

US EPA ARCHIVE DOCUMENT



A GUIDE TO WASTE REDUCTION AT SHOPPING CENTERS



CONTENTS

About This Guide	1
Who Can Benefit From This Guide?	1
What Can I Learn From This Guide?	1
Introduction	3
Section 1: Establishing a Successful Recycling Program	4
Step #1: Obtain management support, determine legal requirements, and identify other incentives or disincentives	4
Step #2: Identify a recycling coordinator	5
Step #3: Form a "green team"	6
Step #4: Assess your waste stream	7
Step #5: Identify materials to be collected	7
Step #6: Select a recycling service provider	8
Step #7: Determine collection program logistics	9
Step #8: Implement your recycling and management program	11
Step #9: Reap the public relations benefits	13
Step #10: Monitor, evaluate, and refine the program	15
Recycling Materials from Shopping Center Construction and Renovation Projects	16
Section 2: Preventing Waste in the First Place	17
Multiple Approaches	17
Transport Packaging	18
Taking Stock: Reviewing Inventories and Point-of-Sale	18
Reuse, Reuse, Reuse... ..	19
WasteWise: Preventing Waste, Recycling, and Buying Recycled	20
Section 3: Resource Management:	
Finding Resource Efficiency in Solid Waste Contracts	21
The Benefits of Resource Management	22
Are You Ready for Resource Management?	22
Section 4: Closing the Loop	23



Section 5: Case Studies	24
Mall of America: Bloomington, Minnesota	24
Westfield Shoppingtown Mission Valley: San Diego, California	26
VF Outlet Shopping Village: Reading, Pennsylvania	29
IKEA, Schaumburg: Schaumburg, Illinois	31
Resources	33
General	33
Retail Recycling And Waste Reduction	34
Material Exchange	35
Corrugated Cardboard	35
Paper	35
Glass	35
Plastic	36
Metal	36
Wood	36
Fluorescent Lamps	36
Toner Cartridges	37
Electronics	37
Construction And Demolition Debris	37
Community Outreach And Take-Back Programs	38
Appendix A: Materials Commonly Included in Recycling and Waste Prevention Programs at Malls and Shopping Centers	39
Appendix B: Products Available with Recycled-Content	44
Appendix C: EPA Programs Relevant to the Retail Industry	46

The mention of any company, product, or process in this publication does not constitute or imply endorsement by the U.S. Environmental Protection Agency.



ABOUT THIS GUIDE

The U.S. Environmental Protection Agency (EPA), in collaboration with the International Council of Shopping Centers (ICSC), created this guide to help shopping centers of all types and sizes assess their waste management practices and identify opportunities to reduce waste disposal, increase reuse and recycling, save money, and contribute to their local communities. This guide also serves as a resource to local and state recycling coordinators to help them work with the shopping centers in their jurisdictions to design and implement waste prevention and recycling programs.



WHO CAN BENEFIT FROM THIS GUIDE?

This guide is intended primarily as a tool for commercial property owners, property managers, and other shopping center employees who might be involved with planning and implementing recycling and waste prevention programs at malls and shopping centers. Because waste management services at most shopping centers are controlled by property management (rather than by retail tenants), management companies will likely play a leadership role in any recycling efforts. Waste prevention on a large scale, however, is more of a retail-level activity, and this guide provides several detailed examples from “big box” retailers.

Recycling and pollution prevention officials from states, municipalities, and nonprofit organizations also can use this guide as a tool for working with shopping centers and retailers.

Waste management companies and recycling service providers can use the guide to help shopping centers

and retail clients achieve their waste reduction objectives.

WHAT CAN I LEARN FROM THIS GUIDE?

This guide does not attempt to present a “one size fits all” process for developing a recycling and waste prevention program. As the case studies at the back of the guide illustrate, each mall and shopping center encounters different challenges and circumstances in setting up and managing a successful program.

What this guide does present are general concepts and factors to consider in planning and launching a program. Property managers and recycling coordinators can use the “how to” information in this guide to determine the appropriate scope and design of their own recycling program, based on the conditions that exist in their facility and on other factors, such as the markets that exist for recyclables in their area. Retailers can consider the waste prevention examples when assessing their own waste generation practices, but they will find

their own opportunities and hurdles in reducing those waste streams.

Section 1 presents concrete strategies that malls and shopping centers can use to develop a well-planned, cost-effective recycling program. For facilities that are not currently recycling, the guide describes the key steps in planning, launching, and managing a successful program, starting from scratch. For facilities that are already recycling on a limited basis, the information in this section can be used to improve or expand on existing efforts—for example, by adding new materials to an ongoing collection program, or by increasing program efficiency. This guide features practical, cost-effective steps that can be implemented over time as resources allow.

Section 2 discusses waste prevention—also known as source reduction and reuse—and how shopping center tenants and “big box” retailers can help reduce the solid waste stream by creating less waste in the first place.



Section 3 summarizes an innovative waste contracting strategy called Resource Management (RM) that helps save money, provides better service, and improves resource efficiencies.

Section 4 talks about “closing the loop”—purchasing recycled-content products to ensure the health of recycling in general.

Interspersed throughout the guide are tips and lessons learned from malls, shopping centers, and retailers that are leaders in the areas of recycling and waste prevention. In addition, **Section 5: Case Studies** at the back of the guide provide detailed information about several of the most successful shopping center recycling programs.

Finally, the **Resources Section** will point you toward dozens of more detailed, useful resources on everything from conducting waste assessments to writing contracts with recycling service providers. Additional programs that can help you get started, improve your program, or gain recognition for your efforts also are highlighted.

Appendix A lists the commodities found most frequently in shopping center waste streams, and describes how they are recycled in the current marketplace. **Appendix B** lists typical recycled-content products used in retail stores and operations. **Appendix C** is a list of other EPA programs relevant to the retail industry.



INTRODUCTION



Shopping centers and other retail outlets have become mainstays in American culture. Each month, more than 200 million adults visit the 46,000 covered malls, outdoor plazas, and other shopping venues in the United States to spend approximately \$300 million on goods, services, food, and other items. More than 10 million employees help make these purchases possible.

While all these people in shopping centers contribute to our nation's economy, they also are generating a large amount of trash. Each American generates about 4.5 pounds of trash per day, some portion of which can be found in a shopping center's waste streams. From corrugated cardboard shipping containers to leftovers in the food court, solid waste is an issue for all retail facilities. And since solid waste disposal costs in the United States have climbed significantly over the past decade, how a shopping center manages its wastes can directly affect the facility's bottom line.

The good news is that many shopping center managers have realized the benefits of implementing various types of waste reduction programs in their facilities. By working with sup-

pliers, hauling contractors, maintenance staff, and customers, shopping centers and other retail outlets have managed to cut costs through waste prevention and recycling, while demonstrating their environmental stewardship to the community.

Many shopping centers in the United States already recycle on a limited basis—focusing, for example, on a single material, such as cardboard. Others may have considered recycling but decided against it, concerned about potential expense or the difficulty of implementing something new. While the economics of recycling do vary from region to region, the truth is that, in many areas, recycling can be cost-effective.

Beyond recycling, retailers have also cut costs through waste prevention by identifying and eliminating items such as excess packaging at their source, before they become waste. Reusing items such as shipping pallets or hangers also has great potential. And for shopping centers that decide to involve the public in their reuse and recycling efforts through public education and events, the result can be a positive image and an increase in shoppers.

As more shopping centers are learning, a well-planned recycling program can produce savings:

- Westfield Shoppingtown Mission Valley, a 1.5-million-square-foot outdoor shopping center in San Diego, California, saw its annual waste disposal costs drop by more than 40 percent between 1994 and 2002.
- Plaza Camino Real Shopping Center, once the largest trash producer in Carlsbad, California, shaved more than \$67,000 from its waste disposal costs in a single year.
- VF Outlet Shopping Village, in Reading, Pennsylvania, managed to decrease its annual waste disposal costs by 67 percent between 1995 and 2002.



Section 1

ESTABLISHING A SUCCESSFUL RECYCLING PROGRAM



Whether you're starting from scratch or looking to expand your shopping center's recycling efforts, there are ten critical steps to success in recycling at the commercial level. This section briefly describes each step.

1. Obtain management support, determine legal requirements, and identify other incentives or disincentives.
2. Identify a recycling coordinator.
3. Form a "green team."
4. Assess your waste stream.
5. Identify materials to be collected.
6. Select a recycling service provider/work with your existing contractors.
7. Determine collection program logistics.
8. Implement and manage your recycling program.
9. Reap the public relations benefits.
10. Monitor, evaluate, and refine the program.

STEP #1:

Obtain management support, determine legal requirements, and identify other incentives or disincentives.

If you are considering a new or expanded recycling program for your mall or shopping center, several key planning steps should be addressed *before* getting started. These include obtaining the support of upper management, researching legal requirements that might drive or shape your program,

and identifying incentives or disincentives for recycling.

Management support. Obtaining the support of corporate management is critical—not only because a recycling program will require an initial investment of time and money, but also because the new program will lead to changes (e.g., new job responsibilities for some staff, or new procedures for shopping center employees and tenants). If corporate management is fully behind the recycling program, employees will be more likely to take the same outlook. For shopping

center managers seeking to justify recycling to upper management or recycling coordinators trying to encourage it, this guide provides numerous examples of leading shopping center recycling programs that are generating significant savings for the property management companies implementing them.

Legal requirements. Several states have passed mandates that require commercial recycling (these include Connecticut, Maine, New Jersey, Pennsylvania, and Rhode Island); others have laws that encourage local governments to set such man-



dates. Before you begin planning your program, check with your state, county, and municipal waste management agencies to determine the status of regulations that will affect your shopping center. Regulations that set waste diversion requirements or call for recycling of certain commodities not only serve as a powerful incentive for program development, but they can drive your program's structure and timeframe. (Visit www.earth911.org to find your local recycling coordinator).

Identify incentives/disincentives.

Finally, conduct research to identify other factors that might influence the development of your program. These might include:

- **High waste disposal costs.** Some parts of the country, such as the Northeast and mid-Atlantic states, have higher landfill tipping fees, which can drive up waste disposal costs for businesses. In these regions, malls and shopping centers have a special incentive to recycle, due to increased potential for significant cost savings. Recycling diverts waste from disposal, thereby reducing disposal costs.
- **Adequacy of local recycling infrastructure.** Shopping centers located in regions where recycling processors and markets are few or non-existent will likely have a harder time developing a cost-effective recycling program. At this early planning stage, initial research with your state recycling office may help to ensure markets are available for your materials.
- **Tenant recycling policies.** Many leading retail chains have corporate policies that promote recycling in their stores. Some retailers, when

negotiating leases, try to add provisions that require property management to provide recycling services. A shopping center's desire to attract and retain these leading retailers as tenants can provide an added incentive for launching a shopping center-wide recycling program.

- **Opportunities to collaborate.** Look for opportunities to partner with a neighboring retail, office, or institutional property. Adding on to an existing recycling collection program could reduce handling fees and increase the marketability of recyclables, since more materials will be collected in a consolidated program.



STEP #2:

Identify a recycling coordinator.

Once you have completed the up-front research and are planning to pursue a new or expanded recycling program, the next step is to name a recycling coordinator who will plan and manage the program. The recycling coordinator should be an enthusiastic person with strong communication and organizational skills. This person should have good rapport with a broad range of employees within different parts of your company (e.g., landscaping, housekeeping, transportation, procurement), as well as with tenants, recycling service providers, and the general public. Shopping centers often look within facility management to find their recycling coordinator, who should be someone who knows the operation inside and out.

ARE CONDITIONS CONDUCTIVE TO SUCCESS?

With persistence and determination, it may be possible to develop an effective recycling program under almost any condition. However, your chances of success rise significantly if at least three of the following five conditions are in place for your facility:

- ✓ Management support
- ✓ Regulatory incentives to recycle
- ✓ High waste disposal costs/potential for significant savings
- ✓ Adequate local infrastructure
- ✓ Tenants interested in recycling



ESTABLISHING A CORPORATE RECYCLING POLICY

Property management companies should consider establishing a corporate policy that requires recycling at all malls and shopping centers. Corporate management should communicate the policy to facility managers and waste management contractors and establish performance expectations. By making recycling a standard practice at all facilities, a property management company can create a corporate culture where environmentally sustainable business practices are valued and where recycling leadership and innovation is rewarded.



At Bloomington, Minnesota's Mall of America, the largest mall in the country, the job of recycling supervisor is a full-time position. At most other malls and shopping centers, however, the responsibilities of the recycling coordinator require much less time. The coordinator might spend anywhere from a few days a week to all of his or her time for a short period making arrangements to get the program started, but once it is running smoothly, the responsibilities may drop to several hours each week or month. For this reason, many malls and shopping centers assign the role of recycling coordinator to an employee such as the facility manager or grounds manager. For example, at the VF Outlet Shopping Village in Reading, Pennsylvania, the recycling program is managed by the facility's maintenance foreman. At Lakeforest Mall in Gaithersburg, Maryland, the general manager personally oversees the recycling program.

The specific responsibilities of the recycling coordinator differ from facility to facility. These tasks are discussed in more detail below but typically include:

- Conducting a waste audit to evaluate the recycling opportunities at your shopping center. Visually inspect the types of materials being discarded and talk with your current waste hauler about the types and amounts of materials being generated by your facility on a regular basis. Determine which materials are recyclable in your area. See Step #4 below for more information on waste audits and [Appendix A](#) for a list of items typically found in a shopping center's waste stream.
- Selecting the recycling contractor(s).
- Determining the logistics of the collection program.
- Communicating with and educating shopping center staff and tenants.
- Keeping records and evaluating program success.

STEP #3:

Form a "green team."

Many companies have found that forming a recycling and waste prevention team (or "green team") helps to ensure a successful program. Together with the recycling coordinator, this group will plan, implement, and manage the program. Team members can also assist with tenant education and program evaluation activities.

The green team should include employees from many parts of the organization, including certain key employees. For example, housekeeping staff should be integrally involved in creating the collection system, since they are involved in waste management and will likely be

relied on to implement important aspects of the program. Grounds staff also should be included.

Depending on the size and scope of your program, you also might consider inviting the following people to contribute to the team:

- **Tenants.** Tenants' input can be valuable when selecting materials for recycling and designing the collection system. For your program to be successful, collection logistics must be convenient, and tenants are in the best position to comment on this issue. If you invite tenants to participate in the team, consider including a cross-section of individuals—for example, representatives of both small shops and major chains, along with one or two representatives from the food court. These individuals are likely to have different perspectives.
- **A recycling service provider.** Once you have selected a vendor (see Step #6 below), you might want to invite that company's representative to provide input to your team. As you plan program logistics (e.g., where to store recyclables, how often to schedule pick-ups), your vendor's input will be critical.
- **A recycling or public works official from your state, municipal, or county government.** Environmental officials often have a wealth of experience to offer. They understand the regulations in your jurisdiction, and they are familiar with local recycling service providers. These officials can also be helpful in identifying markets for your materials or pilot programs to help you launch new aspects of your recycling program.



STEP #4:

Assess your waste stream.

Before you can decide which materials to collect or add to your recycling program, you first have to find out what is in your trash. You can do this by conducting a waste audit for your mall or shopping center. A waste audit is a formal, structured process used to quantify the amount and types of waste being generated by a business or facility. A waste audit can help you:

- Determine which wastes your shopping center generates in greatest volume.
- Understand the recycling opportunities at your shopping center and help predict revenues from the sale of recyclables.
- Evaluate the effectiveness of any existing recycling efforts at your facility.
- Identify opportunities for waste prevention and potential savings from reduced disposal fees.
- Establish baseline data for measuring the future effectiveness of any new recycling or waste prevention program that you put in place.

There are a number of different ways to conduct a waste audit. Some malls and shopping centers might choose to hire a waste management company or contractor to perform the audit. Others might conduct the audit using in-house staff. Assessing your waste stream will probably not require sorting through your refuse containers, but it may call for interviewing or surveying a representative sample of tenants. See the [Resources Section](#) on page 33 for sources of information on waste assessments, including audit forms and procedures.

Appendix A outlines the typical items found in a shopping center's solid waste stream, as well as the factors affecting their recyclability. The appendix provides basic information about recycling markets for each material, along with a brief summary of typical collection logistics.

STEP #5:

Identify materials to be collected.

Once you know what is in your trash, you will probably have some initial ideas about what materials should be collected for recycling. Common sense says that it is best to focus on those materials that appear in your waste stream in greatest volume. This is, in fact, a good rule of thumb. But before leaping to any conclusions, ask yourself the following questions:

- **Are there regulations in your city or state that require recycling of certain materials?** If so, you will need to include these materials in your recycling collection program.
- **Do markets exist for the materials you propose to collect?** Markets for recyclables vary from region to region, community to community. In deciding which materials to collect for recycling, check to see if there are developed markets for that commodity. Talk to your local waste hauler, recycling service providers, and municipal or state recycling officials. If no market is readily apparent, you may be able to identify a home for some products through a waste exchange (see the [Resources Section](#) on page 33).

LAKEFOREST MALL: ENLISTING LOCAL GOVERNMENT AS A RECYCLING PARTNER

Montgomery County, Maryland, where Lakeforest Mall is located, has been active in commercial recycling since 1993, when county officials voted to make recycling mandatory for all businesses. Since then, the management at Lakeforest has worked closely with the county to develop a model recycling program for its 164 tenants. The program is designed to help the tenants meet their recycling obligations, but it also has saved mall management thousand of dollars in solid waste disposal fees.

The close working relationship between mall management and county recycling officials has been key to Lakeforest's success. The county has provided recycling bins for tenants and educated tenants about recycling regulations. Lakeforest's general manager personally visits tenants and writes periodic memos to remind them of their responsibilities and educates them about the mall's recycling procedures.

Not all markets will pay for recyclables. Some will require you to pay a small fee. However, you may still find this to be more cost-effective than paying for disposal of the material.

- **Does your facility generate the materials in sufficient quantity and quality to make recycling viable?** Recycling transporters and recovered materials buyers care about both the quantity and quality of your recyclables. These factors will influence the price the market will pay. Aggregating sufficient



STARTING SMART... WITH OCC

Shopping center recycling programs tend to have one thing in common: an initial focus on old corrugated cardboard (OCC). OCC typically contributes 30 to 40 percent of a shopping center's waste stream. Clean, dry OCC is relatively easy to recycle, and there are numerous mills across the country that use it, so OCC can generate consistent revenues. By starting small, with a focus on OCC from stores, a shopping center recycling program can make an immediate and measurable dent on the facility's waste stream and disposal costs, work out any obstacles in recycling logistics, then gradually begin to grow to include other recyclables. In fact, the revenues generated by OCC are often used to fund the program's expansion.

Pete Homrich, the recycling coordinator at Reading, Pennsylvania's VF Outlet Shopping Village, launched the program with a focus on OCC recycling, then slowly expanded it over a number of years to include other materials. Today, VF Outlet Shopping Village recycles mixed paper, plastic bottles and films, glass, aluminum and other metals, and yard waste; yet OCC still accounts for over 97 percent of the material recycled, by weight, and it also accounts for virtually all of the cost savings and revenues generated. In essence, OCC recycling pays for the facility's collection program and allows the shopping center to recycle other materials.

quantities of recyclables is important, because haulers cannot always afford to handle and transport small amounts of material. You will also have to meet the vendor's quality requirements, which dictate the extent to which the materials must be clean, consistent, and contaminant-free. Your program should stress the importance of minimizing contamination and collecting high-quality recyclables. The vendors you ultimately contract with will provide specific quality requirements and explain how the material must be sorted and prepared. Make sure you take into account how much space you will need to amass the quantities they require.

- **How do the costs and benefits of collecting the material for recycling compare with the**

cost of disposal? To answer this question, you will need to think about the logistics for collecting and storing different materials. Some materials are harder than others to collect and prepare for recycling.

STEP #6:

Select a recycling service provider.

Now that you know what materials you would like to recycle, you need to find someone who will handle your materials at a competitive price. Recycling service providers are one or more vendors that will pick up your recyclables; sort them and remove contaminants; prepare the materials for sale (this might include shredding, crushing, baling, or compacting); transport them; and sell them for use as feedstock in the

SERVING "GREEN" AT THE STATUE OF LIBERTY

Shopping Center food courts can find inspiration for "greening" their operations by learning from the contractor that runs the food service concession and gift shop at the Statue of Liberty for the National Park Service. In three years (2000 through 2003) it has reduced solid waste disposal from 123 cubic yards per 100,000 visitors to 53 cubic yards. The concession is recycling glass, foam, plastics, aluminum, oil, cardboard, and coffee grounds. Innovative practices to reduce waste include:

- Replacing wax paper used to line food baskets with EarthShell® compostable packaging. This eliminated 100,000 sheets of waxed paper from the landfill in 2003.
- Replacing individual relish portion control packets with bulk dispensers. Bulk purchasing also reduced condiment costs.
- Recapturing trays and baskets.
- Working with the ferry company that transports visitors to Liberty Island to replace paper coffee cups with recyclable foam cups, and paper soda cups with recyclable #1 PET plastic cups.





manufacture of recycled-content products.

There are a number of different types of companies and organizations that might provide these services:

- **Waste haulers** often handle recyclables as well as trash. Your first stop might be to check with your current waste hauler to see if the company provides separate recycling collection, and if you generate enough recyclable material to make it economical. If so, the hauler should be able to offer a billing structure that will reduce your monthly waste removal costs. For example, some haulers might charge for hauling both refuse and recyclables, but credit you a portion of the current market value of the recyclables.
- **Specialty recycling firms** will pick up your recyclables and find markets for them, either on a regular basis or as enough quantities amass to justify the trip. These companies offer a variety of arrangements for billing and crediting customers. Some may offer “no charge, no pay” arrangements, where they do not charge for hauling but also do not pay for your recyclables. Others may pay you, and still others may charge you a fee for pickup and hauling.
- **Scrap dealers** may be willing to pick up (and perhaps pay you for) a variety of materials, including scrap metals.
- **Reuse organizations** will often pick up donated items such as used building materials, fixtures, and furniture from store remodeling.

In many areas of the country, you should be able to find recycling service providers listed in the phone

book. In some cases, more research might be required. Your local, county, or state government recycling office, the local Chamber of Commerce, or a local or regional recycling organization might be able to help you find vendors or develop markets for materials you intend to collect. See also the [Resources Section](#) at the end of this guide for national organizations and commercial recycling networks.

Selecting a vendor. Once you have identified potential vendors, how do you decide which one is right for you? Essentially, you are looking for the best service at the best price. When assessing pricing, keep in mind that prices paid for recyclables vary with the type of material and can fluctuate dramatically over time. In practice, your company will probably realize the greatest economic benefit from recycling in the form of reduced disposal costs. Once you select a vendor and reach an agreement, make sure you capture the agreement in a written contract. See the [Resource Management](#) heading in the [Resources Section](#) of this guide for links to Web sites with information on contracting for recycling and solid waste services.

As your recycling program expands, you may find that a single vendor may not provide all of the services you need, especially if you are collecting materials for which recycling markets are not well established. Westfield Shoppingtown Mission Valley in San Diego, California, for example, uses three vendors (a hauler/recycler, a specialty recycler, and a reuse organization) for a recycling and waste prevention program that diverts 63 percent of the facility's waste stream.



STEP #7:

Determine collection program logistics

Once you have decided what materials to collect and you have located a vendor, then it is time to design a collection system that suits the specific needs of your facility. As the case studies at the end of this guide illustrate, there is no one “right” way of designing a collection program—different shopping centers incorporate various program aspects with equal success. For example:

- Minnesota's Mall of America uses a system of built-in chutes and rolling carts to move recyclables (and trash) through the interior of the mall to the loading dock.
- At Westfield Shoppingtown Mission Valley, an outdoor mall in San Diego, housekeeping staff use motorized carts to pick up OCC and other recyclables from the rear of retail spaces and transport the materials to staging areas for storage or baling.
- Tenants at VF Outlet Shopping Village in Reading, Pennsylvania, collect recyclables from their retail operations and self-haul these materials to one of eight consolidation areas within the shopping center (both loading docks and closets). The facility's maintenance and grounds staff pick up recyclables from the consolidation areas daily, using a box truck.



“Shopping center recycling programs with the highest rates of tenant participation are characterized by ease of participation.”

—Benchmark Report: Retail Recycling Project,
Business for Social Responsibility, August 2002.

In determining collection logistics, try to make the system as simple and convenient as possible for your tenants and—if relevant—the public. Inconsistent participation or failure to follow recycling procedures will affect the yields of your program—both in terms of the quantity of the recyclables recovered and their quality (the degree to which the recovered material is contaminated with non-recyclable items). Seek input as you design the collection system. Talk to the heads of the housekeeping and grounds staffs. Ask your recycling service provider for assistance. **Appendix A** also provides information on typical collection logistics for common recyclables.

To simplify the process of designing the system, break it down into three components: the collection bins, the central storage or staging areas, and the process used to transport the recyclables from the collection bins to the storage/staging areas.

Collection bins. Depending on what materials you will be recycling, you will probably want to collect recyclables from two main sources at

your shopping center: shoppers and tenants. You can place clearly marked receptacles in public areas of the facility (halls and the food court) to collect recyclables from visitors (for example, plastic and glass bottles and aluminum cans). Make sure these receptacles are in convenient, heavily frequented locations. Choose receptacles that look distinctly different from your shopping center's regular trash containers, but consider placing a trash container next to each recycling receptacle. Based on your waste audit, order large enough receptacles so that they do not overflow and so that housekeeping staff do not need to constantly empty them.

You should also distribute collection bins to each tenant (retail tenants and restaurants in the food court). Tenants can keep these bins behind the scenes in locations that are most convenient to their employees. Depending on how many materials you will be recycling and whether or not they can be commingled, you may need to provide each tenant with more than one bin. Contact your local, county, and/or state gov-

ernment recycling offices to ask whether they can provide bins for commercial recycling.

Storage and staging areas. These are the central locations where you will consolidate recyclables from throughout your facility and where your recycling service provider will pick them up. You should work closely with your vendor and your building or facility manager to identify the best location(s). Many shopping centers consolidate their recyclables in large storage bins located on loading docks, where the vendor's trucks will have easy access for pickups. Ask your vendor to provide these large storage bins.

If you plan to recycle OCC in large volumes (as many shopping centers do), you will probably need one or more balers or compactors. In some cases, vendors may automatically provide balers to clients who collect OCC at high volumes; ask your vendor about this when you are negotiating your recycling contract. In other cases, shopping centers may have to purchase or rent the equipment. A baler or compactor should be placed in a convenient, easily accessible location with an appropriate power supply. If you choose to use a baler, you may also need to install a trailer or shed for storing the OCC bales until pickup.

Transporting recyclables from collection bins to storage/staging areas. There are numerous ways to transport the materials from the collection points to the pickup spots. One efficient approach is to incorporate recycling collection into your existing trash collection system. Housekeeping staff who empty the shopping center's trash containers can empty the recycling receptacles simultaneously into separated bins (if you have placed the two types of containers side by side). If house-





keeping staff pick up waste from each tenant's space at the end of the day, they can pick up recyclables as well and transport them to the storage area. On the other hand, if tenants self-haul waste from their stores to trash compactors or receptacles, they can probably be expected to self-haul their recyclables.

You can explain to shopping center staff and tenants that they are still handling the same amount of material, only now they are putting trash and recyclables into separate containers. The key is to keep recyclables separate from other trash to avoid contamination. In the case of OCC, recycled paper mills accept clean, dry cardboard, but they will reject a bale that has been contaminated with a large amount of other material, such as food waste. For OCC from restaurant tenants, make sure the employees understand that food-contaminated cardboard is not acceptable; shopping center staff may still be required to inspect OCC for contamination in the staging area.

If your shopping center uses a contractor for custodial services, involve the contractor in the design of your collection system. They can contribute valuable information since they probably have a general idea of the amount and type of trash being generated by your shopping center, the amount of time it takes for a custodial crew to clean a specified area, the maximum weight of a collection container that a custodian can lift and dump, seasonal fluctuations in the generation of trash and recyclables, and other programmatic considerations. They can also help with logistical suggestions for aggregating recyclables at the loading dock since they already remove trash from that location. Ask whether the contractor's staff are trained for recycling, and if not, make plans for training sessions. You may need to renegotiate

your cleaning services contract to include recycling services.

STEP #8:

Implement your recycling and management program.

No matter how much work you put into recycling planning and logistics, the success of your program will depend in large part on your ability to motivate tenants, and in some cases, the public, to participate. Before you launch the program, you will need to spend some time promoting your recycling effort, educating tenants and shopping center staff about recycling procedures. Once the program has begun, you'll also need to find ways to reinforce good habits and keep tenants and staff interested in the program.

Choose a "launch date." Once the pieces of your program are all in place and you are ready to begin recycling, choose a date on which to officially launch the program. Plan at least a few weeks ahead of time, and alert tenants and shopping center staff about the program well in advance. Prepare and disseminate a press release to appropriate media outlets.

Promote the program. Send a kickoff memo from shopping center management to tenants, announcing the program and requesting participation. If your program is driven partly by state or local recycling requirements, use the memo to explain tenants' obligations. Make the memo brief and upbeat. Highlight the benefits of the recycling program, explain the recycling procedures, and let tenants know that you will be providing them with more information before the official launch date.

PLANNING FOR RECYCLING DURING CONSTRUCTION OF NEW SHOPPING CENTERS

The best time to think about recycling is when a shopping center is being built. Architects who plan for recycling can include space for recyclables storage, space and appropriate electrical service for balers or compactors, and easy access for vendors. In some cities, new shopping centers are covered by building codes that mandate space for recycling bins in commercial spaces.

Minnesota's Mall of America is an example of a facility designed with recycling in mind. The innovative chute and cart system that moves trash and recyclables through the mall was designed before construction began. Mall officials estimate that it saves \$200,000 per year in labor costs.

Also, consider a launch event to generate some enthusiasm for the program. While many retail employees may be too busy to participate, you could ask one representative from each tenant to come to a breakfast or lunch meeting. Provide stickers that sales staff can wear on their name badges announcing "I recycle." If the shoppers are involved in recycling collection, you can pass out store coupons in the food court or hold other in-mall events to draw public attention. Consider advertising onscreen in movie theaters located in or near the center. Involve local community business and government leaders with a ribbon-cutting ceremony.



Educate shopping center staff.

Organize training sessions and/or prepare special communication pieces for housekeepers and other shopping center staff who will be involved with implementing the collection program. Make sure they understand their role in the program, and ask for feedback on ways to improve the program. You may have to prepare recycling instructions in languages other than English.

Educate tenants. Shopping center recycling coordinators report that educating and motivating tenants is one of the greatest challenges to a successful program. Yet, these activities are critical to recycling success. Therefore, you will have to teach tenants and their employees how to properly participate in recycling by providing simple and concise information on what to do. You can deliver this information in different ways:

- **Conduct face-to-face visits.** Coordinators of many leading shopping center recycling programs report that they have had the greatest success by visiting tenants face-to-face to explain

recycling procedures. At Lakeforest Mall, in Montgomery County, Maryland, the general manager personally visits tenants to explain procedures and remind them of their obligations under the county's recycling law. County recycling officials also stop by the mall periodically to check on tenants and may give violations to those not recycling.

In the weeks before the official launch of your recycling program, consider paying a visit to each tenant in your facility. This can be a big job—especially in a shopping center with 100 or more tenants—but the effort will pay off in the long run. Use the visit to deliver a recycling bin to the tenant, demonstrate procedures (such as how to break down boxes or separate recyclables), and answer questions. Enlist members of your green team to help with the visits.

- **Develop a recycling handbook, pamphlet, or poster.** Some shopping centers have developed brochures or handbooks that explain their recycling procedures. A handbook or pamphlet provides tenants with official recycling instructions that can be referenced again and again. In practice, however, the document may end up buried in a desk drawer. For this reason, it is probably best to use a handbook or pamphlet in combination with another educational approach, such as face-to-face visits. At VF Outlet Shopping Village in Reading, Pennsylvania, the recycling manager personally delivers a handbook to each new tenant and demonstrates the recycling

procedures, then checks in on tenants from time to time to answer questions.

Developing a recycling poster can be another way to remind tenants and their staffs about the “do’s and don’ts” of recycling. For example, a poster might list materials that can and can’t be recycled through your facility’s collection program. Distribute the posters to tenants and ask them to put them on the walls near their collection bins.

Anticipate and overcome barriers.

As the launch date for your program draws near, think about some of the possible obstacles you may face and prepare solutions in advance:

- **Attitudinal barriers.** If your shopping center is located in a state or county where commercial recycling is mandated, you have a head start, as your tenants are effectively obligated by law to participate. Your local county or city recycling coordinator can be a valuable resource and ally. But even if you are not based in such a state, there are ways to overcome tenant disinterest. For example, you can:
- Include a provision in the leases that tenants sign requiring participation. (See the publication entitled *WasteWise Resource Management: Innovative Solid Waste Contracting Methods* at <http://www.epa.gov/waste-wise>, select “Waste Reduction Resources” from the left-hand navigation bar, and then select “Resource Management” and scroll down to find the publication.)



- Audit tenants' waste disposal and recycling performance and provide feedback to tenants on how they can improve.
- Require non-participants to contract for their own waste hauling services.
- **Economic barriers.** In its 2002 report on retail recycling, Business for Social Responsibility noted that the economics of shopping center recycling programs often do not provide tenants with an incentive to reduce waste. For example, the Common Area Management (CAM) fees charged to tenants to cover waste management services are often based on their square footage rather than on their waste generation, giving them no reason to increase recycling. In general, the economic benefits of recycling, in the form of revenues from recyclables and decreased waste disposal costs, are realized by property management, and are not necessarily passed on to tenants. Shopping centers seeking special means to motivate tenant recycling, however, can allow tenants to realize some economic benefit from their recycling efforts. For instance, as a facility's waste disposal costs drop due to increased recycling, property management could agree to pass on those savings to tenants in the form of reduced CAM fees.
- **Logistical barriers.** Logistical problems can arise in even the best-planned systems, and you should be prepared to address problems as they emerge. For example, some retailers may report that they do not have enough space in their backrooms to accumulate recyclables

such as OCC throughout the course of the day—especially on days when large deliveries arrive. Depending on the structure of your program, you might be able to solve this problem by allowing retailers to call house-keeping staff to schedule extra pickups on busy days.

Reinforce good habits. As tenants grow accustomed to recycling and the procedures you have implemented, you need to reinforce the good habits they are developing. Monitor the progress of your program (see Step #9 below) and report back to tenants about their recycling accomplishments. For example, you might want to send out a quarterly memo listing the quantity of recyclables collected over the past several months, total waste diverted, revenues from commodities, and dollars saved. The recycling manager at VF Outlet Shopping Village, for example, posts recycling results at each of the eight storage areas where tenants drop off recyclables.

Continue to pay occasional visits to retailers to remind them of program procedures. Retailers tend to have high turnover among employees, so the work of educating tenants and their staff is ongoing.

STEP #9:

Reap the public relations benefits.

Environmental stewardship is one of the key benefits of a recycling program, and your shoppers should know what you are doing to benefit their community and the environment. Additionally, your recycling effort may depend on the participation of shoppers to reduce contamination of the recyclables and ensure the success of the program.



Make clear signage: If you are recycling bottles and cans in a food court, for example, make it perfectly clear where recyclables should be placed. Make recycling easy for shoppers. For example, place a distinctive recycling bin (preferably with a round hole in the lid to prevent contamination) right next to a trash bin, but make the lettering large and unobstructed to avoid trash being dumped into recyclables. If your community includes a large foreign-speaking population, make sure to include signs in alternate languages. This may also be necessary/useful for custodial staff.

Promote your results: Compare your baseline waste and recycling streams determined during your waste assessment with your recycling rate after implementing your recycling program. Your hauler and/or recycling contractor should be able to provide these figures. (See Step #10 for more information.) In addition, your municipal or county recycling office may be able to help you establish a simple but reliable accounting system to monitor your recycling program.

Make it mean something: If you are posting a sign, distributing a brochure, or writing a press release, do not just talk about how many tons were recycled—translate that figure into something the average



person can understand (e.g., how many stores that waste would otherwise fill up in the shopping center on an annual basis). You can tell them that almost every corrugated box collected is recycled—typically about two-thirds are recycled back into corrugated boxes and the rest are used to make other types of recycled paperboard products.

Sponsor Shopper Events: Make recycling more real to your shoppers by inviting them to join in the effort and offering incentives, such as coupons or gift certificates for the stores in your shopping center, to those that participate or recycle large quantities. One way to increase foot traffic at your shopping center is to create a recycling or reuse event. The following are just a few ideas that have been used successfully or could be implemented on a pilot basis:

BRING 'EM BACK AFTER THE HOLIDAYS

"Boxing Days" sponsored by the Corrugated Packaging Council (CPC) can encourage consumers to come back to the shopping center after the holidays and bring in their corrugated boxes from home for recycling. CPC provides a kit with an instruction manual, video, and promotional materials. If you're already recycling corrugated with a baler at your facility, this pre-packaged event might be an easy one to implement. See the **Resources Section** for more information.

- **Christmas tree recycling:** This popular event, which brings people back after the holiday rush, involves giving up some parking lot space and partnering with a local municipality or garden center to provide mulching equipment.

THE BEVERLY CENTER KNOWS HOW *To Dress for Success*

On July 25, 2004, the Beverly Center—Los Angeles' most trendsetting shopping destination for tourists and locals—hosted "Shop Fun In The Summertime: A Pool-Side Star-Studded Event." The private shopping event celebrated summer by donating 100 percent of proceeds to *Dress for Success* Los Angeles.

This premier shopping center rolled out the red carpet to raise money for the not-for-profit organization that helps low-income women transition into the workforce. Live music, appetizers, and cocktails were available while guests enjoyed one-night only discounts and plenty of product giveaways. General admission to the event was \$25. For \$100, guests received "VIP" treatment at the rooftop terrace cocktail reception and a film screening.

Dress for Success provides a viable way to reuse old clothes in communities across America and overseas. The organization relies heavily on financial contributions to assist in their efforts. "Shop Fun In The Summertime" not only raised funds through ticket and merchandise sales, but also encouraged shoppers to donate their worn clothes, thereby benefitting the environment as well as women in need.

- **Plug-In To eCycling.** EPA's electronics take-back campaign with the National Recycling Coalition encourages local events in conjunction with electronics retailers to return used electronic equipment for reuse and recycling. See the **Resources Section**.
- **Dress for Success.** This national not-for-profit organization helps low-income women transition into the workforce. It collects

and distributes used women's business suits to wear on job interviews. The program has helped over 45,000 women in 75 cities across America. Hold a special event with your women's apparel retailers, asking customers to bring in a good but used business outfit and then shop for a new one at a discount. Visit <www.dressforsuccess.org> for complete information.





- **Fashion shows:** Shopping centers are great venues for fashion shows. You can include apparel and accessories made from recycled materials, such as fleece jackets and vests made from plastic soda bottles.
- **Donation Events:** Some retailers have sponsored coat drives. In the Fall, for example, a women's apparel retailer held a "Donate One/Buy One At a Discount" coat sale, where customers who brought in a used winter coat as a charitable donation were eligible for a discount upon purchasing a new winter coat.

STEP #10:

Monitor, evaluate, and refine the program.

Once your recycling program is up and running, you should monitor and evaluate it on a regular basis. Request that your recycling service provider send you a monthly tonnage report stating the amounts of recyclables collected, by material. Trucks hauling recyclables from your facility are weighed upon entering and leaving. Landfills also typically use this weighted system, so see if your hauler can provide disposal data (usually in tons or cubic yards) before and after your program started to gauge results. See below for more ways to calculate and promote results. Other factors to monitor and evaluate include:

- **Percentage of waste diverted by the recycling program.** Compare the tonnage of recyclables collected to the tonnage of waste generated by your facility. Set recycling goals and monitor progress toward those goals. Generally, recycling rates are calculated as follows:

$$\text{Recycling rate} = \frac{\text{Total solid waste recycled}}{\text{Total solid waste disposed} + \text{Total solid waste recycled}}$$

- **Dollars saved.** Maintain accurate and up-to-date records regarding the total price your facility pays for hauling waste and recyclables. These figures should be easily accessible from your trash and recycling vendors. Calculate the amount saved each month in the form of reduced disposal costs.
- **Revenues from commodities.** Keep track of the prices paid to you for commodities. Check from time to time to determine if your vendor's rates are competitive with those offered by other service providers in the area. Your state or county solid waste authority can suggest resources that track this information on a local or regional basis.
- **Participation rates.** If shopping center staff collect recyclables from tenants, ask them for a monthly or quarterly report on which tenants are participating

in the recycling program. Set participation goals.

- **Contamination levels.** Your vendor may report to you on the level of contamination in your recyclables. If not, perform routine visual inspections of recyclables to determine the extent of contamination.

You should use all of this information, as well as feedback from tenants and housekeeping and shopping center staff, to evaluate your program and make changes as needed. If contamination levels are high, provide educational materials to let tenants know what is and is not recyclable (e.g., recycling posters or large signs on collection containers). If your recycling program is thriving, and your facility is generating significantly less waste, you may be able to renegotiate your waste services contract to receive lower rates. This may also be a time to consider adding new materials to your program.

SOLID WASTE VOLUME-TO-WEIGHT CONVERSION FACTORS

Waste and recycling data are usually expressed in terms of weight. If you know the volume of materials disposed of and recycled, however, you can convert this data to weight using conversion factors published by EPA in the *Business Guide for Reducing Solid Waste*, EPA530-K-92-004, November 1993. A detailed, material-specific guide, the *Standard Volume-to-Weight Conversion Factor* table is also accessible online at www.epa.gov/epaoswer/non-hw/recycle/recmeas/docs/guide_b.pdf. The following table provides general waste conversion factors:

Type of Waste	Tons/Cubic Yards
Uncompacted Waste	0.143
Compacted Waste	0.250
Construction/Demolition Debris	1.000



RECYCLING MATERIALS FROM SHOPPING CENTER CONSTRUCTION AND RENOVATION PROJECTS

If you are expanding or renovating a shopping mall, you will be managing wastes known as construction and demolition (C&D) debris. C&D debris is a large and varied waste stream. It is not generally regulated at the federal level, except insofar as solid waste landfills must follow a few basic standards outlined in Federal regulations. Various states, however, define and regulate the management of C&D debris. While each state's definition differs, C&D debris is generally considered to be waste produced when structures, buildings, and roads are built, renovated, or demolished.

Depending on your state's specific definition, C&D debris can include the following discarded materials:

- Concrete, cinder blocks, drywall (sheetrock, gypsum, or plaster), masonry, asphalt and wood shingles, slate, and plaster.
- Forming and framing lumber, plywood, wood laminates, wood scraps, and pallets.
- Steel, stainless steel, pipes, rebar, flashing, aluminum, copper and brass, framing, structural steel, and steel utility poles.
- Brick and decorative blocks.
- Doors and windows.
- Plumbing fixtures.
- Electrical wiring.
- Non-asbestos insulation.
- Wood, sawdust, brush, trees, stumps, earth, fill, rock, and granular materials.

The following are several options for reducing the amount of C&D debris requiring disposal:

Deconstruction: Deconstruction means the selective disassembly of buildings to facilitate the reuse or recycling of valuable materials. As opposed to demolition, this practice can involve the recovery of materials such as wood, structural brick, and highly functional finished components like windows, doors, and decorative trim. While traditional demolition is highly mechanized, capital-intensive, and waste-generating, deconstruction is labor-intensive, low-tech, and environmentally sound. When combined with demolition or used entirely as an alternative, deconstruction can produce environmental, economic, and social benefits. Materials salvaged from buildings can then be sold, exchanged for other useful materials, or donated for reuse or recycling.

Reuse/Refurbish: Functional building or architectural components, in addition to scrap materials, can often be reused or refurbished. Some items could be reusable in a renovation project and many items can be sold to used building materials stores, high-end salvaged architectural materials exchanges, salvaged wood distributors, scrap recyclers, individual home-

owners, waste exchanges, or other outlets. Consider placing an ad in the local newspaper for excess salvage materials.

Examples of items you might be able to sell for reuse include:

- Shelving, doors, plumbing, lighting fixtures, tile, carpeting, door hinges, wall paneling, mirrors, stairway bannisters, construction-grade lumber, ornamental wood trim, clay tiles and bricks, metals such as copper and aluminum electrical hardware or wire, and some plumbing hardware.
- Aluminum and steel scrap, which is usually accepted at fabricator's shops or as raw material for other industries.
- Clean, uncontaminated concrete waste which is used in some municipalities as aggregate for soil stabilization or reprocessed for use in roads, foundation stone, and other projects. Check with your local licensed landfill operator, earthmovers, or road construction personnel.

Some items can be reused on the same job site, including the following examples:

- Joist cut-offs can be cut up and used as stakes for forming or for headers around openings in the floor.
- Leftover rigid insulation can be used as ventilation baffles.
- Asphalt can be reused on site by heating pavement, injecting petroleum distillates, grinding, mixing, and re-rolling.
- Wood scraps can be used as bridging, splicers, wall components, filler, scabs, and spacers.

Recycle or Exchange: Some materials, such as the following examples, can be sold to scrap recycling businesses or through material exchanges:

- Metal scrap recycling businesses often take old aluminum or copper wiring, other wiring fixtures, conduit, iron, copper, brass, steel, lead piping, and appliances.
- Uncontaminated scrap lumber or pallets can be recycled into furniture or chipped and used for landscape mulch compost, animal bedding, boiler fuel, or engineered building products. Treated wood should not be used as mulch. Sometimes pallets can be returned to the vendors for reuse.
- Gypsum scraps can be recycled in some locations.
- Rubble (concrete, bricks, cinder block, and certain types of tile) can be crushed and sieved for use as an aggregate.
- Glass can be recycled into fiberglass or used in place of sand in paving material.
- Asphalt shingles can be used in asphalt highway and road paving and pothole repair.

Be sure your construction contractors sort materials as they are generated and prevent hazardous contamination to maximize their recyclability and reuse. This practice is becoming increasingly cost-efficient as processing and disposal costs rise.



Section 2

PREVENTING WASTE IN THE FIRST PLACE



While recycling addresses items that have already become trash, waste prevention goes one step further in reducing overall disposal, since waste that is never created does not have to be managed later. Also known as “source reduction,” waste prevention is the practice of designing, manufacturing, purchasing, transporting, and using materials in ways that reduce the amount of trash created. Reusing products is a key element of waste prevention, as it delays the entry of items into the solid waste stream.

Similar to recycling, practicing waste prevention in the retail sector results in environmental stewardship and economic benefits. In addition to reducing the burden on landfills, waste prevention also helps conserve natural resources and reduces the energy and pollution associated with manufacturing. For shopping center tenants, waste prevention strategies can translate into cost savings in a variety of areas other than waste disposal, including transport and labor, as evidenced by the examples below. Your tenants, especially major national retailers, are in the best position to execute waste prevention strategies, but as a shopping center manager or property owner, you can encourage your tenants to consider the approaches below. You can also support reuse efforts by buying certain products and sponsoring public take-back events.

MULTIPLE APPROACHES

With the variety of retailers today, there is no “one-size-fits-all” approach to preventing waste. There are, however, several key areas

SOUTHPOINTE PAVILIONS: TAKING WASTE REDUCTION SERIOUSLY

SouthPointe Pavilions is a 500,000 square foot outdoor lifestyle center located in Lincoln, Nebraska. The spacious facility is home to eight restaurants, 34 clothing and specialty stores, and a movie theater complex.

Upon its grand opening in 1999, the shopping center joined Wastecap—a nonprofit, non-regulatory, confidential waste reduction organization—to ensure that proper environmental initiatives would be instituted from the start. Together, Wastecap and SouthPointe Pavilions have made recycling an integral part of the facility’s management and practices.

Wastecap first performed a waste assessment at SouthPointe and suggested ways the shopping center could reduce waste. By purchasing just one compactor, SouthPointe was able to recycle almost one ton of OCC per week. The facility soon added a second compactor. In 2003, SouthPointe recycled an average of 150 tons of OCC per week.

The compacted cardboard is removed two to three times per week. While it costs \$17.00 a ton to dispose of OCC in a landfill, SouthPointe avoids this cost by recycling and is able to save about \$2,550.00 each year.

SouthPointe Pavilions also recycles packaging polystyrene foam “peanuts” which are collected by the individual stores once a week. Neighboring mail stores and jelly and jam shops pick up the peanuts and reuse them for their own packaging needs. This process benefits all participants and the environment by helping reduce waste, especially during the holiday season.



In addition to OCC and packaging materials, SouthPointe also manages the proper disposal of fluorescent lamps. The city requires special handling for fluorescent lamps because of the mercury they contain. A local recycling company picks up the lamps four times a year for safe recycling.



where the retail sector has achieved good results:

- Transport packaging
- Inventory and point of sale
- Material reuse

When a shopping center or mall decides to initiate waste prevention practices in any of the target areas listed above, a methodical approach is recommended. The most critical component is a close working relationship with suppliers, since they often control the amount of packaging and materials used in the first place, but can be greatly influenced by the desires of their retail customers. If a retailer plans to initiate a new waste prevention program from scratch, it might be more feasible to start by focusing on one or two of the areas listed above, then focus on additional areas as time and resources allow.

TRANSPORT PACKAGING

To ensure the safety of products during transport from distributors to an

TARGET: ACHIEVING WASTE PREVENTION THROUGH FLOOR-READY MERCHANDISE

Target's Floor Ready Program aims to minimize transport packaging by shipping "floor-ready" apparel, preventing waste, and saving money. Starting with test shipping runs, the company began eliminating the individual plastic packaging on its softline merchandise such as sweaters and other clothing and instead received them "floor-ready." In the one year since the Floor Ready Program's inception, Target has reduced transport packaging by 1.5 million pounds and has saved \$4.5 million in labor costs associated with unwrapping packaged apparel.

COALITION TAKES THE WASTE OUT OF PACKAGING

A coalition of retailers and packaging manufacturers have joined together to promote the development of sustainable packaging. Embracing "cradle-to-cradle" concepts, the group is working to develop packaging that provides positive benefits to society and the environment throughout its life cycle without compromising its functionality. The coalition's founding members include Cargill Dow, Dow Chemical Company, Estee Lauder/Aveda, EvCo Research, MeadWestvaco, Nike, Starbucks Coffee Company, Tropicana, and Unilever. For more information visit www.sustainablepackaging.org.

end market, various types of packaging are used, including pallets, boxes, wraps, and slip sheets.

Transport packaging can be made of materials such as corrugated cardboard, fiberboard, metals, plastics, and wood. Retailers may be reluctant to change transport packaging that has been used for years, since their profits are dependent on the arrival of goods to their store in sellable condition. There are, however, methods that can increase the efficiency of transport packaging while contributing to significant waste prevention and cost savings. The following are different strategies that can be employed to prevent package waste during the transport of goods:

Elimination. Careful evaluation of a retailer's current transport packaging system might reveal the potential to eliminate certain packaging components, such as internal inserts or plastic wrap for individual items.

Lightweighting. This strategy involves the redesign and remanufacturing of transport packaging to reduce the size of the primary container and/or decrease the thickness of the container walls. These design changes need to be evaluated to maintain the safe transport of merchandise to the end market.

Bulk Shipments. When purchasing products from manufacturers or shipping merchandise from the distribution center, doing so in bulk reduces the amount of packaging necessary per product, thus preventing waste.

Shopping centers and retail stores must have sufficient storage space for larger shipments and a larger onsite inventory. This might involve initial costs during construction of a facility or during a renovation to increase storage space; however, long term overall savings can be realized through reduced transport and waste disposal costs.

Reusable Packaging. This waste prevention strategy involves the switching from single-use transport packaging, such as corrugated cardboard and plastic shrink wrap, to reusable packaging, such as plastic totes and reusable strapping. Retailers interested in switching to reusable packaging, however, may require a complete overhaul of current shipping logistics, so a pilot/phase-in process is recommended.

TAKING STOCK: REVIEWING INVENTORIES AND POINT-OF-SALE

For retailers, an accurate inventory of merchandise and/or items required for routine operations is a major part of doing business. Poor inventory management not only leads to over-purchasing and stock surplus, but can also result in waste. Many stores use a retail inventory control system (RICS), a software application that tracks inventory online. RICS can also be used to track and address excess inventory and waste. Just-in-time ordering can also help eliminate overpurchasing



and, in the case of food, spoilage, which leads to unnecessary waste.

Another important location for retailers is the point-of-sale, where items are displayed for shoppers. This is also an area where there is significant potential for waste prevention. Major retailers have learned that, by cutting down on individual product packaging, they not only save waste and can ship more items in bulk, but also save shelf space and stocking time. The "open bin" concept has become much more popular at retail outlets such as hardware and home improvement stores. In fact, when an Ace Hardware store in Alexandria, Minnesota, switched from individual price stickers to one "bin tag" and scanning items at the register, the store realized significant benefits. The number of employees needed each week for price ticketing decreased from two to one, the accuracy of pricing and charges improved, and inventory monitoring efficiency increased. In the first year, the switch resulted in more than \$5,000 savings, or more than 90 percent of the original cost to ticket individual items.

REUSE, REUSE, REUSE...

Reuse is defined as the use of a material after its originally intended purpose, without breaking it down into its raw components. Reuse is fundamentally different from recycling, because when a material is recycled, it is processed and remanufactured into a whole new product, requiring additional resources and energy.

There are numerous opportunities for the reuse of materials throughout a shopping center, both as part of everyday center operations and in individual stores. You should consider donating any unwanted materials, such as computer equipment, to charitable organizations. There are numerous local and national reuse

organizations across the country that can help you find reuse opportunities. See the [Resources Section](#) of this guide for EPA's list of state materials exchanges and other sources of information.

The following are typical items from retail operations that can be reused:

Office paper. Instead of recycling used office paper, use the back side of printouts and copies as notepads. Not only can this reduce your waste disposal costs, you can also save the money you would have spent on purchasing new notepads.

Toner cartridges. Most toner and ink jet cartridges can be refurbished or remanufactured. Many manufacturers offer closed-loop collection programs, which accept used cartridges in the original packaging and refurbish or remanufacture them. Before throwing away your cartridges, contact the manufacturer or vendor and ask if they will collect them. If not, consider donating your cartridges to an organization that offers collection (see [Resources](#), page 33).

Computers. As you and your tenants upgrade computer equipment, think before you throw. Consider contacting area schools to see if they might be able to use your unwanted equipment or host an electronics recycling event (see "Reap the PR Benefits" on page 13).

Reusable air filters. By replacing disposable air filters throughout your shopping center with reusable ones, you will reduce waste and save on the cost of new filters.

Clothes hangers. Clothes hangers are integral to apparel merchandising. Some retailers prefer to display merchandise on their own hangers and discard hangers provided by suppliers. Other retailers discard hangers once the item is sold.

FROM PALLETS TO SLIPSHEETS, HOME DEPOT SAVES BIG!

In 1995, Home Depot, the world's largest home improvement retailer, conducted a thorough assessment of its transport packaging logistics and realized that it could significantly reduce the amount of wooden pallets it used. The company adopted a new corporate policy requiring its vendors to switch from the use of wooden pallets to plastic slipsheets. This switch has eliminated 36,000 tons of wood from the wastestream and saved Home Depot an estimated \$2 million in the inaugural year of the slipsheet program.

Source: "Case Studies in Source Reduced and Reusable Transport Packaging," Source Reduction Forum of the National Recycling Coalition, Inc., 1997.

ACE HARDWARE FILTERS ITS COSTS WITH REUSE

Henricksens Ace Hardware in North St. Paul, Minnesota, uses electrostatic permanent air filters in the store's heating, ventilation, and air conditioning equipment to reduce the cost of replacing air filters and the associated waste disposal costs. Warranted for five years, the permanent filters cost \$18 compared to \$0.89 for disposable filters. While this does represent an initial higher cost, valuable waste reduction results can be realized.

As a result of this substitution, in one year the store avoided 33 pounds of waste and saved \$56, representing a 90 percent reduction in waste and a 50 percent cost savings. The payback on the initial investment is estimated to be five years.

Source: "Retail Hardware Best Practices for Waste Management," July 1998, The Water Foundation.



MIDWEST-BASED RETAILER TARGETS SHOPPING CART REUSE

Target has found a great way to deal with old and damaged shopping carts. The Minnesota-based retailer has a vendor that picks up old carts for both recycling and reuse. In 2002, Target reused 6,700 carts internally, sold 28,500 nationwide, and recycled more than 8,000 (producing 228 tons of plastic and metal for remanufacturing).

Instead of disposing of unwanted hangers, tenants can donate them to thrift shops and homeless shelters. This will not only reduce your onsite waste generation, but also strengthen your shopping center's community relations.

Shopping carts. Several large shopping center "anchors" and "big box" retailers offer shopping carts to customers as a convenience while shopping. While these carts offer shoppers an easier and more enjoyable experience, they also represent a source of waste when carts are damaged. Shopping carts, however, can be refurbished for reuse or dismantled into their plastic and metal components for remanufacturing. Retailers that are interested in reducing cart waste should work with their suppliers to develop a program.

Wooden pallets. Wooden pallets can be repaired or rebuilt with wood from old pallets. Wooden pallets are often reused many times to transport merchandise and when they can no longer be refurbished untreated wooden pallets can be ground up and used for such things as playground mulch, animal bedding, and wood stove pellets. These alternative end uses can significantly reduce waste.

Unsold or damaged merchandise. While unsold or damaged merchandise represents a loss for a retailer, there are many organizations that can use clothing and other products. Consider educating your tenants by holding collection drives with all stores. Retailers can also set up long-term commitments with a local charity.

WASTEWISE: PREVENTING WASTE, RECYCLING, AND BUYING RECYCLED

For shopping centers and other businesses that want to formalize their commitment to waste reduction, EPA has created a voluntary partnership program—WasteWise—to recognize organizations who undertake waste prevention, recycling, and buy recycled efforts. Understanding that waste reduction can be effectively implemented in various ways, the WasteWise program is flexible, allowing partners to customize their waste reduction programs to their individual needs and goals.

Several large and small retailers are already WasteWise partners. Your shopping center or holding company may want to join this program and take advantage of the myriad benefits that WasteWise partners enjoy.

Becoming a WasteWise Partner. EPA asks that all WasteWise partners sign on for at least a three-year commitment to developing and implementing a comprehensive waste reduction program. Partners are free to invest as much time as desired and set individual goals that are the most cost-effective and feasible. Upon completing registration, all WasteWise partners are expected to complete a Goals Identification Form, which outlines their specific waste reduction goals over their three-year commitment. These goals

cover three specific areas:

1. Waste prevention
2. Recycling collection
3. Buying or manufacturing recycled-content products

Reaping the Benefits. All WasteWise partners gain valuable access to free online technical assistance and abundant resources and tools that help develop, implement, and measure the success of waste prevention and recycling initiatives, including:

- The *WasteWise Toolkit*, which includes tips for developing a successful program, guidance on measuring program success, an online reporting system, and guidance on integrating WasteWise into an Environmental Management System (EMS).
- Outreach materials.
- Resource directory.
- *WasteWise Bulletin*, a bimonthly member newsletter.
- Personalized technical assistance from WasteWise representatives.
- Public recognition—a major function of the WasteWise program is to generate public awareness of the benefits of partners' waste reduction activities. EPA promotes its partners' waste reduction accomplishments through an annual awards program, published case studies, and features in well known media outlets, such as CNN, National Public Radio, and *The Wall Street Journal*.

For more information about joining WasteWise, see the [Resources Section](#) on page 33.



Section 3

RESOURCE MANAGEMENT: FINDING RESOURCE EFFICIENCY IN SOLID WASTE CONTRACTS

When it seems you have a top-notch waste reduction program in place, do not be fooled into thinking you cannot possibly recycle or prevent another scrap of waste. You can further maximize your recycling and waste prevention programs by implementing an innovative waste contracting strategy called Resource Management (RM). Unlike traditional disposal contracting, which compensates contractor services based on volume of waste disposed, RM contracts cap disposal costs to encourage a single contractor to work with you to improve resource efficiency through enhanced source reduction, recycling, and materials recovery.

RM provides financial incentives for your waste contractor to help you find cost-effective opportunities to reduce waste, boost recycling, and otherwise optimize waste services. This means that by tying incentives to the value of services that foster prevention, reuse, and recycling—with disposal as the last resort—RM encourages alignment of the contractors’ activities with yours. For example, as your contractors help you identify cost-effective recycling markets for disposed materials or techniques for preventing waste altogether, they receive a portion of the savings resulting from the innovation.

The table below summarizes the differences between traditional hauling and disposal contracts and those incorporating the principles of resource management:

Features	Traditional Hauling & Disposal Contracts	RM Contracts
Contractor Compensation	Unit price based on waste volume or number of pick-ups.	Capped fee for waste hauling/disposal service. Performance bonuses (or liquidated damages) based on value of resource efficiency savings.
Incentive Structure	Contractor has a profit incentive to maximize waste service and volume.	Contractor seeks profitable resource efficiency innovation.
Waste Generator-Contractor Relationship	Minimal generator-contractor interface.	Waste generator and contractor work together to derive value from resource efficiency.
Scope of Service	Container rental and maintenance, compactor/baler rental and maintenance; hauling, and disposal or processing. Contractor responsibilities begin at the dumpster and end at the landfill or processing site.	Services addressed in hauling and disposal contracts plus services that influence waste generation (i.e., product/process design, material purchase, internal storage, material use, material handling, reporting).



THE BENEFITS OF RESOURCE MANAGEMENT

RM is not a new strategy—many organizations maintain that they have used similar performance-based contracts for years. They find that RM contracting makes good business sense because it helps them save money while receiving better service and improving resource efficiency. Consider some of these advantages:

- *Streamlined services from a single contractor.* Traditional waste contracts typically use multiple contractors to handle separate waste streams, creating a fragmented approach that lacks emphasis on recycling and resource efficiency.
- *Reduced waste disposal costs.* By capping the contractor's compensation, you not only cut disposal costs, but also encourage the contractor to find ways to save.
- *Increased quantities of materials being recycled.* Your contractor will help you increase the quantities of current materials being recycled and identify new materials for recycling.
- *Increase waste prevention opportunities.* Better than recycling, your contractor will also help you find ways to prevent waste at the source, such as internal reuse activities or changes in purchasing.
- *Improved data tracking and reporting by contractor.* By working closely with one contractor on all your waste streams, the contractor can better track and record your waste reduction activities and show the resulting success of the RM contract.

ARE YOU READY FOR RESOURCE MANAGEMENT?

When thinking about potentially switching your waste disposal contracting arrangements to the performance-based RM approach, there are some important questions that you should ask yourself to determine whether or not the transition is feasible and/or desirable:

- *Are you currently in a long-term disposal contract or do you have the option of seeking a new one in the upcoming year?*

If you are locked into an existing contract and will incur penalties for breaking it, you should consider postponing the development of a resource management plan until the last six to eight months of your current contract.

- *How many separate hauling contractors do you currently work with to handle your waste and recyclables?*

If you are currently working with multiple contractors, a transition to a RM contract can offer you multiple benefits. By partnering with a single dedicated and knowledgeable contractor, your waste-related activities will be streamlined and managed consistently and more efficiently. This partnership encourages innovation from both parties, which ultimately leads to mutual economic benefits.

- *Are there opportunities for improving your current waste reduction and recycling programs?*

The compensation structure of RM encourages your hauler to assist you in identifying new

strategies to reduce your waste. So, whether you are interested in adding new materials to your mall's recycling program or identifying new waste prevention practices, RM can help you reduce waste and save money.

For more information, visit EPA's Resource Management Web site at www.epa.gov/wastewise/wrr/rm.htm.

RM PRINCIPLES AT WORK IN THE RETAIL SECTOR

Staples, the largest office supply company in the United States, is always looking for ways to reduce its waste. So, in February 2002, the retailer asked Waste Management, a major national trash hauling and recycling service provider, to provide a cost-effective and easy-to-use recycling program for its fluorescent tube re-lamping program. Waste Management worked with Mercury Waste Solutions to offer Staples a program that provided each store with pre-addressed, pre-paid cardboard boxes to ship used fluorescent bulbs for recycling.

Northern Tool & Equipment is a major retailer of power tools and equipment with 40 stores in 10 different U.S. states. At one point, this retailer allowed each of its individual stores to arrange for its own collection of OCC for recycling. In most cases, stores ended up paying to have their OCC hauled, while receiving no rebates on the materials sold to recyclers. As a result, the company as a whole was losing money trying to recycle OCC. In the spring of 2001, the retailer asked Waste Management, its recycling contractor, to develop a plan to integrate all 40 stores into a single recycling program. This new solution guaranteed Northern Tool a stable floor price for its OCC, plus additional rebates when market prices rose past a set ceiling. Since the transition to the new plan, Northern Tool & Equipment has reduced its waste disposal costs by approximately 15 percent.



Section 4

CLOSING THE LOOP

Even if your shopping center is already collecting recyclables, there is much more you and your tenants can do to benefit the environment. Recycling involves more than simply collecting materials—recyclables must be used again as raw materials in new products. Opportunities abound for integrating recycled-content products into shopping center and retail store construction, renovation, landscaping, maintenance, and operations.

Using recycled products not only saves landfill space by diverting raw materials from solid waste, but also reduces mining and processing of natural resources, reducing energy use and environmental impacts. At the same time, buying recycled products helps foster local and regional recycling businesses and manufacturing plants, helping to create and retain jobs. A healthier economy means more business for the retail industry. Furthermore, you do not have to sacrifice product integrity or pay premiums to buy recycled-content items. Buying recycled simply means adding environmental considerations to purchasing decisions.

Generally, recycled products are made from materials that otherwise would be discarded. In addition to “postconsumer” material recovered from consumers, recycled products can also contain “preconsumer” materials generated by manufacturers, distributors, and converters, such as trimmings, damaged or obsolete inventory, and overruns.

Experience shows that it is best to start with the most widely-available recycled items to achieve early suc-

cess. For example, if you are renovating the dining area of your food court, consider purchasing recycled-content “plastic lumber” tables and chairs. Renovating the parking lot? Specify cement and concrete containing fly ash (a recovered material generated in coal burning electric utility plants) if it is locally available. Or call the department of transportation to find a local source for recycled asphalt. Mulching the shopping center’s landscaping? Call the city or county recycling office to find locally-produced mulch or compost. Re-carpeting your business office? Purchase recycled-content carpeting. Contracting for a new roof? Specify recycled-content roofing materials; they are readily available nationwide.

Examine the shopping center’s existing purchasing specifications and policies. Let your suppliers know you want to buy recycled. Refer to the list of recycled-content products in [Appendix B](#) as a guide and use it to help direct your buy-recycled activities.

Visit EPA’s Comprehensive Procurement Guidelines (CPG) searchable supplier database at www.epa.gov/cpg (select the “Supplier Database” button) to find recycled product manufacturers and distributors.

Tenants, employees, and customers alike will appreciate knowing that the materials they are sorting and recycling at home and on the job are being put to good use. Be sure to inform them about the shopping center’s buy-recycled activities. Closing the recycling loop is something that people intuitively appreciate.





Section 5

CASE STUDIES

MALL OF AMERICA

Bloomington, Minnesota

Through a model program, this mega-mall is taking a big bite out of its waste stream.



Overview

For thousands of pigs, life in Minnesota is hog heaven, thanks to the biggest mall in the country. Since 1995, the Mall of America in Bloomington, Minnesota, has contracted with a local hog farmer to haul more than 150 tons of food waste per month from the mall's restaurants to be used as pig feed. The mall pays for the gas burned by the farmer to haul the food waste, but saves much more on landfill tipping fees. But the biggest beneficiaries of this arrangement are the pigs, who routinely find morsels of steak, lobster, and vegetables in their slops.

This livestock feeding program is just one component of a far-reaching reuse and recycling program that is helping the Mall of America divert 50 to 60 percent of the 800 tons of solid waste generated by the facility each month. The largest fully enclosed retail complex in the United States, Mall of America was designed with recycling in mind. The 520 stores and restaurants in the mall use a system of built-in

chutes and rolling carts to efficiently move trash and recyclables through the facility to a single, centralized loading dock. In a busy month, the facility collects up to 200 tons of OCC, selling it directly to a local paper mill. Other common recyclables collected by the mall include paper, plastics, glass, and aluminum; electronics, batteries, and fluorescent bulbs are also recycled.

Because of its ambitious and innovative approach to recycling, Mall of America is considered a model of commercial recycling. Developers, building managers, and recycling experts from around the world have visited the mall to learn from its example.

Operational Details

- Tenants at Mall of America—including hundreds of retailers, 50 restaurants, eight nightclubs, and three schools—collect recyclables from their operations and self-haul the recyclables to one of several waste areas where there is one



chute for OCC and another chute or cart for commingled recyclables such as bottles, cans, and paper. In addition, tenants can store some recyclables in one of the mall's 27 waste rooms; other materials, such as packing peanuts, must be transported directly to the loading dock in bags or boxes.

- The facility's waste management and recycling staff—totaling roughly 20 full time employees—collect recyclables from the chute system, carts, and waste storage rooms and transport the materials to one centralized loading dock for sorting and storage. Materials such as OCC and plastic film are baled.
- Recyclables are picked up from the mall and hauled away by several different vendors and organizations. The mall's waste hauler picks up most types of recyclables, while a local paper mill hauls the OCC and specialty recyclers take materials such as end-of-life electronics and leftover paint. The mall donates all aluminum cans to a local charity, which collects and sells them.
- The mall's 50 restaurants collect food waste in 33-gallon containers. Recycling staff pick up full containers and transport them to the loading dock, where the amount of food waste generated by each restaurant is weighed and documented. The containers are then kept in a storage area, where a truck from the hog farm picks them up each morning.
- The recycling program is managed by the facility's environ-

mental supervisor, who spends roughly 80 percent of his time overseeing the program and educating tenants about recycling procedures. The supervisor visits tenants regularly and also posts recycling reminders in the mall's monthly tenant newspaper.

Keys to Program Success

- The recycling program has had the support of upper management from the beginning. The facility was designed for recycling before construction began.
- All tenants sign a lease that requires recycling (the only exceptions are the anchor stores, which control their own waste and recycling services). Tenants that do not recycle effectively can face increased waste management charges.
- The supervisor of the recycling program is personally committed to recycling and has developed innovative ways of meeting the mall's ambitious goals for waste diversion. For example, the mall has purchased a high-density, water-eradicating extruder to remove 800 tons of water from its waste stream each year.
- Due to its size, the mall collects most materials in sufficient volume to ensure that recycling is cost effective.





WESTFIELD SHOPPINGTOWN MISSION VALLEY

San Diego, California

Multi-faceted reuse/recycling program diverts nearly 65 percent of mall's waste.



OVERVIEW

With 1.5 million square feet of retail space and 130 tenants, Westfield Shoppingtown Mission Valley has the potential to generate a large volume of waste, yet this outdoor mall has just two trash compactors on site, when most facilities of that size would need between five and eight.

Since getting serious about waste reduction in 1995, the mall has gradually expanded its reuse and recycling efforts to the point where it now diverts nearly 65 percent of its waste annually. Today, the program is a multi-faceted effort that includes:

- Routine recycling of materials such as OCC; paper; plastic bottles and films; polystyrene packing "peanuts" and other foam; glass; aluminum and other metals; and fluorescent bulbs. Westfield Mission Valley also recycled more than 600,000 pounds of broken concrete and asphalt during a recent renovation of one part of the facility.
- Reuse of fixtures, furniture, carpeting, and construction materials from store remodelings. The materials are either donated to reuse organizations or reused within the mall itself.

- Collection of food waste from the mall's restaurants for use as livestock feed at area hog farms.
- Composting of yard waste and landscape trimmings.
- Recycling Christmas trees through a program that Westfield Mission Valley hosts in its parking lot every holiday season. Trees brought in by the public are hauled away by the City of San Diego, which partners with Westfield in the program.

As a result of these efforts, Westfield Mission Valley's waste disposal costs have dropped more than 40 percent since 1994. In recognition of this success, the California Waste Integration Board has five times awarded Westfield with its WRAP award for outstanding achievement in waste reduction, recycling, and resource conservation. In 2002, the mall was named California's retail recycler of the year.

OPERATIONAL DETAILS

- Tenants at Westfield collect recyclables from their retail operations, including OCC, plastic wrap, packing peanuts, paper, and other materials. Tenants separate these materials by type and leave



them, along with their trash, at the rear of their space.

- Visitors to the mall can deposit cans and bottles in bins located on walkways throughout the facility.
- The mall's housekeeping staff uses motorized carts to make regularly scheduled pickups of recyclables and trash from the rear of merchant spaces. Tenants can call housekeeping to schedule extra pickups during mall hours. Housekeepers also empty recycling bins located on walkways and in other common areas.
- Housekeeping staff transport all recyclables to one of five staging areas located throughout the mall. Most recyclables are placed in storage bins by type. OCC, plastic film, and polystyrene foam are baled. Two different recycling service providers pick up recyclables from the mall.
- The mall typically remodels 30 to 40 retail spaces each year. During remodelings, large roll-off containers are kept on hand to collect fixtures, carpeting, and construction materials for reuse.
- The facility's operations manager directs the reuse/recycling program, which is supervised on a daily basis by the heads of the housekeeping and landscaping departments. More than 15 staff contribute to the effort, with several housekeeping staff spending most of their time on recycling and waste management.
- During his welcome visit with new tenants, the operations manager provides an introduction to the recycling program.

Mall management visits all tenants frequently and provide recycling feedback.

COST-EFFECTIVENESS

Westfield Mission Valley's reuse/recycling program largely pays for itself. The primary economic benefit from the program comes in the form of reduced waste disposal costs, which have fallen from an annual total of \$63,600 in 1994 to \$37,600 in 2002—a 40 percent drop. These savings have easily offset any initial capital invested in the program.

Keys to the program's cost effectiveness include:

- A "no cost" recycling service agreement. Westfield's primary recycling service provider does not charge a fee for hauling recyclables from the mall. Westfield receives a portion of revenues generated from certain recyclables (such as OCC) once the price of those commodities exceeds an established benchmark. However, this portion generally amounts to less than \$1,000 per month.
- Low capital costs for equipment. Westfield's primary recycling service provider furnishes the mall with balers and compactors at no cost. The motorized carts used for collecting and transporting recyclables are also needed for trash collection, and thus are not an added expense.
- Combining recyclables collection with trash collection. Housekeeping staff collect recyclables at the same time they collect waste from each tenant. This system limits the amount of extra labor required to implement the recycling program.





KEYS TO PROGRAM SUCCESS

- The manager of Westfield Mission Valley's reuse/recycling program is committed to waste prevention and had broad experience from starting a similar program at another Westfield mall (Plaza Camino Real) in the early 1990s.
- The recycling program has the support of Westfield's upper management.
- Westfield Mission Valley limits the amount of work required of tenants by having housekeepers transport recyclables to staging areas. This system not only boosts tenant participation (currently at 100 percent), but also reduces the contamination level of the recyclables.
- Mall management are committed to training and retraining tenants on the recycling procedures. Management view tenant education as an ongoing job.



VF OUTLET SHOPPING VILLAGE

Reading, Pennsylvania

Broad recycling program has reduced solid waste disposal costs by 67 percent.

OVERVIEW

In the early 1990s, VF Outlet Shopping Village found that its solid waste disposal costs had skyrocketed into the \$100,000-per-year range. For mall management, bringing these costs down was a key motivation for launching a facility-wide recycling program.

The program began with a focus on recycling OCC, which the tenants generate in large quantities. Over the years, the program has gradually expanded to include everything from plastic films and bottles to paper, aluminum, glass, and yard waste (which is composted). The facility's 80 tenants all participate in the program—in fact, the terms of their lease require participation. The program's success is illustrated by the fact that, as of 2002, the facility's annual solid waste disposal costs had fallen to \$32,000—a 67 percent drop. VF Outlet Shopping Village received Waste Watcher Awards from the Pennsylvania Department of Environmental Protection in 1998, 2000, and 2001.

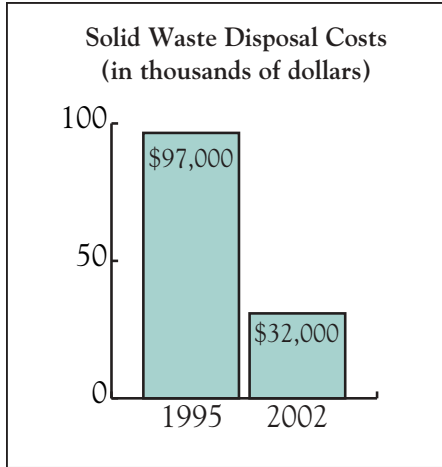
OPERATIONAL DETAILS

- Tenants at VF Outlet Shopping Village collect recyclables such as OCC, plastic wrap, and paper from their retail operations. The tenants self-haul these materials to one of eight

consolidation areas within the mall, loading docks, and closets.

- Shoppers can deposit cans and bottles in bins located throughout the facility and in the food court. Custodial staff empty these bins daily and haul the recyclables to the consolidation areas.
- The facility's maintenance and grounds staff pick up recyclables from the consolidation areas daily, using a box truck. They bail OCC and then store it in an onsite trailer; other recyclables are taken to a staging area. A local recycling company picks up all recyclables on an "as needed" basis.
- The recycling program is managed by the facility's maintenance foreman. Nine maintenance and grounds staff contribute part of their time to the effort, some of them spending an hour or two each day collecting materials and baling OCC.
- Tenants receive a handbook that provides information about the recycling program. The program manager also meets with new tenants to explain the program and their obligations.





- To inform tenants of program accomplishments, the program manager posts information on recycling results at each of the eight consolidation areas.

COST-EFFECTIVENESS

VF Outlet Village's recycling program has been cost effective from the outset due to two factors: the income generated by recycling OCC, and the money saved by reducing waste disposal costs.

VF recycled 499 tons of OCC in 2002, generating over \$25,000 in income. The facility derives little or no income from its other recyclables, but for each ton of material recycled it avoids a \$50-per-ton waste disposal fee. VF saved approximately \$25,500 in avoided disposal fees in 2002, on a volume of over 510 tons recycled.

Estimated labor costs for the recycling program totaled \$26,000 in 2002. Other costs include the capital invested in recycling equipment (two bailers for OCC, bins for bottles and cans, and a box truck that is used for collecting both recyclables and solid waste). This equipment has been purchased gradually over the years.

KEYS TO PROGRAM SUCCESS

- The recycling program has the support of upper management.
- The program started small, with its original focus on OCC recycling. The program expanded to include other recyclables as resources allowed.
- The program manager educates tenants on their recycling obligations through distribution of a handbook and through face-to-face meetings. VF considers

tenant education the biggest challenge for its recycling program.

- VF sought the help of the county recycling coordinator in finding markets for recyclables.

2002 RECYCLING TOTALS

OCC: 499 tons

Mixed paper: 15 tons

Plastics: 8.5 tons

Glass: 1.25 tons

Aluminum: 0.50 tons

Total recycled: 524.25 tons



IKEA SCHAUMBURG

Schaumburg, Illinois

OVERVIEW

Since the 1990's, IKEA has proactively sought ways to minimize waste and materials. IKEA Schaumburg recycles their five main waste materials—cardboard, wood, metal, plastic, and glass. Today, IKEA's recycling rate is more than 70 percent.

IKEA Schaumburg has been a leader in environmental work. For example, they have an environmental education program for IKEA Schaumburg's 600 employees. The training includes general environmental knowledge, an overview of IKEA's environmental policy, what IKEA has done so far, and how the company will continue to improve environmental and recycling initiatives.

IKEA Schaumburg also recycles fluorescent bulbs and restaurant oils—substances that are reprocessed and reused to serve other functions. Their latest effort allows consumers to deposit household batteries and light bulbs—even those not purchased at IKEA—in customized, in-store containers and IKEA pays for the recycling. IKEA Schaumburg is also planning to install a vermicomposting system to handle the food waste from the restaurant.

OPERATIONAL DETAILS

Employees attend training where they learn how to separate and dispose of materials properly. Cardboard, wood, metal, film plastic, hard plastic, paper, ceramic, and glass are recycled. Plant waste is turned into compost.

An environmental coordinator is assigned to promote IKEA's environmental efforts and ensure material that cannot be recovered and recycled is handled and disposed of in the safest possible manner.

New recycle stations were built for IKEA customers and other members of the Schaumburg community. They serve as both a collection station and a communication kiosk.

Containers designed to separately store "flashlight type" batteries and low-energy use light bulbs are mounted on a post between the checkout stations and the customer service/merchandise pickup entrance near the front of the store. Various types of batteries, including: A, AA, AAA, C, D, transistor radio, and rechargeables may be dropped off anytime the store is open.

COST EFFECTIVENESS

Implementing a new storewide recycling effort has reduced waste cost per pallet of merchandise sold at the facility by over 40 percent.





KEYS TO PROGRAM SUCCESS

- IKEA Sweden has an environmental plan that is communicated and carried out at the individual stores.
- IKEA Schaumburg distributes communications to its customers explaining programs, such as the drop-off for bulbs and batteries, so customers have ease of use while contributing to the effort.
- IKEA reports that it is always looking for ways incorporate the purchase of recycled products, including the purchase of 30 percent postconsumer office paper and computer paper for their store.

2003 RECYCLING TOTALS

Cardboard: 770 tons

Paper/Plastic/Glass: 49 tons

Metal: 56.5 tons

Fluorescent Tubes: 0.3 tons

Wood: 558 tons

Waste: 956 tons

Total recycled: 1,436 tons



RESOURCES

GENERAL

- **International Council of Shopping Centers (ICSC)**

1221 Avenue of the Americas

New York, NY 10020-1099

(646) 728-3800

(212) 589-5555 (fax)

<www.icsc.org>

ICSC is the global trade association of the shopping center industry. Its 45,000 members in the United States, Canada, and more than 70 other countries include shopping center owners, developers, managers, marketing specialists, investors, lenders, retailers, academics, public officials, and other professionals. ICSC and EPA have teamed up to form the America's Marketplace Recycles! initiative and have established an awards program recognizing significant recycling and waste prevention efforts. ICSC also has published a brochure explaining the recycling initiative.

- **EPA's America's Marketplace Recycles! Program**

EPA's Web site to support waste reduction and recycling at shopping centers.

<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>

- Measuring Waste Reduction

<www.epa.gov/epaoswer/non-hw/reduce/wstewise/pubs/wwupda3.pdf>

- The Measure of Success—Calculating Waste Reduction

<www.epa.gov/epaoswer/non-hw/reduce/wstewise/pubs/wwupda11.pdf>

- WasteWise Tip Sheet—Facility Waste Assessments

<www.p2pays.org/ref/01/00707.pdf>

- WasteWise's Resource Management Page

<www.epa.gov/wastewise/wrr/rm.htm>

- From Waste to Resource Management: Reinventing Waste Contracts and Services (A discussion paper prepared for EPA)

<www.epa.gov/wastewise/pubs/rmpaper.pdf>

- Model Language for Resource Management Request for Proposal

<www.epa.gov/wastewise/pubs/appendixd.pdf>

- **EPA's Jobs Through Recycling (JTR) Program**

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

<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 State-Specific Universal Waste Regulations**
Comprehensive list of state-specific regulations regarding management of universal wastes such as batteries, agricultural pesticides, and thermostats.
<www.epa.gov/epaoswer/hazwaste/id/univwast/uwsum.htm>
- **Weight-to-Volume Conversion Factors**
Standard weight to volume conversion factors.
<www.epa.gov/epaoswer/non-hw/recycle/recmeas/docs/guide_b.pdf>
- **National Recycling Coalition**
Homepage of the nonprofit organization dedicated to the advancement and improvement of recycling, source reduction, and reuse.
<www.nrc-recycle.org>
- **Reuse Development Organization, Inc. (ReDO)**
Nonprofit organization that promotes reuse as an environmentally sound, socially beneficial, and economical means for managing surplus and discarded materials.
<www.redo.org>
- **U.S. State Recycling Organizations**
Comprehensive list of state recycling organizations provided by the GrassRoots Recycling Network.
<www.grrn.org/resources/sros.html>
- **WasteCap**
This nonprofit partnership works with businesses and communities to implement cost-effective recycling and waste reduction programs. The organization has active programs in Massachusetts <www.wastecap.org>, Nebraska <www.wastecapwi.org>, and Wisconsin <www.wastecaplnk.org>.
- **Earth 911**
Web-based environmental clearinghouse manages a national hotline (1-800-CLEANUP) and Web site to provide community-specific resources to encourage citizen involvement in environmental protection activities. Visit the Web site for a listing of state and local recycling coordinators and other relevant information.
<www.earth911.org>

RETAIL RECYCLING AND WASTE REDUCTION

- **Business for Social Responsibility (BSR)**
A 2002 benchmark report on retail recycling practices.
<www.bsr.org/BSRResources/Environment/Recycling_Benchmark-092002.pdf>
- **California Integrated Waste Management Board (CIWMB)**
<www.ciwmb.ca.gov>
 - **Waste Reduction at Retail Stores**
Additional tips for reducing waste in the retail sector.
<www.ciwmb.ca.gov/BizWaste/FactSheets/Retail.htm>



- **Retail Packaging**
Information on reduced packaging waste in the retail industry.
<www.ciwmb.ca.gov/Packaging/Retail>
- **EPA's Business Guide for Reducing Solid Waste**
Comprehensive waste reduction guide with helpful information about first steps, conducting a waste assessment, and selecting, implementing, and monitoring waste reduction options.
<www.epa.gov/epaoswer/non-hw/muncpl/pubs/red2.pdf>
- **EPA's Resource Management: Innovative Solid Waste Contracting Methods**
This manual, also available on the Internet, is designed to help guide businesses and other organizations through an innovative contracting strategy.
<www.epa.gov/wastewise/wrr/rm.htm>
- **National Soft Drink Association**
The association's recycling page, offering information and helpful resources about recycling soft drink bottles and cans.
<www.nsd.org/Recycling/index.html>
- **"Retail Hardware Best Practices for Waste Management"**
Manual offering guidance and success stories about waste reduction in hardware stores.
<www.moea.state.mn.us/berc/hardware.cfm>
- **Reusable Transport Packaging Directory**
Information and vendor contacts for various types of reusable transport packaging.
<www.moea.state.mn.us/transport/index.cfm>

MATERIAL EXCHANGE

- **EPA's List of Materials Exchange Programs**
Comprehensive list of state-by-state programs with contact information.
<<http://www.epa.gov/epaoswer/non-hw/recycle/jtr/comm/exchstat.htm>>

CORRUGATED CARDBOARD

- **Corrugated Packaging Council's Recycling Center**
Trade association's information and guidance on recycling OCC.
<<http://cpc.corrugated.org/Recycle>>
- **Recycling Today - Online Baler Guide**
February 1997 online issue highlighting information about OCC balers.
<www.recyclingtoday.com/backissues/issue.asp?MagID=1&ID=80>

PAPER

- **American Forest & Paper Association (AF&PA) - Recycling Information**
The official paper manufacturer trade association's information on paper recycling.
<www.afandpa.org/Content/NavigationMenu/Environment_and_Recycling/Recycling/Recycling.htm>

GLASS

- **Glass Packaging Institute - Recycling Information**
The glass container industry's information and guidance on recycling glass.
<www.gpi.org/Recycling.html>



PLASTIC

- **Alliance of Foam Packaging Recyclers**
A wealth of information about recycling expanded polystyrene (EPS).
<www.epspackaging.org>
- **The American Plastics Council**
Information on plastics and the environment.
<www.americanplasticscouncil.com> or <www.plastics.org>
- **The Association of Postconsumer Plastic Recyclers**
National trade association representing companies who acquire, reprocess, and sell the output of more than 90 percent of the postconsumer plastic processing capacity in North America.
<<http://plasticsrecycling.org>>
- **Plastic Loose Fill Council**
Promotes the recovery, reuse, and recycling of packaging “peanuts.” Call the Peanut Hotline at (800) 828-2214 or visit <www.loosefillpackaging.com>.

METAL

- **Institute of Scrap Recycling Industries**
The national trade association of the scrap processing and recycling industry.
<www.isri.org>
- **Steel Recycling Institute**
The industry association that promotes and sustains the recycling of all steel products.
<www.recycle-steel.org>
- **The Aluminum Association, Inc.**
The official trade association of aluminum producers, recyclers, and suppliers.
<www.aluminum.org>

WOOD

- **National Wooden Pallet & Container Association**
Information for being an environmentally responsible wooden pallet user.
<www.nwpca.com/PalletUser/PalletUsers.htm>

FLUORESCENT LAMPS

- **Association of Lighting and Mercury Recyclers**
The nonprofit organization representing members of the mercury recycling industry.
<www.almr.org>
- **State Lamp Recycling Contact Information**
A state-by-list of contacts for recycling lamps.
<www.almr.org/state.pdf>
- **EPA's Environmental Fact Sheet on Used Lamps**
Background information about used lamps being added to EPA's list of universal waste.
<www.epa.gov/epaoswer/hazwaste/id/merc-emi/merc-pgs/fs_lamps.pdf>
- **National Electrical Manufacturers Association**
Lamprecycle.org is a Web resource sponsored by the National Electrical Manufacturers Association (NEMA) to encourage the recycling of spent mercury-containing lamps.
<www.nema.org/lamprecycle>



TONER CARTRIDGES

- **Canon**
The manufacturer's cartridge return program.
<www.ereturn.usa.canon.com>
- **The Green Fund Network**
This organization collects used cartridges to raise money for a variety of charitable programs around the world.
<www.greenfundnetwork.com>
- **Hewlett Packard**
The manufacturer's product recycling page.
<www.hp.com/hpinfo/globalcitizenship/environment/recycle/index.html>
- **Lexmark**
The manufacturer's equipment collection program.
<www.lexmark.com/US/corporate/printer_recycle.html>
- **Xerox**
The manufacturer's printer supplies recycling program.
<www.officeprinting.xerox.com/supplies/recycle>

ELECTRONICS

- **International Association of Electronic Recyclers**
The official trade association of the electronic recycling industry.
<www.iaer.org>
- **National Recycling Coalition's National Database of Electronics Recyclers, Reuse Organizations, and Municipal Programs**
A searchable online database of recyclers, reuse organizations, and municipal programs that accept used electronic equipment.
<www.nrc-recycle.org/resources/electronics/search/getlisting.php>

CONSTRUCTION AND DEMOLITION DEBRIS

- **EPA's Construction and Demolition Debris Web Page**
Defines construction and demolition debris, provides background information, and provides a link to EPA's report, entitled "Characterization of Building-Related Construction and Demolition Debris in the United States."
<www.epa.gov/epaoswer/non-hw/debris>
- **Asphalt Recycling and Reclaiming Association**
Provides information on using reclaimed asphalt.
<www.arra.org>
- **Construction Materials Recycling Association**
Association of the North American construction waste and demolition debris processing and recycling industry.
<www.cdrecycling.org>
- **King County, Washington's Construction Recycling Program**
Valuable guidance on implementing a successful construction recycling program.
<<http://dnr.metrokc.gov/swd/construction-recycling/index.asp>>
- **Triangle J Council of Governments**
Model specifications for construction waste reduction, reuse, and recycling.
<www.tjcog.dst.nc.us/cdwaste.htm#wastespec>



COMMUNITY OUTREACH AND TAKE-BACK PROGRAMS

- **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>
- **Nike's Reuse-A-Shoe Program**
Information about Nike's shoe collection program and how to become a program partner.
<www.nikereuseashoe.com>
- **The Corrugated Packaging Council's Boxing Days**
Information about the Council's corrugated cardboard collection program and how to become a program partner.
<<http://cpc.corrugated.org/recycle/recyboxingdays.aspx>>
- **America Recycles Day**
The official Web site of the nonprofit organization that sponsors the annual national recycling campaign.
<www.americarecyclesday.org>
- **California Integrated Waste Management Board**
A list of public education campaign ideas that promote waste reduction.
<www.ciwmb.ca.gov/WPW/Coordinator/media.htm>



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.	Excellent.
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-Excellent. Mixed paper-Good.



Material	What You Should Know	Typical Collection Logistics	Probability of Stable Market
Bottles and cans	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. 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. 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. 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.	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. 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. 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. 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.	Glass-Good. Plastics-Good (for PET and HDPE). Aluminum-Good. Other metals-Good.



Material	What You Should Know	Typical Collection Logistics	Probability of Stable Market
Plastic film	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. Source: The American Plastic Council's "Understanding Plastic Film: Its Uses, Benefits, and Waste Management Options," December 1996. Visit <www.americanplasticscouncil.org>.	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.	<i>Depends</i>; market prices can vary widely and are based on the type of film, current commodity prices, and contamination level.
Food waste	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). 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. Source: University of Georgia, College of Agricultural and Environmental Sciences. Visit <http://www.ces.uga.edu/pubcd/B1189.htm>.	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.	<i>Good</i>, depending on the local infrastructure.



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	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). 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).	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.	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. * 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.
Fluorescent lamps	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. 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.	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>



United States
Environmental Protection Agency
1200 Pennsylvania Avenue, NW (5305W)
Washington, DC 20460

EPA530-R-04-031
December 2004
www.epa.gov/rcc/amr.htm

US EPA ARCHIVE DOCUMENT



Recycled/Recyclable—Printed with Vegetable Oil Based Inks on 100% (minimum 50% postconsumer) Recycled Paper.