

US EPA ARCHIVE DOCUMENT



APPENDIX A:

Materials Commonly Included in Recycling and Waste Prevention Programs at Malls and Shopping Centers

The following table is intended to provide you with information that is useful when deciding what materials to potentially add to your mall's recycling program. In addition to general recycling information about each commodity, there is also helpful information regarding the collection of these recyclables. This information is by no means "the recipe" for your program's success. Instead, it is merely a summary of what has generally been practiced in retail settings. You should use this information as a general guide, realizing, however, that you might need to tailor it to the particular needs and impediments of your mall's unique logistics. There is also information about the economic market for your recyclables. This information can play a crucial role when deciding which material(s) to add to your program, as a stable market will ensure that you receive economic benefits from your recycling efforts. The table is organized by the commodities with the most stable markets to those with the least, top-to-bottom. This will allow you to work your way down the list, adding the most economically feasible commodities one at a time as resources and time allow.

| Material | What You Should Know | Typical Collection Logistics | Probability of Stable Market |
|--------------------------------|---|---|--|
| Old corrugated cardboard (OCC) | Retailers generate a high volume of OCC. Recycling experts estimate that OCC typically constitutes 30 to 40 percent of a mall's waste stream. OCC is a great candidate for recycling because it is easily separated from other materials, it is bulky, and it is the most consistent revenue generator among materials in a mall's waste stream. | Malls that generate large volumes of OCC typically bale or compact the material. Retail tenants flatten boxes and store them in back of retail space. Boxes are transported to the baler or compactor by the tenant or by mall staff (housekeeping or grounds). Vendor picks up OCC as needed or according to a routine schedule. | <i>Excellent.</i> |
| Paper | Waste paper may be generated by retailers and in mall management offices. Office paper is usually collected in two grades: high-grade and mixed paper. High-grade paper typically consists of white copier paper, white computer paper, white office stationery, and white note paper. Mixed office paper includes nearly all paper generated in an office, including both white and colored paper, file folders, manila envelopes, etc. Newspapers and magazines may be collected separately, as they are a different type of fiber. Mixed paper is considered low quality and generally yields low market prices. The highest prices are paid for high-grade paper with little contamination. | Retail tenants and mall offices collect paper in plastic bins or cardboard boxes. Paper is transported to a consolidation or storage area by the tenant or by mall housekeeping staff. The vendor picks up paper as needed or according to a routine schedule. | High grade- <i>Excellent.</i> Mixed paper- <i>Good.</i> |



| Material | What You Should Know | Typical Collection Logistics | Probability of Stable Market |
|------------------|--|---|---|
| Bottles and cans | <p>Glass Glass is readily recyclable. Depending upon the vendor and the quantity of material, glass bottles may have to be whole or crushed, separated from other containers, or separated by color. Non-bottle glass, such as window glass or light bulbs, should not be mixed in a bottle recycling program.</p> <p>Plastics The most easily recycled plastics are soda, milk, and other beverage containers; these containers are polyethylene terephthalate (PET)—primarily soft drink bottles—and high density polyethylene (HDPE)—usually milk and water bottles. PET bottles are marked number 1; HDPE bottles are marked number 2. Some vendors accept plastics commingled with other recyclables (glass, aluminum, steel); others require that plastics be separated.</p> <p>Aluminum Cans Most vendors accept aluminum cans for recycling. Some vendors accept cans commingled with other recyclables (glass, plastic, steel); others may require that cans be separated. Cans can be crushed to save space; however, storing them outside may attract bees and other pests.</p> <p>Other Metals Tin/steel cans and other scrap metals are readily recyclable. They can usually be commingled with aluminum because they are easily extracted from the recycling stream with magnets. Vendor requirements vary with the metal type and the local market situation.</p> | <p>Many malls place clearly marked receptacles in public areas of the facility (halls and food court) to collect plastic and glass bottles and aluminum or steel cans. House-keeping staff empty these receptacles and transport recyclables to consolidation or storage areas for pickup by vendor.</p> <p>Retail tenants and food court restaurants may also collect plastic bottles and containers, glass, and aluminum cans generated by their business practice or by employees.</p> <p>Many vendors will collect commingled bottles and cans and sort them at materials recovery facilities. Plastics and cans help to cushion the glass. However, you should not expect high prices for commingled materials; in some markets, the high value of the aluminum offsets the lower market prices of the plastics and glass.</p> <p>If you are required to separate bottles and cans, make sure you have enough space in your staging area to sort and store the separated containers for transport.</p> | <p>Glass-Good.</p> <p>Plastics-Good (for PET and HDPE).</p> <p>Aluminum-Good.</p> <p>Other metals-Good.</p> |



| Material | What You Should Know | Typical Collection Logistics | Probability of Stable Market |
|--------------|---|---|--|
| Plastic film | <p>Most of the retail industry's plastic film waste, which can be made of various types of plastic resins, is generated during the transport of merchandise from central warehouses to individual retail outlets. Plastic film waste includes plastic bags, pallet wrap, and packaging on individual items such as clothing, known as "soft goods." Once recycled, plastic film can be used to manufacture a variety of new products, including stretch wrap, trash bags, construction film, grocery sacks, and retail bags. There are three basic processes for reprocessing plastic film for use in manufacturing of new products. The process that is utilized by a recycling facility ultimately depends on (1) the type and source of film being recycled, (2) the level of contamination, and (3) the application for which the film is being used. It is important to note that film recycling programs tend to be most successful and cost-effective when large volumes of like film and low rates of contamination are generated. Consult with a plastics recycling specialist before undertaking a plastic film recycling project.</p> <p>Source: The American Plastic Council's "Understanding Plastic Film: Its Uses, Benefits, and Waste Management Options," December 1996. Visit <www.americanplasticscouncil.org>.</p> | <p>Similar to logistics for OCC. A standard baler, like one used for OCC applications can be used for plastic film, however there are specialized balers that are made explicitly to compact film. This specialized baler will yield more dense bales, and help improve efficiencies and reduce transportation costs. If the same baler is used for OCC and plastic film, care should be taken to clean the baler between materials to reduce the potential for cross-contamination, which reduces the value of the recyclables.</p> | <p><i>Depends</i>; market prices can vary widely and are based on the type of film, current commodity prices, and contamination level.</p> |
| Food waste | <p>There are several options for developing a food waste recycling program: (1) donate unwanted food to food banks, shelters, and/or other needy organizations; (2) donate food scraps to local farms to be used as feed; (3) set up a contract to have food waste picked up by a composting company; (4) initiate a composting program on or off site. An internal composting program will require proper staffing and time to collect and process the food waste. Additionally, if composting, source separated food scrap is more valuable in the marketplace because of higher nutritional values. The selected option will depend on available resources (i.e., staff, time, money, storage space).</p> <p>Several municipalities have ordinances pertaining to food waste recycling and composting. Make sure to check with your state, county, and/or local department of waste management before developing a food waste recycling program.</p> <p>Source: University of Georgia, College of Agricultural and Environmental Sciences. Visit <http://www.ces.uga.edu/pubcd/B1189.htm>.</p> | <p>Food waste in shopping centers can be categorized into three main sources: (1) preconsumer food scraps, resulting from the preparation of food; (2) preconsumer food waste-food that has not been purchased and is no longer safe to sell; and (3) postconsumer food waste. The primary collection of these wastes can be staged in two locations-clearly marked receptacles in the food preparation area for preconsumer food waste, and clearly marked receptacles in the cleanup areas for postconsumer food waste. Postconsumer waste typically comes from the plates of diners once they have been retrieved, rather than from individuals disposing of their food court waste. Waste should be collected in a central location for composting or daily pickup by a contractor.</p> | <p><i>Good</i>, depending on the local infrastructure.</p> |



| Material | What You Should Know | Typical Collection Logistics | Probability of Stable Market |
|---|---|--|---|
| Landscaping waste | Commercial organic landscaping waste, such as grass clippings, leaves, branches, and shrubbery can be readily added to an existing municipal or commercial composting program. In addition to reducing waste disposal fees and the amount of solid waste that enters landfills, the resulting compost can be used to improve the health and appearance of landscapes. Switching from a traditional mower to a mulching mower can also significantly reduce waste disposal costs while offering landscapes a protective layer of natural mulch. | Logistics vary depending on landscaping contractor. Contact your contractor to learn your options. | <i>Good</i> -material can be sold or given away. Consider hosting an event at your mall to distribute compost in the spring. |
| Construction and demolition (C&D) waste | <p>Construction, demolition, and/or renovation of a structure can produce an enormous amount of waste known as construction and demolition (C&D) debris. Much of this material can be reused or recycled. There are three types of waste created on a project site: (1) nonhazardous waste; (2) hazardous waste as regulated by the U.S. EPA or a state; and (3) items that contain hazardous components, but are not regulated as hazardous. It is important that all contractors are aware of any local and/or state regulations that impact the generation, storage, transport, and disposal of hazardous waste items, such as lead-based paint, mercury, tires, and oil. These regulations vary by state (see Resources Section, page 33).</p> <p>In addition to making sure your contractor is knowledgeable about any pertinent environmental regulations, you should also consider a contractor who has proven experience in construction recycling. Ask to see a list of previous projects and onsite recycling rates achieved. Finally, to ensure that C&D waste is minimized on your project site, include specific language in your contract that requires contractors to meet various waste reduction and recycling goals (see Resources Section, page 33).</p> | Logistics will depend on the contractor selected. Make sure to include specifications in your contract that require collection logistics to maximize C&D waste recovery and reuse. | <p>Cement-<i>Good</i>. Asphalt-<i>Fair</i>. Drywall or Gypsum board-<i>Fair</i>. Carpet-<i>Good</i>. Untreated Wood*-<i>Good</i>. The largest market is boiler fuel.</p> <p>* Treated wood should be segregated from untreated wood. For treated wood, contact your local or state solid waste agency for the most appropriate recycling and/or disposal options.</p> |
| Fluorescent lamps | <p>Used mercury-containing lighting, such as fluorescent lamps, is regulated by U.S. EPA under the Universal Waste Rule. Check with your state to confirm regulations, as some states' regulations are more stringent than Federal regulations. Spent lamps have no intrinsic value and the recovered mercury has minimal value.</p> <p>Broken lamps must be carefully cleaned up—use disposable articles for clean up (i.e., paper towels, disposable wipes) and place all recovered material and wipes in a sealed plastic bag for disposal. Never use a vacuum cleaner, as this can distribute mercury widely in the air. Ventilate the room thoroughly after clean up.</p> | Used fluorescent bulbs need to be stored in a manner which will help prevent breakage, such as in the original lamp boxes or boxes supplied by lamp recyclers. Due to the mercury in fluorescent bulbs, used lamps should be stored in a marked area. Arrange with a lamp transporter (conforming to EPA universal waste regulations and state regulations) to pick them up for recycling. | <i>Good</i> , although mercury use is decreasing. You must pay to have fluorescent lamps recycled. The typical cost can be up to \$1.00 per lamp for very small volumes; prices go down with larger volume recycling. |



| Material | What You Should Know | Typical Collection Logistics | Probability of Stable Market |
|--------------------------------------|--|---|---|
| Pallets | Wood pallets are used at malls for material transport. When an untreated wooden pallet can no longer be reused or repaired, it can be managed as any other clean wood waste. As long as it is not chemically treated wood, it can be ground up for use as landscape mulch, animal bedding, compost, soil amendment, boiler fuel or core material for particleboard. Pallet users can avoid end-of-life issues by opting to lease their pallets, using a pallet management company, or switching to reusable plastic totes or slip sheets as an alternative. Any treated wooden pallets should be segregated from untreated pallets. For treated wooden pallets, contact your local or state solid waste agency for the most appropriate recycling and/or disposal options. | Each facility and/or individual retailer will have different collection methods. Since pallet reuse can save businesses money, there may not be a collective pallet storage area. Pallet recyclers may require a minimum number of pallets for pick-up. | <i>Good.</i> According to the National Wooden Pallet and Container Association, the market for pallet recycling has increased slightly over the last few years. |
| Expanded polystyrene (EPS) loosefill | EPS loosefill—often called packing peanuts—can be reused for outgoing shipments. If reuse is not an option, EPS loosefill can be recycled where programs exist. The EPS must be clean, uncontaminated and separated from other materials. | Storage of EPS can be a challenge, as the facility needs to collect enough of this lightweight material to make recycling economical. Transporting loose EPS by truck is cost-effective within a 100-mile radius. | <i>Good,</i> where local markets exist. |



APPENDIX B:

Products Available with Recycled-Content

The following list is intended to demonstrate the range of currently available recycled-content products. As a mall manager, please share this information with existing and prospective tenants, and encourage the use of recycled-content products as you implement a recycling collection program in your mall.

RECYCLED-CONTENT PRODUCTS FOR RETAIL OPERATIONS

| FUNCTIONAL CATEGORY | RECOVERED MATERIAL | FUNCTIONAL CATEGORY | RECOVERED MATERIAL |
|------------------------------------|----------------------------------|--------------------------|--------------------------------|
| Advertising & Promotion | | Lumber | Plastic-Wood |
| Brochures | Paper | Nails, Studs | Steel |
| Coupons, Flyers, Newspaper Inserts | Paper | Paint | Recovered Paint |
| Posters, Banners, Shelf Talkers | Paper, Plastic | Paneling | Plastic, Wood |
| Signage | Plastic, Aluminum, Paper | Parking Bumpers | Plastic, Rubber |
| | | Paving Materials | Asphalt, Glass, Rubber |
| | | Pipe Fittings | Plastic, Copper |
| | | Retaining Walls | Concrete |
| | | Roofing Shingles | Paper, Slag, Plastic, Aluminum |
| Building & Construction | | Roofing Membranes | Rubber |
| Carpeting | Plastic | Safety Netting | Plastic |
| Ceilings (acoustical) | Paper, Slag, Fiberglass | Siding | Aluminum, Plastic, Steel |
| Ceiling Grid Supports | Plastic (PVC) | | |
| Cement & Concrete | Coal Ash | Subdrainage | Rubber, Glass |
| Ceramic Tile | Glass | Wallboard | Paper |
| Concrete and Brick | Coal Ash | Wall Coverings | Plastic, Paper |
| Doors, Frames | Wood, Aluminum, Steel | Windows | Aluminum |
| Downspout Splash Blocks | Plastic | | |
| Drain Covers | Iron | Business Office | |
| Fencing | Wood, Metal | Binders | Paper, Plastic |
| Film Sheeting | Wood, Metal | Bulletin Boards | Rubber |
| Flooring | Marble, Glass, Rubber, Plastic | Carpeting | Plastic |
| Framing | Steel | Desk Accessories | Plastic |
| Insulation | Paper, Fiberglass, Plastic, Slag | File Folders | Paper |
| Lighting Housings | Aluminum, Steel, Plastic | Furniture | Plastic, Steel |
| | | Labels, Paper, Envelopes | Paper |
| | | Ribbons | Reinked |
| | | Toner Cartridges | Refurbished |



| FUNCTIONAL CATEGORY | RECOVERED MATERIAL |
|--------------------------------|--|
| Food Courts/Restaurants | |
| Buckets | Plastic, Steel |
| Containers and Packaging | Plastic (PET), Paper |
| Drink Carriers | Paper |
| Egg Cartons | Paper (molded pulp), Plastic (polystyrene foam) |
| Fatigue Mats | Rubber |
| Labels | Paper |
| Milk Crates | Plastic |
| Napkins | Paper |
| Racks and Shelves | Steel |
| Refrigeration Units | Steel |
| Serving Dishes | Glass, Plastic |
| Tables, Chairs | Plastic-Wood, Steel |
| Trays | Plastic |
| Front End | |
| Bags | Paper, Plastic, Reusable Fabric |
| Gift Boxes | Paperboard |
| Gift Wrap | Paper |
| Checkout Stations | Steel, Rubber, Plastic |
| Coin Rolls | Paper |
| Bike Racks | Steel |
| Cash Register Tape | Paper |
| Fatigue Mats | Rubber |
| Cash Register Ribbons | Reinked, Refurbished |
| Janitorial | |
| Bottles for Cleaning Solutions | Plastic |
| Cleansing Pads | Steel, Plastic |
| Recycling/Trash Receptacles | Plastic, Steel |
| Sanitary Tissue | Paper |
| Trash Bags | Plastic |
| Wipers | Paper, Plastic, Textiles |

| FUNCTIONAL CATEGORY | RECOVERED MATERIAL |
|-------------------------------|-----------------------------------|
| Landscaping | |
| Barricades | Plastic, Concrete (Coal Ash) |
| Benches, Picnic Tables | Plastic-Wood |
| Drain Covers | Iron |
| Fencing | Plastic |
| Film Sheeting | Plastic |
| Hose | Rubber |
| Landscaping Timbers | Plastic-Wood |
| Lawn Edging | Plastic |
| Mulch | Compost, Paper, Untreated Wood |
| Paving | Asphalt, Glass, Rubber |
| Soil Amendments | Compost |
| Subdrainage | Rubber, Glass |
| Transportation | |
| Antifreeze | Re-Refined Antifreeze |
| Lubricating Oil | Re-Refined Oil |
| Mud Flaps | Rubber |
| Retreads | Used Tires |
| Truck Bed Liners | Plastic |
| Wheel Chocks | Rubber |
| Warehouse/Loading Dock | |
| Bale Wrap | Paperboard, Steel |
| Bins | Plastic |
| Conveyor Belts | Rubber |
| Dollies/rolling flats, Ramps | Steel |
| Dumpsters | Steel |
| Loading Dock Bumpers | Plastic |
| Pallets | Plastic, Wood |
| Pallet Wrap | Plastic |
| Shelving | Steel |



APPENDIX C:

EPA Programs Relevant to the Retail Industry

EPA's Resource Conservation Challenge

America's Marketplace Recycles! is a component of EPA's Resource Conservation Challenge (RCC), a national effort to find flexible, yet more protective ways to conserve natural resources through waste reduction, recycling, and energy recovery.

<www.epa.gov/rcc/amr.htm>

EPA's WasteWise Program

EPA's free, voluntary program designed to help organizations eliminate costly solid waste offers a host of free tools and resources.

<www.epa.gov/wastewise>

EPA's Jobs Through Recycling (JTR) Program

EPA's program that helps connect nationwide recycling market development efforts.

<www.epa.gov/jtr>

EPA's Comprehensive Procurement Guidelines (CPG) Supplier Database

Searchable online database of products in a variety of categories containing recycled-content materials.

<www.epa.gov/cpg>, then select the "Supplier Database" button on the left.

EPA's Database on Environmental Information for Products and Services

Searchable online database containing environmental standards, contract language, and additional information about a wealth of products and services that have environmentally preferable attributes, including recycled content.

<www.epa.gov/oppt/epp/database.htm>

EPA's GreenScapes Alliance

Designed to help preserve natural resources and prevent waste and pollution, GreenScapes is a partnership program focusing on large land use applications such as roadside landscaping, Brownfields land revitalization, and the beautification and maintenance of office complexes, shopping centers, golf courses, and parks.

<www.epa.gov/epaoswer/non-hw/green/index.htm>

EPA's Plug-In to eCycling Program

Information about EPA's electronic recycling program and how to become a partner organization.

<www.epa.gov/epaoswer/osw/consERVE/plugin>

EPA and DOE's ENERGY STAR® Program

ENERGY STAR is a government-backed program helping businesses and individuals protect the environment through superior energy efficiency.

<www.energystar.gov>





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