



Pallet Recycling A Guide for the Private Sector

FACT SHEET

BACKGROUND

In 2005, North Carolina enacted [House Bill 1465](#), which bans the disposal of wooden pallets in municipal solid waste landfills by October 1, 2009. Pallets may be sent to construction and demolition landfills if they are generated as C&D waste (as defined by the NC Solid Waste Management Rule 15A NCAC 13B .0532). Pallets from an industry other than construction of homes and buildings would not be allowed in any landfill.

The legislation recognizes many management methods are available to pallet generators other than disposal. This fact sheet is designed to give pallet generators information on options that will help comply with the disposal ban. In many cases, using these options may save money for pallet generators not only in avoided disposal costs, but also in the purchase and use of pallets and related packaging.

ASSESS PALLET USE

A good first step for generators of wooden pallets is to determine the kinds and amounts of pallets used or received. Performing the following tasks will provide valuable information:

- Compile a list of suppliers who deliver products or materials to your facility. Record how many are received in a week or month's time, including sizes and types of pallets received.
- Determine how much it costs to manage pallets as disposable items, including rental or purchase fees of any disposal containers, hauling charges and any related disposal fees.
- Determine the types and amounts of pallets used internally or for shipping. How many are common sizes (e.g., 48" x 40")? Are some custom sizes? How much do you pay for pallets and who are your suppliers? Do the pallets on which you receive supplies and materials match ones you use internally or to ship out products or materials?
- Determine the cost of any pallets purchased for material handling or shipping. What types of pallets are used? Is there flexibility in the kinds of pallets used?

In short, an inventory of pallets received, used and shipped, along with a sense of the costs associated with pallet use and disposal, will help in choosing the management options discussed below.

SOURCE REDUCTION (WASTE PREVENTION) OPTIONS

Businesses, industries and others who use or receive wooden pallets may be able to eliminate pallet usage or otherwise avoid having to manage discarded pallets. Options include:

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- Requesting or requiring suppliers who deliver materials or products on pallets to take back used pallets, or to deliver materials without the use of pallets. You may even consider charging a disposal fee for those pallets not taken back.
 - Small businesses that receive only a few pallets every week or every month may find this option useful.
- Taking steps to eliminate or limit the use of pallets in internal or shipping operations. Palletless systems include the use of slip sheets, reusable containers, recyclable top and bottom cardboard covers, rolling carts and other material handling systems. These products are usually tailored to a company's specific needs and are often reusable, recyclable and easy to clean. The following sections explore a few of these options in more detail.

Slip Sheets

As mentioned above, one alternative to wooden pallets is the use of "slip sheets." Slip sheets are flat sheets, 1/32" to 1/16" thick, manufactured from corrugated, solid fiber or plastic (usually polypropylene or high density polyethylene). Each sheet has one to four "tabs" that run the length of the sheet and are bent upward for grabbing by push/pull attachments used on retrofitted forklifts. They may be custom-designed with alterable features including thickness, size, number of tabs, and coatings for tensile strength, slip resistance and moisture resistance. The California Integrated Waste Management Board has produced a list of [Slip Sheet Manufacturers](#). A simple Web search may also yield more leads for slip sheet vendors.

Slip sheets may be best used in a warehouse or distribution center. The following list explores some pros and cons of slip sheets versus wooden pallets:

Advantages of slip sheets over pallets:

- Slip sheets are lighter and less bulky, weighing around two pounds compared to 50 pounds for a standard wooden pallet.
- Slip sheets use less storage space: as many as 50 can be stored in the same space as one pallet.
- Slip sheets may help workers avoid stress, strain and injury from manually handling pallets.
- Slip sheets are inexpensive enough for one-time use to avoid the need to keep track of pallets.
- Slip sheets may decrease product damage. Broken pallet boards, protruding nails and splinters can damage products.
- Slip sheets are usually recyclable.

Disadvantages of slip sheets

- Switching to slip sheets could entail a large start-up cost - push/pull forklift attachments can cost more than \$5,000 each.
- If slip sheets are used for external deliveries, customers must be in a position to handle them, including having push/pull forklift attachments.
- Water and moisture can weaken corrugated and solid fiber sheets.
- Slip sheets are not rackable. Slip sheets must be placed on rackable pallets or a steel wire support system must be installed in racks.
- The use of slip sheets will require specialized training of forklift drivers to ensure proper handling.

Reusable Containers

Reusable containers are another possible alternative that can be employed to avoid the use and generation of wooden pallets. They can be manufactured from plastic, corrugated, solid fiber or metal. The strength, durability and cleanliness of reusable containers depend upon the material used. Containers can be ordered to fit your needs, including size, shape, color, partitions and reusable cushioning systems. Features offered include being stackable, nestable and collapsible for convenient storage and return.

Rolling Carts

Rolling carts usually made from heavy duty plastic or metal can be tailored to fit odd shaped products with considerably less protective packaging. Rolling carts tend to save labor and reduce injuries, as they are easier to work with than pallets. Savings on labor, injuries and protective packaging can often pay for these carts within a year.

REUSE AND RECYCLING OPTIONS FOR WOODEN PALLETS

If wooden pallets cannot be eliminated, reduced or returned to suppliers, pallet generators can turn to reuse and recycling options. Some pallets are more recyclable and reusable than others, so pallet generators should assess and possibly be prepared to change the kinds of pallets received or used. Pallet recycling companies are good sources of information regarding the most desirable types of pallets - generally the most attractive is a standard "GMA 48 x 40 pallet" - see the Grocery Manufacturer Association Pallet Resource Center Web site at <http://www.gmabrands.com/publications/palletres.cfm>. Internal reuse options may also be available, allowing a company to use incoming pallets to send outgoing shipments.

Pallet Recycling

Most pallet recycling companies are interested primarily in receiving immediately reusable or repairable pallets. These pallets represent the highest value for pallet recyclers, which is why they give those companies that generate them the best deal. Many pallet recyclers also work to restore broken pallets to working condition to get as much value as they can from the product.

Recyclers may pay for pallets, take them for free or charge to take them, depending upon the amount and kinds available from any given generator. Large supplies of GMA pallets will generally yield revenues to the generator, whereas small supplies of odd-sized pallets will cost the most to recycle.

Although it can be difficult to do so, pallet generators are well served by improving the attractiveness of their pallet stream to potential recyclers by standardizing sizes, moving to more desirable types of pallets and working to keep pallets in good working order.

If pallets are not suitable for reuse or repair then they can be processed for other uses. This processing usually entails grinding the pallets for use as landscape mulch, playground cushion bedding, animal bedding, compost and soil amendments or biomass fuel. Many companies offering pallet repair services are also capable of this type of processing. In addition to companies specifically involved in pallet recycling, other types of recycling firms such as commercial composters, wood waste grinders and construction waste recyclers are possible outlets for discarded pallets.

North Carolina keeps an extensive list of pallet recyclers and other companies able to accept and manage wooden pallets on its recycling markets directory, searchable on-line at www.p2pays.org/dmrm.

Generators can also make use of two on-line waste exchanges to help find home for their wooden pallets: NC WasteTrader at www.ncwastetrader.org and NC BiomassTrader at www.ncbiomasstrader.org. Pallet generators who do not have Internet access or who want additional guidance can also contact staff with the North Carolina Division of Pollution Prevention and Environmental Assistance at (919) 715-6500 or (800) 763-0136.

In addition, some local governments (counties and municipalities) may be able to offer other assistance and possibly a local drop-off location for wooden pallets. It is an important step for pallet generators to contact their county solid waste and recycling office to see what help or services may be available. For access to local contact information, see: <http://p2pays.org/localgov/ncwaste.html>, or call DPPEA at the numbers listed above.

Third-Party Management

One kind of recycling alternative for pallet generators is use of third-party pallet management services. Third-party pallet management companies and their networks of individual pallet companies can provide an efficient way to manage used pallets and source pallets for use.

In essence, third-party management companies rent pallets to a user on a per trip basis. The management company tracks pallets throughout their usage and retrieves them for reuse or refurbishing. Third-party systems often use higher quality pallets, increasing the trips per pallet an average of 20 to 40 times compared to five times when managed by the user. This management method can optimize reuse and recycling and may save the pallet user money and time. A list of Third Party Pallet Organizations can be found on the [Pallet-Mall](http://www.pallet-mall.com/logisticsnew.htm) Web site: <http://www.pallet-mall.com/logisticsnew.htm>.

OTHER METHODS FOR AVOIDING PALLET DISPOSAL

In addition to pursuing reducing pallet reduction and recycling options discussed above, pallet generators may also consider some of the alternative management methods described below.

Pallet Exchanges

One way to handle excess pallets is through exchanges with other pallet users. These arrangements can be made by the businesses themselves or can be facilitated by local government recycling coordinators and local groups such as the chamber of commerce. Another possibility is finding a sister facility that can exchange pallets with your facility. Exchanges may reduce costs for pallet management and purchase, and may work especially well when participating businesses do not require top-quality pallets.

Donate Pallets

Companies can give away clean scrap pallets to employees for building projects and firewood. During the winter, scrap pallets can also be given to the public to fuel fireplaces and wood stoves. A small classified ad in the local paper can generate considerable demand. It should be noted that some wooden pallets are not suitable for use as firewood in residential settings.

TAKING ADVANTAGE OF DISPOSAL COST AVOIDANCE

Companies can experience considerable costs in the storage, transportation and disposal of discarded pallets. Often these costs take the form of waste container rental, hauling fees and tipping fees charged by waste management companies, all of which may be able to be reduced substantially when a company eliminates pallet use or pursues recycling options. Sometimes recycling options may entail their own costs, especially if a company has many unusual sizes or kinds of pallets. It is therefore important for pallet generators to closely evaluate their waste management services and charges, and to take advantage of cost savings on that end if reduction, reuse and recycling options are implemented.

OTHER IMPORTANT POINTS ABOUT PALLET GENERATION AND MANAGEMENT

Use High-Quality Pallets and Possibly Repair In-House

High-quality pallets are easier to repair and more likely to be repaired and reused again and again. The cost per trip of higher quality pallets tends to be lower than cheap pallets because high-quality pallets can withstand more trips before repair is needed.

Companies that use higher quality rebuildable pallets also can save as much as \$3 to \$4 per pallet by repairing them in-house. Dedicated pallet handlers can be trained to provide minor or major repairs to broken pallets for a fraction of the cost of buying new ones. Companies that use large quantities of pallets should analyze whether simple repair operations can be established that help avoid disposal and save the cost of buying new pallets.

Closed-Loop System With Plastic, Composite and Metal Pallets

Pallets made from plastic, metal or composite materials can be a long-lasting alternative to wooden pallets. All three materials are durable, reusable, easy to clean and recyclable. Despite higher initial costs, these pallets may save money in the long run. According to the Purdue University AGVS Research Group the average life of these pallets is 100 trips, where one trip is defined as five handlings. These pallets usually meet both USDA and FDA standards for pharmaceutical, chemical, grocery and food processing operations as they can be sanitized and steam cleaned. They also exhibit low breakage rates and work well with automated material handling systems. Product damage is lowered and employee safety is increased when using these pallets because they have no nails, staples or broken boards.

Plastic, composite and metal pallets are best used in a closed loop or internal use system where shipping is restricted to moving goods within or between specified plants and facilities. Closed-loop systems operate under one or more of the following conditions: short distance shipments, frequent deliveries to the same customer, delivery to a limited number of customers and/or delivering with company owned vehicles.

Plastic Pallets

Plastic pallets are created in three general forms. Plastic lumber pallets resemble the wooden pallet with the exception that the boards are made from extruded plastic. Structural foam and thermoformed pallets are distinctive in style as they are one solid piece of plastic. These pallets have no nails, screws or staples, thus reducing product damage and employee injuries. They often offer a grooved deck, a raised lip on the outer edges and hollow feet that provide nesting capacities saving storage space. Some plastic pallet manufacturers have worked to create a rackable structural foam or thermoformed pallet. Heat and weight may prove a detriment to these types of pallets if they bend under open racking conditions.

Composite Pallets

Composite pallets, as their name states, are made of two or more distinct materials. Some are made from a combination of plastics while others are extrusions of sawdust, wood shavings and recycled plastics. Composite pallets are fairly new to the pallet industry. They have high loading capacities and racking ability like wooden pallets, but are easily cleaned like plastic pallets.

Metal Pallets

Metal pallets generally are made of aluminum or stainless steel. They are most often used as slave pallets, which do not leave a facility. Metal pallets are the strongest and most durable pallets on the market. They usually are heavier than their wooden counterparts and have a much higher initial cost. Metal pallets are most often used in a manufacturing setting where a pallet is needed to withhold heavy racking weights, high temperatures, the rigors of conveyor systems and cleanliness standards set by the FDA and USDA.

Corrugated Paperboard Pallets

A small percentage of manufactured pallets are made from corrugated paper or pressed wood composites. Reasons for using corrugated pallets include lightweight, recycling ease and strength. Some corrugated pallets boast static load capacities as heavy as 30,000 pounds (at 70° F and 50 percent relative humidity). Corrugated pallets are also able to meet the special dimensions and disposal needs for shipping goods to Europe. Some European customers request corrugated pallets because they can be recycled with corrugated boxes. For those interested in completing the loop and buying recycled, corrugated pallets are typically manufactured from recycled paper.

However, there are drawbacks to corrugated pallets. First, they can be relatively expensive, especially when used only once. Corrugated pallets are not as durable as wooden, plastic or metal pallets, and products often must be stacked in specified ways for the pallet to hold the load. Furthermore, exposure to moisture will damage corrugated pallets possibly causing pallet failure.

Pallet Standardization

As mentioned above, standardizing pallet sizes promotes reuse and recycling. Work with vendors to supply incoming materials on pallets your company can use to ship out its final products. A change in pallet size may require modifications to racking, storage facilities or product orientation, but the savings may be well worth it. Using one standard size will reduce pallet inventory needed and labor needed for sorting different pallet sizes.

OTHER RESOURCES ON PALLETS

Minnesota Office of Environmental Assistance - MOEA has posted a Management Options for Wooden Pallets fact sheet on its Web site at <http://www.moea.state.mn.us/berc/pallets.cfm> and also posts a Reusable Transport Packaging Directory at <http://www.moea.state.mn.us/transport/index.cfm>.

California Integrated Waste Management Board - CIWMB hosts a Web site with useful information about wood packaging, including pallets. See: <http://www.ciwmb.ca.gov/Packaging/Wood/>.

National Wooden Pallet and Container Association - NWPCA is a trade association for manufacturers, recyclers and distributors of pallets, containers and reels - <http://www.nwpga.com>.

Recycler's World is a national recycling exchange Web site that includes a specific page on wood pallets: <http://www.recycle.net/recycle/Wood/pallet/na/>.

FINDING MANUFACTURERS AND DISTRIBUTORS OF WOODEN PALLET ALTERNATIVES

Because the packaging marketplace is dynamic and contact information changes frequently, DPPEA recommends pallet generators searching for material handling alternatives to wooden pallets make concerted use of the World Wide Web. The many different Web search engines available will allow companies to conduct extensive Internet searches that help retrieve the most recent information on alternative pallets, pallet recycling, pallet markets, etc. Using online industrial directories such as the *Thomas Register* can also help find pallet alternatives or vendors of alternative shipping systems.



The North Carolina Division of Pollution Prevention and Environmental Assistance provides free, non-regulatory technical assistance and education on methods to eliminate, reduce, or recycle wastes before they become pollutants or require disposal. Telephone DPPEA at (919) 715-6500 or (800) 763-0136 for assistance with issues in this fact sheet or any of your waste reduction concerns.