered wood flooring work platforms are readily demountable structures and can be considered equipment with very favorable tax advantage, compared to a concrete structure, which is considered part of the building, and must be depreciated over a period of years.

When deciding on a new industrial flooring system, organizations have some difficult choices to make. Do they stick with the familiar or try something newer? Do they prioritize cost-savings, ergonomics, or the expected installation time frame? By opting for the right industrial engineered flooring panels at the outset, such as ResinDek panels, companies don't have to choose between those must-haves; they're all included in the benefits.

About Cornerstone Specialty Wood Products, LLC[®]

Cornerstone Specialty Wood Products is the manufacturer of ResinDek flooring panels, the premier flooring system designed for manufacturing, material handling, supply chain and self-storage industries. ResinDek flooring panels are designed for elevated platforms. They have the proven structural integrity to support dynamic and static rolling limits from 2,000 to 8,000 lbs. Cornerstone offers multiple flooring options that are customized for load capacities, required finish type, volume and type of traffic including heavy rolling pallet jack loads and robotic traffic with AGVs and AMRs. ResinDek flooring panels have been independently evaluated and approved for use in Types I-V construction and as part of a fire-resistance rated assembly by the IAPMO Uniform Evaluation Services.

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