

RECYCLE THIS!



by R. Marc Fournier

Colleges, universities, and schools have been recycling for years. Some programs have been amazing successes while others have floundered, and the success of individual programs have expanded or contracted as political and financial climates changed.

This article provides a look at how 36 programs across the United States have fared over the past five years and where they expect to go in the near future. It also presents a glimpse into recycling at the University of Edinburgh in Scotland.

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Data Collection

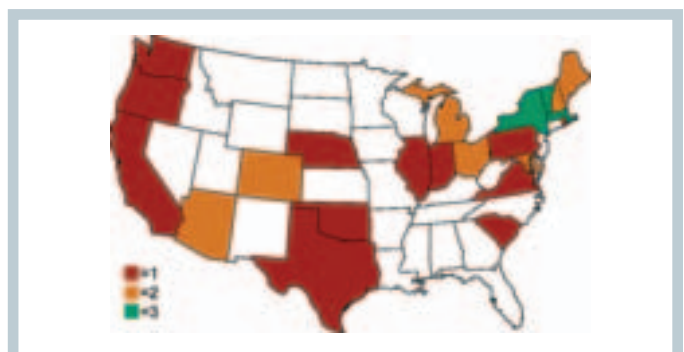
The first step in the project was to collect data from as many colleges and universities across the country as possible. To see if any research had been done recently, contacts were made with APPA, the National Association of Educational Buyers (NAEB), and the National Recycling Coalition College and University Recycling Council (CURC). No one was familiar with any recent surveys, so a draft survey was designed and circulated to peers in the industry. The goal was to design a short, easy-to-complete survey that captured data relevant to colleges and universities, both in managing their current operations and in deciding where to lead their programs in the future. The draft survey was converted to an electronic survey that was sent to members of APPA, NAEB, and CURC. The survey received 36 responses in one month, and this article is based on the data collected.



Harvard University recycling staff at work

Who Responded

The respondents from 22 states represent a broad cross section of the country as illustrated below.



Arizona - 2	Nebraska - 1	Texas - 1
California - 1	New Hampshire - 2	Vermont - 3
Colorado - 2	New York - 3	Virginia - 1
Illinois - 1	Ohio - 2	Washington - 1
Indiana - 1	Oklahoma - 1	Unknown - 1
Maine - 2	Oregon - 1	
Maryland - 2	Pennsylvania - 1	
Massachusetts - 3	Rhode Island - 1	
Michigan - 2	South Carolina - 1	

The Waste Hierarchy

The waste hierarchy reads something like this: reduce waste at the source, reuse where we can, and recycle as much possible before the remaining waste is landfilled or incinerated. What really has happened over the past decade or so is that we have focused extensively on recycling because it gives people instant gratification and the knowledge that they are helping save the environment. Colleges and universities reported that, in general, they are concentrating their resources on recycling first; reuse second; source reduction, buying recycled, and disposal third; and composting fourth.

Source Reduction

By far, campus source reduction is focused on double-sided copying to reduce the use of paper, and many campuses are requiring duplex copying features for all new copy machines. Other source reduction initiatives include expanded use of electronic documents, pay-for-printing systems in libraries and other public areas, bulk procurement of supplies (less packaging), jumbo roll toilet paper/towel rolls, and point-of-use napkin dispensing.



Surplus sale at Harvard University

Reuse

Campuses reported a wide range of reuse and donation programs. Many campuses now have “surplus stores” where they sell surplus office furniture, electronics, appliances, bicycles, and even cars and tractors. Some programs retain the revenues to build their programs, and others turn the funds over to their general fund. A number of creative schools are using these revenues to establish scholarship funds for students. Middlebury College in Vermont contracted with an outside vendor to manage 600 sets of furniture, a portion of which was sent to hurricane victims in Florida.

Many colleges and universities redistribute furniture and electronics internally between departments to extend the use of the equipment on campus. And more and more schools are collecting portions of the mountains of items discarded at the end of the school year including clothing, food, appliances,

and school supplies, and reselling them to students in the fall or donating them to local charities.

Buying Recycled

Colleges and universities buy tons of copy paper each year. Nearly every campus responding to the survey stated that they purchase recycled content copy paper with at least 30 percent post-consumer content. These efforts have been more successful recently due to the price competitiveness of recycled content copy paper compared to the price of virgin copy paper. In many instances, recycled content copy paper now costs the same as virgin. Campuses are also purchasing other recycled content of-

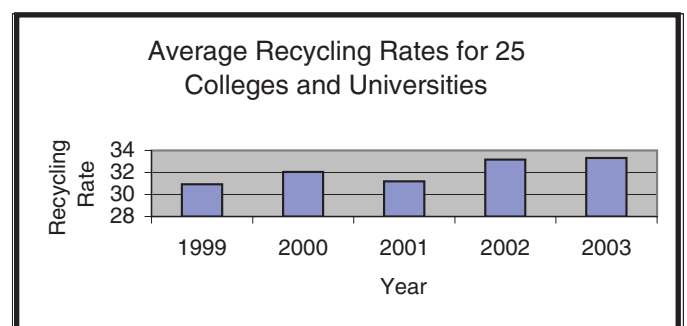
ice products including business cards, folders, pads, and letterhead paper. Many outdoor furnishings, including park benches, picnic tables, planters, and outdoor trash and recycling containers, are now being manufactured using recycled plastic lumber and are appearing on college and university campuses. Other initiatives include procurement of recycled content paper towels, toilet paper, motor oil, antifreeze, and office furniture.



Mixed paper at the University of Massachusetts Amherst

Recycling

As one would expect, recycling rates varied dramatically from school to school, and within schools from year to year. Of the 26 schools reporting percent-based recycling rates, 14 reported an increase in recycling between 1999 and 2003, 7 reported a decrease, and 5 remained statistically the same. And within this group, 16 schools saw recycling rates fluctuate up and down (some rather dramatically) during the five-year period.

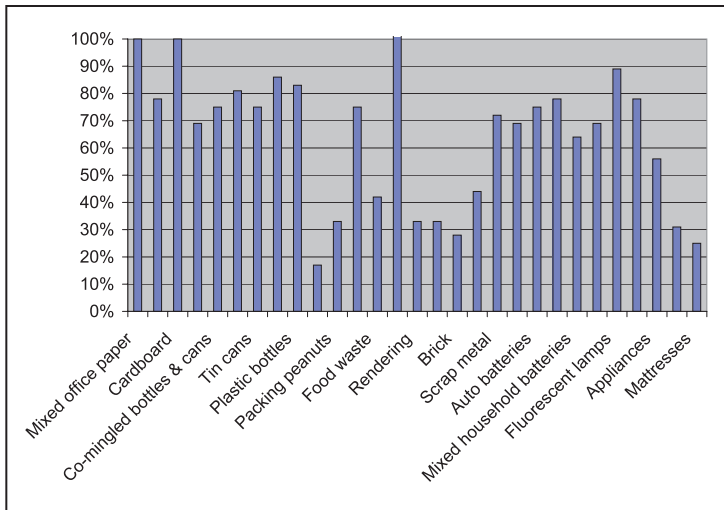


Approximately two-thirds of the respondents use a weight-based system to determine their recycling rates, one-third of the schools have no measuring system in place, and one campus uses a volume-based approach.

The following chart illustrates the average trend for the group from 1999 through 2003:

Materials Recycled

The following is an overview of materials recycled and the percentage of schools recycling them:



Materials Recycled and Percentage of Schools Recycling

Mixed office paper	100%	Asphalt	33%
Residential mixed paper	78%	Brick	28%
Cardboard	100%	Concrete	44%
Books	69%	Scrap metal	72%
Comingled bottles & cans	75%	Tires	69%
Glass containers	81%	Auto batteries	75%
Tin cans	75%	Oil	78%
Aluminum cans	86%	Mixed household batteries	64%
Plastic bottles	83%	Mixed electronics	69%
Shrink & stretch wrap	17%	Fluorescent lamps	89%
Packing peanuts	33%	Lamp ballasts	78%
Leaf and yard waste	75%	Appliances	56%
Food waste	42%	Propane tanks	31%
Animal bedding	22%	Mattresses	25%
Rendering	33%		

Many of the responses were predictable, including the high number of schools recycling mixed office paper, cardboard, and bottles and cans, and the low number of schools recycling difficult-to-recycle materials like shrink-and-stretch wrap and mattresses. Pleasant surprises included large numbers of campuses recycling fluorescent lamps, lamp ballasts, and mixed electronics. The markets for these materials have matured over the past five years, recycling valuable natural resources and keeping toxics like mercury and lead out of the waste stream.

Other Materials Recycled

Some schools recycled other materials through their programs including:

Coal bottom ash	Appliances
Coal flyash	Sporting goods
Printer cartridges	Paint
Toner cartridges	Antifreeze
Pallets, clean and dirty wood waste	Carpet
Greenhouse waste	Furniture
Magnetic media	Textiles and clothing

Composting

Seventy-five percent of campuses reported composting leaf and yard waste, and 42 percent recycled food waste. Food waste diversion is becoming more common, both because of its large fraction of the waste stream and its nutrient value in the composting process. The implementation of food waste recycling programs is largely controlled by the availability of nearby composting facilities. Because food waste must be hauled away every day or so, long distances between campuses and composting facilities can make food waste recycling programs unfeasible.

Disposal

High disposal rates help drive recycling programs, and disposal costs vary widely across the United States. In this survey, disposal costs ranged from \$17 to \$100.50 per ton, with the average rate being \$52.27 per ton. Most colleges and universities (97%) reported that their waste is landfilled, 14 percent stated that their waste is incinerated, and some schools use a combination of both practices.

In its last bid, Harvard University required their trash collection company to use a CNG (compressed natural gas) fueled trash truck, which is much quieter than its diesel counterpart and produces less air emissions.



Harvard University's Mount Trashmore

Trends Over the Past Five Years

In assessing their progress over the past five years, 66 percent of the respondents said their programs had improved, 22 percent said they had declined, and 12 percent said their

programs had remained the same. During the five-year period, the focus on sustainability and sustainable operations grew at many schools. Some campuses became more focused on source reduction, buying recycled, water and energy use, and vehicle emissions, fostering a greener campus culture and promoting recycling programs.

Causes for declines in programs included transient student populations, volatile recyclables markets, cutbacks in funding for recycling programs, and apathy about environmental programs.

At some schools, administrators realized the potential improved public image and financial savings to be reaped from recycling and waste management programs. They hired staff and funded the purchase of recycling containers and educational materials. Others continued to focus on the short term and didn't support campus efforts to improve their environmental performance and reduce long-term costs.

Many budgets became tighter during the period, resulting in fewer education efforts, and decreased purchasing of recycled content products that can carry a cost premium.

Problems with staff, faculty, and students not recycling continued to exist. Ironically, a large number of campuses felt faculty were the most difficult segment of the campus population to convince that recycling is important. This was definitely not true at all campuses, but was cited as a more difficult issue than convincing students to recycle.



Food waste recycling at the University of Mass Amherst

Many schools instituted recycling mandates and proactive recycling education initiatives with varying results. Recycling in residence halls continued to be a huge challenge. Some campuses sponsored contests with rewards ranging from pizza parties to cash rewards for dorm staff to boost recycling rates. The results were mixed.

On many campuses, student groups were the environmental conscience of the institution and drove efforts to improve recycling and other environmental programs on campus. Donation programs that support charities became more widespread.

Many campuses found creative ways to compost on site or partner with local farms or other facilities to divert food waste. Some agricultural campuses composted animal bed-

ding to better manage nutrient loads from manure, and other campuses used biodegradable plates, cups, and utensils at some of their events. The University of Massachusetts at Amherst composted leaf and yard waste and animal bedding on campus, and sent all of its pre- and post-consumer food waste to an off-campus facility for composting. Harvard University installed Somat food pulpers in all renovated dining halls to keep food waste out of the sewer system and reduce water consumption. Space constraints and concerns about



Glass Bottles

odors and vermin continued to keep composting from coming to some campuses.

Additional packaging and more newfangled, less durable products created more waste for campuses to manage.

Markets for Recyclables

Half of the schools affirmed markets for recyclables had improved, especially for mixed office paper, newspaper, and cardboard. The balance of the campuses stated that markets in their regions fluctuated or were depressed.

Some schools have improved their ability to find end markets for their recyclables by working with regional transfer stations. And some are creating new end market opportunities by using their mixed glass cullet as an aggregate substitute in "glassphalt" paving, and greenwaste and woodwaste in biomass energy facilities.

Revenue

Three-fourths of the programs said they received revenue for their recyclable materials. Materials generating revenue included paper, cardboard, aluminum, scrap metal, plastics (especially 1&2), and inkjet and toner cartridges.

Recycle Mania

Recycle Mania is a competition between leading university recycling programs in the United States. Schools compete to determine which can collect the largest amount of recyclables from residence halls, on-campus apartments, and dining halls during a ten-week period. Measurements are reported on a weekly basis in pounds recycled per student living on cam-

pus. Recycle Mania provides students with a fun, proactive activity in waste reduction, and a Recycle Mania trophy is presented to the winner.

Although 72 percent of the survey respondents stated they had heard of Recycle Mania, only 23 percent said they participated in the program. Many schools would like to participate in this worthwhile program, but do not have the staff to collect the required data.

Barriers

The most glaring barrier cited in establishing recycling programs was the lack of support from many campus administrations. A large number of campus administrators still view recycling as a luxury, not a necessity.

In the financial arena, artificially low trash disposal fees and tight campus budgets have hampered recycling efforts. Challenging local and regional markets for recyclables have caused revenues to ebb and flow, making it difficult to develop long-term staffing and financial plans. Buy recycled programs are difficult to enforce on many campuses due to decentralized purchasing systems.

Operationally, the inability to weigh materials and poor facilities for sorting and storing recycled materials create inefficiencies and make it difficult to track data. The separation of the recycling operations from trash collection and custodial functions and the inconsistency of custodial support hamper efforts to create a coordinated, efficient system.

At some schools, administrators feel recycling containers are unattractive, and as a result limit the numbers and locations of containers placed on campus. Aesthetic and fire egress issues also constrain placement of recycling containers.

From a big picture point of view, federal and state governments have failed to create a framework to support recycling initiatives, and funding for recycling programs has vanished in countless areas. Recycling has lost some of its luster, resulting in a general apathy about recycling in many areas. And people are moving too fast these days to worry about recycling and other environmental issues.



Recycling drop-off area, Edinburgh, Scotland

Recycling at the University of Edinburgh, Scotland

Karen Bowman, David Somervell, and other sustainability staff at the University of Edinburgh in Scotland were gracious hosts and spoke about recycling and sustainability in Scotland and the United Kingdom. University of Edinburgh recycling rates over the past five years have increased from 10 to 18 percent, and they have a clear target from the university's Sustainability & Environmental Advisory Group to increase recycling to 30 percent by 2006-07. Participation in the program continues to rise and is promoted by a People and Planet student campaign (www.edinburghpandp.org).

Mixed office paper, cardboard, books, tin and aluminum cans, leaf and yard waste, fluorescent lamps, appliances, and mobile phones are recycled. The campus uses a combination of volume and weight based systems to measure trash and recycling. They do not receive any revenue for their recyclables, but they are not charged for recycling. Their landfill tip fees are \$150 per ton. Markets for recyclables are poor but have been improving marginally. Much work needs to be done in the UK in this area.

Electronics and office furniture are donated to local charities. As part of the Extended Producer Responsibility



Creative public education - University of Massachusetts Amherst recycling statistics on display

initiative, computer suppliers are required to take back all their packaging. The university's buy recycled program focuses mainly on Fairtrade issues, especially beverage and confectionery purchases.

The Future

We hope that by educating administrators about the societal, public image, and cost avoidance benefits of recycling initiatives, many recycling programs will become institutionalized in the future and move from being run by student volunteer groups to being managed by paid college and university staff.

Many schools will focus on improving recycling rates for materials currently recycled, especially mixed electronics (personal computers, monitors, televisions, cell phones, personal digital assistants), bottles and cans (especially plastic containers), and universal wastes (batteries, mercury containing products including thermostats, switches, and fluorescent lamps). Other campuses will be searching for markets for ad-



ditional materials not currently recycled including propane cylinders, mattresses, and food waste. The recycling of food waste appears to be the major target, and many schools plan to use the compost end product on campus to close the loop.

The use of biomass energy—energy generated from organic matter—has the potential to reduce our greenhouse gas emissions and will probably become a more viable end market for campus organic wastes over the coming years.

Single stream recycling programs, where mixed paper and bottles and cans are collected and recycled together, will probably become more common. Single stream recycling programs are causing some controversy across the country due to concerns about contaminating paper with glass and plastic. The benefits of the program are reduced collection costs and environmental impacts, and increased convenience for faculty, staff, and students generating the recyclables. Maybe in time improved processing technologies will overcome the contamination issues.

Many colleges and universities will be searching for ways to better educate and motivate faculty, staff, and students, and to institute recycling programs at new buildings and public events including football tailgating areas and concerts.

Participation in Recycle Mania is expected to increase.



Recycled plastic benches and planter, University of Massachusetts Amherst

Campuses will use this competition to increase student awareness about the importance of recycling and other issues including waste reduction, water and energy conservation, and greenhouse gas emissions.

The Health Insurance Portability and Accountability Act of 1996 (HIPAA) established na-


tional standards for the security and privacy of health data. As a result, many organizations, including campuses with medical facilities, are shredding greater quantities of confidential documents than ever before. This fee-based service will result in increased costs and in some cases decreased revenues for campus recycling programs.

Sustainability initiatives will continue to grow and make environmental issues including recycling more relevant in our daily lives by highlighting more and more opportunities to save energy and reduce waste. One national program,

Leadership in Energy and Environmental Design (LEED), promotes the construction of high performance, sustainable buildings and will advance the recycling of construction materials including asphalt, brick, concrete, wood, sheetrock, and scrap metal. It will also foster the procurement of building materials and site amenities made with recycled materials, and enhance other buy recycled programs focused on recycled content copy paper, paper towels, toilet paper, motor oil, antifreeze, office furniture, carpet, and Energy Star products.

Many people hope that markets will become somewhat more stable and viable over the coming years due to increased demand from China and domestic mills. Cooperative marketing efforts between large and small colleges and universities will help smaller institutions access markets previously inaccessible to them due to their location and low generation rates. Networking opportunities to share lessons learned through groups like APPA, NAEB, and CURC will help campuses walk into the future and build healthy, dynamic college and university recycling programs. 🏛️

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