

Trailer Loading Techniques

By Dave Piasecki

Process decisions are seldom as simple as they seem on the surface, and decisions related to loading trucks are no exception. From manually floor loading parcels, to loading reusable containers into trailers with fully automated loading systems, loading decisions must seek to balance productivity, safety, transportation costs, equipment costs, and product protection.

With the diversity of products and services offered today, it's possible that a single operation may need to accommodate parcel carriers, rail cars, truckload (TL) carriers, less-than-truckload (LTL) carriers, overseas containers, and local delivery trucks. Loads may consist of bulk materials, palletized loads, non-palletized unitized loads, parcels, crates, totes, drums, carts, rolls, bundles, and loose oversized items. Loads may require special material handling equipment such as, roll clamps, slip-sheet devices, carton clamps, or drum-handling devices.

Parcel Loading

Oddly enough, the easiest loading decisions come with the most labor-intensive types of loads. That's right, I'm talking about parcels. With few exceptions, if you are shipping parcels, you will likely be **floor loading** the parcels by hand into vans and trailers. This is the preferred method of the major parcel carriers.

There's no getting around the fact that floor loading is going to be very labor intensive. The only means of attempting to apply some level of automation to floor loading comes with the delivery of the parcels to the workers doing the loading. This generally involves using telescoping conveyor, boom conveyor, or expandable flex conveyor that extends into the trailer, bringing the parcels directly to the loaders. Dock design—the grade of the trailer approach to be more precise—is very important when floor loading small parcels into trailers. You do not want your workers to have to be working “uphill” when trying to assemble the three-dimensional puzzle that ultimately makes up a full trailer of parcels. A dock approach with a level grade can prevent a lot of aggravation.

Operations that load parcels into delivery vans also need to consider dock design. The standard raised docks used to load trailers are too high for these types of vehicles. You can either use an approach ramp (fixed or temporary) that raises the vans to a more appropriate level or use a street-level dock.

Whenever floor loading is used it's very important to inspect the trailer to ensure it is clean and dry. Though a leaky trailer may be a problem for any load, it can have much worse consequences when floor loading since the parcels will be in direct contact with the floor.

When shipping parcels, product damage prevention is much more dependant upon the strength of the carton and fill materials than on the loading technique. Since your parcels will be unloaded and reloaded several times before they reach their destination, it's impractical to expect to control the loading and handling procedures. “This side up” and “Fragile” stickers are somewhat of a joke in the parcel shipping industry, and though it doesn't really hurt to use them, it may not be helping either. Anyone involved in the parcel shipping industry had to enjoy the opening scene in the first “Ace Ventura” movie where “Ace”, disguised as a parcel delivery person, proceeds to abuse a package while making a delivery. We've all probably received one of these battered packages that ends up looking more like a crumpled paper bag than a corrugated carton.

In real life, it isn't the delivery activity that is causing this damage, but rather the unloading and sortation that occurs at the carrier's distribution hubs. I think anyone that ships parcels on a regular basis should tour a parcel sorting operation just to witness this phenomenon. Once you see parcels being bounced around on conveyors and dumped through chutes you will probably wonder how anything survives this process. You'll also realize that you must choose your cartons and fill materials with the assumption that a 70-pound carton will, at some point, fall on top of your package.

Palletized Loads

When it comes to loading palletized product or other unitized loads, there are many more variables that affect the loading methodology. The first variable that needs to be dealt with is weight. If the loads you are handling are heavy, it's possible that the capacity of the trailer or container will limit your loading options. With lighter loads, cube utilization becomes a key variable. Unfortunately it's not as simple as just determining the method that best utilizes the cube of the trailer or container. In most situations, methods that increase cube utilization will also increase the labor required to load and unload the shipment. This is where you must balance productivity with transportation costs. Loads going further distances will justify putting more effort into utilizing the cube than those going shorter distances. You may find that it makes sense to straight-load pallets for local and regional shipments, turn the loads or use pinwheeling for more distant shipments, and floor load containers for overseas shipments.

Straight loading involves using two-way pallets and loading them straight (in the direction of the pallet stringers) into the trailer or container. With standard 40"x48" pallets this will allow two pallets to be loaded side by side with plenty of extra space between the pallets and the trailer sidewalls. This is the quickest method of loading pallets, but does not fully utilize the trailer cube and may not adequately prevent loads from shifting.

Very high volume operations that straight load standardized palletized loads have found the use of extended carriages with two pair of forks on their lift trucks allows them to quickly move and load two pallets at a time. This can provide significant productivity gains.

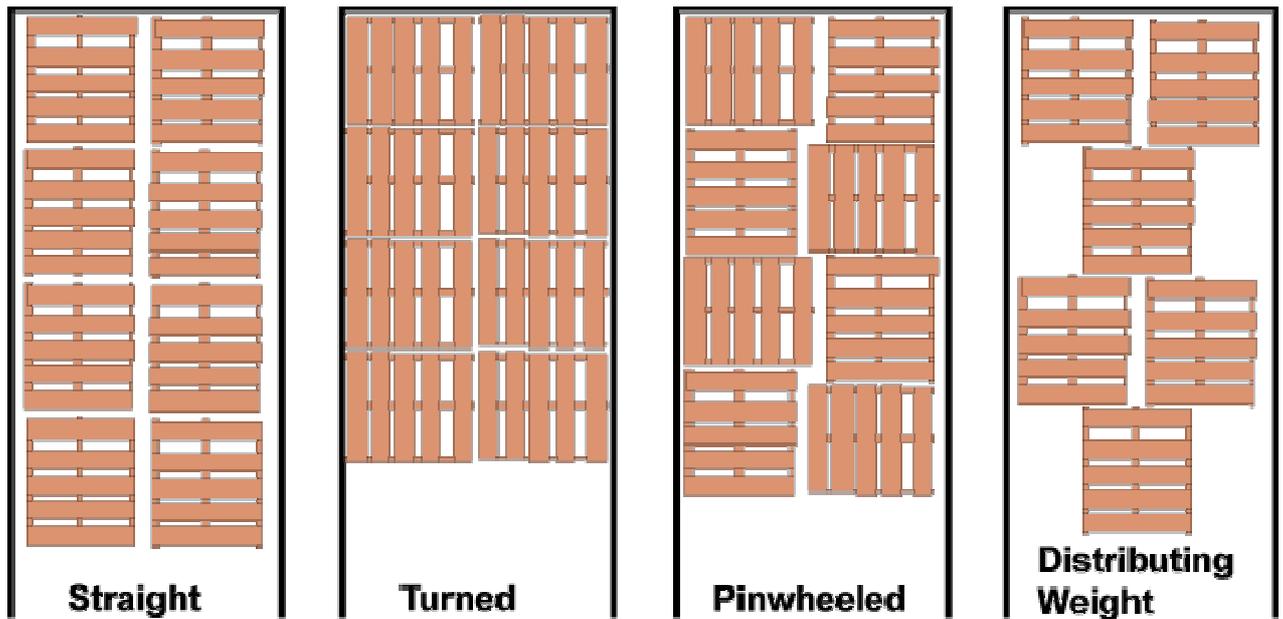
Loading pallets turned (or sideways) requires the use of four-way pallets. In this method, the lift truck will pick up the pallet from the side (perpendicular to the pallet stringers) and place them in the trailer. With standard 40"x48" pallets, this will allow two pallets to be loaded side by side in most dry trailers. There may not be adequate width in overseas containers and refrigerated trailers to do this with standard pallets. Turning pallets gives the best space utilization for loading palletized loads and provides better protection from product shifting than straight loading.

Pinwheeling refers to a method where you alter the direction of every other pallet. It's a combination of loading pallets straight and turned. Pinwheeling can be used to more fully utilize the space in a trailer or container when there is inadequate width to allow loading two turned pallets side by side. This is practical when the depth of the pallet is longer than half the trailer width, but the depth plus the width is less than the trailer width.

Another reason for using pinwheeling is the additional stability created by the interlocking of pallets with different load orientations. If you ship tall palletized loads made up of layers of stacked cartons, you will find that the lateral forces put on the loads during the transportation of the shipment can make seemingly stable loads lean or fall over in the trailer. This is especially a problem when handling tall loads that are barely stable when standing still. The grocery industry is a good example of an industry that is challenged to deal with tall unstable loads made up of a mix of dissimilar items in weight, size, and shape. Since every load is different, it's often up to the skill level of the order picker to somehow assemble a stable load out of a "little bit of everything".

Pinwheeling can also be used as a compromise of productivity and cube utilization since it provides greater cube utilization than straight loading but may require less labor than turning all the loads (which sometimes makes for some very tight loading conditions).

When loading anything but the lightest loads, equalized weight distribution is critical. Depending on the specific loads, this may involve alternating commodities as you load, using braces to leave empty spaces, or alternating side-by-side pallets with single pallets.



Securing Loads

There are a variety of blocking and bracing techniques used to secure and protect loads. There is a saying in the transportation industry that goes something like this, “gravity is not an acceptable method of securing a load”. Loads should be secured and protected as needed by using blocking and cleats nailed to the floor, braces, straps, load bars, separators, or air bags and other void fill materials. In addition, load preparation through the use of stretch wrap, shrink wrap, banding, and edge protectors, will help in stabilizing and protecting individual loads.

Wheeled totes, carts, and hoppers can facilitate very quick loading of trailers, but come with their own unique challenges. Whenever using wheeled containers to transport materials you should make sure the containers are equipped with some type of locking device such as wheel locks or floor locks. Additional blocking or bracing should also be used. As with hand-stacking parcels, you will find that a dock design with a flat grade is very important when frequently loading wheeled containers.

Fully automated trailer loading systems are available that provide the ultimate in productivity. Though applications for these systems are somewhat limited, they can provide a reasonable ROI in certain environments. Automated loading systems may use unit-load conveyor to move the loads to the loading device or may require using lift trucks to stage loads on the loading device. Tight tolerances are required in the design of the dock and the trailers to make these systems work. Automated loading systems are usually best suited to applications where dedicated trailers are used for frequent short-distance deliveries of standardized loads, such as moving manufacturing materials between nearby plants.

LTL

For less-than-truck-load (LTL) shipments, you cannot effectively control the loading of your shipments since the loads may be unloaded and reloaded several times before reaching their destination. One of the most common problems when shipping LTL is related to trying to prevent the carrier from double stacking other loads on top of your load. As with parcel shipments, the use of warning labels tends to be less than effective. There are a variety of products such as cones or corrugated pyramids that can be attached to the top of palletized loads to try to prevent this activity. You can also try putting your loads together in a manner that makes it extremely difficult to stack something else on top of them.

Though LTL carriers will accept non-palletized loads, it's generally recommended that you try to palletize anything shipping LTL. This will provide protection of the loads as they are unloaded and reloaded at the transportation hubs.

Additional Considerations.

It's also important to understand the material handling capabilities at the shipment's destination. Don't assemble 5,000-pound loads if your customer only has 4,000 pound lift trucks. Don't turn the pallets if your customer unloads with a pallet jack. And don't use slipsheets if your customer does not have slipsheet handling capabilities.

Always consider [safety in loading dock areas](#). Many of the most serious accidents occur in dock areas and it's critical that lift truck operators as well as pedestrians working in these areas are fully trained on the hazards and proper procedures.

Source

<http://www.inventoryops.com/articles.htm>, May 09