

# Load Optimization for Logistics Companies

## A Glance at Clean Freight Strategies

### PALLET LOADING STRATEGIES

Pallets can be arranged strategically to maximize space. A standard combination truck can hold more standard pallets (Grocery Manufacturers Association standard 48 inches by 40 inches), depending on how the pallets are loaded: 24 to 26 pallets with traditional loading methods, 26 to 28 pallets in pinwheel formation, and 30 pallets with turned loading.



*When loading freight trucks, companies can use strategies such as side loading, using lighter shipping containers, and requiring a minimum order size to increase the efficiency of the load. By increasing how much freight each truck can carry, these strategies reduce fuel use and emissions on a ton-mile basis.*

### WHAT IS THE CHALLENGE?

Empty space in trucks wastes labor, fuel, and money. According to the American Transportation Research Institute, the average marginal cost per mile for truck carriers is \$1.69, and the average truck tractor logs almost 100,000 miles each year. These costs add up. Truck carriers with empty space or unused weight capacity can improve efficiency by optimizing loading strategies.

### WHAT IS THE SOLUTION?

A variety of strategies can help companies ship full loads more consistently:

-  **Order optimization.** Carriers work with customers and offer incentives to create full truckload orders. Software identifies optimal order frequency and the most efficient fleet use.
-  **Volume optimization.** For trucks that cube out—reach the volume limit before the weight limit—changing loading strategy fits more goods into trailers. Pallets are arranged to maximize space by pinwheeling (rotating every other pallet 90 degrees) or using turned loading (with the long side of pallets parallel to doors). In-trailer equipment and lifting systems increase load capacity. Three-dimensional sensors and cameras capture data about load density and trailer fullness.
-  **Weight optimization.** For trucks that weigh out—reach the regulatory weight limit before the volume limit—investment in lightweight equipment enables the fitting of more goods in each load. For instance, plastic pallets are lighter than wood pallets and absorb less moisture. Aluminum plate wall trailers are lighter and have a little more interior volume. And third-party logistics providers (3PLs) can encourage suppliers to use lighter packaging.
-  **Dock operations tools.** Technology helps early in the loading process. With global positioning systems (GPS) and radio frequency identification (RFID), dock controllers can see which goods are associated with which incoming trailer, warehouse management systems can track inventory; and communication systems can process orders and handle scheduling.

### COSTS

The costs of the load optimization strategy vary depending on the tactics and equipment used. Minimizing weight could involve purchasing new trailers or pallets. Using alternative loading layouts requires pallets that can be lifted from any side, so carriers may need to buy new pallets or forklifts. Technology and software involve initial investment. These tactics may also require employee training and coordination throughout the supply chain.

A major office supply company uses pinwheeling and turned loading in aluminum trailers to fit 23% more freight per truckload than before the innovations.

**23%**  
more freight  
per truck



### SAVINGS AND BENEFITS

Optimizing truck loading helps companies improve:

-  **Fleet efficiency.** Full loads translate to fewer trips and thus fewer vehicle miles traveled, lower labor costs, and reduced fuel use and emissions.
-  **Reliability.** Load optimization helps companies predict load capacity more accurately and ensure that orders fit in a given load. The risk of product damage due to product shifting in transit is also lower when vehicles are full.
-  **Efficiency of dock operations.** In-trailer equipment, lifting systems, and dock management tools can improve the efficiency of operations. Loading management software can also reduce employee training needs, as these tools provide exact instructions for loading.
-  **Customer savings.** The load optimization strategy helps customers save in receiving and processing costs as a result of fewer shipments.

## NEXT STEPS

- 1** Examine each step of the loading process, including ordering procedures, vehicle assignment, and dock operations. Identify factors that limit carriage of more cargo—weighing out, cubing out, inaccurate load size estimates—as well as other inefficiencies in the loading process.
- 2** After identifying inefficiencies, explore the opportunities. If weighing out occurs frequently, explore lightweight equipment options. If cubing out occurs frequently, test alternative loading strategies and technologies. If load size estimates are often inaccurate, consider investing in load management software.
- 3** Conduct a cost-benefit analysis to identify investments. Conduct pilots to test new strategies. Train employees to use the new loading methods. Work with customers and offer incentives to optimize order sizes.