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Forklift-Free:  
Driving Safety and Profitability



Safety is driving momentum for forklift-free environments. Although training and legislation are instrumental in managing some degree of risks associated with forklifts, statistics reveal numerous accidents occur every year, providing reason for greater acceptance of forklift-free environments. This motivation towards forklift-free leads the way to adopting a more efficient form of transport—vision guided vehicles (VGVs)—favorably driving benefits beyond safety and profitability.

To protect workers, agencies in the United States and abroad, such as OSHA (Occupational Safety and Health Administration) and EU-OSHA, provide analysis, research and prevention information, which policy makers use to regulate workplace safety and health. Various groups focus on standardized training and encourage continuous process improvements in workplace safety. Even with legislation and training enforcement, there is no evidence that these preventative methodologies have verifiable best practices and safe behaviors among forklift operators globally. Without evidentiary data to support these prevention techniques, companies concerned with safety are proactively seeking alternatives to forklifts with vision guided vehicles and forklift-free environments.

### Forklift Incidents Bring Cause for Safety Initiatives

Every year hundreds of fatalities occur from forklifts worldwide. Federal OSHA estimates that in the United States alone, there are nearly 100 worker fatalities and another 20,000 seriously injured in forklift-related incidents annually. According to the National Institute of Standards and Technology,

- OSHA estimates that there are 110,000 forklifts accidents each year
- \$135 million immediate costs are incurred due to forklift accidents
- Approximately every 3 days, someone in the US is killed in a forklift related accident
- Almost 80% of forklift accidents involved a pedestrian
- 1 in 6 of all workplace fatalities in the U.S. are forklift related



“Fork-free environments are inherently safer. Just the injury-to-incident rate tells you that. Forklifts cause just 1% of industrial accidents, but over 10% of industrial injuries. You still have to find safer ways to move palletized and heavy loads, but those methods are out there. At the very least, reducing the number of forklifts helps you operate safer, since you are training fewer drivers (meaning you can train them better). With a hundred annual deaths and 20,000 serious injuries every year, forklifts tend to be the most dangerous machinery in any industrial operation. There are risks with the various fork-free methods—there are always risks in handling heavy unit loads—but they tend to be mitigated to a greater degree.”

Scott Stone, Marketing Manager  
Cisco-Eagle

Forklift accidents cost employers an average of \$48,000 per single work-related disabling injury and \$1,390,000 per cost of death, as reported by The National Safety Council. In addition to those costs, according to OSHA, unsafe working environments can lead to OSHA citations resulting in penalties from \$7,000 to \$70,000.

Randy Blaylock of Trilogiq USA, a global material handling solutions firm, suggested, "There are various causes of forklift related accidents, including operator distraction, visibility issues, and operator error (very similar to causes of automobile road accidents). Forklift operators are constantly barraged with interruptions such as other forklifts, line operators' requests and route alterations. Visibility can be an issue as they often don't have a clear view over obstacles or stock areas, which can lead to forklift overturns and accidental run-ins with other employees or objects."

Training initiatives, safety protocols, and standard operating procedures (SOPs) have not eliminated the dangers that forklifts impose. After decades of systematic process improvements in the use of forklift operations in warehouses, distribution centers, and manufacturing plants, many companies, industry leaders, and government organizations are concluding that forklift-free environments may be the only fail-proof approach to ensuring safety. For that reason, automation in materials handling has been gaining momentum in the drive for forklift-free in manufacturing, as well as warehousing facilities.

True there are important advantages to a forklift-free environment; however, it may not be conducive for all operations, such as when lifting and overhead storage is required in the warehouse area. Additionally, it is still common to find loading docks using forklift trucks to load and unload deliveries.

However, Chuck Paulausky, CHMM (Certified Hazardous Materials Manager) at CP Safety & Environmental, stated, "For companies that can implement the forklift-free systems, there can be huge benefits in terms of both reducing employee injuries and forklift maintenance costs, and in reducing production costs through lean manufacturing."



Approximately every 3 days, someone in the U.S. is killed in a forklift related accident.



Paulausky suggested that powered industrial trucks (also known as forklifts) can be inherently dangerous. Many aspects of forklift operation, such as unstable loads, unsafe driving, ramps and rough terrain, and inadequate maintenance can kill or injure the operators and anyone else in the vicinity.

These frequent conditions pose dangers to the operator and pedestrians, especially true if the operator fails to follow safety operation rules or makes cognitive errors. Therefore, companies are looking towards forklift-free environments with automation solutions that will protect the welfare of workers.

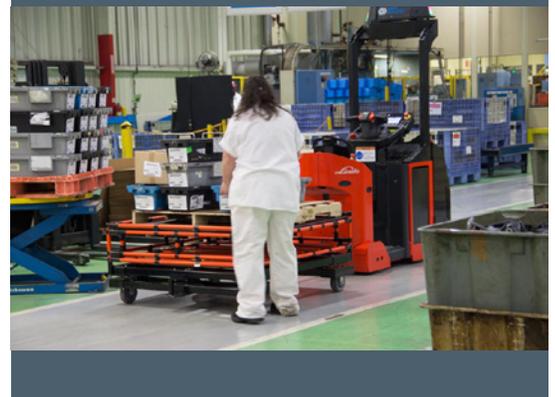
### Forklift-Free Environments Boost Lean Efficiency

Automation solutions coupled with lean manufacturing is the step in the right direction for a more efficient operation. However, really boosting lean and efficient operations is a forklift-free environment and properly designed systems. Fundamentally, this model eliminates waste and non-efficient processes, having quality products on time, and removing non-value-added activities, safely and accurately, which in turn delivers greater efficiency.

Whereas, forklift operations do not always provide greater efficiency, forklifts typically deliver large loads of palletized goods, taking up valuable aisle space and keeping excess inventory on the floor. Blaylock commented, “The primary function of a forklift is to take advantage of vertical stacking and to transition product from alternate heights. Yet the vast majority of forklift activity and utilization is driving horizontally, not lifting vertically.”

Properly designed systems can reduce forklift traffic by more than 80%, creating immediate process improvements. In the case of horizontal transport, an automated tugging solution with dollies, trains, or carts can easily move the right amount of product for Just-In-Time (JIT) delivery, keeping inventory levels low and aisles free from excess product. Forklift trucks are ill-suited for this task, whereas, carts can be customized for a wide range of tote and bin deliveries.

Ultimately, eliminating waste, managing a smooth flow of materials, and reducing non-value-added steps to achieve JIT is the goal of lean for becoming an efficient operation.



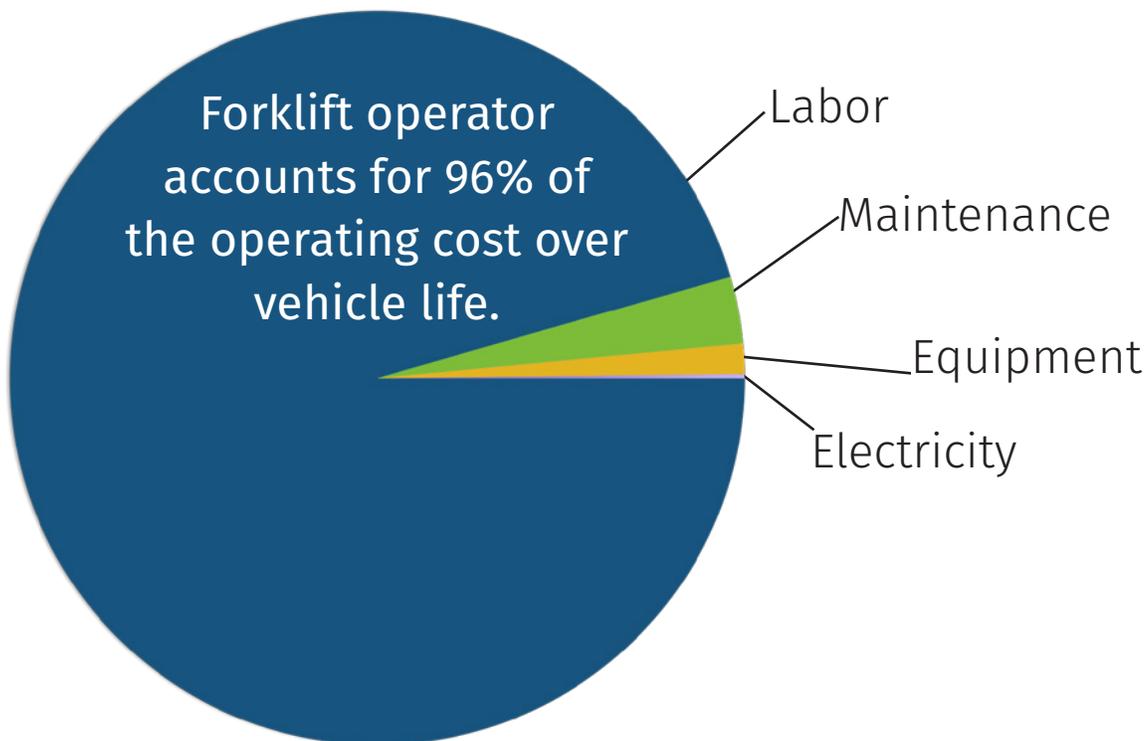
## Forklift-Free Environments Drive Cost Reduction

Beyond safety and lean manufacturing, forklift-free environments drive down cost normally incurred from labor wages, medical costs and training expenses, as well as expenditures suffered from facility, equipment, and unsaleable product damage due to forklifts.

Forklift operators require expensive labor, approximately \$62,000 per year to operate the machinery in the U.S. and €60,000 in Europe. Derek Cribley, Director of Systems Engineering at Bastian Solutions explained, "Increasing labor costs combined with the availability of a steady workforce can make it difficult for companies to maintain enough trained forklift operators. High turnover rates also create an expensive training regimen as operators come and go."

Three forklift operators moving product during three shifts would cost employers \$186,000 in labor wages per year. The forklift operator accounts for 96% of the operating cost over the vehicle life. Where as, with an automated tugging solution replacing manned forklift travel, the vehicle can operate for approximately \$3 per hour, 24/7.

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Cribley noted, “Forklifts can be effective tools for many distribution and manufacturing environments, but in facilities where space is limited and a high number of product loads must be handled, forklifts are often not the most effective or safest form of material handling. The transportation of loads by forklift is labor intensive. Operators must be thoroughly trained, but accuracy concerns often remain due to human error or lack of training. Small aisles and tight turns can also be a challenge for operators, which can lead to safety hazards including employee injuries and damaged equipment.”

When injuries occur the impact is substantial. According to The American Society of Safety Engineers, businesses spend \$170 billion a year on costs associated with occupational illnesses and injuries. Employers spend billions on wages and medical care. OSHA reported lost productivity in the workplace costs companies \$60 billion each year. Such productivity losses paired with expensive medical and wage payments greatly affect bottom-line performance.

Further to the bottom-line, forklifts transporting palletized goods often result in product and pallet damage, and unsaleable merchandise. In the 2008 Joint Industry Unsaleables Report: The Real Causes and Actionable Solution, the Grocery Manufacturers Association (GMA), Food Marketing Institute (FMHI), and Deloitte reported that 2007 industry survey data showed manufacturers’ unsaleables rates range from 0.4% to 2.64%, averaging 0.83% of gross sales. Retailers’ and distributors’ unsaleables rates range from 0.24% to 2.78%, averaging 1.21% of gross sales. The report shared an example of what this data means for a \$5 billion manufacturer and retailer. Unsaleables for a manufacturer represent a cost of \$41 million on average. Unsaleables cost for a retailer before reimbursement is \$60.5 million on average.

“American Packaging was experiencing safety concerns in a present application, which was pulling/pushing, by two associates, heavy cylinder carts to the printing presses. A VGV tugger was the ideal solution for addressing the safety challenges the company was facing. The percentage of decreased safety incidents since the VGV was implemented is dramatic. Powered industrial truck incidents decreased by 94%.”

Chad Kellis, Major Account Manager  
Torrance, Inc.

## Automation Benefits with Vision Guided Vehicles

Not all accidents or damage result from misuse of forklifts, often, supplementary factors such as physical limitations, training, work stress, perception, and decision-making affect operators. Therefore, reducing exposure to forklifts by deploying vision guided vehicles will reduce consequential costs from human error associated with incidents, such as death benefits, medical costs, workers' compensation claims, lost workdays, litigation fees, and fines, among others. Such concerns have influenced companies to examine safety and other benefits from automation with VGVs.

VGVs maximize efficiency, and just as importantly accuracy. According to Cribley, "VGVs provide a higher efficiency environment. Breaks are not needed and non-productive time is nearly eliminated. Maintenance costs are also typically higher for forklifts as operators can be hard on the equipment creating more frequent need for repairs. Overall, VGVs provide a more productive, safe, and cost-efficient facility."

Cribley also explained that VGVs are an effective solution for a variety of tasks such as "the transfer of product over long routes between pickup and drop off points. They are also a good option for transporting work in process (WIP) between assembly cells, replenishing work cells with raw materials, and removing finished goods from work areas."

Automated delivery eliminates the concern of running out of parts for production. VGV delivery is predictable and consistent, and is important as manufacturers move to smaller lot deliveries. VGVs ensure the delivery of the right parts to the right place every time.



Legislation affecting forklift training in the UK include the Corporate Manslaughter and Corporate Homicide Act, a landmark in law. For the first time, companies and organizations can be found guilty of corporate manslaughter as a result of serious management failures resulting in a gross breach of a duty of care. The Act clarifies the criminal liabilities of companies including large organizations where serious failures in the management of health and safety result in a fatality. Although the new offence is not part of health and safety law, it will introduce an important new element in the corporate management of health and safety.

### Complexity Factor Driving Forklift-Free Environment

Ensuring the delivery of right parts in an efficient manner has become somewhat more difficult to maintain, as customization in large volumes of manufactured product is good for sales, but adds complexity to the production process. Throughput can be stifled by order complexity, impacting inventory, lead times and profits, though the effect is not easily quantified.

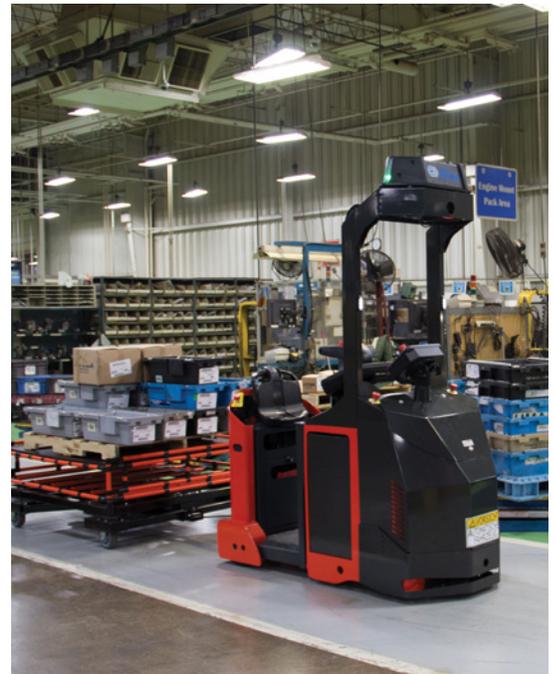
According to Blaylock, “Complexity and efficiency are two key factors driving the current urgency for forklift-free environments. Virtually all manufactured products are becoming more complex as consumers demand more specialized features, color choices, and power options. This requires more part density in the line side assembly area, which in turn requires more forklift traffic to move the parts to the line with higher frequency.”

Blaylock stated, “A forklift-free environment is far more than a direction. Several major manufacturers have a top down edict that all new lines will be FTF. This is driven by the desire to meet the demands of complexity, kitting, and efficiency while increasing safety, reducing line side inventory, delivering parts accurately, and increasing quality.”

### With Forklift-Free Environments, Safety and Profitability are not Mutually Exclusive

Obviously, there is no greater concern than the safety, health, and lives of workers; profits while very important are secondary. However, safety and profitability are not mutually exclusive, and no greater is that evident than with forklift-free environments. Suited for safety and profitability, vision guided vehicles provide added benefits of lean manufacturing, and an efficient and productive operation.

Vision guided vehicles provide benefits that make sense for companies suited for a forklift-free environment in terms of both reducing employee injuries and deaths, to reducing production costs through lean manufacturing. Given these additional cost burdens, safety considerations, and lean manufacturing initiatives, there is pressure to seeking alternatives to forklifts, especially where VGVs can accomplish the same job (material flow and movement) as they prove to be safer, more productive, and efficient than traditional forklifts.



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