



# LABOR SHORTAGES AND WORKPLACE SAFETY: HOW AUTOMATION CAN HELP

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**RAYMOND**  
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## LABOR SHORTAGES AND WORKPLACE SAFETY: HOW AUTOMATION CAN HELP

Once considered too costly or too complicated, automation is on the upswing, spurred by an ongoing labor shortage that many economists predict could last another two to five years.

The struggle to fill jobs has created a take-what-we-can-get approach among many hiring managers in manufacturing, warehousing and distribution. And as many companies turn to temporary staffing and third-party contractors to meet the demand for workers in material handling, ineffective training and the lack of operating experience are creating high-risk work environments, safety managers say.

Often portrayed as an adversary to workers who feared being replaced, automated technology today is perceived as an ally that can make their jobs easier, more fulfilling and safer, according to a new survey of 500 U.S. warehouse workers commissioned by Lucas Systems.

*The Lucas Systems Voice of the Warehouse Worker Insights* found that technology is a critical driver in employee attraction and retention, with 74 percent of respondents saying they were willing to trade pay for better technology tools to do their jobs.

One of the study's most impactful findings shows that 90 percent of respondents believe investment in new technology will help attract and retain workers rather than create a fear of replacement. And 88 percent said they believe that investing in automation is an investment in the company's workforce.

In addition to bottom-line benefits such as higher productivity and increased profits, automated solutions have inherent benefits such as less physical exertion that leads to increased personal safety, greater job satisfaction and less staff turnover.

In fact, a recent survey by Salesforce, a San Francisco, CA-based customer relationship management software company, found that 89 percent of full-time workers are more satisfied with their job because of automation, and 91 percent say that automation saves them time and offers a better work-life balance.



# ELIMINATING ERGONOMIC RISK FACTORS

According to The National Institute for Occupational Safety and Health, the three leading causes of work-related injuries seen in emergency departments are: contact with objects and equipment; overexertion and bodily reaction; and falls, slips and trips without a fall.

The U.S. Bureau of Labor Statistics lists the most common causes of nonfatal workplace injuries as:

- Overexertion and bodily reaction
- Falls, slips and trips
- Contact with objects or equipment
- Violence and other injuries by persons or animals
- Transportation accidents

Overexertion is a common concern among workers surveyed in the Lucas study, who said they spend more than a third of their day walking to various places within the warehouse to complete tasks.

The National Safety Council lists overexertion and bodily reaction as the second-leading, nonfatal injury or illness involving days away from work, representing 22 percent of all such injuries. When it comes to occupations with the highest incidence rates for workplace injuries, many are found in warehouse, manufacturing and transportation environments, according to the U.S. Bureau of Labor Statistics.

Protecting the health and safety of workers through improved ergonomic design has been a focus of material handling equipment manufacturers for the past several years. For example, adjustable seats, seat-side hydraulic controls, rear-assist grip and horn, and tilting steering columns have become common lift truck features.

## OCCUPATIONS WITH THE MOST JOB-RELATED INJURIES AND ILLNESSES

OCCUPATION	INCIDENTS
NURSING ASSISTANTS	370 PER 10,000 FULL-TIME EQUIVALENT WORKERS
HEAVY TRUCK AND TRACTOR-TRAILER TRUCK DRIVERS	360 PER 10,000 FULL-TIME EQUIVALENT WORKERS
LABORERS, FREIGHT, STOCK AND MATERIAL MOVERS	350 PER 10,000 FULL-TIME EQUIVALENT WORKERS
LIGHT TRUCK DRIVERS	340 PER 10,000 FULL-TIME EQUIVALENT WORKERS
CONSTRUCTION LABORERS	250 PER 10,000 FULL-TIME EQUIVALENT WORKERS
MAINTENANCE AND REPAIR TECHNICIANS	210 PER 10,000 FULL-TIME EQUIVALENT WORKERS
STOCKERS AND ORDER FILLERS	150 PER 10,000 FULL-TIME EQUIVALENT WORKERS
JANITORS AND CLEANERS	120 PER 10,000 FULL-TIME EQUIVALENT WORKERS
REGISTERED NURSES	105 PER 10,000 FULL-TIME EQUIVALENT WORKERS
RETAIL SALESPERSONS	60 PER 10,000 FULL-TIME EQUIVALENT WORKERS

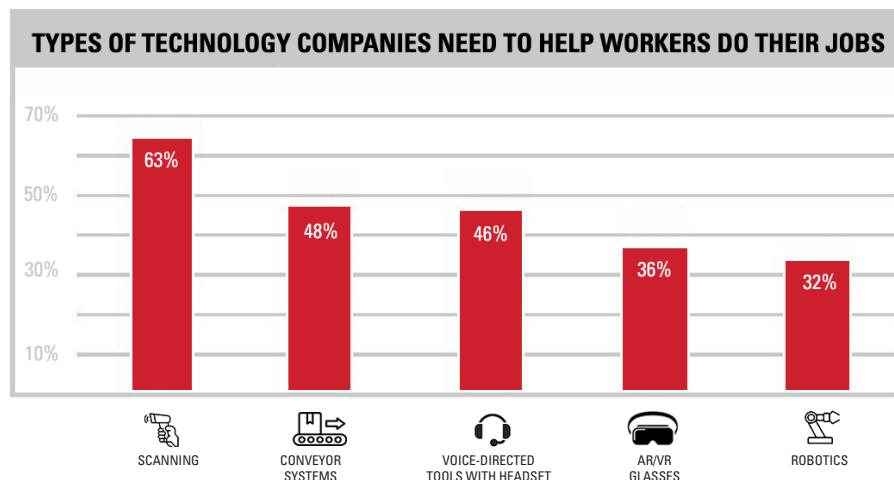
SOURCE: U.S. BUREAU OF LABOR STATISTICS, 2019

Figure 1: Occupations with the most job-related injuries and illnesses.

Automation solutions such as conveyors, automated storage and retrieval systems, pallet shuttles and automated guided vehicles (AGVs) take the reduction of ergonomic risk factors to an even higher level by eliminating tasks such as bending, reaching overhead, performing repetitive motions and lifting, pushing and pulling heavy loads.

The 2022 Lucas Systems study asked warehouse workers which types of technology they believe would best

provide relief from the physical and mental strains of warehouse work. The results appear in the graphic below.



SOURCE: LUCAS SYSTEMS VOICE OF THE WAREHOUSE WORKERS INSIGHTS, LUCAS SYSTEMS INC., 2022

Figure 2: Types of technology companies need to help workers do their jobs.

This white paper examines the power of telematics, automated storage and retrieval systems, conveyor systems and automated guided vehicles (AGVs) to not only drive return on investment, but also improve employee satisfaction and safety.

## THE POWER OF DATA

Visibility into day-to-day operations is a critical ingredient when running a busy warehouse, especially in today's hiring environment, where candidate availability and selection dictate the hiring of workers who often are swiftly trained and have little operating experience.

The ongoing worker shortage also is causing many companies to overlook policies that affect safety, according to Carolina Handling Safety Manager Mark Hernandez.

**"IN 2022, I SAW AN IMMEDIATE INCREASE IN CUSTOMER ACCIDENTS WITH INJURIES, AND THE MAJORITY WERE DUE TO OPERATOR ERROR. WE'RE SEEING WORKERS PUT ON MOBILE EQUIPMENT WITH TRAINING BUT LITTLE OPERATING EXPERIENCE, AND THAT IS A HIGH-RISK OPERATION."**

**— CAROLINA HANDLING SAFETY MANAGER MARK HERNANDEZ**

Telematic tools such as iWAREHOUSE® from The Raymond Corporation provides real-time data that gives companies the ability to make timely changes that affect the bottom line and promote a safer work environment.

iWAREHOUSE® immediately detects truck impacts, delivering a real-time alert via email or text message. Impacts are classified according to severity, and reports are recorded that include data such as speed, acceleration and G-force of impact. Companies can quickly determine what is contributing to impacts and make informed decisions about physical changes needed within the warehouse or in operator training.

## THE POWER OF ADVANCED STORAGE

The Lucas Systems survey asked respondents to weigh in on the perceived benefits of automated technology. Making the job less physically demanding and increasing personal safety ranked third and fourth, respectively, on a list of seven benefits.

From improving accuracy to increasing worker satisfaction, automated storage and retrieval systems such as Modula vertical lift modules (VLMs) address all of the top-ranked technology benefits in the Lucas study.

Designed using ergonomic principles to significantly reduce the stress and strain of manual material handling, Modula VLMs deliver stored items to an operator at a comfortable height, eliminating the time and energy spent searching, walking, reaching and bending to pick components.

An additional order-picking laser pointer can be used to pinpoint an item’s exact location within a tray, further improving production and operator accuracy.

Building up, not out, vertical lift modules (VLMs) utilize the available ceiling height in a facility, compressing as much as 9,050 square feet of traditional shelving management, reduces mispicks and handling errors, and ensures the safety of products and personnel.

## THE POWER OF CONVEYING

Automating the transfer of materials from one location to another within a facility is perhaps the most effective way to minimize workplace injury by reducing competitive motions like lifting, carrying and pushing heavy loads.



Figure 3: Top-ranked tech benefits by warehouse workers.



Figure 4: Conveyor systems reduce ergonomic risk factors by significantly reducing the number of human touches.

Conveyor systems also can increase workplace safety by maximizing floor space. For example, conveyors can be designed for overhead use to allow for larger workspaces below. More space on the warehouse or production floor can improve traffic flow and lower the risk of collisions.

But about 25 percent of all reported warehouse injuries occur on loading docks, according to the Occupational Health and Safety Administration, with most of those injuries a result of slip-and-falls, lifting/pushing/pulling/reaching and forklift accidents.

Portable ergonomic conveyor systems such as Destuff-it and Restuff-it are designed to help dock personnel safely and quickly move packages up to 165 pounds. They can be used on inbound and outbound docks and have a modular belt that can travel in one direction or bidirectionally.

**“CONVEYOR SYSTEMS REDUCE THE NUMBER OF TOUCHES AND ALLOW YOU TO TRANSPORT MATERIALS TO DESTINATIONS WITHOUT HAVING TO HAND CARRY. IT’S IDEAL FROM AN ERGONOMIC STANDPOINT.” – CAROLINA HANDLING SAFETY MANAGER MARK HERNANDEZ**

## THE POWER OF AGVS AND AMRS

According to the Association for Advancing Automation, orders for workplace robots by U.S. companies were up 40 percent in the first quarter of 2022 compared to the same period last year. The surge in sales coincided with U.S. job openings reaching a record high of 11.5 million in March.

Additionally, the global, automated, guided vehicle market, which was \$2 billion in 2021, is projected to increase to \$4.11 billion by 2029. Automated forklift trucks are predicted to account for a significant amount of the market share in the years ahead due to their improved stability, control and storage capacity.



*Figure 5: AGVs offer built-in safety features, such as sensors and obstacle detection.*

Automated Guided Vehicles (AGVs) and Autonomous Mobile Robots (AMRs) offer built-in features to support safety such as sensors and obstacle detection that allow them to work safely alongside human coworkers.

Operating in a controlled, programmed manner, AGVs eliminate the human errors that most often lead to workplace accidents and injury. Automated stackers, tow tractors and pallet trucks by The Raymond Corporation operate autonomously to handle repetitive horizontal transportation and cart-towing tasks.

The risk of on-the-job accidents also decreases drastically with the use of AMRs. Workers are no longer lifting packages in non-ergonomic positions; rather, the AMR ventures into the warehouse to retrieve products and bring them to their human coworkers. These mobile robots autonomously navigate around humans and obstacles along their path while calculating the best route to their defined destination. In many cases, AMRs are the best way to optimize both workplace productivity and safety.

**“WE ARE ALWAYS LOOKING FOR WAYS TO MAKE MATERIAL HANDLING EASIER AND LESS DEMANDING FOR THE WORKER, AND AUTOMATION IN MATERIAL HANDLING EQUIPMENT HELPS US DO THAT.” – CAROLINA HANDLING SAFETY MANAGER MARK HERNANDEZ.**

## CONCLUSION

Historic imbalances in the U.S. economy have many analysts predicting that the labor shortage could continue for years. The need for workers is especially profound in the warehousing and distribution segment, where business is growing dramatically to support the global shift toward e-commerce-driven distribution models.

“There is every indication that there will be labor shortage challenges for the next two to five years. The solution is not how do we find people, but how do we automate processes,” said Carolina Handling Safety Manager Mark Hernandez. “Similar to the way health care providers mastered telemedicine as patients became accustomed to the convenience during the pandemic, companies will master automation.”

As more companies turn to automation solutions to meet hiring and production demands, more workers are beginning to see automation as a benefit. A 2022 study entitled *The Lucas Voice of the Warehouse Worker Insights* revealed that three out of four survey respondents believe that automation, especially workplace robots, may help them in their jobs in the following ways:

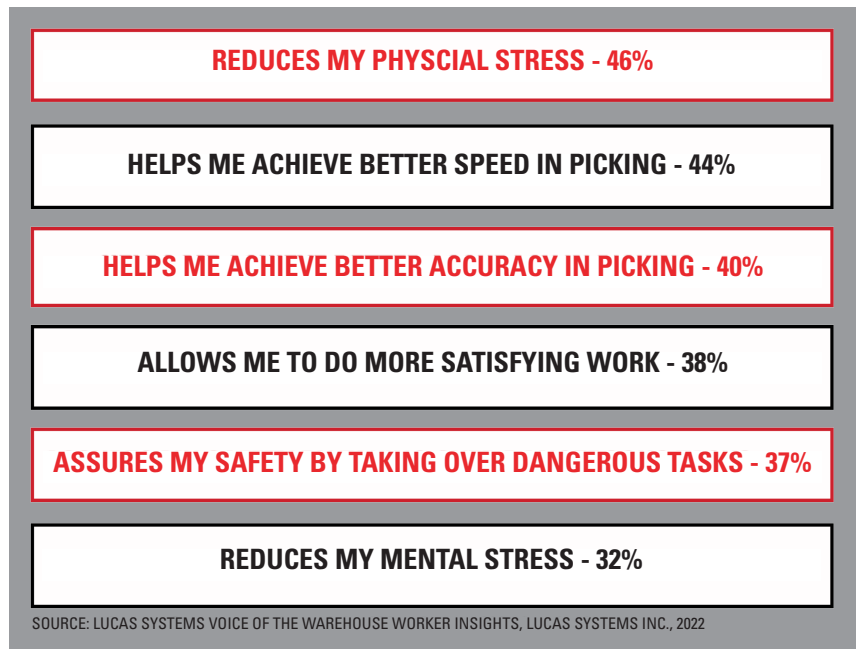


Figure 6: Top ways workers believe robots can help them.

Automation can cover everything from a simple conveyor to more complex systems that require integrated software and electronics. In addition to handling customers' lift truck needs, Carolina Handling has begun operating in a more consultative manner, providing engineering and data-driven solutions to help customers refine their processes and find solutions.

In addition to bottom-line benefits such as higher productivity and increased profits, automation solutions offer inherent benefits such as less physical exertion, which leads to increased personal safety and greater job satisfaction which, in turn, influences the rate of employee turnover.

For more information on automated solutions from Carolina Handling, contact:

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