



WHITE PAPER

# Reducing costs with automated lift trucks

Think the efficiency gains carry a steep price?  
Automated lift trucks can actually help lower costs significantly

This isn't the warehousing landscape of the past. Modern warehouses are increasingly turning to automation and other technologies to improve productivity. While automated lift trucks were traditionally considered inaccessible for many warehouses due to the upfront expense and uncertain financial return, thanks to available rental and leasing options, that is no longer the case. According to one [report](#), robotic forklifts cut labor expenses by up to 32%. Over time, these solutions can also generate additional savings through lower maintenance and equipment costs and increased productivity. And because an operation can begin by deploying just a single truck as proof of concept before cash flowing a larger fleet, automated lift trucks offer a lower cost of entry and greater scalability than industry leaders might expect.

This white paper examines the ways in which warehouses can not only justify an investment in automated lift trucks through fast ROI but achieve meaningful savings.

## Reducing labor costs

---

Today's warehouse labor challenges require a different approach, one that transforms the way work gets done. Warehouse space is projected to increase 31% between 2022 and 2027. That amounts to around 2.5 billion square feet of additional space. About 80-100 lift trucks are required to service every million square feet of warehouse space. The problem is, who is going to operate them?

Although the [U.S. warehousing workforce](#) has more than doubled between 2015 and 2025 to 1.8 million, the labor gap is expected to continue growing with a [projected labor shortage](#) of nearly 24 million workers across the Americas by 2030.



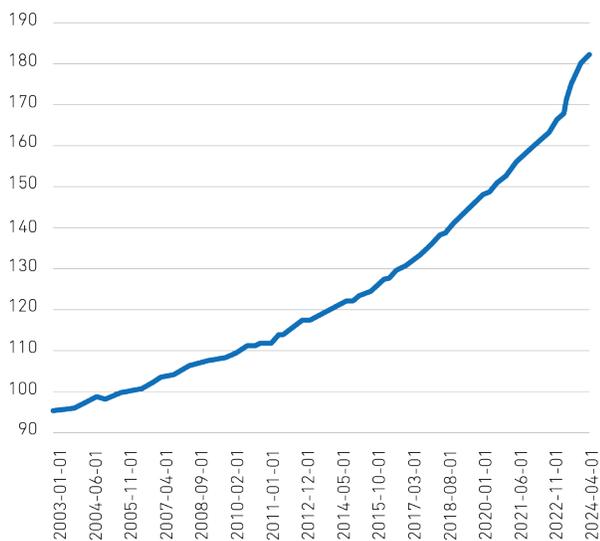
But, even if warehouses could find enough talent to fill all their available positions, the cost of doing so is increasingly prohibitive. Warehouse labor costs in the U.S. have reached an all-time high, according to data from the Federal Reserve Bank of St. Louis

When automating processes and calculating the associated payback, direct labor savings add up, with expenses like hourly wages, overtime and holiday pay. In the last decade, increasing demand for labor pushed lift truck operator pay rates up dramatically. As of 2024, the average base pay rate for lift truck operators was \$18 per hour, with competitive pay rates hovering closer to \$21 per hour. Replacing employees due to turnover also exposes warehouses to a heavy financial burden outside of standard wages, with one study pegging the average cost per hire at \$4,700.

Automation also drives savings in other, indirect ways by drastically reducing costs associated with:

- Retraining and re-education
- Insurance
- Workers' compensation
- Lost time due to illness or injury

WAREHOUSE LABOR COSTS IN THE U.S. ARE AT AN ALL-TIME HIGH



## WHAT ABOUT SOFTWARE ENGINEERING COSTS?



One of the traditional shortcomings of automated lift trucks is the complicated programming work that is typically required to get automation up and running and to adapt it to facility and workflow changes over time. The average salary of a software engineer in the warehouse industry is approximately \$100,181 per year, or \$48 per hour, which is significantly higher than that of a lift truck operator. This raises the concern that the labor costs to implement automation might equal — or even exceed — those of simply hiring more operators. However, the software for some modern automated lift trucks is designed for use by non-engineers, obviating the need for complex coding and, thus, eliminating the software engineering costs associated with startup and making changes.

## Reducing mistakes

---

In today's high-turnover warehouse, there simply isn't enough skilled talent available to address productivity issues by adding more headcount. Because of the deficit of practiced lift truck operators within the labor market, operations have increasingly turned to less-experienced employees or workers without substantial experience at a specific site. But successful operations can't settle for this status quo within their labor force. Distracted or inexperienced lift truck operators may travel too fast, cut corners too sharply, or even operate through prohibited areas, which can lead to mistakes, damage and injuries. Compare the variety of risks inherent in a staffing model that relies exclusively on people with one augmented by technology, in which automated lift trucks follow programmed site-specific rules such as maximum speed or minimum distance from pedestrians or objects.

What kind of cost do accidents carry? In 2023, the cost per medically consulted injury was \$43,000, according to the [National Safety Council](#), and that does not include the cost of property damage. Impacts or mistakes may cause expensive damage to inventory, equipment or racking. Violations of the Occupational Safety and Health Administration (OSHA) standards for powered industrial trucks can also result in significant financial penalties. OSHA can impose penalties with fines of up to \$16,550 per safety violation and that amount can increase up to \$165,514 for willful or repeated violations.

Mistakes impede productivity and bloat costs in other ways, too. The wrong pallet placement may require staff to stop and search for the missing load or delay delivery to a customer. To replace a damaged lift truck, companies often resort to renting or leasing a truck, which further adds unplanned cost. In anticipation of frequent downtime, companies may even regularly carry more lift trucks than necessary, adding additional units through lease, short-term rentals or outright purchase. And in most cases, automated lift trucks can last longer than a manually operated lift truck, due to the abuse often associated with human operators.

## Increasing productivity

---

Automation is a reliable solution to minimize the risk of costly downtime and unexpected delays. An automated lift truck does not need to take time off, relentlessly working 24/7 and only stopping to recharge.

Introducing an automated lift truck into a facility starts with manually operating the truck through the space to establish routes and build a map. Once this data is collected by a single truck, the map can be used by not only that truck, but all the trucks in the automated fleet.

Trucks automatically follow their programmed routes, using built-in sensors to detect obstacles and obstructions and communicate information back to the supervisor so that the problem can be addressed. Modern, infrastructure-free navigation and intuitive software enables operations to quickly and easily make route changes to balance the flow of traffic and accommodate layout adjustments due to changing inventories and workflows.



# Achieving return on investment

By reducing operating costs and improving productivity, automated lift trucks can deliver a relatively quick return on investment (ROI), though that timeline naturally varies by operation. Several variables, such as the number of manual trucks replaced, number of shifts and operating hours, and the burdened labor rate, will influence the speed with which an operation can reasonably expect to achieve ROI. The acquisition and payment method, whether automated lift trucks are purchased outright as a capital expenditure or adopted through an operational expenditure model like rentals, leasing or Automation as a Service (AaaS), also influences the time to break even.

In a rental scenario, an automated lift truck deployment can be cashflow positive in as little as one month for certain operations.

	THIRD-PARTY LOGISTICS FACILITY	SMALL WAREHOUSE	LARGE DISTRIBUTION CENTER
Operators reallocated	2	1	3
Schedule	2 10-hour shifts 5 days/week	1 8-hour shift 5 days/week	3 8-hour shifts 7 days/week
Compensation	\$20/hour + benefits	\$25/hour + benefits	\$23/hour + benefits
Monthly savings	\$8,700	\$2,100	\$21,000
Time to positive ROI	2.5 months	10 months	1 month

*\*Calculations assume full-service maintenance and average turnover rates and costs.*

# Looking to the future

---

In both the short and long term, automated lift trucks can provide significant cost savings related to labor, injuries, damage and manual equipment fleets. However, ROI is not the only appeal of automation. Many leaders choose automated lift trucks to hedge against long-term labor challenges and promote scalability without labor constraints and volatility. Converting to an autonomous fleet fosters a predictable and productive operation. With the operational benefits and savings achieved through automated lift trucks, companies can focus on business growth and innovation.



For more information about reducing operating costs with automated lift trucks, contact a solutions expert at your [local Yale dealer](#).