June 2001

- ✓ Waste Prevention
- ✓ Reuse
- ✓ Recycling
- ✓ Composting

Staying Green: A Guide to Waste Management for the Lodging Industry in New Hampshire

NH DES Document
NH DES-R-WMD-05




Working to reduce waste at hotels, inns, bed & breakfasts and campgrounds

- **Specific steps to reduce solid waste and avoid disposal costs**
- **Guidance for addressing the major barriers to waste reduction**
- **Summaries of resources and technical assistance**
- **New Hampshire lodging case studies**

In Cooperation with:

- NH Travel Council
- NH Campground Assoc.
- NH Lodging & Restaurant Assoc.

Funding provided by:

EPA United States Environmental Protection Agency

Grant No. X1991952-01

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

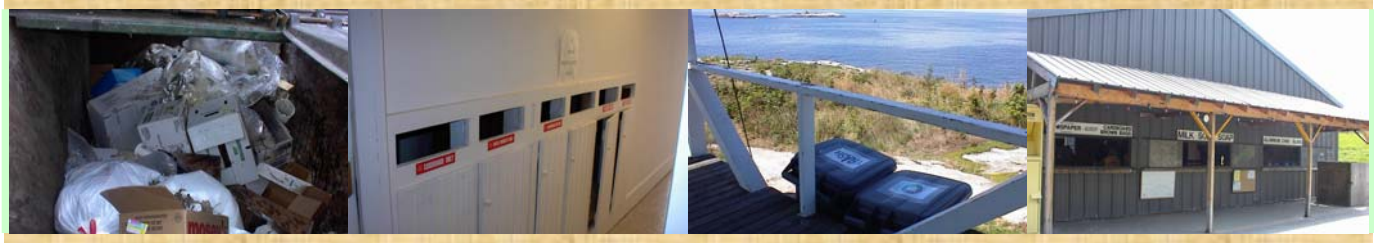
NH DES
Waste Mgt. Div.
6 Hazen Dr.
Concord, NH
0330

Table of Contents

List of Tables

List of Figures

Staying Green: A Guide To Waste Management for the Lodging Industry in New Hampshire



Introduction

Each year millions of people visit New Hampshire to enjoy the mountains, lakes, seacoast and the rural character of our state. Tourism is the state's second leading industry, and lodging and food service account for $1.9 billion in revenues annually. Overnight lodging at hotels, inns or campgrounds is a significant portion of the tourism industry in New Hampshire. There are more than 600 lodging establishments (hotels, motels, inns, bed & breakfasts) with over 55,784 units garnering sales of over $364 million dollars.

A growing number of people staying at lodging accommodations within the state translates into more solid waste that is generated and disposed of at landfills or burned in incinerators. Given this trend, the challenge is to take advantage of the opportunities to reduce the amount of solid waste whenever possible, extend the lifespan of waste facilities and reduce the impact to the environment. This guidebook summarizes the basic steps and practices of reducing solid waste within the lodging industry.

With disposal costs rising in New Hampshire and in the northeast, lodging managers are looking more closely at minimizing waste and the associated cost of disposal. Some in the industry have succeeded in diverting waste away from disposal through recycling, reuse, or composting. Usually, these businesses incur lower disposal costs by reducing disposal fees and hauling charges.

Lodging establishments generate high volumes of solid waste. National estimates range from one-half pound to 28 pounds per unit per day, with an average of approximately 14 pounds per day per unit. Studies indicate that 50 to 65 percent of a typical lodging waste can be diverted from disposal through recycling, reuse or waste prevention. Food waste, cardboard, beverage containers, and newspaper represent over one-half the typical lodging facilities' waste stream and all of these materials can be sold to markets both in New Hampshire or the New England region.

Wentworth By the Sea, New Castle, NH (Circa 1920)

As greater numbers of visitors stay at lodging facilities, it is important to minimize the associated impacts upon the environment. A combination of waste prevention, reuse and recycling practices can reduce a lodging facility's solid waste by 50-65%, limiting the need for additional transfer stations, landfills and incinerators.

Industry Trends

According to the American Hotel and Motel Association (AHMA), between 1996 and 1998 the percentage of AHMA members offering recycling services dropped from 59 percent to 46 percent. Larger, luxury hotels continue to offer recycling services while economy lodging are currently less likely to offer such a service. However, waste prevention measures such as towel/linens programs, soap dispensers and hand dryers are being used more now than in the past. Reasons may include poor prices for recycled materials, labor shortages, or lack of competitive recycling services.

What Does Waste Reduction Mean?

Waste reduction is anything that results in less waste. Recycling, reuse, composting or waste prevention (also referred to as source reduction) are activities that result in diverting wastes from disposal at a landfill or incinerator.

New Hampshire solid waste laws endorse a "solid waste hierarchy", which is a qualitative ranking of waste management practices. (RSA 149:M:3) The three options for diverting waste from disposal under this hierarchy include:

Waste Prevention (also referred to as *source reduction*) can involve buying in bulk, reusing products or packaging as well as lengthening the life of products to postpone disposal. Examples include soap dispensers (instead of disposable bottles), electric hand dryers (instead of paper towels), donating food to food banks, diverting food scraps and yard trimmings through backyard (onsite) composting, and reusing plastic containers or pallets.

Recycling refers to those materials recovered from the solid waste stream and transported to a processor or end-user for recycling.

Composting refers to the organic component of solid waste that is biologically decomposed under controlled conditions. It is an aerobic process in which organic materials are ground or shredded and then decomposed to humus in windrow piles or in mechanical digesters, drums, or similar enclosures.

Deciding to Reduce Solid Waste:

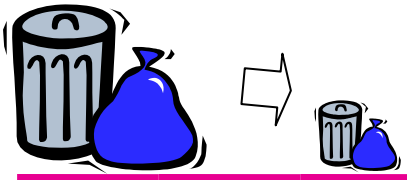
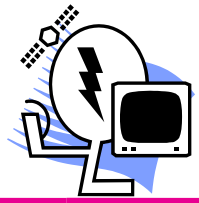
Perhaps the most important question beyond how to expand business is how to reduce costs. Recycled materials are already handled (collected, stored, moved) by your staff on a daily basis as waste. Recycling involves primarily changing how staff initially collect the materials. Here are some considerations.

- **Does your waste hauler offer recycling services?**
- **What materials (glass, cardboard, etc.) are thrown away, in what quantities and where do they originate?**
- **Can the amount of waste generated be cost effectively reduced?**
- **Has your waste bill been increasing rapidly?**
- **Does it cost less to recycle per unit than to dispose?**
- **Does the current waste service match the business' need?**
- **Will the community transfer station take recycled materials from your business at little or no cost?**
- **Can your staff easily move recycled materials to appropriate storage areas where waste haulers have access?**
- **Will guests be involved in any part of the recycling/waste reduction activities?**

"Recycling programs can often save money; but if the time required to separate the waste is too great, or the procedure too impractical, frustrations and increased time-pressure on employees could negate any dollar savings." **(Florida Hotel & Motel Journal, June 1999)**

Waste reduction (recycling, reuse, waste prevention) is a great way to express civic responsibility, stewardship, promote green activities and services to customers, and save money on waste disposal. Reducing the amount of waste also reduces greenhouse gas emissions from landfills and incinerators that warm our climate.

Table 1
Benefits and Challenges of Instituting Waste Reduction
(Recycling, Reuse, Waste Prevention)

	Benefits	Challenges
Avoided Disposal Costs 	Save money through reduced waste disposal costs and reduced waste hauling services.	Developing an efficient system of handling recyclables, identifying excessive waste, finding competitive waste management services
Cash for Materials 	Recycling often results in revenues through the sale of recycled materials.	Generating enough recycled materials or having enough storage to attract a market and produce a revenue stream from recycling. Many recycling companies require large volumes and may require material to be baled in order to provide revenue for materials
Customer Service… 	Recycling, reuse and waste prevention practices cater to a new kind of guest who recycles at home and likes minimum environmental impact while on vacation.	Involving and educating guests to use collection bins and follow other waste reduction measures usually requires continuous attention.
Free Public Relations… 	Free advertising and public relations as an environmental steward within the industry	Meeting environmental expectations! As a green hotel, guests will visit and expect environmental business practices. Educating guests to participate in waste prevention activities will require some effort.
Protecting Our Resources… 	Reducing waste limits the need for additional landfill development and reduces methane gas, a potent greenhouse gas that plays a role in altering climate.	The connection between solid waste and climate impacts is often not emphasized and the challenge is to educate employees and guests as to the benefits of greener waste management practices.

Moving Toward Better Solid Waste Management

Solid waste management service costs typically include hauling, equipment rentals, disposal charges, and on occasion, fuel surcharges. The frequency of collection also affects the charges levied for waste services. Another factor is the distance the hauler must travel to dispose of or recycle materials. The reduction of waste bills involves reducing the volume, weight, distance to markets or disposal facilities, and the frequency of collection by your waste hauler.

1. Reducing Weight and Volume

The heaviest component of lodging waste is "organics", comprising up to two-thirds of the total waste stream. Organics include food, paper, leaves and grass, brush/prunings, and textiles. Significant waste disposal savings can be obtained with on-site composting of leaves, brush, or food, provided there is enough space and that the space is confined. Farmers, landscapers or sod growers may have an interest in picking up food or yard waste depending upon the volume.

Some waste haulers offer recycling dumpsters for plastic, glass and aluminum containers, cardboard or mixed paper for a lower fee than disposal.

Waste representatives often fail to encourage their clients to recycle because recycling waste is less expensive to dispose of than wet waste. (Florida Hotel & Motel Journal, June 1999)

Reducing, reusing or recycling materials like cardboard will eliminate a significant percentage of the volume of the waste stream. Cardboard can amount to between 20-30 percent of the volume of a lodging businesses' solid waste, making it the largest waste component by volume. A cardboard recycling dumpster alongside a solid waste dumpster is a common practice.

2. Reducing Distance to Recycling Markets

Almost every community in New Hampshire has a public transfer station or recycling center. Many towns open the transfer station service to the local business community to recycle or to dispose of trash. A partnership with a municipal transfer station should save your hauler travel time and money and allow you to negotiate a lower cost for hauling services. Also, look for local materials recovery facilities (MRFs), or paper mills.

3. Reducing Frequency of Waste Collection

Increasing the size of the collection containers will reduce the frequency of trips necessary to handle the waste stream. Six, ten or twenty-yard dumpsters for cardboard or mixed containers (glass, plastics, metals) are usually available from the hauler. Waste compactors and balers compact waste or recycled materials and also reduce the frequency of required hauling service. Monitor the dumpster the day before pickup to determine if the frequency of weekly collection is appropriate or if recycling has eliminated some of the trips needed for disposal service

4. Reducing Waste Through Purchasing

Purchasing products that can be recycled, generate less waste or are composed of post consumer recycled materials all have the net effect of reducing waste. For example,

- Purchase aluminum vs. plastic containers.
- Use soap dispensers/electric hand dryers vs. bottles/paper towels.
- Print paperwork on recycled content paper vs. virgin paper.

5. Reducing Waste Through Waste Prevention

Prevent waste before it is created!

- Institute a towel and linens programs (providing new linens and towels upon request).
- Buy liquid cleaning supplies in concentrate form.
- Provide reusable mugs, glasses or serviceware.
- Buy in bulk to reduce packaging waste.

Linen and towel programs that allow guests to request linens and towel changing reduce the amount of soap, water and labor required for housekeeping. These practices are becoming standard practice in the industry. Many hotels find that they are saving at least $1.50 per occupied room per day when they give their guests the choice of changing linens and towels.

GETTING STARTED: LOOK BEFORE YOU LEAP

Before you can reduce waste, it is important to identify how much waste is generated, where it is produced, and what staff should help to reduce it.

Precise information on the volume or tonnage of waste and recyclables may not be known and will be useful. Many businesses conduct a waste audit to find out these details.

The devil is often in the details! Invest some time in planning who is going to oversee changes to your waste management operations, resources and logistics. There are a number of steps to take before actually getting started.

6 Steps to Waste Reduction

1. **Conduct a Waste Audit.** Knowing the waste stream, what and how much is recyclable, is crucial and serves as a baseline of information to improve waste management at your business.
2. **Establish a Waste Reduction Policy and Goals.** A message to employees and guests can put everyone on the same page regarding what is happening and how things are changing.
3. **Build Management & Employee Support.** A successful waste reduction effort requires full support and participation.
4. **Secure Recycling Markets.** Before recycled materials can go out the back door, plan for how to market those materials.
5. **Set up a Collection System.** The size, durability, weight and placement are a few factors to consider when setting up interior and exterior collection system.
6. **Train and Educate Employees.** This is necessary for success and can fit into existing training.

Step 1: Conduct a Waste Audit

A waste audit is a thorough dissection and record of items thrown away at your facility. Explore every area of your business to determine the type, amount and source of solid waste generated. Your hauler, purchasing manager, and general manager may all play a role in completing the audit.

Conduct A Waste Audit to…

- **Identify waste materials that can be recycled, reused, composted or otherwise diverted from the waste stream.**
- **Reduce overall disposal / hauling service costs.**
- **Improve the logistics of how waste is handled throughout the facility.**
- **Verify the accuracy of waste service billing.**

HOW TO CONDUCT A WASTE AUDIT

- **Walk through the facility.** Record what type of waste is discarded in each area. Monitor materials in the trash containers, wastebaskets, and dumpsters.
- **Review purchasing records.** Look for items that can be purchased in greater bulk, with less packaging or that can be reused by other departments.
- **Review hauling bills and service.** Secure copies of waste service bills to determine the cost of waste services per pickup or per ton.
- **Conduct a Waste sort.** If you wish to have even more detail save one day's trash from all departments and dump it onto a plastic sheet. If possible, sort and measure individual departments by volume or weight.

Questions Answered by an Audit:

- **How much waste, by volume or weight, are you throwing away?**
- **What are the major components of your waste stream?**
- **How much of your solid waste could be recycled, reuse or prevented?**
- **Can the hotel's waste stream be changed to reduce the volume of non-recyclables?**
- **Do you have too many or too few pickups?**
- **What size containers and frequency of collection would be required to move recycled materials?**
- **What departments (office, kitchen, guestrooms) generate the largest amount of recycled material?**
- **Are you paying too much for equipment rentals?**
- **What are you currently paying your hauler per pickup and per ton?**
- **Is your staff properly trained to handle your solid waste efficiently**?
- **Is the recycling and waste disposal system transparent and unobtrusive to your guests?**

Conducting a solid waste audit

Resources Available: WasteCap Resource Conservation Network of New Hampshire offers free waste audits to New Hampshire businesses. A waste audit form entitled "Lodging Waste Audit Form" can be found in Appendix A.

Table 2
Example of a Detailed Lodging Waste Audit
(by weight)

Material Type	%	Material Type	%
Food	28.0%	HDPE Containers	0.9%
Newspaper	12.7%	Construction and Demolition	0.9%
Remainder Paper	8.8%	PETE Containers	0.8%
Corrugated Cardboard	5.7%	White Ledger paper	0.8%
Film Plastic	4.9%	Paper Bags	0.7%
Other Paper	4.4%	Mixed Residue	0.7%
Clear Glass Bottles and Containers	4.3%	Tin/Steel Cans	0.7%
Brown Glass Bottles and Containers	3.5%	Computer Paper	0.6%
Composite Organic	2.8%	Other Plastic Containers	0.5%
Leaves and Grass	2.6%	Aluminum Cans	0.5%
Textiles	2.0%	Composite Glass	0.4%
Composite Plastic	1.8%	Other Office Paper	0.4%
Magazines and Catalogs	1.7%	Tires	0.4%
Prunings and Trimmings	1.7%	Remainder Metal	0.2%
Green Glass Bottles and Containers	1.6%	Other Non-Ferrous	0.1%
Other Ferrous	1.4%	Rock, Soil and Fines	0.1%
Durable Plastic Items	1.3%	Concrete	0.1%
Phone Books and Directory	1.1%	Color Ledger	0.1%

Source: California Integrated Waste Management, 2000

The waste audit can be a baseline of solid waste financial and logistical information. Use it as a reference for making further improvements to solid waste diversion and overall management.

Step 2: Establish a Waste Reduction Policy and Set Goals

Goals can be expressed in a variety of ways: an improved facility recycling rate, a waste service cost reduction, better inventory control (less spoilage), or waste prevention.

Consider the big picture but use the waste audit results to derive waste reduction goals. What are you trying to accomplish? Better management of solid waste costs? Maximum recycling? Consider an environmental policy that expresses to staff or guests the benefits of the effort. Employees must clearly understand these benefits to the organization and that waste reduction is now integral to the organization's operations.

Form a waste reduction team comprised of staff from departments that generate a high proportion of the waste and ask them to determine how to best reduce the waste they generate. Ask them to develop a set of waste reduction goals and the strategies to achieve those goals.

Placing the responsibility of overseeing progress toward meeting waste management goals with one employee, perhaps a volunteer, adds a measure of importance to the task.

Promote the policy and goals to your employees and the public! Ensure that the staff understands what must be done as well as how customers can participate.

Management and staff should work together to establish goals and strategies.

Try setting incremental goals that phase in waste reduction practices over time and allow time to work out the "kinks" before embarking on the next goal. For example, recycle one material (such as cardboard) until it is being recycled without any issues.

Examples of Waste Reduction Goals

Set waste reduction goals that minimize waste volume and weight and that are attainable and measurable over time. Make it short but sweet! Many goals can be summarized in one page, and can be attached to an "environmental policy".

Possible Waste Reduction Goals & Strategies

SAMPLE GOALS

- **Recycle all cardboard generated at the facility.**
- **Recycle 40% of all solid waste generated within a year.**
- **Reduce your waste disposal bill by 30%.**
- **Purchase only paper products that use more than 20% post consumer recycled content.**

STRATEGIES

- **Make arrangements to recycle at the local transfer station.**
- **Set up a database to track waste materials and costs.**
- **Have your environmental policy and goals broadcast in newsletters, websites or other media outlets.**

SAMPLE ENVIRONMENTAL POLICY

All of us at the [*business name*] are taking actions to make the world a cleaner, safer place for ourselves and our children.

We continue to expand our efforts to limit the generation of solid waste, reduce our energy and water consumption and educate our employees, suppliers and general public about environmental concerns.

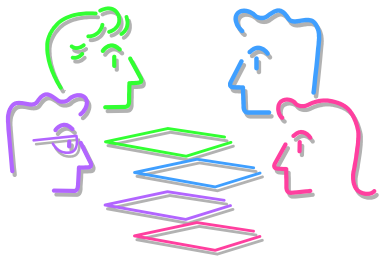
We invite our guests to help us maintain a clean environment by taking part in our environmental practices. Information at the front desk is available to help us work together to make a difference and better protect the environment we enjoy both at home and on vacation.

Step 3: Build Management and Employee Support

Leadership and commitment are perhaps the most important factors related to a successful waste reduction program. As with other aspects of your business, teamwork, initiative, follow-through and professionalism are important attributes for a successful waste reduction program.

Building support is crucial to successful implementation of changes in waste management and reduction. Owner or management support is usually based upon financial, manpower or aesthetic issues. If it is cost effective, requires little time and doesn't disrupt normal operations, management will likely support a waste reduction effort.

Employee support usually goes hand in hand with their level of participation within the decision making process when those decisions affect their workload. Forming a "green team" composed of employees or adding a "green issues" topic to staff meetings can be an effective way to solicit opinions or transmit information to employees.



Communication is key to employee support.

To support changes to the work-day, employees must clearly understand the benefits to the organization, the commitment of the management to these changes and lines of responsibility for specific tasks.

Building Organizational Support

It is easier to gain support for waste reduction practices that are cost effective and provide better service to customers who care about these issues, provided the practices do not require a significant increase in time.

- **Participation** -- Involve the staff that will be implementing changes and doing the work.
- **Cooperation** -- Staff from throughout the building may be involved in the separation, collection and transportation of materials. Cooperation is crucial!
- **Simplicity** -- Waste reduction through recycling or other means must be understandable and "do-able" by staff.
- **Responsibility** -- Without anyone specifically assigned responsibility, problems will likely be ignored and may result in staff becoming unsupportive.
- **Recognition & Financial Incentives** -- Recognizing employees for work that reduces waste is good way to engender support. Also, some of the savings through reduced waste bills could be returned as bonuses to employees primarily responsible for reducing the cost of waste services.

While some employees will view recycling or other waste reduction efforts as a responsible or necessary part of their job, others may see this as more work for the same pay. It is important to make waste reduction practices as simple and easy as possible to avoid complaints concerning more work. It is also important to include waste reduction responsibilities as part of employee training, orientation and job description.

Step 4: Secure Recycling Markets

HAULERS. *The first step is to call local waste haulers and assess the recycling services to see if they meet your needs and fit within your budget.*

Ask the hauler for a price that includes any container rental fee, transport charge and processing fee. Processing which includes sorting, crushing, granulating, and baling typically involves a Material Recycling Facility (MRF). For a statewide listing of solid waste haulers, check out the DES webpage http://www.des.state.nh.us/pcas/newhaul.htm.

TRANSFER STATIONS. Call the municipal transfer station / recycling center and ask about the ability to recycle at the facility. For a complete listing visit the Department of Environmental Services website at http://www.des.state.nh.us/pcas/lists.htm.

MRFs. Call a MRF directly to find the requirements for using the facility. MRFs will pay a price for most materials that are pre-sorted, however, mixed paper or containers tend to incur a processing fee. A listing of MRFs is on the next page.

BROKERS. Contact a recycling materials broker if the local market for recyclables or transfer station is not an option. A broker will search for haulers and markets for larger volumes (typically more than 5 tons) of recycled materials. See http://www.des.state.nh.us/pcas/brokers.htm for a listing of available brokers.

PAPER MILLS. Some paper mills will accept paper products from all sources. Paper (cardboard, newspaper, etc.) is the largest portion of the lodging waste stream by volume.

Cost of Hauling Recycled Materials

The ability of your hauler to provide a recycling service that is cost effective largely depends upon the trucks/equipment in use, current routes in place, the distance to market, and the price (value) of the materials. Haulers may need to send a different specialized truck to pick up recycled materials, resulting in more collection service. However, the hauler may be able to reduce overall hauling services for solid waste from your facility as recycling increases, in effect trading disposal for recycling services.

Hauling costs range from $1 to $2 per mile per ton, so there is a distinct advantage for haulers that can access a local facility for recycling and / or disposal.

Disposal costs at a landfill or incinerator are typically higher than processing fees on recyclables at MRFs. Recycling allows a hauler to avoid a disposal charge, usually between $50-$100 per ton of waste, not including transportation charges. If the hauler uses the municipal facility, all cardboard, glass, plastics or aluminum usually can be recycled locally with little or no processing fee. If the hauler sells recyclables to market, the hauler will be paid for the materials (aluminum, cardboard, etc.). Ask whether these advantages will translate into lower costs for hauling service.

It is possible to negotiate free pick up service, especially if you can reduce the hauling services for waste pick up. Use the information from the waste audit and monitor how full the dumpsters are just before pickup to ensure the efficiency of hauling services. Haulers want your business and should be willing to be flexible in scheduling service and pricing.

For many lodging businesses that generate small volumes of recyclables and have little storage space, electing to self-haul recycled materials to the municipal transfer station or a processor avoids the hauling fees. Recycling "trailers" with compartments for bottles and newspaper can be set up next to the dumpster and easily hauled to the local transfer station, paper mill, or MRF.

AlleyCat Recycling Trailer

Table 3
Material Recycling Facilities of New Hampshire

Material Recovery Facility (MRF)	Recyclables Processed	Acceptable Condition	Transportation Available	Service Area
Androscoggin Valley Regional Refuse Disposal District (AVRRDD) Berlin, NH (603) 752-3342 Contact: Sharon Gauthier	Glass, Plastics, Non-Ferrous Metals, Steel Cans, ONP, OCC, Mixed Paper, Textiles, Auto Batteries, Propane Tanks, Pallets and Leaf and Yard Wastes	Loose Separated	No	Berlin, Dummer, Errol, Gorham, Jefferson, Milan, Northumberland, Randolph, Stark, and unincorporated areas
Barnstead, Chichester, Epsom, Pittsfield (BCEP) Solid Waste Planning District Pittsfield, NH (603) 435-6237 www.bcepsolidwaste.com Contact: Earl Weir	Mixed Paper, ONP, OCC, Glass, Plastics, Non-Ferrous Metals and Steel Cans	Loose Separated	No	Call for Details
BFI Hooksett Recyclery Hooksett, NH (603) 669-2282 Contact: Mark Gelinas	Glass, Plastics, Non-Ferrous Metals and Steel Cans	Baled or loose Commingled or Separated	Yes	Southern New Hampshire
City of Keene Transfer/Recycling Center Keene, NH (603) 352-5739 www.ci.keene.nh.us/recycle/ Contact: Duncan Watson	Glass, Plastics, Non-Ferrous Metals, Steel Cans, ONP, OCC, Mixed Paper, Textiles, Auto Batteries, Propane Tanks, Pallets and Leaf and Yard Wastes	Loose Commingled or Separated	No	Southwest New Hampshire
Conigliaro Industries, Inc Framingham, MA (508) 872-9668 www.conigliaro.com Contact: Greg Conigliaro	All Fibers, all Plastics, Glass, Non-Ferrous Metals, Scrap Metal, Electronics, All Batteries, C&D, Tires, Fluorescent Bulbs, Pallets, Brush	Baled or Loose Separated or Commingled	Yes	Southern New Hampshire
Town of Littleton Transfer/Recycling Center Littleton, NH (603) 444-1447 Contact: Tony Ilacqua	Glass, Plastics, Non-Ferrous Metals, Steel Cans, ONP, OCC, Mixed Paper, Textiles, Auto Batteries, Pallets and Leaf and Yard Wastes	Baled or Loose Separate	No	Northern New Hampshire

* ONP is old newsprint. OCC is old corrugated cardboard. C&D is construction and demolition debris.

Table 3
Material Recycling Facilities of New Hampshire (Continued)

MRF	Recyclables Processed	Acceptable Condition	Transportation Available	Service Area
Manchester Recycling Corp Manchester, NH (603) 622-8422 Contact: Robert Francis	Non-Ferrous Metals, Mixed Paper, ONP and OCC	Prefer Loose	No	Call for Details
Town of Plymouth Plymouth, NH (603) 536-2378 Contact: Paul Freitas	Glass, Plastics, Non-Ferrous Metals, Steel Cans, ONP, OCC, Mixed Paper, Textiles, Auto Batteries, Pallets and Leaf and Yard Wastes	Baled or Loose Separate	No	Call for Details
Recycling Services, Inc. Claremont, NH (603) 542-8755 Contact: Jim Silvers	Non-Ferrous Metals, Mixed Paper, ONP and OCC	Baled or Loose	Yes	Call for Details
Waste Management, Inc. Rochester, NH (603) 330-2150 Contact: Austin McKnight	All fibers, OCC, All Glass, Plastic, Non-Ferrous Metals, and Steel Cans	Baled or Loose Commingled or Separated	Yes	New Hampshire

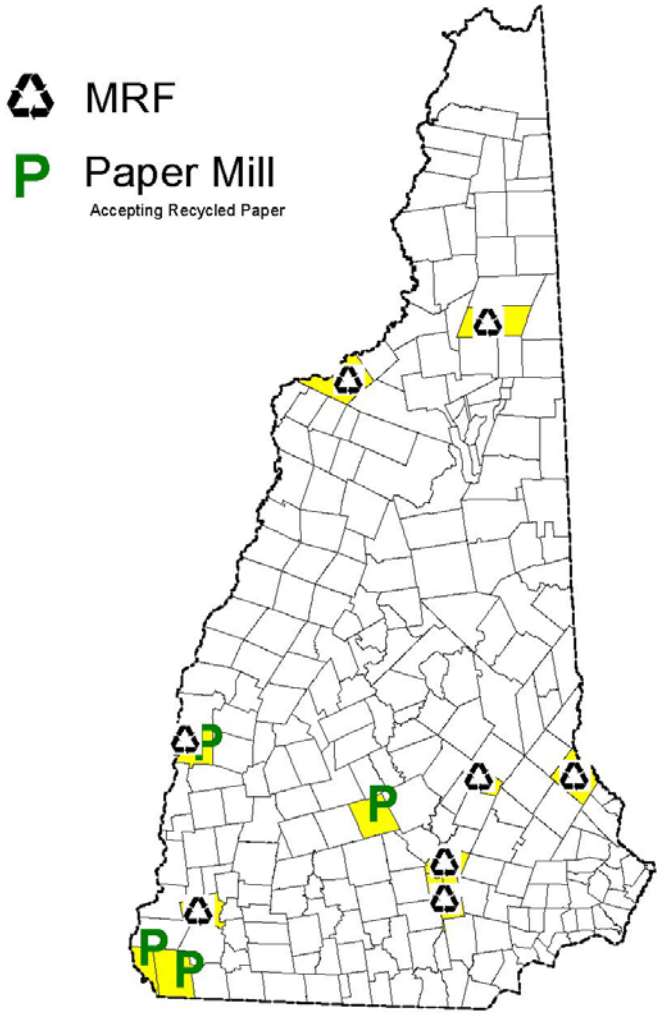
Recycling at Paper Mills

A number of paper mills in New Hampshire accept recycled paper that will be reused to make new paper products. Paper is accepted baled, in gaylords (large containers), or loose. Typically, paper accepted at these mills includes old corrugated cardboard (OCC), old newsprint (ONP), paperboard, and magazines (MAGS). Check with the specific mill to determine exactly what paper products are accepted and how they must be delivered. Usually, there is no charge for recycling paper through the mills and several pay by the ton.

Table 4
Paper Mills Accepting Paper from Individuals Haulers, Businesses or other Solid Waste Entities

Paper Mill	Location	Paper Accepted	Baled, gaylord or loose
APC Paper Co.	131 Sullivan St. Claremont, NH 03743 (603) 542-6330	OCC,ONP mags, and office mix	Baled or Gaylord
Graton-Weeks, Inc	28 Canal St. Hinsdale, NH 03451 (603) 336-5981	ONP,mags office mix	Baled or Gaylord
Paper Service Co.	Ashuelot, NH 03441 (603) 239-6344	ONP, mixed office and junkmail	Baled or Loose

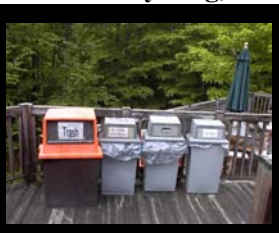
Figure 1
Material Recycling Facilities and Paper Mills

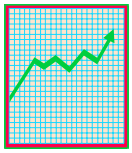


Regional Municipal Transfer Stations

A number of transfer stations in New Hampshire accept recycled materials from other communities or businesses within other communities. Some of these facilities solicit recycled materials from businesses outside of their municipal service areas. DES's online list of transfer stations includes the "service area" which lists those communities served by a regional municipal facility. See the webpage, http://www.des.state.nh.us/pcas/lists.htm.

Table 5
Recycling, Reuse and Waste Prevention Tips & Ideas

Common Materials at a lodging establishment ⬇	 Recycle…	 Reuse…	 Reduce…
Office paper	Remove paper clips, tape.	Shred office paper and use it to package shipments.	Make double-sided copies, use email.
Cardboard	Remove wood, soiled or waxed cardboard.	Reuse boxes for shipping and storing.	Ask suppliers to reduce amount of packaging and/or take back cardboard.
Paperboard	Recycle with mixed paper.		
Magazines	Recycle with mixed paper or bundled separately.	Donate to local library, senior center, or other community group.	Eliminate duplicate copies of publications.
Newspaper	Remove "glossy" printed items and recycle with mixed paper.		Provide newspapers upon request instead of automatically.
Telephone books	Recycle with mixed paper.	Donate to charity	
Outdated tourist info.	Recycle with mixed paper.	Donate to school, travel agents, library	Set up a digital tourism "kiosk" that provides paper information upon request.
Computer & fax paper	Recycle with mixed paper.	Use both sides of paper	Print or fax using both sides.
Paper towels			Consider electric hand-dryers in common restrooms.
Envelopes	Recycle with mixed paper.	Reuse for routing in-house mail.	Purge mailing lists of outdated information.
Aluminum cans	Rinse clean.		Consider reusable glassware and fountain drinks for beverages.
Steel/tin cans	Rinse clean, remove tops		
Glass bottles	Rinse clean, remove tops		
Plastic cleaning/hand soap bottles	Rinse clean, remove tops	Refill using cleaning fluid from concentrate	Install soap dispensers in restrooms.
Plastic beverage containers (#1,2)	Rinse clean, remove tops		Offer beverages in reusable glassware, mugs.
Plastic bags			Eliminate the use of plastic liners in ice buckets or plastic bags on newspapers.
Cooking grease	Collect for rendering.		Change cooking oil filters often
Food & yard waste		Compost or donate to charity.	
Used motor oil	Recycle oil for re-refinement.	Burn at the municipal facility.	
Appliances	Arrange for a reseller to pick up for repair	Charity or swap shop	Enact long term maintenance agreements.
Furniture		Charity or swap shop	



Waste Reduction & Financial Expectations: Cost Avoidance & Recycling Revenues of a Typical 40 Room Inn

Waste reduction offers two financial opportunities: (1) avoidance of disposal fees and (2) generation of revenues from the sale of recycled materials.

Example:

The revenue received from the sale of a ton of newspaper:	**$ 47.00 per ton**
The cost avoided by not sending newspaper to a landfill and paying for disposal:	**$100.00 per ton**
The Gross Financial Benefit of recycling and marketing 1 ton of newspaper:	**$147.00 per ton**

Many factors influence the cost effectiveness of recycling, however, disposal is usually more expensive than recycling in New Hampshire. The efficiency of the **collection** and the cost of **transportation** impact the overall cost effectiveness of a recycling program. A 40-room inn, generating 36 tons of waste annually, can recycle 23 tons of waste. The table below calculates the total financial benefits of recycling. Column A in the table distributes the 23 tons of recycled materials according to waste audits completed at lodging establishments. For example, newspaper is 12.5% of the lodging waste stream, 12.5% of 23 tons results in 4.5 tons of newspaper waste annually.

Table 6
Annual Gross Financial Benefits
At a 40-Room Lodging Facility

	A	x	B	=	C	+	D	=	E
Potentially Recycled Materials	**Recycled Material's % of the waste**		**Recycled Materials (tons)**		**Prices[1] of Recycled Material (per ton)**		**Revenues from Recycled Materials**		**Avoided Disposal Fees $100 / ton**	**Gross Financial Benefit[3]**
Newspaper	12.50%		4.5		$46.67		209.95		$450	**$660**
Office Paper	0.40%		0.1		$100.00		$14.40		$14	**$28**
Corrugated Boxes	5.70%		2.1		$65.67		134.71		$205	**$340**
Mixed Paper	1.70%		0.6		$84.17		51.50		$61	**$113**
Aluminum Cans	0.50%		0.2		$846.67		152.35		$18	**$170**
Steel Cans	0.70%		0.3		$18.83		4.74		$25	**$30**
Glass	9.90%		3.6		$13.61		48.49		$356	**$405**
HDPE	0.90%		0.3		$131.67		42.65		$32	**$75**
PET	0.90%		0.3		$86.67		28.07		$32	**$60**
Lumber	1.20%		0.4		$0.00		0.00		$43	**$43**
Food Discards	28.00%		10.1		$0.00		0.00		$1,008	**$1,008**
Yard Trimmings	2.60%		0.9		$0.00		0.00		$94	**$94**
TOTAL	**65.00%**		**23**		**$1,247**		**672.5**		**$2,339**	**$3,012**

[1] 5 year average of prices for recycled materials are from New Hampshire the Beautiful.
[2] $100.00 is used to illustrate the cost of disposal *and transportation*. The average cost to dispose of waste at a landfill is $61.50 (Chartwell Data, Jan. 2001).
[3] The gross benefit is the revenue added to the avoided cost of disposal. "Gross benefit" does not include any additional cost of labor or costs associated with self hauling, recycling services through a hauler or processing fees at a material recovery facility.

Quality of Recycled Materials

The hauler will rarely be directly involved in any cleaning, sorting, bundling or other quality control work required to recycle materials. A hauler will require that materials be at the specifications that are required by the market in which the materials will be sold. Contamination of either recycled materials or waste (with recycables) can cause problems with respect to disposal or recycling facilities accepting the materials. Contact the MRF directly for information regarding the pre-processing requirements.

Sorting and processing cardboard at the BFI materials recovery facility (MRF) in Hooksett, NH

Minimizing Contamination of Recyclables

Contamination is probably the leading reason why recycling programs at lodging establishments fail! It is a serious issue that, if not addressed, can end a recycling program. Ask your hauler for written materials (flyers, descriptions) of the allowable level of contamination in recycled materials. If the hauler is using a local transfer station, the municipal facility usually has printed materials explaining contamination.

If contaminants are frequently found in your recycled materials, the educational materials, orientation or supervision of employees may need to be reviewed. It is often possible to determine where the contamination is coming from and remind employees of the importance of not contaminating recycled materials.

Employee education is a continuous process and is usually required to train new employees. Also remind experienced employees of the recycling requirements.

Levels of Contamination

The allowable level of contamination is determined by the marketplace. Paper, plastics, glass, and metals all have specific standards required by those who reprocess these materials into new products. Here are some of the standard contamination issues.

Contamination of Aluminum, Glass, and Plastic Containers

Aluminum. Any nonferrous metals are the most serious contaminants to a load of aluminum. Lead is not used in any alloy of aluminum and must be bled out of the system. Tin is also not typically mixed with aluminum. Paper, plastics or glass in small quantities are usually acceptable as they will melt during the smelting process. However, such contamination can reduce the price paid for aluminum or cause the load to be rejected.

Plastics. The biggest contamination problem is mixing different types of plastics, which are numbered from one to seven, depending upon the resins used. For example, people often throw number 3 (PVC) plastic (typically used for bottled spring water and detergent containers in the loads of PET (#1,2). In the recycling process, plastic is ground into flake and melted into feedstock. Number 3 has a lower melting point than PET, and if it gets into the flake, it will burn and blacken the molten plastic.

"Once ounce of PVC can ruin a 500 lb load of flake," says Sandi Maurer of Southeastern Container, Inc.

Glass. The main contamination issue with glass is color. Glass must often be sorted by color, however, the trend is toward commingled (mixed) containers that are sorted at a Materials Recovery Facility (MRF). Today, blue glass or other non-traditional colors are more difficult to recycle. Colors other than clear, brown, amber or green may be difficult to recycle in New Hampshire. Check with your beverage distributor to see if they will take back beverage containers that are not easily recycled.

Many restaurants and bars have arrangements to take back liquor, beer or other beverage containers.

Ceramics (plates, cups), light bulbs, mirrors and cookware are other forms of contamination that will cause a load to be rejected from a processing facility. In glass furnaces, any aluminum, steel or lead can sink to the bottom where the metal can eat through the wall of the furnace and cause serious damage.

Contamination of Cardboard and Mixed Paper

Corrugated cardboard is a layered cardboard and can be identified by interior ripples seen along the edge of a box. Cardboard is different from paperboard, which is a thin non-corrugated paper product often used to package cereal, crackers, or paper tissues. Most municipal cardboard recycling programs do not mix paperboard with cardboard.

Most cardboard recycling markets only accept brown, non-waxed, corrugated cardboard boxes. Boxes that have any food residuals, exterior wax coatings, plastic or other wrapping materials are either not recycled or must have exterior wrappings removed from the cardboard prior to recycling. Cardboard that is exposed to the elements (rain, snow, etc.) is always of lower value. Dry storage is recommended and may be required by your hauler.

Paperboard may also be recycled as mixed paper. Mixed paper recycling usually includes newspaper, office/fax paper, magazines, old mail, flyers, brochures, catalogues and folders.

Commingling paper avoids having to spend time sorting and makes it easier to recycle, however, such commingling often leads to a lower sale price. Sorting requirements will be determined by your hauler, private material recycling facility or community transfer station.

If you choose (or are required) to sort paper, waste haulers can provide containers with compartments for different grades of paper. Exterior paper containers should be covered and secured with locks to avoid contamination or vandalism.

Compartmental Recycling Container, USC Recycling

Table 7
Typical Mixed Paper Recycling Guidelines

Mixed Paper	Contaminants
❑ Newspaper	❑ Waxed (glossy) paper
❑ Magazines	❑ Soiled paper
❑ Phonebooks	❑ Used tissues
❑ Old mail	❑ Food waste
❑ Greeting cards	❑ Plastic, wood or metal
❑ Flyers	❑ Dirt
❑ Catalogues	❑ Residual oils
❑ Folders	❑ Plastic bags
❑ Clean food boxes (liners removed)	
❑ Cereal, rice, cracker pasta, tissue, paper towel rolls, writing pad backs	

Source: Waste Management, Inc.

Lodging businesses that can control the level of contamination will have more sustainable recycling programs that yield high value materials. Recycling programs with poor control over the quality of materials will encounter problems as haulers or end markets reject materials.

Table 8
Options for Diverting 50% of Lodging Waste
(Processing, Collection, Storage and Management)

Waste Material	% of Waste[1]	Typical Pre-processing	Container & Collection points	On-site Storage	Management Issues
Food waste	28%	Removal of meats, oils, bones, typically done by kitchen staff or dining staff	55-gallon covered, portable containers in kitchen	Fenced, covered, access control	Piles must be actively managed to avoid bugs/odors; access must be controlled to limit animals.
Newspaper & magazines	12.7%	Removal of plastic covers, glossy print (newspapers only)	33-gallon receptacle at front desk, foyer, or guest recycling area; modified housekeeping carts to collect during room cleaning	Mixed paper dumpster or in 96-gallon toters	Contamination with waxed, or soiled paper
Glass, plastic and steel /aluminum containers	9.9%	Sorted by color, plastic code, steel separated from aluminum; emptied, rinsed, tops removed	55 or 96-gallon covered toters in kitchen, bar/restaurant or guest recycling areas	Dumpsters (commingled), 96-gallon toters (color sorted)	Contamination with food, odors, weight of full containers
Cardboard	5.7%	Flattened, removal of any wood, plastic or metal packaging; removal of waxed or cardboard contaminated with residuals.	One cubic yard tilt carts to collect from kitchen, bar/restaurant, or laundry	Dumpsters, roll-offs, trailers or sheds	Adequate space for interior or exterior storage; contamination

[1] Percentage of the waste stream is based upon the **weight** of the material.

Step 5: Set Up a Collection System for Recycling

Now that available recycling services (and associated costs) are known, and you have a better understanding of how much and where waste is generated, invest some time setting up a system to collect and move these materials within the facility to a central collection area.

Solid waste is already collected and moved through the facility to a main collection point, so the only difference will be that employees may have additional collection containers for recyclables, both inside and outside the facility. The recyclable materials will be separated out and taken along with waste to the waste collection area.

Once the requirements for recycling are provided by the hauler, town or processor, a collection schedule, internal storage points, the size, number and type of containers, can be established and fit into the chain of waste collection logistics. Key personnel in the kitchen, restaurant, or housekeeping departments should to be identified and given the responsibility of ensuring the recycling logistics work.

Tips for Collecting Recycled Materials

Decisions regarding the frequency of collections, location of recycling bins inside or on the grounds may be a simple matter of building upon the collection system you already have in place.

- Visibility: Who will see them and will the recycling containers match the interior design of its surroundings?
- Placement: Can recycling be done next to solid waste containers, near work areas and other generation points?
- Pathways: Are there any structural barriers to moving these materials? (stairs, no loading docks, etc.)
- Handling: Strive to have employees pick up and handle recycled materials as few times as necessary. By using multi-compartment collection equipment, both trash and recyclables can be picked up at the same time.
- Interior Storage: Review any interior storage of materials with regard to local fire and heath codes. Will storage of these materials violate any local ordinance?
- Control: If recycling containers are in public areas, fit the top with a reduced diameter opening to fit only beverage containers or other recycled materials.

Waste and Recycling Containers, Oceanic Hotel, Rye, NH

Interior Collection Containers

Perhaps the first consideration is whether the interior containers you employ now can be used for collecting recyclables as well. In working areas (kitchen, bar, etc.), an extra barrel to collect mixed containers is feasible. In administrative offices, cardboard boxes can be used to collect office paper. In public areas, the size, placement, aesthetics, diameter of openings, and printed instructions are key issues to consider before purchasing and setting up a collection system. Container selection is primarily a function of what materials you choose to recycle – are they wet or dry, heavy or light, sorted by color or code? Also, do they work with the exterior containers?

Questions to Ask About Containers

- How much do they cost?
- How easily can they be cleaned?
- Are they leak-proof and durable?
- Are they easy to empty?
- Are they covered with reduced diameter tops?
- How heavy will they be when full?
- Are they the appropriate size or volume?

Figure 2
Sample Interior Recycling Collection Containers

Foyer & Front Desk
United Receptacle Designer Series

Common Areas
Recycling System Containers,
Keysan, Inc.

Office Collection
Saddle Basket™ Keysan, Inc

Office Collection
Corrugated Recycling Bin,
Safeco Products, Inc.

Interior containers vary in cost from several dollars to several hundred dollars. Canvas duffle bags or plastic bags can be added to housekeeping carts to collect recycables from guestrooms. Plastics bags are inexpensive ($.02 / bag) while duffle bags are in the range of $10 - $20. However, duffle bags are more durable and last longer than plastic bags.

Medium Sized Mobile Containers

Bulky materials, like cardboard, can be collected using larger collection toters, typically on wheels. Mixed containers of paper can be collected from smaller collection containers using portable toters. These containers are typically made of durable plastic and can be easily moved and cleaned. Covers limit odors, bugs and other nuisances.

Various Sized Portable Plastic Toters

Open Top Tilt Carts

Open top tilt carts are ideal for collecting cardboard or other dry bulky items that you plan to recycle. Tilt carts are easy to load and unload (by tilting) as employees can reach to the bottom and are versatile as they can be used for a wide variety of recyclables.

A waste hauler can supply a dumpster or series of toters (containers) that hold recycled materials.

All collection containers should be well marked with signs and instructions pertaining to the recyclable materials. Having instructions visible on the containers will help to reduce contamination and better prepare the materials for further processing.

Exterior Collection System Set Up

Recycling containers need to function as a system. The dumpsters or roll-off containers placed at loading docks or free standing need to be easy to access and load using the toters, tilt carts or other containers from inside the building. Unloading recyclables into a dumpster or roll-off placed at a loading dock reduces the chance of injury and the effort required to lift recycled materials 3-5 feet high to the dumpster opening. If a loading dock is not available, choose interior containers small enough to be safely lifted to the side or top of the outside dumpster when full. In some cases, a ramp or stairs can be built to allow easier access, however, consider the weight of individual collection containers. For example, 96-gallon toters filled with uncrushed glass, weigh approximately 300 pounds and are difficult to load into a side or top loading dumpster or roll-off.

Table 9
Weights of Commonly Sized Waste Containers
(Weight measured in Pounds)

	96 gal.	55 gal	33 gal
glass	300	172	103
plastics	12	7	4
aluminum	62	36	21
ferrous metals	75	43	26
office paper	310	178	107
newspaper	300	172	103
cardboard	150	86	52

Source: NC State Extension, 2000

96-gallon recycling containers at Eastern Slopes Inn, North Conway, NH

Side loading roll-off container for mixed paper, Concord Drop-Off, Concord

Take the time to work out all of the steps involving the collection, movement and loading/unloading of recycled materials. If the containers are poorly laid out or not appropriately sized, it may lead to contamination or overloading. If interior containers are too heavy, they will be difficult to move and possibly unsafe for employees to unload.

Dumpsters

Two, six and ten-yard dumpsters are commonly used for waste and recyclables at many lodging facilities. Again, utilizing the largest dumpster that will physically fit your facility will be most cost effective. Odors should also factor into the size and frequency of service to a waste or recycling dumpster.

Dumpsters can be loaded from the side or the top, or both. Movable covers and sliding doors on the side can be closed to keep out bugs, animals or weather.

Six-Yard Side Loading Dumpster, Concord, NH

It may be important to keep dumpsters secure with locks and/or fencing. This is vital to prevent people from placing waste into dumpsters without regard to its prescribed use, possibly contaminating recycled materials or adding to your solid waste costs.

We eliminated the extra pick-up service needed during the season by simply putting an eight yard cardboard dumpster alongside our waste dumpster.
Bill McDonald, Port Motor Inn

Top Loading Dumpster, Sunset Hill House, Franconia, NH

Compactors and Roll-offs

To minimize costs, it is important to maximize compaction of both wastes and recycled materials and utilize larger waste containers whenever possible. Compactors and roll-off containers can reduce transportation costs by reducing the frequency of service trips required from a waste hauler. A typical 35-yard compactor can hold between 10 and 15 tons of solid waste while a comparable roll-off or trailer can only hold one-third to one-half of that amount. Solid waste volume compaction that reduces the number of service visits should reduce your overall budget for hauling services.

Compactors and roll-offs are large and require access for large flatbed trucks. A 40-yard roll-off container is a steel box on rollers that is 22 feet long, eight feet wide and eight feet high. Compactors require three-phase power or a converter, both of which can be expensive to install. Established waste management companies should be able to determine the feasibility of utilizing compactors or roll-offs and will provide them at a set rental fee. Typically, a 35-yard compactor rental fees can range from $150 - $350 per month, on top of which a hauling and disposal fee will be assessed. A rental fee for a roll-off will cost approximately $75, plus hauling and disposal.

35 Yard Compactor, Sheraton Harborside, Portsmouth, NH

Volume Compaction of Wastes

A baler is a machine that compacts and compresses cardboard or other recycled materials into wire bound bales to reduce volume and facilitate transport. Reducing the volume of recycled materials reduces the cost of transportation and the amount of storage required for the materials. By reducing transportation costs and increasing the amount stored on-site, more revenue per ton can be obtained through the recycling markets.

A commercial bale is usually 5' x 2' x 3' and may weigh between 600 to 1,800 pounds. Baling increases the value of recycled materials between $20-$40 per ton. However, baling requires additional equipment, including a forklift, large bins to hold loose materials, storage for bales, as well as additional staff training.

Cardboard Baler in Milford, NH

Short of baling it, breaking down (flattening by hand) corrugated cardboard boxes allows *six times more cardboard* to be placed in a dumpster than simply placing the intact boxes in the dumpster.

Mobile Cardboard Recycling Trailer, USC Recycling

Step 6: Train & Educate Staff

Having existing and new employees informed to the details of a waste reduction program that includes recycling or using new products (loading soap dispensers, mixing concentrated cleaners) is vital to the success of a waste reduction program. If employees are not properly trained, management's support for the program will dwindle as problems and issues arise that interrupt the normal operations of the lodging facility.

Training Employees to Reduce Waste

One of the most common remarks that small business owners make about starting a waste reduction program is that it is difficult to find employees who will pay attention to the details of these efforts. Lodging businesses are often temporary or seasonal, and it's difficult to be a stickler about recycling or other issues when the labor market is tight. Look for employees that show interest in waste reduction activities and that will take some leadership in implementing waste reduction efforts.

Keep it Simple

Employees want to do the job they were hired to do. Unless they're involved with maintenance or housekeeping, most probably do not see waste management as their responsibility. However, many of these employees are now recycling at home, and these habits can easily carry over into the workplace. Keeping containers accessible and making recycling specifications clear, minimizes the obstacles employees face while trying to recycle. Ensure that recycling, reuse or waste prevention is as easy as throwing waste away and this will translate into greater cooperation and participation by all employees.

Use Frequent Reminders

There are a number of ways to communicate recycling goals to employees. Signs above time clocks, notes in check stubs, e-mail, employee newsletters, and memos can be used to encourage employees to reduce waste and recycle. Placing signs in worker break areas is often done. Other companies have assigned "recycling coordinators" that remind and encourage their immediate co-workers to recycle and reduce waste.

Including recycling or other waste reduction information in employee training sessions can be an effective way to bolster your program. As employees turn over, practices to reduce waste become the norm at your company, and time spent correcting old habits decreases greatly.

Share Results

Employees are often more responsive to recycling programs when they realize that they are accomplishing something with their efforts. Statements like "*with your work, the company recycled 2 tons of paper this month, saving the company $150 in disposal costs and preserving up to 60 trees*" can help employees see the real-world value of waste reduction through recycling, reuse or waste prevention.

Awards

Some companies choose to provide employees with incentives to recycle or achieve waste reduction. These can include cash bonuses to individuals, a pizza party for the department that recycles the most, free coffee for the staff, etc.

Ideas on Employee Training and Motivation

- **Employee Orientation.** Include information on waste reduction practices at the facility and a description of each employee's required level of participation.
- **Continuity.** Frequent postings of reminders as to the requirements for waste prevention, recycling, reuse or composting.
- **Accountability.** Require some accountability of those who are identified to be responsible for the overall quality and success of waste reduction related activities.
- **Sharing Results.** Let the staff celebrate important milestones. This will improve morale and enthusiasm if set in the context of overall facility goals.
- **Awards & Recognition.** Create support with financial or non-financial awards and recognition and link these awards to the initial waste reduction goals.

WASTE REDUCTION BY DEPARTMENT

DEPARTMENT	COMMON WASTES	WASTE REDUCTION
❑ **Housekeeping** 	❑ cleaning bottles, paper or cloth rags / wipes, plastic buckets	❑ Add plastic or canvas bags to housekeeping carts to separately collect beverage containers, newspapers and other recyclables. ❑ Purchase cleaning agents in concentrate and use refillable bottles. ❑ Purchase vacuum cleaners with reusable bags.
❑ **Guestrooms** 	❑ newspaper, plastic cups, magazines, tourist information, carpet, textiles and furniture	❑ Institute a towel and linen program that allows guests to request new linens or towels. ❑ Place recycling containers in the rooms or in an accessible area for guest recycling. ❑ Use reusable glassware in the bathroom and reduce disposal amenities, wherever possible. ❑ Deliver newspapers upon request. ❑ Donate old furnishings (drapes, furniture, beds, etc.) to charity. ❑ Provide amenities, such as shower caps, upon request. ❑ Use refillable bath soap, shampoo, hair rinse and hand lotion dispensers. ❑ Use reusable mugs for coffee instead of Styrofoam cups.
❑ **Food & Beverage** 	❑ cardboard, bulk food and glass, plastic, aluminum food containers, food waste, disposable service-ware (cups, plates, utensils, etc.)	❑ Use reusable food storage containers. ❑ Use dispenser systems or reusable glassware for soda and beer. ❑ Use reusable flatware for restaurants. ❑ Set up a container for food waste for composting on the grounds or a local farm. ❑ Reuse or recycle bulk plastic, glass or tin food containers. ❑ Ask vendors to provide supplies in non-waxed cardboard boxes, with the least amount of packaging or to "take back" waste. ❑ Distribute condiments from behind the counter or in bulk dispensers instead of single service packets.

Department	Common Wastes	Waste Reduction
❑ **Front Desk / Public areas** 	❑ printed tourist information, office paper, newspaper, magazines, paper / Styrofoam coffee cups	❑ Place recycling containers at or behind the front desk or other public areas to collect paper waste. ❑ Purchase refillable or recycled toner cartridges. ❑ Go digital – use a computer to replace paper files. ❑ Post signs/placards to announce waste reduction practices and options available to guests. ❑ Purchase stationary, computer and other paper products composed of at least 20% post consumer recycled content paper fiber. ❑ Use reusable cups for coffee.
❑ **Laundry** 	❑ plastic detergent containers, stain removal containers, water softener containers, worn linens	❑ Purchase laundry soaps in bulk or in concentrated form and mix in reusable plastic containers. ❑ Reuse or recycle plastic soap containers or ask distributor to take back. ❑ Use reusable baskets or protective covers for dry cleaning service instead of disposable plastic covers.
❑ **Bathrooms** 	❑ plastic soap or shampoo bottles, paper towels, shower caps, disposable cups, worn towels	❑ Use paper towels, toilet paper, tissues with at least 20% post consumer recycled paper. ❑ Replace paper towels with electric hand dryers in common bathrooms. ❑ Use reusable cups in the bathroom.

Reducing Organic Waste: Waste Prevention & Composting

*Over **30%** of a lodging business' waste is comprised of organic wastes, namely food and yard waste. Food managers and kitchen staff can limit this waste, resulting in the greatest potential revenue savings in terms of reduced stock purchasing and disposal costs.*

Much of this waste is disposed of at incinerators, landfills or wastewater treatment facilities at a high cost, even though this material can be a valuable soil amendment.

Considering the importance that lodging establishments place on improving the landscaping and general appearance of their surrounding property, composting can be a valuable activity. With a bit of effort, food waste can be composted into a odorless, nutrient rich material ideal for use as a natural fertilizer on lawns, flower beds, and along foot paths.

Ideas on Preventing Organic Waste

Preventing organic waste can begin with changes to the food management system to reduce food leftovers, overstocking or spoilage. Talk with the Food and Beverage manager and/or kitchen staff to begin the process of eliminating excessive food waste. Here are some ideas on eliminating food waste.

- Buy meats in bulk or in uncut form to be cut to size.
- Buy shelled eggs in bulk for general cooking or baking. Nearly a third of egg whites stay with the egg shell when raw eggs are used.
- Date and rotate perishable stock during delivery.
- Store raw vegetables in reusable airtight containers to prevent dehydration and spoilage.
- Cut off ends and immerse "stalky" vegetables like carrots and celery in warm water for 15-20 minutes to prevent wilting.

What Can Be Composted?

A majority of organic waste at lodging establishments is food waste or kitchen scraps. These nitrogen rich kitchen scraps include fruit and vegetable trimmings, coffee grinds, egg shells and breads. This material is a welcome addition to any compost pile. Meats, oils, bones, citrus, and dairy can be composted but require a greater level of management.

Food waste can be collected as "pre-plate" waste in the kitchen, or "post-plate" waste in the dining area. Pre-plate may be easier to manage because sorting would be left up to those who prepare the raw foods.

Yard Waste in the Compost Pile

Many lodging establishments already have a carbon rich yard waste, primarily comprised of leaves, grass clippings, brush, etc. Leaves and brush are a readily available source of carbon. They play an important role in limiting odors, bugs, absorbing liquid, and speeding up decomposition.

Case Study: Oceanic Hotel at Star Island, Rye, NH

In 2000, the Oceanic Hotel composted approximately 16 tons of food waste or nearly two-thirds of its waste stream. After an initial investment in concrete bunkers, the hotel now has a long-term option for controlling a majority of its waste stream. Composting on the island also limits the labor and expense of transporting organic waste off the island.

Food Waste Composting Recipe

Recipes are only as complicated as you make them. A number of resources are available to aid in mixing up a compost recipe.

Generally, the carbon to nitrogen ratios, <u>by volume</u>, should be about 3:1. That is, the amount of carbon rich materials -- leaves, wood chips, brush, should be three times the amount of nitrogen rich materials -- food waste or lawn clippings. Assistance in putting

together a compost recipe can be obtained from the county Cooperative Extension office (Contact Information at http://ceinfo.unh.edu/) or the New Hampshire Composting Association.

Pre-plate food waste collection should take place near where the food is prepared. Post-plate food waste collection could take place near a dishwashing area. Proper placement of collection containers can affect participation in the program and contamination of the food waste to be composted.

Table 9
Food Composting Containers and Estimated Weights

Food Waste	Weight Full
5-gallon pail	37 lbs.
33-gallon barrel	247 lbs.
55-gallon barrel	412 lbs.

Compost Pile Management

Composting involves managing the process of decomposition of organic materials. The carbon to nitrogen recipe of organic materials, the moisture, temperature and aeration of the pile are all important factors to an active compost pile.

Moisture: The key to maintaining an appropriate level of moisture in a compost pile is to mix in the right amount leaves, sawdust, or fine woodchips. The pile should be moist and should absorb all of the liquid from the food waste.

Temperature: An active compost pile will attain temperatures of over 130 degrees (F) as microbes break down the organic material. Over 130 degrees (F) temperatures in the pile will eliminate pathogens. Composting thermometers are available for monitoring temperature.

Aeration: Aerobic decomposition results in carbon dioxide, which is an odorless gas. Turning or layering the pile with brush or other bulky organics allows greater aeration and less odor. Not properly aerating through turning or layering contributes to anaerobic decomposition and odor problems.

Methods of Composting

Food waste composting at a lodging facility can be accomplished in a variety of ways. Things to consider include: the availability of space, labor, money and the volume of organics to be composted. Food waste can be composted on site or taken to a facility permitted and equipped for this activity.

Table 10
Methods of Composting

Static Pile Composting

Static pile composting is the simplest form of composting. This method is done just as the name implies: organic matter is put in a pile and left to decompose. Perforated pipes may be inserted into the pile to increase the rate of decomposition.

In-vessel Composting

In-vessel composting requires a more mechanized process and takes place in a specially designed enclosed container. Some benefits to in-vessel composting are odor control and less space required. Some space on or off site will be needed to store compost for curing. Multiple containers may be necessary, depending on the container system chosen.

Windrow Composting

Windrow composting is accomplished using a series of rows of organic materials to be composted. The height to width ratio is typically 1:2, 7 feet high and 14 feet wide. The rows are turned periodically using mechanical equipment to speed up the composting process by aerating, mixing in organic matter, maintaining necessary temperatures and encouraging bacterium growth.

Other Options for Food Waste Reductions

Food Banks

Local food banks may be an outlet for non-perishable foods, such as mixes, dried or canned foods.

Soup Kitchens

Many times, more food is prepared in restaurants than is needed. In this case, perishable foods may be donated to a local soup kitchen. Because these foods spoil quickly, food would be donated on a daily basis or right after meals are served. Tax benefits may apply for food donations to charities and such donations are excellent examples of civic responsibility.

Food for Animals

Perishable food that is not suitable for human consumption could be used to feed animals. Local farmers may be willing to collect food scraps.

Purchasing Practices that Reduce Solid Waste

Businesses have many opportunities to save money and decrease their impact on the environment by making wise decisions about the wide variety of materials they purchase. Buying items that generate less waste (less packaging), are able to be recycled/reused, or contain post consumer recycled content define "green" purchasing.

Green purchasing reduces the impact upon our natural resources, creates demand for recycled materials and extends landfill capacity. Today, many manufacturers that use recycled materials as a feed-stock make high-quality products at a cost that is comparable to those of virgin materials.

Review supplier catalogues for products that contain recycled content. Follow up directly with suppliers if their products do not specify the amount of recycled content.

- **Recycled-content products** are made from materials that would otherwise have been discarded. Items in this category are made totally or partially from material destined for disposal or recovered from industrial activities—like aluminum soda cans or newspaper. Recycled-content products also can be items that are rebuilt or remanufactured from used products, such as toner cartridges or computers.
- **Post-consumer content** refers to material from products that were used by consumers or businesses and would otherwise be discarded as waste. If a product is not labeled specifically as post consumer recycled content, the recycled materials may be from excess or damaged items generated during normal manufacturing processes—not collected through a local recycling program.
- **Recyclable products** can be collected and remanufactured into new products after they've been used. These products do not necessarily contain recycled materials and only benefit the environment if people recycle them after use. Check with your local recycling program to determine which items are recyclable in your community.

Table 11
Guidelines and Examples of Green Purchasing

Green Purchasing	Examples
❑ Purchase items that can be recycled by a local processor or market.	If you cannot recycle plastics, consider aluminum or glass containers when purchasing.
❑ Purchase items that can be reused, refilled or remanufactured.	Toner cartridges are refillable, usually at far less a cost than a new cartridge.
❑ Purchase items that have a longer lifespan and come with extended maintenance agreements.	Any item expected to last more than several years -- washing machines, toilets, beds, and ovens
❑ Purchase items from vendors that take back and recycle or reuse cardboard, plastic containers, etc.	Beverage distributors will take back bottles or cardboard for reuse.
❑ Purchase items in bulk whenever possible.	Laundry detergents and other cleaning agents are sold in concentrates that can be mixed in reusable spray containers.
❑ Look for items that contain recycled content.	Paper towels, tissues, and office paper Follow the EPA guidelines (see below) for post consumer recycled content.

Common Lodging Supplies: Below is a list of materials commonly used by the lodging industry that are available in recycled-content alternatives.

- Account books
- Antifreeze
- Bathroom and facial tissue
- Benches
- Binders
- Brochures
- Brooms
- Buckets
- Bulletin boards
- Business cards
- Can liners
- Cardboard containers
- Carpeting
- Carts
- Cash register tape
- Coffee filters
- Computer equipment
- Construction materials
- Containers
- Custom rubber stamps
- Date books
- Desk blotters
- Envelopes
- Fax paper
- File folders
- Flooring
- Floppy disks
- Food containers
- Forms
- Garbage cans/recycling bins
- Index cards
- Inkjet cartridges
- Insulation
- Laser toner cartridges
- Letter trays
- Letterhead
- Lighting fixtures
- Message pads
- Mops
- Motor oil
- Mugs
- Note pads
- Office paper
- Pallets
- Paper towels and napkins
- Pens/Pencils
- Placemats
- Plastic lumber
- Postcards
- Push pins
- Refurbished office furniture
- Retread tires
- Rulers
- Stationary
- Scissors
- Shingles
- Sticky notes
- Wiping rags

As shown above, hotels have a wide range of opportunities for purchasing recycled-content materials. Like their virgin counterparts, these materials may vary in price and quality, but the list of materials above is generally available at competitive prices. In some cases, as with mugs, pens, and note pads, the items can be used to display your hotel's name and make your guests aware of your efforts. Other products, such as printer cartridges and floppy disks, can save you 20-50% on purchasing costs. Look for a full guarantee on these products, just as you would when buying non-recycled versions.

EPA hosts several websites concerning environmental standards related to purchasing and procurement.

EPA Procurement: ***http://www.epa.gov/epaoswer/non-hw/procure/index.htm***

EPA Buy Recycled ***http://www.epa.gov/epaoswer/non-hw/muncpl/buyrec.htm***

Finding recycled-content materials

Recycled-content materials are widely available, and are probably carried by your current suppliers. However, most wholesale suppliers do not maintain a separate listing of products containing recycled-content materials. When ordering products, ask your sales representative which products contain recycled content. It may be helpful to provide the supplier with a list similar to the list on page 29, and ask them to provide the price comparisons and item numbers for products on the list containing recycled materials.

The WasteCap Resource Conservation Network also lists a number of sources of recycled-content products in its ***Recycled and Reused Products Directory***, available at: http://www.wastecapnh.org/pubs/buyrec/

The guide currently contains 135 vendors of goods containing recycled materials to New Hampshire businesses.

Recycled content levels

Recycled-content materials differ greatly in the amount of recycled material they actually contain. Pick a level of recycled content that balances cost and quality. Many purchasing managers find it easier to start with simple, proven recycled-content products. As these products gain acceptance within their companies, more recycled-content products can be added to the company's purchasing mix. The following list contains the US Environmental Protection Agency's recommendations for several product categories.

Table 12
Minimum Levels of Recycled Content

Paper Products	**Assort. Paper**	
	Carbonless copy paper	20% post-consumer
	Bathroom tissue	20-60% post-consumer
	Paper towels	40-60% post-consumer
	Paper napkins	30-60% post-consumer
	General purpose industrial wipers	40% post-consumer
Non-Paper Office Products	**Recycling containers & waste receptacles:**	
	Plastic	20-100% post-consumer
	Steel	25-100% recovered material
	Plastic desktop organizers (polystyrene)	20-100% post-consumer
	Plastic covered binders	25-50% post-consumer
	Plastic trash bags	10-100% post-consumer
Transportation Products	**Traffic cones:**	
	Plastic (PVC and LDPE	50-100% recovered material
	Crumb rubber	50-100% recovered material
	Traffic barricades:	
	Plastic (HDPE, LDPE, PET)	80-100% post-consumer
	Steel	80-100% post-consumer
	Fiberglass	100% recovered material
Park and Recreation Products	**Playground Surfaces:**	
	Plastic or rubber	90-100% post-consumer
	Running tracks:	
	Plastic or rubber	90-100% post-consumer

Summary of Green Purchasing

- Ask your supplier not to use waxed corrugated containers. These containers, which are often used to store food products, are not recyclable and must be disposed of.
- Ask suppliers to reduce packaging or begin using reusable packaging. This will save you money on waste disposal and handling, and will save purchasing costs for your supplier.
- Purchase condiments in bulk whenever possible. Serving condiments in individually-wrapped packets in restaurants and guest rooms causes excessive waste and adds cost.
- Use cloth napkins, placemats, and tablecloths. These are reusable, and will generate less trash and improve your hotel's image.
- Purchase newspapers based on occupancy. Give guests the option of refusing the newspaper if they wish, or make newspapers available at the front desk.
- Use reusable cups, mugs, plates, and silverware instead of disposables.
- Store food in reusable plastic containers instead of plastic wrap.
- Use soap dispensers in common and employee bathrooms instead of bars. This will reduce cost and leave the restroom neater.
- Provide dispensers for soap, conditioner, and shampoo in guest rooms. Purchasing these items in bulk can save up to $.06 per room per night.
- Try to purchase as many similar types of containers as possible. For instance, purchasing only aluminum or only plastic soda containers gives you a larger volume of one material instead of smaller volumes of each material. This makes recycling easier and more cost-effective.
- Use recyclable open-window envelopes instead of ones with plastic windows.

Reuse tips

Sometimes the best purchasing practice is not to purchase at all. Reusing items you already have, or items that are available from other businesses, saves money and reduces waste. Here are some tips on getting the most out of materials already purchased:

- Set your copy machine so that it defaults to double-sided copying. This simple measure can save an enormous amount of paper by making double-sided copying more convenient for staff than single-sided copying.
- Use partial note pads from guest rooms for staff to-do lists, bar and restaurant orders, etc.
- Use rechargeable batteries where possible.
- Turn Tyvek mailing pouches inside-out and reuse for mailing.
- Repair furniture when possible. Even when it has outlived its usefulness for your company, you may find that local churches, schools, or other non-profit organizations would be interested to receive it.
- Turn file folders inside out for reuse.
- Give Styrofoam packing peanuts to a local mailing service. These peanuts can be used several times before they need to be discarded.
- Use short cardboard case boxes (the type that holds soda or beer cans) for recycling bins that can easily fit under desks.
- Cut worn-out linens for use as drop cloths, cleaning rags, etc.
- Use outdated letterhead, obsolete forms, printing over-runs, or other scrap paper for staff notes and telephone messages.

Appendix I
Purchasing Survey

The following survey was produced by DES in conjunction with WasteCap-NH and distributed to the project partners over the 2000 season. Below is a summary of responses received from the participants.

Waste Prevention / Purchasing Alternatives	The Wolfeboro Inn	The Port Motor Inn	Oceanic Hotel & Conf. Ctr.	Sheraton Harborside Portsmouth
1. Do you buy recycled products or products that contain recycled materials whenever possible? Do you ask your suppliers or shop for items like recycled toilet paper, facial tissues, fax, copier, notepaper and office/computer paper?	Yes, and plan to make improvements in the future.	Only to a limited extent, but plan to make improve-ments in the future.	No, but plan to in the future.	Currently, yes.
2. Do you ask suppliers to take packaging back or if they can reuse containers, such as detergent containers? Do you look for excessive packaging? Some vendors will provide the same product with less packaging. Sysco used to take back materials as a courtesy to customers.	No.	Currently, yes on some items.	No.	Plan to do so in the future.
3. Are your cleaning products purchased in bulk, whenever possible?	Currently, yes.	Currently, yes.	Yes, and plan to continue doing so.	Currently, yes.
4. Do you ask for a list of products that are wrapped in reusable or recyclable packaging and packaging that has recycled content in it? Examples: fish, chicken, vegetables may be packaged in waxed cardboard, ask your supplier if they can box in un-waxed cardboard or reusable containers.	No.	No, waxed cardboard used now.	No, but plan to in the future.	Plan to do so in the future.
5. Could you switch to specific products that are composed of materials that can be cost effectively recycled, for example from plastics to aluminum; consider switching to kegs and washable glasses for events?	No, but may do so in the future.	No.	No, but plan to in the future.	Currently, yes.
6. Do you look for local produce and ask farmers if they will take organic waste for compost? (better produce, lower costs)	Currently, yes.	No.	Use a local produce mark, but compost on own facility.	Currently, yes.

Waste Prevention / Purchasing Alternatives	The Wolfeboro Inn	The Port Motor Inn	Oceanic Hotel & Conf. Ctr.	Sheraton Harborside Portsmouth
7. Could you buy a dispensing system for common bathroom or to replace guestroom amenities such as shampoo and lotion bottles?	Currently, yes.	Not currently, but possibly in the future.	Only provide small soaps packaged in paper wrappers.	Do not plan to do so.
8. Do you install electric hand dryers in common bathrooms?	No.	Not applicable.	No.	Unsure.
9. Do you purchase rebuilt or recycled toner cartridges that have been re-filled?	No.	No, but plan to do so in the future.	No.	Currently, yes.
10. Do you announce to participating corporations or parties holding events at your facility that recycling and waste prevention will be available at your facility during their event?	No, but plan to do so in the future.	Not applicable.	Yes, and plan to continue doing so.	Do not plan to do so.
11. Do you institute a linen policy that changes linens for customers staying multiple nights upon request?	Currently, yes.	Currently, yes.	Yes, and plan to continue doing so.	Currently, yes.
12. Do you consider reuse of items (5 gallon pails, old linens, etc.) between different departments at your facility?	Currently, yes.	Currently, yes.	Yes, and also use old linens as rags.	Currently, yes.
13. Do you use ceramic mugs (possibly with your logo and for sale) instead of disposable cups in common areas, such as the lobby? Do you use reusable cups in guestrooms?	Partially do so now.	No, but possibly in the future.	Partially yes, may look into improving in the future.	Currently, yes.
14. Do you avoid purchasing paper towels for cleaning? Do you cut up old linens can be used for cleaning and save money?	Currently, yes.	Currently, yes.	Partially yes, and may look into improving in the future.	Currently, yes.
15. Do you consider the life span of equipment and shelf life of products? Do you consider products with longer shelf life and equipment with long-term service and maintenance arrangements?	Currently, yes	Currently, yes.	Yes, and plan to continue in the future.	Currently, yes.

Appendix II
Waste Reduction Practices and Measurement Summary

Waste Reduction Practices

Recommendations made to participating businesses focused on the four general waste reduction themes: prevention, reuse, recycling and composting. The use of recycled content was also recommended at most facilities. Some of the facilities already had in place practices to reduce waste including recycling. In those cases, the focus was placed upon the other general waste reduction themes.

Table 1
Summary of Waste Reduction Practices

Lodging Establishment	Recycling	Waste Prevention	Reuse	Composting
Cannon Mountain	cardboard, mixed containers	electric hand dryers, soap dispensers, bulk orders	NA	NA
Eastern Slope Inn	mixed paper, cardboard, mixed containers	electric hand dryers, soap dispensers, bulk orders	NA	NA
Oceanic Hotel & Conference Center	cardboard, mixed containers	soap dispensers, towel & linens, bulk orders	old linens	food and yard waste
Oxbow Campground	mixed paper, cardboard mixed containers	electric hand dryers, soap dispensers, bulk orders	NA	NA
Port Motor Inn	cardboard	bulk orders	old linens	NA
Sheraton Harborside	newspaper, cardboard	towel & linens program, bulk orders	old linens	NA
Sunset Hill House	cardboard, mixed containers	soap dispensers, bulk orders	NA	NA
Wolfeboro Inn	cardboard, mixed containers	soap dispensers, towel & linen policy, bulk orders	old linens, 5 gal pails	yard waste

Measurement Study: The purpose of the measurement study was to better evaluate the financial and environmental impacts of waste reduction. Information from this study was used in the WARM Model to calculate emissions. Table 2 compiles the waste measurement information assembled and tracked during the project. The information available was provided either from the lodging facility or the waste hauler, however, such specific information was not available from municipal facilities. Volume estimates using EPA volume-to-weight conversions were used in many cases due to the fact that waste weights were unavailable. Tracking was done from the beginning of implemented waste reduction practices to the end of the 2000 season, which varied from ten-weeks to six months.

The results indicate that the lodging units achieved an overall average of a 22% diversion rate by the end of the monitor period conducted during the pilot.

Table 2
Measurement of Waste Stream

Business Partner	Waste (tons)	Recycled (tons)	Composted (tons)	Diversion Rate	Method of Measurement	Waste Diversion Activity
Star Island	13.5	5.75	16	62%	Weights estimated from volume	Food Waste Composting program
Sheraton Harborside	157.5	14.4	0	8%	Weights received from waste hauler	Cardboard recycling program
Port Motor Inn	14.4	7.2	0	33%	Weights received from waste hauler	Cardboard recycling program
Wolfeboro Inn	96	7	0	6%	Weights estimated from volume	Cardboard and Mixed containers recycling program
Sunset Hill House	9	2.5	0		Weights estimated from volume	Cardboard and Mixed Containers recycling program
Eastern Slope Inn and Resort	299.4	37.1	0	11%	Weights received from waste hauler	Mixed paper, cardboard, better recycling education
Oxbow Campground	3.6	.78	0	13%	Weights estimated from volume	Cardboard and Separated containers recycling program
TOTALS	**593**	**91**	**16**	**22%**		

Appendix III
WARM Model Inputs and Results

Appendix IV
WastePlan Model Inputs and Results

Appendix V
Copies of Outreach and Educational Materials

Appendix VI
Customer Survey Data

Appendix VII
New Hampshire Case Studies

Appendix A
Solid Waste Audit Form

The Solid Waste Audit Form can be used (1) to document the amount and type of wastes discarded, (2) to identify opportunities to reduce waste disposal, and (3) to predicate changes to existing service.

Date of Waste Audit
__/__/__
day / month / yr.

Waste Audit Completed By: _____
name of staff

Waste Audited Over ❑ 1 day ❑ 1 week ❑ 1 month

Method of Waste Audit ❑ visual inspection ❑ waste sort ❑ other method _____

✓ if generated	Lodging Waste	Percent of Total Waste (by volume or weight)	Can Reuse	Can Recycle	Can Prevent	Comment
	Paper:					
❑	Office Paper					
❑	Cardboard					
❑	Newsprint					
❑	Other					
	Wood:					
❑	Pallets					
❑	Boxes					
❑	Stumps					
❑	Other					

✓ if generated	Lodging Waste	Percent of Total Waste (volume or weight)	Can Reuse	Can Recycle	Can Reduce	Comment
	Metal:					
❑	Ferrous (steel)					
❑	Non-ferrous (tin, aluminum)					
	Glass					
❑	Container					
❑	Other					
	Plastic					
❑	PET #1					
❑	HDPE #2					
❑	PVC #3					
❑	LDPE #4					
❑	Polypropylene #5					
❑	Polystyrene #6					
❑	Other					
	Organic Waste					
❑	Food waste					
❑	Yard waste					
❑	Textile					
❑	Other					

Appendix B
Volume to Weight Conversion Factors for Waste Materials

Material	Volume	Weight (lbs)
Automotive		
Tire, car	1 tire	12
Tire, truck	1 tire	60
Used motor oil	1 gallon	7
Glass		
Glass, whole bottles	1 full grocery bag	16
Glass, uncrushed to manually broken	55-gallon drum	125-500
Glass, whole bottles	1 cubic yard	600-1,000
Glass, semi-crushed	1 cubic yard	1,000-1,800
Glass, crushed	1 cubic yard	800-2,700
Metals		
Aluminum cans	1 full paper grocery bag	1.5
Aluminum cans	1 55 gallon plastic bag	13-20
Aluminum cans	1 cubic yard	50-74
Ferrous cans, whole	1 cubic yard	150
Ferrous cans, flattened	1 cubic yard	850
Organics		
Fats, solid/liquid	55 gallon drum	400-410
Grass clippings	1 cubic yard	400-1,500
Leaves, uncompacted	1 cubic yard	250-500
Leaves, compacted	1 cubic yard	320-450
Leaves, vacuumed	1 cubic yard	350
Pallets	1 cubic yard	30-100
Wood chips	1 cubic yard	500
Paper		
Computer paper, loose	1 cubic yard	655
Computer paper, baled	1 cubic yard	1,310
Corrugated cardboard, loose	1 cubic yard	300
Corrugated cardboard, baled	1 cubic yard	1,000-1,200
Newsprint, loose	12 inch stack	35
Newsprint, loose	1 cubic yard	360-800
Newsprint, baled	1 cubic yard	
Newsprint, compacted	1 cubic yard	720-1,000
Office paper, loose, flat	1 cubic yard	375-465
Office paper, baled	1 cubic yard	755-925
Plastics		
HDPE (#1) milk jugs, whole	1 cubic yard	24
HDPE (#1) milk jugs, compacted	1 cubic yard	270
HDPE milk jugs, baled	32” x 60” bale	400-500
HDPE mixed, baled	32” x 60” bale	900
PET soda bottles, whole	1 cubic yard	30-40
PET soda bottles, whole	Gaylord box	40-53
PET soda bottles, baled	32” x 60 “	500-550
Mixed PET and HDPE (dairy, whole)	1 cubic yard	49

Source: Business Guide for Reducing Solid Waste, U.S. EPA, 1994; National Recycling Coalition Measurement Standards and Reporting Guidelines, 1989.

Cannon Mountain Ski Area

Contact: Bill Roy
Interim Mountain Manager
Cannon Mt. Ski Area
Rte 3
Franconia, NH 03580
Phone: (603) 823-8800

Cannon Mountain, NH

Background

Cannon Mountain Ski Area is located in Franconia within the White Mountains National Forest. The ski facility's season runs from December to April each year, but continues to have summer visitors to the summit for hiking and related outdoor activities. This park is owned by the State of New Hampshire and maintains a "carry in, carry out" waste policy. Most of the waste is generated on-site and comes primarily from the food and beverage concessions located at the base and top of the slope.

Based upon a visual waste audit, the ski area generates a high percentage of cardboard, glass, plastic and aluminum food and beverage containers. Non-recyclable wastes include paper trays, paper plates, plastic silverware, plastic packaging and food waste.

Cannon Mountain uses a 6-yard dumpster for trash, typically emptied three times per week. Approximately 5,400 pounds or about 2 ¼ tons of waste is generated each week. During the summer / fall of 2000, the ski area began a cooperative pilot arrangement with the town of Littleton and began to transport cardboard to the town's transfer station, which is approximately ten miles from Cannon Mountain. During the fall of 2000, the ski area recycled approximately thirty (30) cubic yards or cardboard or about 2 ¼ tons of cardboard through the Littleton transfer station. Beverage containers continued to be recycled through a local hauler and information regarding the weight or volume for this facility was unavailable.

A number of issues were identified and presented to the facility, including better visitor education, better coordination between state and private concessions staff, retrofitting recycling containers and rearranging the placement of these containers next to the trash containers, improving operations and changing some purchases to prevent waste.

Recycling

Based upon a visual waste audit completed during this project, it was clear that many containers were being tossed in the trash containers. In response, the ski area invested in new recycling containers to improve participation of visitors.

It was suggested that the ski area further educate staff and skiers as to the availability of recycling at the facility and the efforts to reduce waste. Samples of pop up table "tents", intended to provide recycling instructions for visitors, were given to Cannon Mountain's concession's contractor for placement at the facility's cafeterias. It was suggested that a professional company provide table tents to the facility to improve participation and reduce contamination.

The ski facility's recycling bins were located in separate areas away from trash barrels or by doorways. This led to contamination by skiers who found it convenient to toss trash into recycling containers on their way out to the slopes. Recycling bins located in the food concessions area had the lids retrofitted to accommodate recyclable containers and relocated next to trash barrels. The combination of educational signs, container placement and retrofitting, help to reduce contamination and encourage participation.

Recycling in the kitchen to capture tin cans, glass, and fiberboard was also seen as an opportunity to divert more from the waste stream. For example, tin cans of meat or fish products, mayonnaise or pickle jars, or fiberboard (chipboard) packaging for snack foods and beverages could also be recycled at the Littleton transfer station. Littleton required the caps be removed from all containers, that glass and plastics be sorted by color or code, and that the containers be rinsed clean. The option to recycle containers through Littleton was not implemented and the existing container recycling service was continued by the current waste hauler.

Source Reduction

A variety of source reduction options were reviewed with Cannon Mountain, including switching to reusable beverage glasses in the cafeterias, which would involve adding another dishwasher in the kitchen. Using washable soda glasses or coffee mugs would eliminate a significant amount waste generated from disposable soda, juice and milk containers.

The facility uses soap dispensers and electric hand dryers in the restrooms to reduce packaging and paper waste, however, the electric hand dryers are removed during ski season as skiers use them for drying boots, which shortens the lifespan of the units.

Purchasing

Cannon Mountain purchases most supplies for concessions from Alliant Food Service. Alliant's **Envision** brand products list the percentage of recycled content in their *AnswerLink North American Commercial Business Product Line Catalog*. This fact was conveyed to the concession's manager, who was unaware that his supplier could provide recycled content paper.

A suggestion was made to the concessions manager to switch from plastic to aluminum beverage containers, which can be marketed more readily in the area. The concessions manager needed to review this change with the beverage suppliers. The ski area sells approximately fifty (50) cases (each case has 24 bottles) of soda and juice beverages per week during ski season.

Most fountain drinks or coffee are sold in paper or plastic cups that could be reduced with the purchase of reusable/washable glassware.

Conclusion

The project was well received by the original Cannon Mountain Ski Area Manager, who managed the overall ski facility operations. Additional recycling bins were purchased and a cardboard recycling program was put in place over the summer. Significant opportunities existed to reduce the paper and container waste from this facility by making modest changes to their waste management system and purchasing decisions. Cardboard was the single largest component of the ski facility's waste stream and was targeted first for recycling. Beverage containers were the second most prevalent waste that could easily be identified, separated out and recycled at a local facility. More progress can be made at this facility in the future to implement realistic waste reduction options, specifically with regard to waste prevention and purchasing.

One of the largest obstacles to recycling was the lack of competition in the hauling market. Only one hauler provided service in this area, and this hauler did not offer cardboard recycling services. Another obstacle was the lack of incentive to the concessions contractor, who associated recycling with more work without a discrete savings to the waste bill, as the waste hauler had no competitive pressure to return any savings on tipping fees to the concessions company.

The cooperative arrangement with the town of Littleton functioned well until later in the fall when a management change was made at Cannon Mountain and the Mountain Manager left for another job. This resulted in a interim manager, with a different opinion regarding the state's responsibility and level of participation under the contract with the concessions contractor. The new manager required that the concessions contractor be completely responsible for all waste management services at the ski area, which precluded any state assistance in terms of transportation or staff. The concessions manager, under contract with the state to run the cafeterias, snack areas and other concessions, is also required to manage and pay for solid waste disposal under this contract. This resulted in the cardboard recycling program ending in the fall and it was the opinion of the interim Mountain Ski Manager that recycling services would need to be entered into a new contract with the concessions contractor in the spring of 2001. A number of the suggestions from this project will be worked into the contract with the concessions manager next year.

The Eastern Slope Inn

Contact: Steve Bossinger,
P.O. Box 1288 Conway, NH 03818
Phone: (603) 447-3666

Background

Eastern Slope Inn is located along the Main Street in North Conway and offers a mix of daily, weekly or seasonal lodging rentals. Several smaller structures contain vacation timeshares that are privately owned. The main building contains eighty (80) rental units, fifty (50) more units in various buildings around the main inn that are privately owned vacation timeshares. The inn also features a bar/restaurant, function hall, dining areas and kitchen. The inn uses a local hauler for recycling and disposal and waste is taken to the Conway municipal landfill. The landfill charges a tipping fee of $27, well below the state average. The inn had in place a recycling program for cardboard and mixed containers, however, collection from all points was not being completed and participation from guests and staff was limited. The project was undertaken to improve the existing system.

Recycling

The inn offers only one location for guest recycling, however, this location is, for all intents and purposes, not accessible to many of the units outside the main structure. Guests carrying recycled materials from one building to another (50 yards or more), up a set of stairs to the central recycling area is unlikely. No reference or guidance concerning recycling was available to guests at the front desk, in the rooms or other public areas. The collection containers used within the building were undersized and no containers existed outside the main building, beyond the 96-gallon toters in the main waste collection area.

Recommendations regarding recycling included, (1) greater visibility of recycling options and activities at the inn to include signs at the front desk, within common areas and rooms; (2) pop-up tents or door hangers within rooms indicating waste reduction practices at the inn; (3) exterior recycling containers located in front of buildings without interior recycling (at the Playhouse Theatre), along walkways or within waste storage locations; (4) collection of tin, glass and plastic containers from the kitchen (collection already within bar area); (5) placement of recycling containers in all guestrooms or timeshare units at the Randall House; (6) inclusion of recycling information with all rental and/or lease agreements; (7) collection and recycling of mixed office paper at the front desk and administrative offices.

The Director of Operations at ESI was able to provide greater visibility by posting a recycling memo at the front desk and instituted a mixed-paper recycling program at the front desk. During a site assessment and visual audit of the guestroom waste, it was clear that many guests were not recycling and further education was needed. The inn updated its in-room directory to include information about recycling at the inn. Also, an additional cardboard dumpster and 96-gallon toter for mixed office paper was placed adjacent to administrative offices and the existing waste area.

A number of barriers came up regarding in-room recycling. Space within guestrooms is limited and the inn felt recycling containers in the rooms could be a problem for guests. The inn was

provided information to purchase guestroom containers and is a member of the Green Hotel's Association. The inn was able to place a number of duel use (recycling/disposal) containers in a limited number of rooms. The restaurant and associated kitchen are leased to a third party and during the project the lease was not renewed leaving the restaurant vacant. The units under timeshare arrangements are privately owned and presented difficulties as the Vacation Trust Ownership organization that oversees management activities felt the space issues within the units prevented in-room recycling. The historic nature of the inn includes the fact that many rooms are smaller than conventionally built inns or hotels.

The Town of Conway offers a recycling area for businesses at the town's landfill, and ESI's waste hauler and the inn are required to recycle under local ordinance. The town enforces this ordinance on a random basis. The inn's hauler already uses the town facility to recycle. Recycling composes about eleven percent of the total waste bill, however, it is about eighteen percent of the waste stream by volume. According to cost information provided by ESI, recycling costs approximately $3 per yard while disposal costs about $4, or approximately twenty-five percent more. However, financial advantage was not a controlling factor in terms of decisions regarding recycling. Ownership arrangements, room size, and aesthetics came to be more important to the Director of Operations and the inn. To some degree, the private ownership also limited the management's ability to implement recycling within guestrooms.

Waste Prevention

The inn uses soap dispensers and electric hand dryers in common restrooms and provides linen and towel changes upon request. Few room amenities are handed out to guests automatically and the inn uses ceramic mugs for coffee in common areas.

Composting food was discussed and local organic farmers met with the Director of Operations. Although there was interest, the inn and the farmer did not agree to set up a timetable for instituting a program. The local farmer indicated that he would pick up food waste and could use it in composting at his farm, however, he was interested in setting up a milk run with other businesses to ensure his truck was filled. The inn was interested but did not actively pursue this option with the interested farmer. Storage issues and pick up coordination, as well as the vacancy of the inn's leased restaurant over the summer, were obstacles to moving forward. Perhaps the greatest issue with implementing a composting program was the time limitations of the Director of Operations. The inn continues to look at offsite composting as a way to reduce waste.

Conclusions

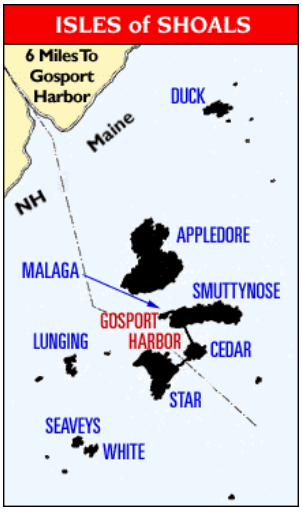
The intended goal for this facility involved increasing the diversion rate through better capture rates for recycling, further waste reduction measures and through food composting. The amount of waste reduction attributable to the improvements couldn't be quantified, however, the additional containers for cardboard and office paper and greater visibility of the recycling program should have an overall positive effect. During the project timeline, the recycling rate fluctuated between 24-30% by volume and did not change appreciably during the pilot.

The ownership arrangements, historic guestroom size and the vacancy of the inn's restaurant presented obstacles to improving the waste management practices that were in place when the project started. The choice of affordable, yet aesthetically pleasing, recycling containers for guest rooms and common areas was also a problem for the Director of Operations. The greatest potential for further waste reduction remains in the restaurant and kitchen.

Oceanic Hotel & Conference Center

Contact: Joe Watts
Star Isle. Corp.
10 Vaughn Mall
Suite 8
Portsmouth, NH
03801

E-mail: joe@starisland.org
Island (603) 964-7252
Office (603) 430-6270
Website: starisland.org



Background

The Star Island Oceanic Hotel and Conference Center is located on the Isles of Shoals, 10 miles off the coast of Portsmouth. The Star Island Corporation has owned the conference center since 1916. The corporation has a year-round office in Portsmouth and a management team that lives and works on the island. The hotel has hosted spiritual retreats since 1897 at the island's largest structure, a late-1800s grand hotel called the *Oceanic House*. The hotel has a three-month operating season beginning in early June and ending in September.

The Isles of Shoals Steamship Company ferries guests, staff, and materials to and from the island. Non-recyclable solid waste is taken off the island by ferry, to a 10-yard dumpster shared by three businesses at the ferry's dock in Portsmouth. The hotel uses 96-gallon plastic wheeled totes to move all materials off the island. Waste Management, Inc. empties this dumpster three times per week. Recyclables are managed in the same way. The major waste components on Star Island are food wastes, cardboard and mixed containers primarily associated with food service. Very few guestroom amenities are offered and the dining room offers reusable dinnerware.

Recycling

In total, Star Island recycled approximately 20 percent (by weight) of their waste stream in the 2000 season, excluding composting. A cost analysis indicated that on a per-ton basis the cost of recycling and disposal were equal. Star Island recycled 5.75 tons of materials during the season, including 3.5 tons of commingled containers and 2.25 tons of cardboard. Each week approximately 3 cubic yards of cardboard and eight 96-gallon toters of commingled containers were recycled at a cost of approximately $60 per pick up. The hotel makes recycling services available to overnight guests and day visitors as well as to visiting conferences.

A crew of three to four employees handle all trash and recycling activities on the island. It is collected twice daily from the hotel and surrounding grounds. Recycling containers, distributed throughout the island, are placed next to trash containers to limit contamination. Cardboard is collected and placed at a main waste storage area behind the hotel. Employees use a converted

delivery truck for the collection of solid waste from across the island. Star Island generated 150 96-gallon toters of trash during the season. Each toter weighs approximately 125 pounds when full of mixed solid waste. This equates to approximately six (6) tons of solid waste generated during the 2000 season.

Composting

Food waste is a large portion of Star Island's waste stream, as full meals are served three times daily. According to Julia Case, the island's Solid Waste & Compost Manager, the facility generates 2,800 pounds of food waste per week. In the past, the hotel managers had kept several pigs, and tossed food waste to seagulls, but neither option worked well. Assistance was provided under this grant to set up a composting program in the summer of 2000. The Rockingham Cooperative Extension offered expertise in designing a compost "recipe" that provided the amount of materials required to produce a good carbon-to-nitrogen ratio, allow for aeration and absorb liquids. Island staff constructed four 8 cubic yard cinderblock bunkers to compost food waste. These containers were covered with ¼ inch wire mesh to keep rats and sea gulls out.

The rocky island doesn't provide enough of a carbon source in the form of leaves and wood chips to mix together with the food waste. Arrangements were made to have this material brought to the island by ferry from the City of Portsmouth's yard waste collection area. The compost pile was turned using a tractor and the finished product will be applied to the grounds around the hotel next year. Approximately sixteen tons of food waste, generated by the hotel, was composted during the 2000 season. Composting the food saved the hotel staff the labor of transporting a large portion of their waste stream off the island. Not only is this waste diverted from the landfill, it will be a valuable amendment to hotel's gardens and footpaths.

Oceanic Hotel Compost Bunkers

By adding food waste composting to their waste reduction program, Star Island diverted a total of 21.75 tons from the waste stream and increased the hotel's diversion rate to 78 percent.

Source Reduction

Being located 10 miles out into the Atlantic Ocean, it is important for the Star Island Hotel to generate as little trash as possible.

Linens are changed once per week instead of every day. Star Island's guests typically stay for week-long retreats. Once linens are worn out from repeated use, they become rags or drop cloths for the hotel's maintenance staff to use. Newspapers are used to clean windows and to start fires in their fireplaces. Five-gallon buckets are reused for a variety of tasks, including taking food waste to the compost bins. The disposal of paper cups is avoided by providing ceramic mugs in guest rooms.

Some changes could be made at the hotel's snack bar, including, more durable cups, plates and utensils. The snack bar currently uses plastic cups, silverware, and wax coated paper. Alternative products were suggested for next season.

Purchasing

The hotel offers limited amenities (i.e., hand creams, shower caps, etc.) and purchases from local produce markets in bulk. They do not purchase or distribute any individually wrapped food products. Food products are purchased in bulk, as are paper supplies, most of which have at least a 20 percent post consumer recycled content. Recycled-content paper towels, plastics, toilet paper, napkins, and office paper products are purchased whenever possible.

The staff person responsible for waste management on the island would like to switch to more recycled-content products, returnable packaging, and durable dishes, but these ideas could not be implemented until the next season. Next year's supplies will be purchased with recycled content in mind.

Conclusions

Star Island exceeded the project's expectations, particularly in terms of food waste composting. A number of compost management issues did arise during the operating season, including equipment failure, the design of the concrete bunkers, and employee education on how to effectively manage the composting. The key to the project's success was the hotel's Solid Waste Manager who took responsibility for addressing issues as they arose.

While recycling and general waste management activities at Star Island present some unique logistical issues, the management and staff's commitment to sound environmental practices has resulted in a high level of waste diversion. It also has reduced the amount of staff time and effort required to move solid (food) waste off the island. The management intends to develop employee guidance documents for managing the compost program and minimizing waste.

Oxbow Campground

Contact: John Ramsey, Owner
8 Oxbow Rd
Deering, NH 03244
Phone: (603) 464-5952
Email: oxbow@conknet.com or j_ramsey@conknet.com
Website: www.ucampnh.com/oxbow/

Background:

The Oxbow Campground, located in Deering, New Hampshire, is a family owned and operated campground comprised of 97 campsites. The campground covers several hundred acres and has a central waste and recycling center used by the camp's guests. A private hauler is contracted for dumpster service and recent increases in waste disposal services nearly tripled the campground's waste bill from $60 per month to $170 per month. This has made waste reduction very important to the campground. The private hauler providing service to the campground, Naughton & Sons Disposal, did not offer recycling services.

The project assisted the campground in establishing a relationship with the Town of Hillsborough, using the town's transfer station for recycling cardboard, newspaper and mixed containers at no charge.

Recycling

During the project, the campground achieved a 20 percent recycling rate, diverting about a ton of recycled cardboard and containers. Mr. Ramsey was very interested in beginning a recycling program and guests at the campground have responded with support to waste reduction efforts according to the owner. At the outset of the 2000 camping season, the "Recycle-Mobile," a decorated trailer for sorting and hauling recyclables from the N.H. Governor's Recycling Program was used to demonstrate (1) that guests would deposit recyclables at the trailer, and (2) that significant amounts of waste could be removed from the waste stream. Campers used the trailer throughout the Memorial Day weekend. Over that weekend, four (4) cubic yards of *glass, plastic, aluminum* and *steel* were recycled. Within a month, Mr. Ramsey had built a similar recycling trailer that he uses to transport recycled materials to Hillsborough's transfer station.

Oxbow Recycling Trailer

A mobile trailer eliminates the need to move individual collection containers and reduces overall handling time. Campers bring recyclables to the trailer, located next to trash dumpster. Glass, plastic, aluminum, steel cans, cardboard and newspaper are separated out and placed in the appropriate bins. When the trailer is full, the materials are taken to the Hillsborough transfer station, where they can be dropped off at no charge. The Hillsborough facility is set up primarily for residential use, however, small businesses can use the facility as well. The only time invested is the time to haul and unload the trailer, usually with assistance from Hillsborough solid waste operators at the transfer station.

Seasonal and transient campers have different participation habits regarding recycling. The campground's owner felt the seasonal guests would be more responsive to the recycling opportunities at the campground and he promoted it in the campground's newsletter.

Source Reduction

Many of the supplies and products (food, beverages, etc.) used by campers are brought into the campground by the campers themselves. However, to reduce paper waste generated in the bathroom, electric hand dryers were installed in the common bathrooms.

Conclusions

By recycling, the campground is avoiding approximately one pick up per month, which translates into eight eliminated pick-ups for the season**.** The total avoided waste hauling charges saved nearly $400 for the season. The campground could continue to expand recycling / waste diversion by focusing on its weekend functions, and by further educating guests about waste reduction, primarily seasonal guests. Seasonal guests are more likely to follow camp rules and are usually more receptive and attentive to the operations of the campground. Busy weekends, such as Memorial Day or the Fourth of July, often require special "unscheduled" waste collection service by the hauler. The campground avoided most of the unscheduled service calls over the course of the 2000 season.

The Port Motor Inn

Contact: Bill McDonald
Port Motor Inn
Rt. 1
Portsmouth, NH 03801
(603) 436- 4378

Background

The Port Motor Inn is located just off of Interstate 95 on Rt. 1 in Portsmouth. This is a 57-room facility that offers continental breakfast as well as a full vending area, however no meals are prepared on the premises. Since full meals are not offered to the guests of the Port Motor Inn, food waste is minimal. The trash generated is made up of mostly paper products (office paper, paper towels, etc.) and cardboard. A central vending area for soda, snacks and coffee comprises another section of the Inn's waste stream. Prior to this project, the Inn did not have a recycling program.

Recycling

After a visual waste audit and tour of the facility, the project team and inn manager estimated that the Port Motor Inn could reduce its solid waste volume by an estimated 25 percent, primarily through a cardboard recycling program. A six-yard dumpster is now used to collect the cardboard and is placed next to the waste dumpster. The addition of a six-yard cardboard recycling program eliminated the need for extra "unscheduled" service calls on busy weekends, and reduced disposal by approximately 25 percent. The inn's manager believes cardboard recycling has paid for itself in terms of avoided waste hauling service calls. Over the six months of the 2000 season, the inn disposed of 14.4 tons of solid waste, and recycled 7.2 tons of cardboard, resulting in a 33.3 percent recycling rate.

There are few recycling service providers in the Portsmouth area that would provide a recycling service for loose cardboard at a cost effective price. Options for self-hauling to the Portsmouth Transfer Station at no charge were discussed. However, the current waste hauler (WMI) was selected to provide cardboard recycling at $25 per pick up of the cardboard dumpster. Although self-hauling is a low cost method of handling the cardboard, the manager decided to request this service from WMI.

Prior to recycling cardboard, staff flattened boxes before putting them in the trash. Putting the cardboard in a different dumpster next to the trash required no extra labor, according to the inn's management.

The Port Motor Inn chose not to establish a beverage container recycling program for glass, plastics or aluminum due to the low volume of containers sold and the fact that some employees already redeem the 5 cent deposit containers during regular housekeeping functions. Certain housekeeping employees take advantage of Maine's Bottle Bill as well as collecting and selling precious scrap metals from on-site construction. It is not clear how much waste is handled using this method.

Source Reduction

A number of waste prevention practices adopted by the inn's management include a towel/linen's program (service upon request), reuse of certain plastic cleaning containers, as well as reusing old linens for cleaning rags. Recommendations to use ceramic mugs in the common areas instead of Styrofoam, and installing a guestroom soap dispensing system remain under consideration, but were not implemented during the project's timeframe.

Purchasing

A purchasing survey was given to the inn to determine their status and level of interest in changes to reduce waste through modifying purchasing. The inn purchases office paper, bathroom tissue, copier paper and facial tissues that contain some recycled content materials. The inn also purchases window cleaner, air fresheners and disinfectant in "super concentrates". For example, the inn purchases 2.5 gallon concentrated window cleaner that replaced three (15) gallon drums of window cleaner. The diluted cleaners are distributed using a dispenser (mixing) system, eliminating packaging and disposable bottles of cleaning agents. Also, the inn switched to recycled toner cartridges for its printers and continues to factor in the longevity of equipment and materials into purchasing decisions.

Conclusions

The inn's addition of a cardboard dumpster was the single most effective way to reduce solid waste at this facility. The net effect of cardboard recycling was to eliminate additional service calls on busy weekends, such as Memorial Day. The inn implemented a number of practices that minimize waste, such as buying cleaners in concentrated form and using a dispenser system for cleaning agents. Due to the limited food service, the inn's waste stream primarily consisted of paper products, with cardboard being the most significant paper waste that could be recycled.

Labor shortages, turnover and available time by management played a role in slowing the implementation of other waste reduction recommendations. Office paper and newspaper recycling could be instituted, however, neither is generated in significant volumes at the inn. The inn considers the program a success and will continue it into next year and is looking at other ways to pursue additional waste reduction practices.

Sunset Hill House

Contact: Lon Henderson
Sunset Hill Road
Sugar Hill, NH 03585
(603) 823-5522
Email: innkeepers@sunsethillhouse.com

Background

Sunset Hill House is located on a picturesque hillside looking out onto Mt. Washington and the Presidential Peaks in Sugar Hill. There are 28 guest rooms in this elegant turn-of-the-century wood framed inn. The inn is a "Second Empire Victorian" which first welcomed guests in 1880. The inn offers full dining in formal dining rooms and has a small tavern, as well as meeting facilities that can handle groups from 20-175.

The inn is open for eleven months, closing in April to do repairs and maintenance. Their busiest time is June through October. During this time, the Sunset Hill House has an occupancy rate of 70 percent. During the slower season, this number falls to approximately 10 percent, for a yearly average of 33 percent.

As a family owned business, the owners take a hands-on approach to managing their business and they fill a number of roles at the inn -- making beds, cooking, washing dishes, booking guests, sweeping floors, and emptying trash. The labor market has been extremely tight in northern New Hampshire, and finding employees can be difficult in many rural areas of New Hampshire.

Prior to the start of this grant, the host community of Franconia instituted a pay-as-you-throw program. Since the inception of the pay-as-you-throw program, Sunset Hill House has contracted with Whiting's Rubbish Removal of Littleton, NH to haul trash to be landfilled in Bethlehem. The inn had an eight-yard waste dumpster placed on site. This dumpster is picked up twice per week during the busy season, and once per week during the slow season. Prior to the dumpster, trash was stored in the basement and removed daily by the waste hauler.

Recycling

Between dining service, bar and bathroom paper supplies, the Sunset Hill House generates a substantial percentage of cardboard as a percentage of its waste stream. The lounge and weekly functions also generate varying amounts of glass and plastic containers. Although Whiting's Rubbish Removal (the only local hauler) does offer recycling services to its business clients, the owners decided to self-haul recyclables to the transfer station in Franconia to save money. A cardboard dumpster to be serviced by the inn's hauler was suggested by the project team, however, the owner decided to attempt to self-haul the cardboard.

The inn started a cardboard and container recycling program during May, the busy season and ended it in August. Items included: cardboard, glass, aluminum and plastics. Staff loaded a maintenance vehicle with recyclables and transported them to the Franconia Transfer Station, usually every other day. Total recycling during the season amounted to 2,500 pounds of glass, 150 pounds of plastic and 2,400 pounds of cardboard.

Purchasing & Source Reduction

The inn saves money, detergent, and water by changing linens every other day, unless a customer requests otherwise. Most of their beverages are served from kegs or soda fountains into re-usable glasses. Disposable coffee cups are available at the registration counter at the guests' request only. The inn's food is freshly prepared, which eliminates some food and packaging waste. They also reduce waste and save on paper purchasing costs by using both sides of office paper for printing. Soap dispensers are used in common area bathrooms reducing wasted soap. A variety of paper products made from post consumer fiber are used at the inn.

Conclusions

The inn was not able to implement, in a systematic way, an efficient recycling program during this pilot program. Two major obstacles limited the inn from adopting or successfully implementing many of the suggested recommendations. The historic building housing the inn had no loading or unloading area, and very limited storage in the basement with no exit from the basement to a waste collection area. Recommendations regarding interior movement through a floor chute to the basement or storage off the kitchen area in a cook's office were not adopted. This made is exceedingly difficult to handle recyclables within the structure and the owner had to dedicate a parked truck in front of the inn so that recycled materials could be loaded as they were generated. Due to the limitations of the lot, no dumpsters could be located within 150 feet of the building.

The variability of staff, either hired by contract or as needed for functions, made training very difficult and this resulted in contamination of recycled materials. Between two and thirty employees are utilized on an "as needed" basis for functions, making this workforce transitory and unfamiliar with the inn's operations and recycling program.

Odors from contaminated cardboard also made the program unpopular. Due mostly to the inn's historic structure and variability of its labor force, the owner decided at the end of the summer to discontinue the recycling program, however, the inn will continue to review purchasing and other practices to minimize waste.

The Sheraton Harborside Portsmouth

250 Market Street
Portsmouth, NH 03801
Calvin Blood, Director of Maintenance
Phone: (603) 559-2628
Fax: (603) 433-5649
Email: cblood@sheratonportsmouth.com

BACKGROUND

The Sheraton Harborside, located alongside Portsmouth Harbor, consists of 205 guest rooms, including 33 luxury rooms and 24 condominium suites. The hotel also has 12,000 square feet of meeting space, which hosts events for groups of up to 300 people. The hotel's dining room, kitchen, laundry, and maintenance departments all were included in discussions of how to reduce solid waste at the facility. The hotel uses a 35-yard compactor that is emptied approximately every 15 days at a cost of between $15,000 and $19,000 per year in 2000. There was interest in looking at these issues, however, the hotel had instituted a recycling program in the past without great success.

RECYCLING

Several years ago, the hotel had recycled glass, plastic, aluminum, steel cans and newspaper. The glass, plastic, aluminum and steel recycling program lasted about one year. The program was suspended due to staff members breaking bottles on the asphalt on and around the loading dock area. In addition, containers of recyclables often became contaminated, resulting in the hauler not recycling the materials. All Sheraton hotels provide guest rooms with a daily copy of *USA Today*. Housekeeping employees recycle newspaper, from guestrooms using a set of wheeled containers stored outside.

Aside from newspapers, cardboard represented the largest and most easily separated portion of the Sheraton's waste stream. Hotel management decided to start with cardboard, and depending on the success of the program, add other materials later.

Storage space for trash and recyclables is extremely limited at the hotel. The building is set into a granite ledge, which prohibits expansion of the loading dock area where waste is stored. The hotel's 35-yard trash compactor, and a set of wheeled recycling containers are located against a busy loading dock in the rear of the hotel. Since the waste collection area also serves as the hotel's receiving area, there is little room for large recycling containers.

To recycle cardboard, the project suggested using a pair of wheeled, two-yard plastic containers to collect cardboard. This allows staff to store 4 yards of cardboard in front of the trash compactor, but allows employees to move the containers as necessary. The hotel's waste hauler supplied the Sheraton with the containers for $25.00 per pick up.

The Sheraton's hauling service for containers is listed below.

1 - 35 yard compactor	every other week
4 - toters - commingled	every week
2 – 2 yard corrugated	monthly / on call for extras

The central problem that the Sheraton encountered with its cardboard recycling program was contamination of the cardboard with other wastes. Also, staff was not consistently breaking down the cardboard. Contamination resulted in the hauler requiring staff to resort the cardboard before it could be hauled. Failure to break down the cardboard limited the financial benefits due to the size of the containers (only a few full boxes can take up the majority of the space in the containers). The project suggested that the hotel needed to work with department heads to alter the way boxes are transported to the recycling area. It was suggested that the department responsible for not breaking down the boxes be notified of this requirement. If boxes were broken down where they were generated, carrying them would be easier for staff and a greater amount of cardboard would be recycled per 2-yard container.

Being in downtown Portsmouth, the Sheraton also should secure the lids of recycling containers to avoid vandalism or contamination. During the pilot, one of the cardboard containers was vandalized. Without proper security controls, the hotel is vulnerable to further contamination or vandalism.

PURCHASING

In response to a survey distributed by this project, the hotel indicated that it purchases seasonal local produce in bulk, and many items in bulk from laundry detergents to beverages, and are evaluating whether to purchase products with recycled content. The hotel purchases rebuilt toner cartridges instead of new ones, saving hundreds of dollars each year.

WASTE PREVENTION

The hotel uses soap dispensers instead of bar soap in common bathrooms, but is unable to do this in guest rooms due to quality standards set by Sheraton's parent company. The hotel provides guests with reusable mugs instead of disposable cups in guestrooms. Also, the facility has an "on-demand" linen change policy for guests staying more than one night, and worn linens are reused as cleaning rags. Other items are reused, including 5-gallon containers by various departments, as needed. One of the greatest opportunities to reduce waste involved paper reduction at the front desk but the hotel was unable to implement a recommended front-desk recycling program during the pilot program.

CONCLUSIONS

The hotel continues to address waste management issues through a Safety Committee composed of department managers. Recycling of newspapers and office paper in 96-gallon toters works well with limited space. However, a full recycling program at this facility is limited primarily because of the building site limitations. Recycling beverage containers was discussed, and various off-site storage alternatives given, however beverage container recycling was determined infeasible given the limited storage space.

Waste prevention measures also are working well, however the hotel could end its policy to automatically deliver daily newspapers to all guests. This policy is set by the Sheraton corporate offices and would need to be addressed at that level.

The Wolfeboro Inn

Contact: Aaron Morrissey
90 North Main Street
Wolfeboro, NH 03894
(603) 569-3793
Website: http://www.wolfeboroinn.com
e-mail: aaronm@wolfeboroinn.com

Background

The Wolfeboro Inn was built in 1812 in downtown Wolfeboro, along the shore of Lake Winnepesaukee. The inn contains forty-four rooms, two restaurants, a private beach, and a landscaped area with a gazebo for events such as weddings or conferences. The inn employs a staff of up to one hundred people and is open throughout the year with business dropping off only during the winter months.

Prior to this project's efforts, all of the inn's waste was disposed of without any recycling. Recycling had been tried in the past through a service provided by the hauler, but had been discontinued due to contamination issues. The inn generated nearly 250 cubic yards of waste monthly and the annual waste disposal costs for the 2000 season was approximately $12,000. Employees carry the trash from the inn to a ten-yard dumpster located behind the building. The company's trash hauler, Osgood Waste Hauling, provides service for trash once daily during the week. On occasion, due to the number of guests and types of functions, extra pickups are needed.

Recycling

The primary reason the inn discontinued its original recycling program was due to contamination and increased costs due to contamination. However, staff and management at the inn were interested in pursing a variety of waste reduction practices, and were enthusiastic about reviving their recycling program. The inn's assistant general manager circulated a memo detailing the recycling program and encouraging employees to fully participate.

The inn was encouraged to pursue a relationship with the Town of Wolfeboro's transfer station, as the inn has the option of using the facility at no charge. With limited space behind the building, self-hauling the bulky cardboard daily was an attractive option. The inn decided to recycle cardboard at the town's transfer station and the general manager was directly involved in cardboard recycling, including breaking it down and transporting it to the transfer station. The cardboard was transported in a company pickup truck to the transfer station, which is only a short distance from the inn. However, consistently having staff or the assistant general manager available to recycle the cardboard proved to be difficult as demands for staff time reduced the

time available for recycling activities. The assistant general manager decided to maintain the cardboard recycling responsibility, even with his busy schedule. Eventually, his direct involvement became impossible as other duties required his attention and, toward the end of the summer, self-hauling cardboard was discontinued. In conjunction with limited storage, stockpiling of recycled cardboard became a major issue and the inn was warned by the town's fire warden about the improper storage of cardboard.

At this point, the inn's waste hauler was contacted by the assistant general manager and asked to provide a cardboard recycling dumpster, however, the inn did not want to incur additional costs for the dumpster and was not willing to add this service. Reducing waste disposal service in exchange for a cardboard recycling service was discussed with the hauler. However, the hauler was unconvinced that large volumes of cardboard would be diverted and subsequently reduce the waste disposal service enough to offset the additional cost to provide the cardboard recycling service. The project estimated that one eight yard dumpster of cardboard could be diverted per week, and the inn could exchange one waste pick up for one cardboard recycling pick up. The hauler was unwilling to provide the service without additional cost. The hauler also felt more of a commitment toward recycling was required from the inn.

During the 2000 season, the inn recycled approximately 10 short-bed pickup truck loads (approximately 1.5 tons) of cardboard while its program was active, and they are planning to continue waste reduction efforts in the 2001 season.

The importance of assigning responsibility for recycling tasks is clear as the self hauling option for cardboard recycling would likely have succeeded if dedicated staff time had been consistent and part of an employee's job description. Suggestions for the 2001 season included assigning a seasonal staff person the responsibility of recycling cardboard and this suggestion was favorably received.

Glass, plastic and metal containers are collected within the kitchen, dining and function events. These containers are stored behind the kitchen in 55-gallon toters supplied by the hauling company. During summer months, the inn recycles approximately six (6) toters of mixed containers per week, dropping to 3-4 toters per week during the winter. Over a four-month period, 5.5 tons of the Wolfeboro Inn's recyclables were hauled to the Waste Management, Inc. Materials Recovery Facility (MRF) located in Rochester. For the 2001 season, cardboard and container recycling could result in the inn avoiding the disposal of 53 full dumpsters of material per year. Currently, the inn is only recycling waste generated by the kitchen and staff. The inn is considering participation of guests in the recycling program in the 2001 season.

Source Reduction

The inn's bar has a personalized beer mug club that allows patrons to reuse the mug, and after a certain number of drinks, the mug is given to the patron. The inn further reduces waste through a linen policy that changes linens (sheets, towels, etc.) for customers staying multiple nights upon

request only. This saves labor, water, electricity, detergent, and reduces packaging. The inn reuses items, such as old linens and buckets, between departments whenever possible. Ceramic mugs are used in guestrooms to avoid waste created by using disposable cups. The mugs also enhance the inn's image with its guests. Dispensers for soap, shampoo and hand lotion were discussed with the assistant general manager.

Purchasing

The company is also making efforts at reducing waste through its purchasing decisions. They buy recycled-content products where practical, and are interested in switching to recycled-content versions of products currently in use as well as more durable products (e.g., glassware and kegs). The lifespan and shelf life of products is currently considered in their purchases, with preference is given to more durable items. The inn purchases cleaning products in bulk, which reduces packaging waste and saves on product costs.

Conclusion

The Wolfeboro Inn's interest in waste reduction and recycling is based upon the ability to both reduce waste disposal costs and to be good stewards of the environment. The inn has a successful container recycling program, recycling in the kitchen, bar and restaurant areas and reduces waste in a variety of ways, as noted above. The assistant general manager continues to look for waste reduction options and will attempt to assign a seasonal employee the responsibility of overseeing the recycling program in the 2001 season.

A number of factors circumvented the inn's ability to fully implement waste reduction suggestions. Foremost was the lack of available seasonal labor that precluded the assistant general manager from delegating responsibility for cardboard and container recycling. Self-hauling a bulky waste, like cardboard, requires constant attention and work. The second obstacle was the inability of the inn and the hauler to agree upon a cardboard recycling service at a cost effective price. On-site storage was limited and that, in part, limited the ability of the inn to reduce the overall level of waste hauling services. The idea of trading waste for recycling service was discussed but not seen as cost effective by the hauler. Only one other hauling service was available in the area, so negotiating a lower service price for both waste and recycling services wasn't likely for the inn.

The opportunity to utilize the town's transfer station remains open to the inn for both waste and recycling, however, the town's mandatory recycling ordinance is a barrier to the inn, limiting the use of the facility. Some flexibility in mandatory policies to allow minor amounts of contamination in the waste stream or recycled materials could better facilitate partnerships. Clear financial advantages exist for the inn and the hauler to use the town's facility, as waste is otherwise hauled to Maine and recyclables to southern New Hampshire. However, the town's strict adherence to mandatory recycling made the inn reluctant to use the municipal facility.

Organization	Information About the Organization
EPA Global Warming Website	The EPA's website presents information on the very broad issue of climate change and global warming in a way that is **aible** and meaningful to all parts of society – communities, individuals, business, public officials and governments. http://www.epa.gov/globalwarming/
EPA Climate Change and Waste Website	The manufacture, distribution, and use of products – as well as management of the resulting waste – all result in greenhouse gas emissions. Waste prevention and recycling reduce greenhouse gases associated with these activities by reducing methane emissions, saving energy, and increasing forest carbon sequestration. http://www.epa.gov/globalwarming/actions/waste/index.html
Technical Assistance	
NH Department of Environmental Services – Waste Management Division 6 Hazen Drive, Concord, NH 03301 (603) 271-1749 e-mail: nhpcas@des.state.nh.us	DES's Green Lodging webpage offers information and technical assistance to lodging businesses regarding solid waste reduction, pollution prevention, markets for recycled materials, equipment, and compliance with state and federal environmental laws and rules. http://www.des.state.nh.us/pcas
WasteCap Resource Conservation Network 122 North Main Street Concord, NH 03301 (603) 224-5388 Fax: (603) 224-2872 email: mail@nhbia.org	The WasteCap Resource Conservation Network (ReCoN) is an initiative of the Business & Industry Association of New Hampshire. Their goal is to help businesses save money and conserve natural resources by providing free, confidential assistance in reducing solid waste, conserving energy and water, and preventing pollution. http://www.wastecapnh.org/
New Hampshire Cooperative Extension 59 College Road, Taylor Hall, Durham, NH 03824-3587 (603) 862-1520, fax (603) 862-1585	UNH Cooperative Extension provides New Hampshire citizens with research-based education and information, including composting and other resource management information. http://ceinfo.unh.edu/
NH Governor's Recycling Program 2 ½ Beacon Street Concord, NH 03301-4497 (603) 271-1098	The NHGRP provides technical assistance, stimulates and promotes new recycling ideas, and has developed databases on municipal recycling and markets for recyclables. http://webster.state.nh.us/recycle/
Industry Associations	
New Hampshire Lodging & Restaurant Association P.O. Box 1175 • Concord, NH 03302-1175 603-228-9585 • Fax: 603-226-1829 email: nhlra@nhlra.com	NHLRA's mission is to promote, protect and educate the foodservice and lodging industries of the state and to ensure positive business growth for our members. NHLRA strives to represent the best interest of its members on small business issues, hospitality and tourism concerns and towards the protection of New Hampshire's quality of life.http://www.nhlra.com/

New Hampshire Travel Council PO Bo 241, Concord, NH 03302-0241 603-223-9900	The Travel Council is a statewide advocate and steward of the New Hampshire Tourism Industry. The Council sponsor's workshops, conferences and provides a variety of assistance to the tourism industry in New Hampshire.
NH Campground Owners' Association Ron Brown, Executive Director PO Box 320 #427 Rte 115 Twin Mountain, NH 03595-0320 603-846-5511 Fax: 603-846-2151 email: info@ucampnh.com	The New Hampshire Campground Owner's Association works to promote camping and outdoor activities in New Hampshire. The Association develops standards for campground management, publishes guides and information for campers regarding hunting, boating and fishing information. http://www.ucampnh.com/
Green Lodging Organizations	
Green Hotels Association PO Box 420212 Houston, TX 77242-0212 713-789-8889, fax 713-789-9786	The Green Hotel Association is an organization of lodging establishments that support and incorporate green practices into their operations. The Association provides signs, placards, information and analysis on the benefits of green lodging practices. http://www.greenhotels.com
Project Planet 3031 E. Ponce de Leon Ave. Decatur, GA 30030 Phone: 800-527-1195 or (404) 373-0074 fax: (404) 373-0480 email: savenow@projectplanetcorp.com	Project Planet offers signs, placards and other materials for guests that wish to use their bed linens and towels more than once. This results in reduced water, energy, labor, detergent, and sheet/towel replacement costs. http://www.projectplanetcorp.com