

# **ELEVATE MANUFACTURING EFFICIENCY WITH SHUTTLE SYSTEMS.**

How to Find and Realize the Benefits of AS/RS in  
Manufacturing Operations

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# ELEVATE MANUFACTURING EFFICIENCY WITH SHUTTLE SYSTEMS

# 1

## How to Find and Realize the Benefits of AS/RS in Manufacturing Operations

Balancing supplier commitments, labor demands, supply chain costs and quality while protecting tight margins and defending market share leaves little room for error. This ongoing quest for efficiency screams for innovation, and manufacturers have validated this with increasingly sophisticated, high-tech production processes.

But there's still opportunity to elevate the game. For storage and inventory management, automated storage and retrieval systems (AS/RS) provide solutions to enhance quality, timeliness, space utilization and capacity — all at reduced cost.

This white paper, the third installment in Honeywell Intelligrated's series on AS/RS, explains how manufacturers can put shuttle solutions to work for greater throughput, quality and efficiency.

### SO MUCH INVENTORY, SO LITTLE SPACE

Today's manufacturing operations deal with a fundamental storage problem. They face an imbalance of inbound and outbound parts, components and materials — essentially, the volume coming in for production does not equal the rate leaving the facility. Operations that dry or cure parts feel this pain the most, as those items must be left undisturbed for hours or even days for the setting process to complete.

Inadequate storage hinders an operation's ability to scale for seasonal surges, take advantage of bulk pricing and maintain predictability, due to insufficient space for inventory and the added complexity of workaround solutions. It also conflicts with 5S principles — unacceptable for lean manufacturing operations that depend on refining production cycles into efficient, repetitive processes for consistent outcomes and ongoing improvement.

Storage requires space, but allocating this in an existing footprint is no easy task. Manufacturers often use various buffering systems to absorb excess volume, but these are limited by space just as storage is, and can yield unfavorable results if not properly executed. Operations might source additional racking space through new construction or off-site storage facilities, but these approaches bring their own inefficient, costly challenges.



# THEY WORK — WITH A LOT OF STRINGS ATTACHED

# 2

## Facilities can cope with limited storage space in a variety of ways, but each comes with pitfalls.

One solution is to physically expand the existing facility with new construction. Unfortunately, this option is not only time consuming but extremely costly, as builders face both the cost of construction and rising land costs — especially near growing urban centers.

Another option is to use off-site storage, but this is subject to the construction and land costs cited above, and most importantly, an increased risk of product damage. This comes as a result of disturbances in transit, and impact during putaway and forklift transport. The more touches by either personnel or machinery, the slower and more expensive a process becomes, and the risk of error and damage grows. In fact, companies commonly lose 0.75–1.5 percent of inventory during shipping and handling processes.

Off-site storage also accumulates excess transportation costs that extend well beyond basic fleet operation and maintenance. Weather events or other issues can significantly increase the risk of downtime and production delays. Transport to and from off-site locations also limits inventory replenishment speed, slowing down the overall rate of production.

Finally, the costs mount further when considering the price of extra shipping and receiving personnel to orchestrate the flow of product to and from off-site storage. This adds vulnerability and inefficiencies due to employee turnover and availability that can result in an inability to fill necessary positions. For example, lack of labor in one region might cause an operation to send work to a region with better availability, even if that location accumulates excess travel time and shipping costs.

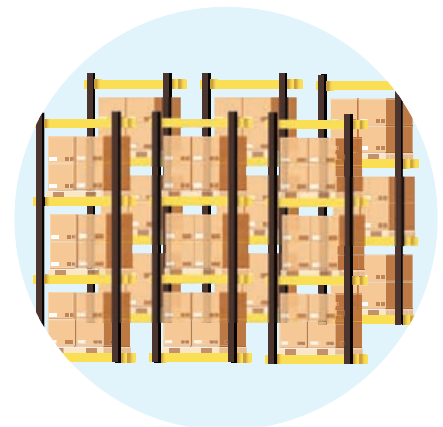
### 1. EXPAND FACILITY



### 2. USE OFF-SITE STORAGE



### 3. MAKE BETTER USE OF EXISTING FACILITY



# MORE SPACE? LOOK UP!

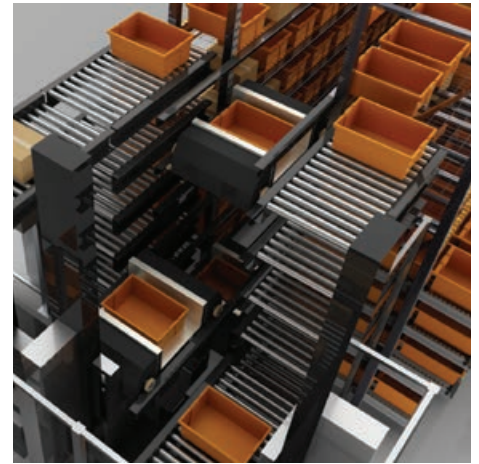
# 3

## Facilities can cope with limited storage space in a variety of ways, but each comes with pitfalls.

Traditional storage racking is limited not by the height of the building, but the maximum reach of a picker or forklift truck, leaving extensive vertical space empty and unused. However, a shuttle system allows operations to build up and take advantage of a facility's true cubic volume, increasing storage density and expanding overall capacity.

This increased storage density makes a fully integrated, on-site shuttle system an ideal solution for manufacturers working with limited room. In fact, a shuttle system uses 40 percent less floor space than traditional storage systems. Operations get the flexibility to accommodate layout requirements of existing sites and enable the most efficient greenfield designs possible, leaving extra operational space free for other tasks.

Furthermore, on-site storage enables a more precise release of inventory to keep production lines flowing more efficiently while reducing touches and the associated risk of damage and delays. Increasing storage capacity in an existing facility can also avoid costly new construction, allowing operations to extend the useful life of existing infrastructure.



## FINDING A SHUTTLE SYSTEM THAT FITS

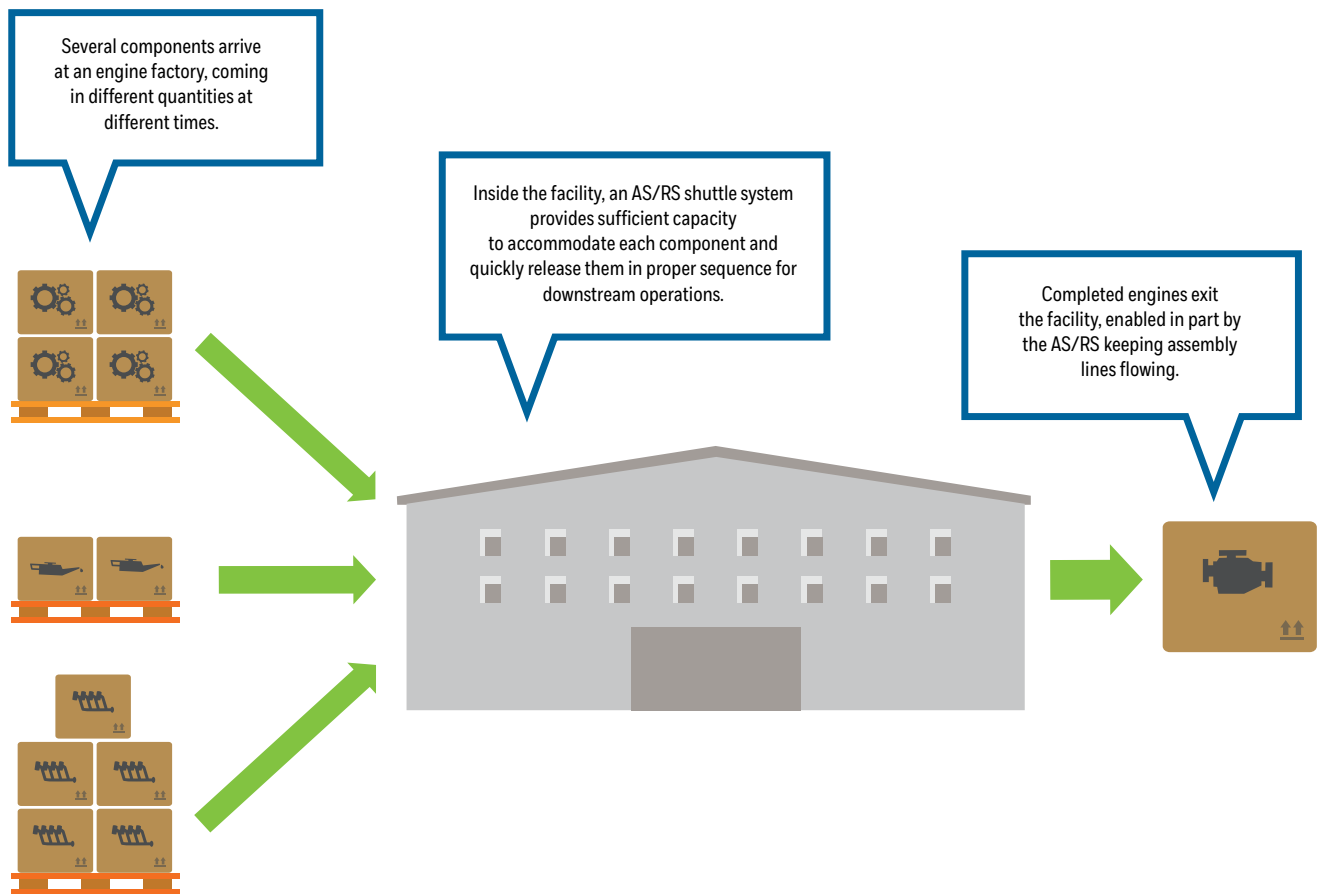
Lean practices prioritize simplicity, but market demands push manufacturers for greater complexity. This seemingly contradictory sentiment means that there's no one-size-fits-all approach to an effective shuttle system. A variety of operational characteristics influence design variations, from the number and type of shuttles used to retrieve inventory to the height and spacing of the racking on which they move. To start, an operation must look inward to assess unique inventory management challenges that drive its complexity.



SKU proliferation is one such challenge. Customers demand more options, driving companies to develop new products and variations of each. For example, laptop computers come with a variety of storage capacities and capabilities, beverage companies offer new drinks and varieties of soda, and auto makers offer several models, each available with a degree of customization and special features. These realities push manufacturing operations to manage a larger, more diverse inventory, requiring a solution tailored to deliver the necessary capacity, flexibility and quick access to keep production flowing efficiently.

Seasonality can also stretch storage capacity with mismatched procurement, production and consumer buying timelines. Consumer purchasing is often influenced by time of year, such as electronics and school supplies during back-to-school season. However, these consumer buying patterns do not necessarily line up with corporate sourcing. Take buying in bulk – an operation may bring in truckloads of components in order to take advantage of cheaper unit pricing, even if this means occupying storage for an extended period. This imbalance of inbound and outbound materials requires careful planning and a storage solution with sufficient capacity and flexibility to keep production flowing.

Different inventory moves through a facility at different speeds. Assessing this SKU velocity helps determine where to house specific SKUs, and in what quantity. For example, fast movers may stay in individual cases or totes located in strategic areas for quick access, while slow movers might be stored elsewhere, even in pallet load quantities outside the shuttle system.



# THE RIGHT SOLUTION DEPENDS ON THE RIGHT PARTNER

# 4

Of course, delivering a system that addresses the diverse array of challenges requires a high level of application expertise, experience with similar projects and access to the right technology.

And one more thing – ideally, this all comes from a single source. Simplicity strikes again, avoiding stress and confusion of managing multiple vendors. For projects of such a large scale featuring so many pieces that depend on myriad factors, leveraging a single partner helps keep quality high, delivery on track and accountability clear.

So what does this partner look like? The right system supplier has a proven integration track record and access to a wide range of technologies, including shuttles, conveyor, sortation and other supporting automation components. Add an understanding of the entire manufacturing process and this produces a partner capable of delivering a customized system tailored to unique requirements from initial conceiving to installation to ongoing support.



## MANY PATHS TO ROI

Storage must be solved one way or another, and replacing alternative methodologies with AS/RS offers distinct paths to return on investment, based on different benefits and financial advantages.

**Payback:** 16–18 Months

**Cost savings:** no additional real estate, no extra transportation, reduced/eliminated labor. Replacing off-site storage with a local shuttle system achieves ROI in 16–18 months via improved inventory flow, and reduced labor, real estate and transportation costs.

### Off-site Storage



**Payback:** depends on severity and timing of anticipated surge

**Cost savings:** no construction, no extra land/real estate, reduced labor. Implementing a shuttle system allows operations to maximize growth in an existing footprint as efficiently as possible – avoiding the need to construct a new facility. Timeline depends on anticipated (and actual) growth.

### New Construction



# GET ONLINE, NOT DERAILED

# 5

Getting a shuttle system online requires connecting it with auxiliary systems and processes, which means temporarily interrupting production or adopting alternative workaround processes.

Minimizing disruptions to production is a critical characteristic of a successful installation. This can mean building ahead during favorable periods by scheduling installation during slower months and avoiding peak season. Or, installation can be broken into phases. While this may take longer, minimizing lost productivity can make this a more cost-effective approach. Renting out a remote space and moving storage or certain processes temporarily off-site can also keep business moving during installation.

Developing the right plan depends on communication. Sharing operational schedules with an experienced integrator can allow the full view of manufacturing interests to be considered when planning implementation. This helps strike the balance between getting online fast and avoiding disruption to everyday production.

## RELENTLESS COMPETITION, DRIVEN BY TECHNOLOGY

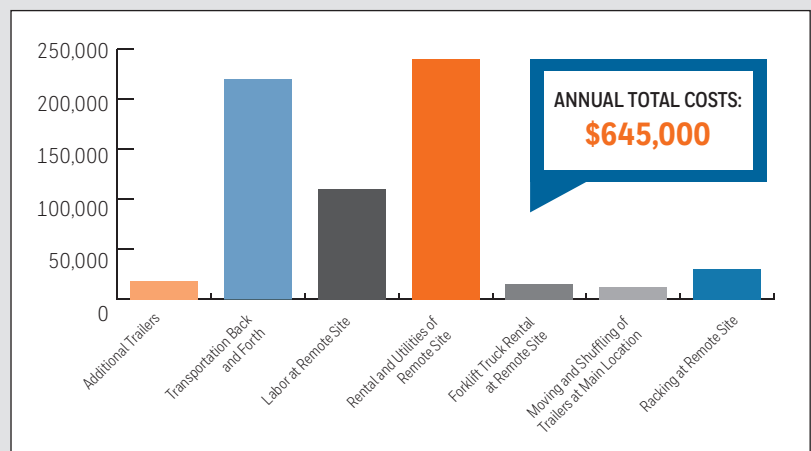
Today's manufacturing operations are driven in large part by technology – the sector is responsible for [69 percent of American research and development](#). In an arena subject to global competition, this emphasis on technology is key to finding a competitive edge and enabling profitability.

While high levels of automation are common in production processes, material handling processes for storing and moving inventory lag behind in many manufacturing operations. As lean operations continue the ongoing quest for greater efficiency, leveraging shuttles in manufacturing can support higher output, better quality and low cost. And with storage under the efficiency microscope, leveraging the right technology, design and partner can improve profitability with a well-refined process.

To learn more, read the Honeywell Intelligrated white paper, [What to Consider for a Successful AS/RS Investment](#) or [contact a representative](#).

## SLOWER, MORE DAMAGE – AND MORE EXPENSIVE

Operating a truck fleet. Coordinating shipments. Damage in transit and through the facility. Extra shipping and receiving personnel. The list goes on, and the annual costs of off-site storage add up quickly.





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