



University of Michigan Ann Arbor, Michigan

30% Waste Reduction Rate from Residence Halls



Michigan law mandates a 30% waste reduction for "major waste generators," including the University of Michigan. An enthusiastic and involved student body, a program design that is flexible and accommodates the needs of the collection staff and changes in collected materials, and a very visible outreach program all contribute to the success of the University of Michigan's student housing recycling program, which diverts 30% of the residence hall waste.

Program Description

The University of Michigan (U-M) is one of the largest academic campuses in the country, with over 36,000 students. Approximately 10,000 students live in dormitories.

Students bring recyclables to trash/recycling closets on their floor. Each closet contains a shelf for corrugated cardboard and separate containers for mixed paper and mixed containers. Housing Facilities staff collect trash and recyclables on each floor of the 15 student residence halls on campus.

Housing Facilities staff bring the material from recycling closets to containers on the loading dock. They collect from the loading dock once a week and bring materials to the nearby city-owned material recovery facility (MRF). Grounds Department staff collect yard trimmings and bring them to the city-owned compost facility.

On residence hall move-in days, students discard large quantities of cardboard boxes. U-M instituted special collections for this cardboard, and in 1997 students recycled 52 tons of material during move-in days.

When students vacate their dorms for the summer or at graduation they often discard loft

wood, toiletries, furniture, carpets, food, clothing, and other items that they cannot store or transport. Thus, these items often ended up in the trash. Now the University collects and donates these materials to charitable organizations, except for loft wood and carpet, which are stored on campus grounds. Ann Arbor residents are encouraged to take these materials.

Other campus recycling efforts include: collection of pallets, scrap wood, and metals; a worm bin composting project; a food discard composting trial; and recycling at the football stadium. In addition, a Recycling Task Force works with the U-M Purchasing Department to utilize and sell more recycled-content products.

Outreach Activities

One of the keys to program success is U-M's active outreach efforts, which include:

Materials Collected

Mixed paper (including virtually all types of paper: high grade, glossy stock, mail)
Newspaper
Corrugated cardboard
Glass
#1 and #2 plastics
Aluminum
Juice boxes
Ceramics
Scrap metal

student town meetings, training sessions with staff, a recycling newsletter, an email address to answer questions (recycle.help@umich.edu), an extensive Web page, and the Ecolympics, a competition between residence halls that rewards conservation efforts. Residence hall outreach includes displays at new student orientations and table tents in dining halls, presentations upon request, and signs in residence hall trash/recycling closets.

Turnover of the student population is an obstacle to even higher recycling rates. New education efforts are needed every year.

Costs/Benefits

When U-M's recycling program began in 1989, its actual total cost for disposal from the residence halls was \$239,200 per year. The University spent \$200,000 in 1989 to modify buildings to create recycling closets and to purchase containers. In 1997 its total cost for residence hall disposal and recycling was \$245,900 (including move-out day costs of approximately \$11,000 per year and equipment pay back). Adjusting 1989 figures to 1997 dollars, the University's total solid waste management costs for residence halls decreased approximately \$53,800 per year. This is explained in part by improved collection systems and in part by avoided disposal costs through recycling.

In spring 1998, markets for commingled containers were poor, so the University paid a higher tip fee at the MRF for these materials than trash. Tipping fees at the MRF were \$2.64 per ton for paper (newspaper, old corrugated cardboard, mixed paper), \$18.92 per ton for commingled containers, and \$17.11 per ton for trash. Although the tip fee for containers was higher than trash, the tip fee for mixed paper was \$15 per ton less than trash disposal. Overall, recycling costs averaged \$35 per ton while trash costs average \$48 per ton.

Tips for Replication

- Pay attention to the needs of your collection staff; they are the most important element in a successful recycling system. Be open to letting workers create systems that work for them. Listen...listen...listen!
- Pay attention to the ergonomics of handling. Do not be afraid to go into debt to capitalize equipment that improves efficiency and safety.
- Keep good records of material flow. Keep track of costs.
- Develop good relationships with processors of your recyclables.

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Program Summary, FY97

Start Date	September 1989	
Buildings in Program	15	
Type of Multi-Family Buildings	2- to 8-story residence halls	
Households Served	5,000	
Residents served	10,000	
	FY89* (Before program)	FY97 (With program)
Total Waste Generated (Tons)	5,750	5,552
Disposed	5,750	3,893
Diverted	0	1,659
Total Diverted (%)	0%	30%
Fees per Year	\$299,700	\$245,900
Disposal	\$299,700	\$187,921
Diversion	\$0	\$57,978
Net Costs per HH per Year	\$60	\$49
Disposal services	\$60	\$38
Diversion services	\$0	\$12
Net Costs per Ton	\$52	\$44
Disposal services	\$52	\$48
Diversion services	\$0	\$35

FY = fiscal year

HH = household

Note: Numbers may not add to total due to rounding.

*FY89 costs have been normalized to FY97 using the gross domestic product deflator.