FY 2023-24

NC Public College & University Solid Waste & Materials Management Annual Report

North Carolina Department of Environmental Quality
Division of Environmental Assistance and Customer Service
1639 Mail Service Center
Raleigh, NC 27699-1639

Recycling and Materials Management Section
recycleright@deq.nc.gov

Prepared by Delaney King
Community Recycling Specialist

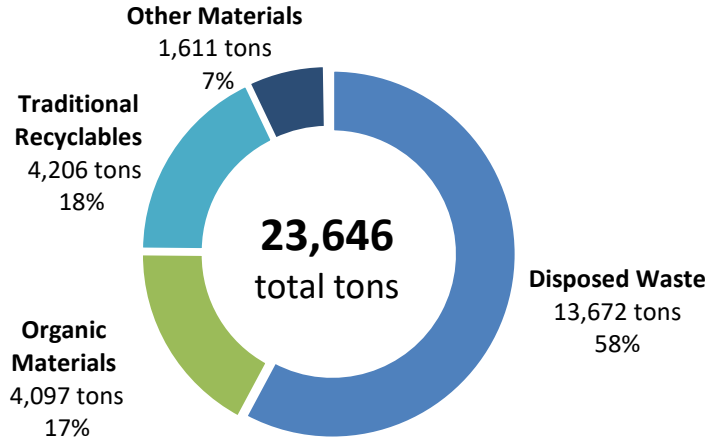
Executive Summary

This report presents recycling and waste data from public universities and community colleges in North Carolina in FY 2023-24. During the past reporting cycle, 39[1] of 76[2] public colleges and universities completed a survey administered by the N.C. Department of Environmental Quality's (DEQ) Division of Environmental Assistance and Customer Service (DEACS). The submitted surveys provide recycling and waste data for this summary report.

In FY 2023-24, material recovery by responding schools was slightly higher than in FY 2022-23, which may signal continued recovery from COVID-19. Notably, there is a certain degree of natural variation in data between years based on which schools answer the survey, particularly larger material generators. Still, of the 39 schools that responded in FY 2023-24, 32 also answered the survey the previous year, which contributes to relative consistency in the data set.

As Figure 1 illustrates, responding schools discarded a total of 23,646 tons of material in FY 2023-24. Of that total, schools disposed of 58 percent of the material and diverted 42 percent of materials through recycling or recovery.

Figure 1. Materials Disposed, Donated, or Recycled by Public Colleges and Universities in FY 2023-24



*Not shown: Donated Materials, 60 tons, 0%

Figure 1. Forty-two percent of materials generated by public colleges and universities was diverted from the landfill.

In compliance with N.C. General Statute 130A-309.14, each school has implemented some type of recycling program to capture traditional recyclables (paper, cardboard, plastic, metal cans, and glass bottles). Several schools have implemented practices to continually improve their recycling programs and achieve waste diversion beyond their statutory requirement:

[1] 42 total schools submitted but three were excluded for incompleteness having only completed the contact information.

[2] The total number of public colleges and universities includes North Carolina School of Science and Math and Carolinas College of Health and Science.

- Over 80 percent of reporting schools have paired waste and recycling bins together, or “twinned” bins in some capacity;
- Over 90 percent of all reporting schools have recycling bins in academic and office buildings. Schools also frequently place recycling bins in dining facilities, athletic venues, pedestrian walkways, and at special events, where possible;
- Seven out of eight surveyed universities have food waste diversion programs, using strategies like composting and animal feeding operations.

To improve the effectiveness and efficiency of recycling programs, DEACS recommends that colleges and universities budget to expand their recycling outreach, twin all their public bins, recover non-traditional recyclables, and donate excess food and material goods. While recommended, DEACS recognizes that school budgets may not have the funds to expand their recycling budgets. Schools can contact DEACS to learn how other programs have overcome similar challenges.

About DEACS - RMMS

The Recycling and Materials Management Section (RMMS) in N.C. DEQ’s Division of Environmental Assistance and Customer Service (DEACS) works with recycling businesses, local governments, and state agencies. The Section provides data-based technical assistance to colleges and universities. Using data from this report, DEACS offers solutions to common recycling challenges such as contamination, low participation rates and implementation of new programs on college campuses. Staff members frequently make site visits to North Carolina colleges to offer face-to-face assistance, and staff also presents data and recycling strategies at regional conferences. Contact Hannah Stroot (hannah.stroot@deq.nc.gov) with requests for technical assistance or data about collegiate recycling.

Table of Contents

Introduction

As state agencies, North Carolina public colleges and universities are required by North Carolina General Statute 130A-309.14 to recycle office paper, newspaper, aluminum cans, glass bottles, and plastic bottles. State agencies are also required to recycle fluorescent bulbs and abide by statewide landfill bans. These bans prohibit landfilling the following materials: used oil and oil filters, antifreeze, yard waste, wooden pallets, tires, lead acid batteries, plastic bottles, aluminum cans, televisions, and computer equipment.

N.C. Department of Environmental Quality's (DEQ) Division of Environmental Assistance and Customer Service (DEACS) distributes a survey to schools and compiles the data for this summary report. While the reporting process is voluntary, it is worthwhile for all schools to collect data and track progress on their solid waste and diversion programs. These data inform recommendations about how schools can improve their solid waste reduction and increase recycling. Thirty-nine public universities and colleges, or 52 percent of public collegiate entities, reported data in FY 2023-24. When schools did not provide specific information, they were excluded from individual counts. A list of reporting schools is provided below.

Figure 2. North Carolina Public College and University Respondent Map

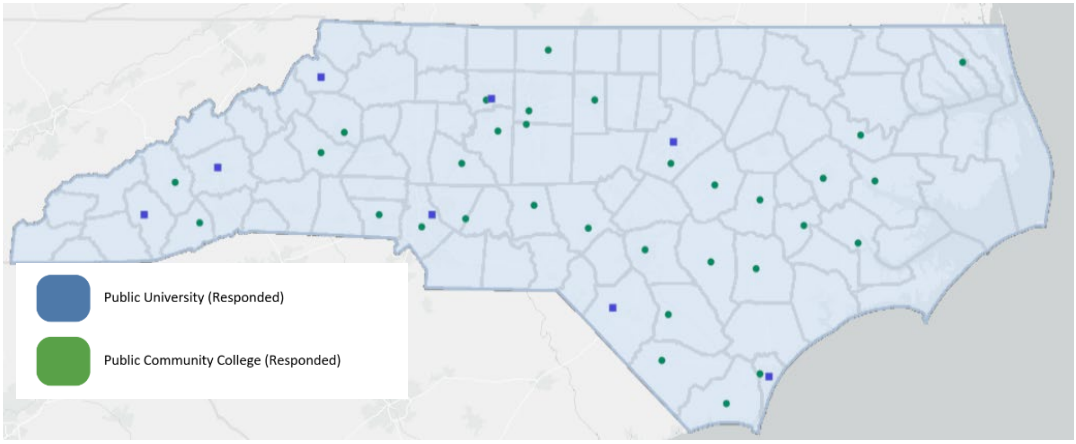


Figure 2. Of the 76 public colleges and universities, 39 schools responded to the annual survey.

Alamance Community College
Appalachian State University
Beaufort County Community College
Bladen Community College
Blue Ridge Community College
Brunswick Community College
Caldwell Community College and Technical Institute
Cape Fear Community College
Central Piedmont Community College
College of the Albemarle
Craven Community College
Davidson-Davie Community College
Fayetteville Technical Community College
Forsyth Technical Community College
Gaston College
Guildford Tech Community College
Haywood Community College
James Sprunt Community College
Johnston Community College
Lenoir Community College
Martin Community College
Montgomery Community College
North Carolina State University
Pitt Community College
Randolph Community College
Rockingham Community College
Rowan Cabarrus Community College
Sandhills Community College
Southeastern Community College
Stanly Community College
UNC Asheville
UNC Charlotte
UNC Pembroke
UNC School of the Arts
UNC Wilmington
Wake Technical Community College
Wayne Community College
Western Carolina University
Western Piedmont Community

Education and Outreach

Education Methods

Educational information geared towards students and employees is essential to operating a functioning recycling program on a college campus. Signage and various forms of outreach help people know what materials do and do not belong in the recycling or compost container. The absence of educational outreach exacerbates problems such as contamination and low recycling rates. Because contamination lowers the value of recyclable materials or can make these materials unusable, recycling markets emphasize the importance of clean, non-contaminated recycling loads. Therefore, proper outreach and education are vital to ensure quality recyclable material.

Figure. 3 Waste Diversion and Recycling Education Strategies Used by NC Public Colleges and Universities

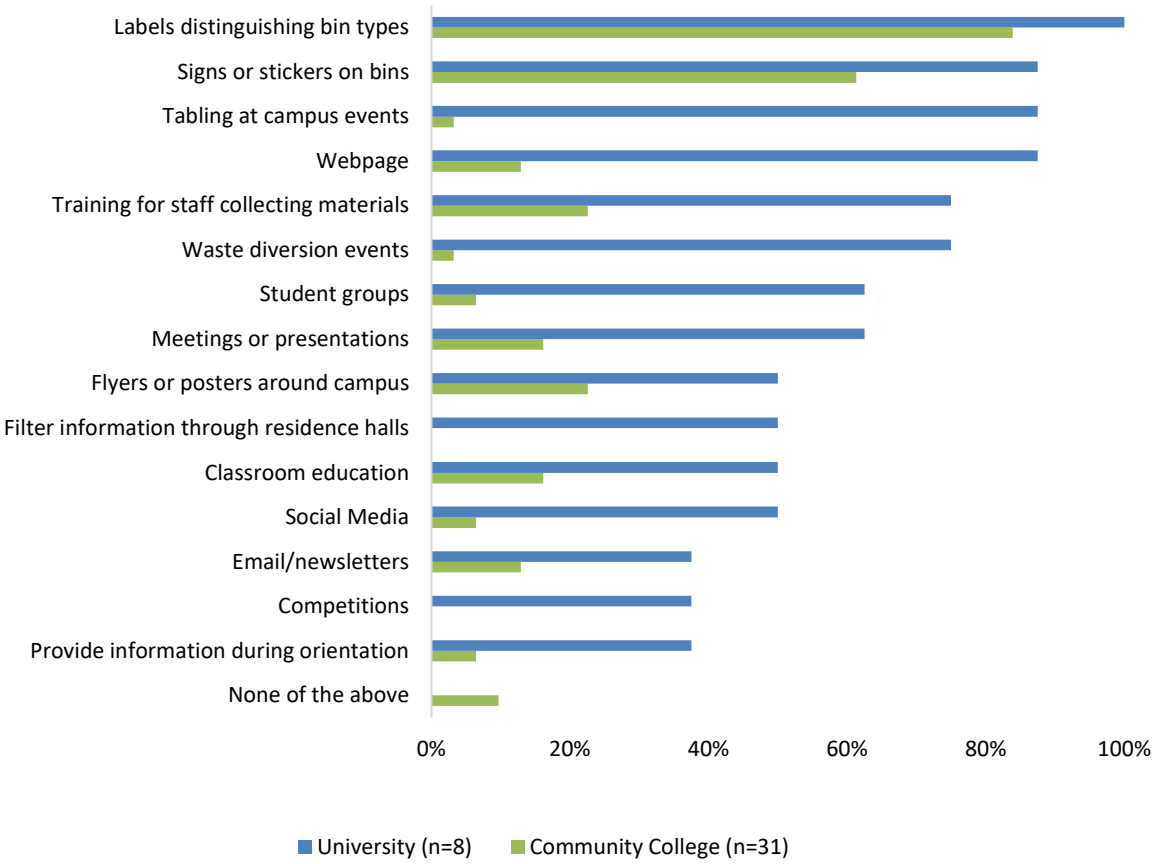


Figure 3. Labels and signs are the most popular educational methods on campuses.

Figure 3 identifies the various methods colleges and universities use in their education and outreach efforts. The most popular strategies among community colleges and universities are the use of labeling

Figure 4. Labels distinguishing bin types is a low-cost method to reduce confusion and encourage recycling.

bins as well as using signs or stickers to identify acceptable items; in fact, 85 percent of respondents report using labels distinguishing bin types. This strategy is low-cost, requiring little financial or time investment from the institutions once the labels are in place. Figure 4 shows an example of labels used at Western Carolina University. Waste reduction strategies also include posting information about how to reduce waste at the source, like using reusable drink containers and tips to reduce food waste in dining facilities.

Still, schools also use more time intensive methods. Over 60 percent of residential colleges and universities surveyed employ staff training, in-person presentations or meetings, tabling at campus events, waste diversion events, and collaborating with student groups. The survey demonstrates higher educational institutions use a mix of indirect, low-cost and direct, time-intensive outreach methods in their efforts to educate staff and students about appropriate waste reduction and recycling practices.

Outreach Campaigns

In addition to in-house education methods, the survey asked schools to report on any external large-scale outreach campaigns used to educate people on their campuses. Most schools report not using large-scale campaigns and competitions on their campuses. However, of those that participate in these recycling outreach strategies, most use national recycling campaigns, including Campus Race to Zero Waste and America Recycles Day. Campus Race to Zero Waste is an eight-week national competition held each spring to encourage colleges and universities to benchmark and improve efforts to reduce or eliminate waste. America Recycles Day, celebrated on November 15, is a national initiative of Keep America Beautiful to promote and celebrate recycling. Keep America Beautiful offers promotional materials and guidance for event planning and education to all types of public and private organizations, including schools.

Traditional Recycling

Public Space Recycling

The recycling survey asked colleges to detail where people on campus had opportunities to recycle. Specifically, colleges reported where bins are publicly located, what buildings had recycling collection, and the percentage of recycling bins paired with waste bins.

Placing bins in public areas is a best practice because students, faculty, and staff often need the opportunities to recycle away from their desks, offices, and dorm rooms. While walking through campus, people are more inclined to recycle when a bin is nearby.

Figure 5. Recycling in Campus Spaces at NC Public Colleges and Universities

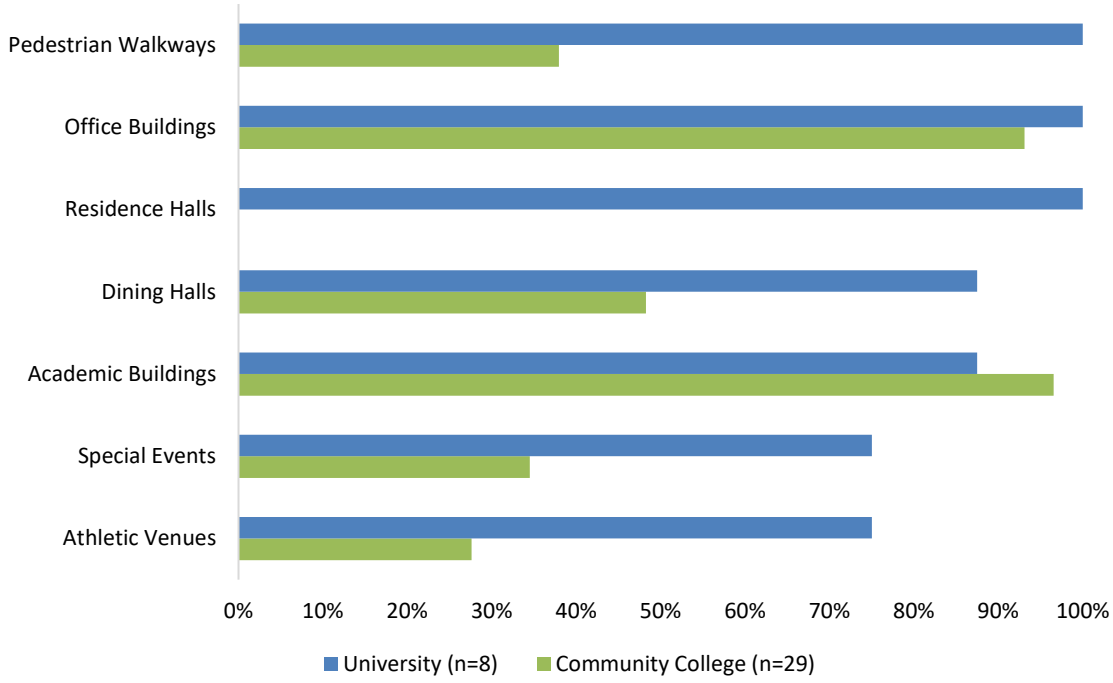


Figure 5. Universities report recycling containers dispersed across campus spaces.

As Figure 5 illustrates, most surveyed residential colleges and universities have a wide variety of locations where individuals can easily recycle. At least three-quarters of universities report recycling bins located in each of the areas identified: pedestrian walkways, office buildings, residence halls, dining halls, academic buildings, special event spaces, and athletic venues. In contrast, community colleges primarily report bins located in office and academic buildings. Although a lower percentage of community colleges have recycling bins in other spaces, it is important to remember that their facilities differ from residential institutions, so they may have fewer areas to offer recycling opportunities.

Along with having recycling bins widely available, twinning bins – pairing recycling and waste bins side-by-side in public areas— is a best recycling practice. Waste bins are more prevalent in public areas, so when recycling bins are co-located with waste bins, people are more likely to recycle. Further, when recycling bins are located next to waste bins, they have lower contamination rates because people are less likely to discard trash in them. Lone recycling bins are often treated as trash cans.

Figure 6. Recycling and Trash Twin Bins on Campuses at NC Public Colleges and Universities

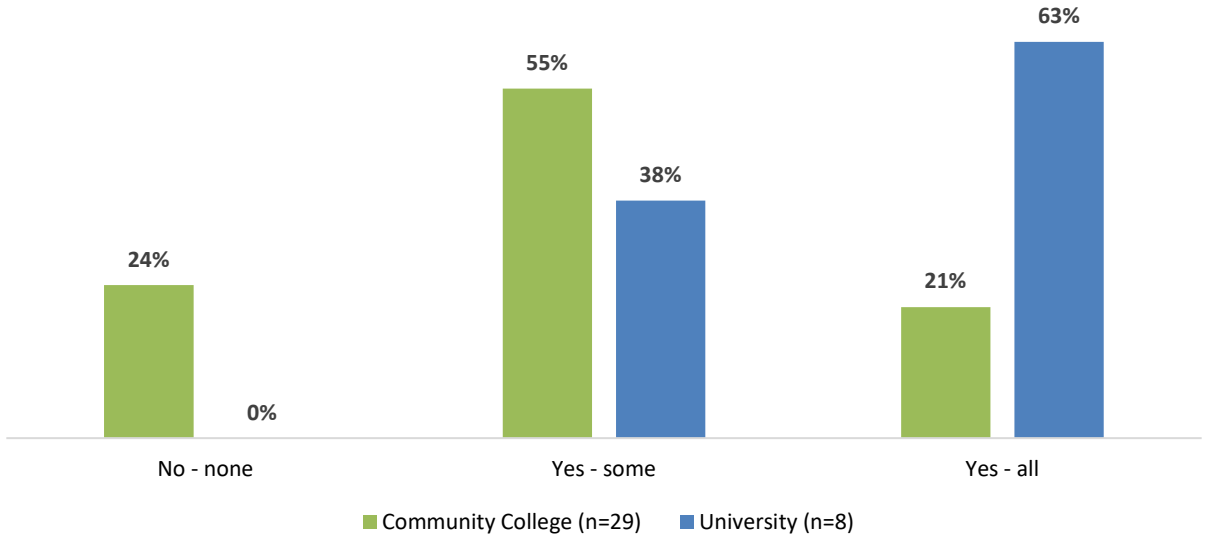


Figure 6. Most schools report having at least some recycling and trash bins twinned. The figures may not sum due to rounding.

As Figure 6 demonstrates, approximately three-quarters of surveyed community colleges and all surveyed residential universities pair at least some of their bins. Over 30 percent of all respondents pair all their bins, which is a ten percent increase from FY 2022-23. Only 7 community colleges do not pair their trash and recycling bins, choosing instead to provide only recycling or trash bins in certain spaces. Overall, more schools than last year report using the best practice of placing containers together.

Tons Recycled

Surveyed colleges and universities report recycling 4,206 tons of traditional recyclable material in FY 2023-24, a 1,175 ton or 39 percent increase from FY 2022-23. Reported tonnage has varied widely over the past several years. Notably, the participating respondents are not consistent year-to-year, introducing a natural amount of variability. Thirty-two of the 39 schools responded last year as well, but the participation of some schools that are large generators, like North Carolina State University, can significantly impact the results year-to-year.

Figure 7. 3-Year Direct Comparison of NC College and University Traditional Recycling Tonnage (n=26)

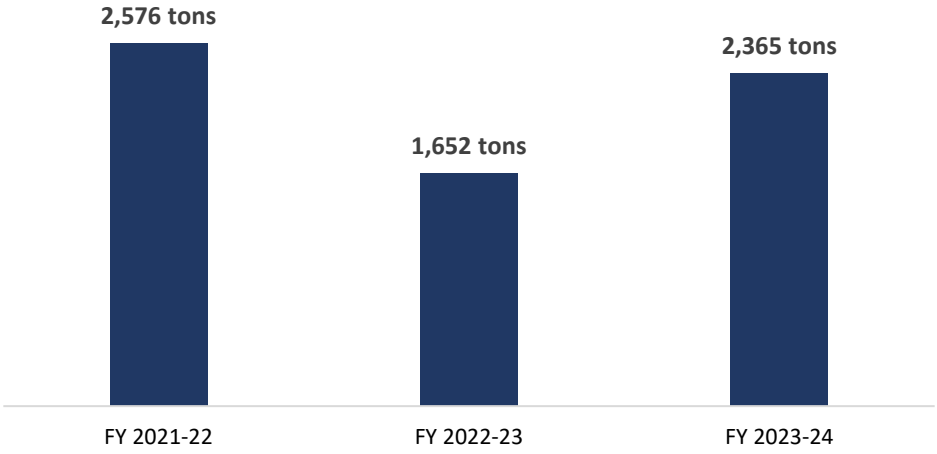


Figure 7. The amount of traditional recycling increased compared to last year.

Still, a side-by-side comparison of the 26 schools that completed the survey for the past three years demonstrates that traditional recycling tonnages rebounded following the most recent fiscal year, as Figure 7 illustrates. Tonnage dropped significantly during the COVID-19 Pandemic and impacted schools' recycling programs. It is likely that lingering effects of the pandemic are continuing to impact tonnage, but it will take several additional years before the overall impacts of the disruption and the state of recovery are known.

Recycling Collection Styles

Collegiate recycling programs collected most of their traditional recyclables in a single-stream system. In single-stream recycling, all traditional recyclable materials—cans, bottles, and paper—are collected in the same receptacles. Single-stream, or commingled recycling, is convenient and simple for users. As a result, recycling participation increases with single-stream, and the system is more efficient since staff empty fewer receptacles. At the same time, materials from single stream systems can be costlier because more effort and time is required to sort them into commodity types, and recovered materials can be of lower quality as commodities like paper and cardboard may be contaminated by other materials. It is important to consider the costs and benefits of each stream type and work closely with haulers and material recovery facilities to determine which collection style works best for your campus.

Echoing the larger trend of traditional recyclables, single-stream recyclable tonnage increased in FY 2023-24 from the previous year. Last year, there was a drop-off in tonnage among the overall respondents, as well as among the 26 schools that have consistently reported for the past three years. This was the case for both universities and community colleges.

Sixty-one percent of respondents collect materials in a single-stream system. Twenty-two percent of the remaining schools collect materials using a dual-stream system and 14 percent using a source-separated

program. The materials collected in dual-stream or source-separated programs were grouped into the following categories:

- Containers, including aluminum cans, steel cans, glass bottles and plastic bottles;
- Cardboard, which is often collected separately from other materials;
- Shredded paper, which is often shredded and recycled by a private company; and
- Mixed paper, including office paper, newspaper and paper cartons.

As depicted in Figure 8, schools report recycling 1,796 tons of fibrous materials, 106 tons of containers, and 2,305 tons of commingled materials in FY 2023-24.

Figure 8. Traditional Recyclable Materials Collected by NC Public Colleges and Universities

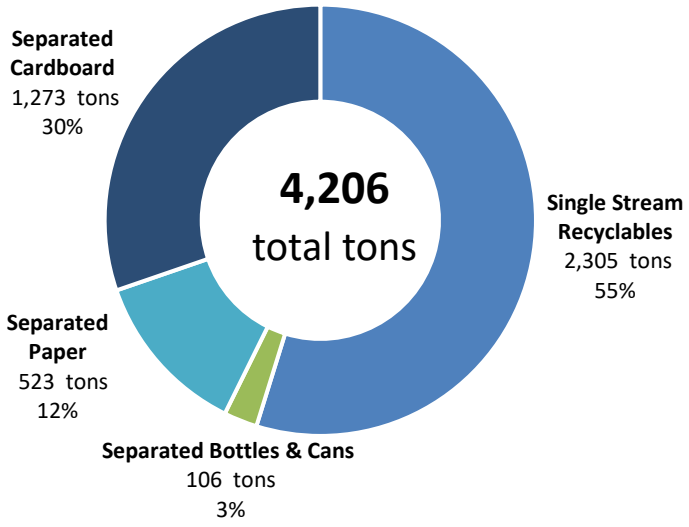


Figure 8. Over half of traditional recyclables are recovered from commingled streams. The figure may not sum due to rounding.

Other Recycling and Waste Diversion

Waste diversion and recycling have expanded beyond the traditional materials diverted in previous decades. Colleges seek new methods to reduce, reuse and recycle quality materials, and several schools have adopted solid waste plans to divert as much material from landfills as possible. As a result, organizations increased their recovery of materials like organics, electronics, construction and demolition waste, textiles, and hazardous waste.

Surplus and Donation

The N.C. Department of Administration's State Surplus Property Agency is the seller of all surplus supplies, materials and equipment owned by the State of North Carolina. Through the surplus process, items that

are no longer needed or useful are evaluated to determine the preferred disposition method. Reusing, trading-in, selling or recycling is prioritized over sending items to the landfill.

Figure 9. The Appalachian State University Mountaineer Free Store offers food products for individuals on campus. Photo courtesy of Lanie Karstrom.

Colleges and universities also create opportunities for reuse by establishing programs to donate student-generated materials to individuals and organizations in need. Surveyed community colleges tend to have fewer donation programs than universities. Only five surveyed community colleges report having a donation program, while seven of the eight surveyed universities report offering a donation program for food and/or other materials. In total, schools report donating 33 tons of food and 27 tons of other materials, like clothes and sanitary products; however, some schools note they do not consistently track the weight of donated materials, so the total amount is likely much more than reported.

These donation programs vary in type. Some occur at specific times of the year, like move-out, while others offer year-round opportunities for collection. For instance, Appalachian State University's Mountaineer Free Store (see Figures 9 and 10) and UNC Wilmington's Seahawk Swap Shop offer year-round free stores while schools like UNC Asheville have pop-up free stores. Stores frequently offer a wide variety of items including clothing and accessories, household decor and office supplies, kitchen items and small appliances. Multiple schools, including community colleges like Fayetteville Technical Community College and Southeastern Community College, have campus programs which offer gently used business clothes to students for work or interviews. Free stores often function as food pantries as well. For example, North Carolina State University channels donated food and cleaning supplies to the on-campus Feed the Pack Food Pantry for anyone in the campus community. These donation programs are circular systems, diverting materials from the landfill and redistributing donated goods back to students, staff, and faculty.

Figure 10. Several colleges and universities provide interview clothing for students at free stores, like Appalachian State University's Mountaineer Free Store. Photo courtesy of Lanie Karstrom.

Additional Waste Reduction Strategies

Along with donation efforts, schools employ other waste reduction strategies including offering reusable trays, dishes, utensils, take-out containers, compostable utensils, and compost programs. Most community colleges do not offer campus dining options or have limited operations, but a small percentage still report offering waste reduction strategies where applicable. By contrast, waste reduction strategies are near ubiquitous among surveyed residential university dining operations. Universities use at least one of the strategies listed in Figure 11. Seven out of eight surveyed universities use reusable materials like take-out containers, trays, dishes, or utensils, and five out of eight surveyed universities use compostable materials.

Figure 11. Waste Reduction Strategies Used in Campus Dining

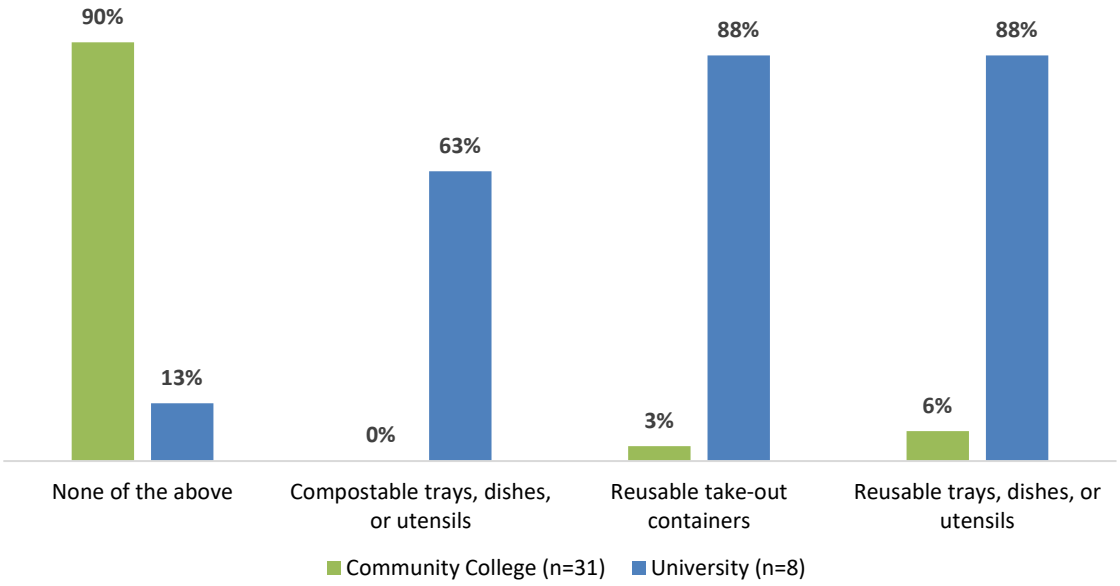


Figure 11. Universities use a variety of waste reduction strategies in campus dining. Responding schools could choose more than one strategy. The figures may not sum due to rounding.

In addition to reusable or compostable materials, some surveyed colleges and universities have procurement policies that encourage the purchase of goods with recycled content. Approximately 43 percent of universities and 40 percent of community colleges that responded note having a recycled content procurement policy. For more information on developing specifications for recycled content policies and access lists of suppliers, visit NC Purchasing Toolkit: Recycled Content Products developed by Waste Reduction Partners (WRP).

Schools also operate waste reduction programs around specific events. Paralleling the donation programs run during student move-out, some residential schools provide special recycling programs, like temporary cardboard collection, during student move-in including UNC Asheville, Charlotte, and Pembroke.

Organics Recovery

Residential colleges feed thousands of people daily, and they have expansive campuses that produce yard waste. Recovering this organic material has become important in the field of waste reduction.

Figure 12. NC State University operates its own compost facility to process food and yard waste. Photo courtesy of Meredith Smith.

Food donation and compost programs are the most popular strategies to manage excess food among surveyed schools. Schools that have on-site compost operations, including Appalachian State University, North Carolina State University, Sandhills Community College and University of North Carolina at Pembroke can extend the useful life of organic material by processing and using the finished compost product on campus grounds. Other waste reduction strategies like education and take-out containers are also popular and reduce the creation of food waste at the source. Two schools, Western Carolina University and University of North Carolina at Pembroke, collect excess food for animal feeding operations. Please note, animal feeding operations must be permitted.

Responding colleges and universities recovered 1,296 tons of food waste (not including donated food) and 2,584 tons of yard waste and clean wood waste. Table 1 illustrates the reported tonnages of surveyed respondents in both categories.

Table 1. Organic Tonnage Recovered by Public Colleges and Universities		
Year	**Food Waste (tons)**	**Yard Waste and Clean Wood Waste (tons)**
FY 2023-24	1,296	2,584
FY 2022-23	464	1,135
FY 2021-22	164	536
FY 2020-21	109	222

Of the eleven schools that report food waste collection programs (for compost or animal feeding operations), approximately 73 percent collect food scraps from the dining room area (post-consumer), the most popular collection location. Collection programs typically locate compost bins with compostable liners next to trash and recycling stations for the diners' convenience, like the one pictured in Figure 13. The higher cost for compostable liners is a common challenge for residence hall food scrap collection. Generally, compostable liners are more expensive than standard trash bags. Therefore, if a school were to consider implementing a compost program, program managers should consider the cost of liners in yearly budgets.

Figure 13. NC State University provides central waste stations that offer recycling and composting options to divert waste from the trash. Photo courtesy of Meredith Smith.

As Figure 14 illustrates, nearly half of the surveyed school food waste collection programs have kitchen scrap (pre-consumer) and special events composting. Less popular areas for collection include on-campus culinary programs, academic buildings, sports venues/stadiums, and residence halls. Certain spaces like residence halls can be challenging logistically because of collection and monitoring contamination, which may increase program costs. To reduce contamination costs for special events, schools, like North Carolina State University place individuals at waste stations to help passersby dispose of waste correctly.

Figure 14. Food Waste Collection in Campus Spaces at NC Public Colleges and Universities (n=11)

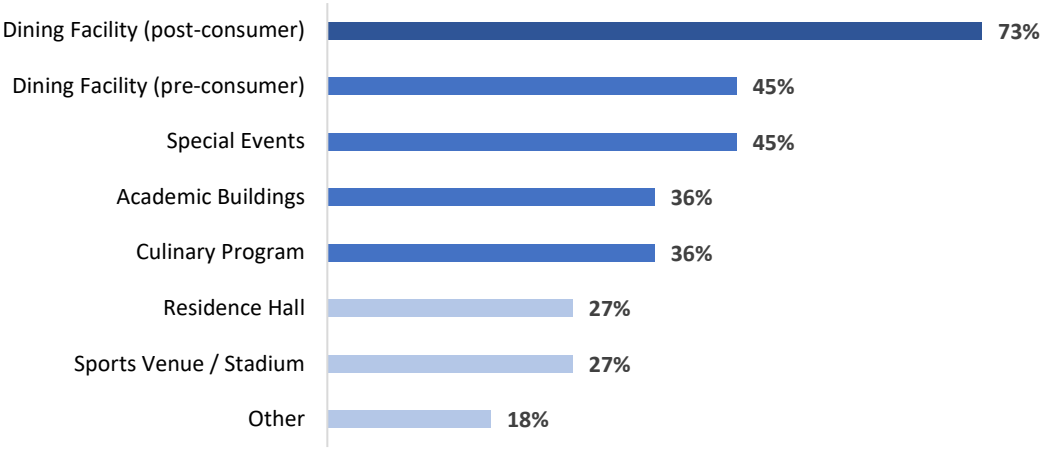


Figure 14. Along with post-consumer food waste, pre-consumer food waste, or kitchen scraps, and food waste from special events are the most common collection points for food waste programs.

Among the schools that do not operate food waste collection programs, the most cited reason is lack of personnel. Interestingly, approximately half of the schools that have compost programs use private contractors rather than operate the program themselves on-site, requiring fewer personnel. However, the second most common obstacle to implementing compost programs was cost. In addition to lack of staffing and funding, gaps in composting infrastructure, namely private contractors and haulers in a region, are likely to exacerbate these existing composting challenges.

Special Waste

North Carolina General Statute 130A-309.10(f) bans some of these materials from landfill disposal in the state, so organizations must recycle these items, such as electronic equipment, antifreeze, motor oil and filters, pallets, tires, and batteries. In addition, several schools report operating additional programs for special wastes like textiles and expanded polystyrene (Styrofoam).

Reporting schools recovered a total of 1,828 tons of special waste during FY 2023-24. Table 2 shows a breakdown of special waste collected by colleges and universities. Note: although listed among special waste, used cooking oil and pallets contribute to organic materials in the total amount of generated materials, as depicted in Figure 1 and Figure 15.

Table 2. Special Materials Recovered from NC Public Colleges and Universities

Special Material	Tons Recovered
Scrap Metal	887.37
Electronics	294.24
Pallets	209.80
Other Miscellaneous	171.48
Construction & Demolition	164.01
Tires	48.64
Motor Oil	17.28
Lead Acid (Auto) Batteries	12.18
Fluorescent Bulbs	7.47
Used Cooking Oil	6.80
Dry Cell (Alkaline) Batteries	2.89
Expanded Polystyrene	2.06
Antifreeze	1.26
Toner Cartridges	1.23
Textiles	0.74
Oil Filters	0.54
Total	**1,827.99**

Disposal

Tons Disposed

According to the survey, North Carolina public colleges and universities disposed of 13,672 tons. This tonnage includes both municipal solid waste (MSW) disposal and construction and demolition (C&D) waste disposal. Of that total, 13,208 tons (97 percent) were sent to MSW landfills for disposal and the remaining 464 tons disposed (3 percent) went to C&D landfills.

The seven universities that reported tonnages are responsible for 68 percent of the MSW disposal and 67 percent of the C&D disposal. The 23 community colleges that reported tonnages are responsible for the remaining 32 percent of MSW material and 33 percent of C&D disposal.

Because the number and makeup of schools participating in the survey differs each year and can lead to variable data, like the apparent sharp increase of landfilled material, it is helpful to have a more consistent

measure to compare changes year-to-year. As a result, we use the pounds per capita of MSW generated, including full-time equivalent staff (FTE) and students enrolled at the university or community college.

Table 3. Total Materials Disposed by NC Colleges and Universities				
Year	**MSW (tons)**	**C&D (tons)**	**Total Landfilled (tons)**	**MSW (lbs)/Person**
FY 2023-24	13,208	464	13,672	174
FY 2022-23	14,836	151	14,987	176
FY 2021-22	8,333	361	8,694	116
FY 2020-21*	6,280	624	6,904	94

**The COVID-19 Pandemic, which began in 2020, reduced the number of individuals on campus and is therefore a major factor in the significantly lower amount of generated material.*

As depicted in Table 3, in FY 2023-24, the ratio was 174 pounds of MSW per person. This is an almost unchanged amount from the prior year. Compared to previous years, however, the rate of MSW per person has increased markedly. It is important to note that the amount of generated material was low during and following the COVID-19 Pandemic because of the reduced number of individuals on campus. Unsurprisingly, residential universities consistently generate more pounds of MSW per person than community colleges since individuals at residential universities spend more time on campus and have more opportunities to generate materials.

As colleges and universities continue tracking and estimating the amount of solid waste disposed, it is recommended that they consider the following best management practices:

- Include language in solid waste contracts to require monthly tonnage reports from the hauler. This can be actual weights, if the capability exists, or estimates from the hauler; or
- Request that the hauler periodically collects actual solid waste tonnage information. For example, during one week per quarter, the hauler collects all the school's regularly scheduled pickups and takes that material directly to a scale to be weighed before servicing other customers on the route.

Waste Assessment

Waste assessment studies are valuable tools for agencies to learn what they are discarding in their waste stream and how much of that material is recyclable. Understanding what and where material is being thrown away can help direct recycling strategies to recover the most material possible. Best practices include measuring waste from several different types of buildings across several months. Studying various building types will provide more robust data about the nature of disposal across campus. Diversifying the times of year studied will show how waste and recycling rates differ from month-to-month.

Three universities and one community college conducted solid waste assessments in the last several years. Some administer the audits internally while other use external contractors or partners, including Waste Reduction Partners (WRP). Schools seeking advice on waste characterization studies can contact DEACS for assistance.

Summary and Recommendations

Figure 15. 5-Year Generation of Materials by Type from NC Public Colleges and Universities

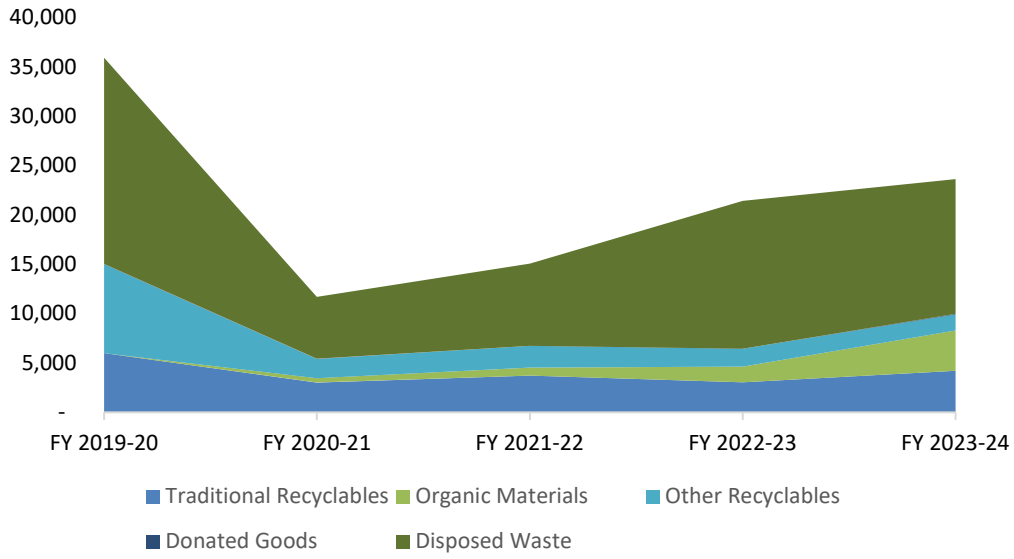


Figure 15. Material generation from schools continues to recover following the COVID-19 disruption. Survey respondents vary between years, which can impact reported tonnages.

Remarkably, in the past five years, the recovery rate of materials has remained steady despite the actual generation of materials decreasing sharply in FY 2020-21 when the COVID-19 Pandemic greatly reduced the number of individuals on campuses. Since FY 2019-20, the material recovery rate held between 42 and 46 percent, except for last year, which saw the rate plummet to 30 percent among surveyed schools. The reason for this deviation is unclear.

Figure 15 illustrates the amount and distribution of recyclable and solid waste materials managed by the 39 reporting schools. Responding schools generated a total of 23,646 tons of material in FY 2023-24. Of that total, 13,672 tons (58 percent) were sent to a landfill for disposal, and a total of 9,974 tons of materials (traditional recyclables, other recyclables, organics, and donations) were recovered.

Recycling and waste reduction programming remains relatively accessible across campuses, particularly at public universities. Traditional recycling collection points are ubiquitous in spaces like academic and office buildings and are also available in dining spaces, athletic spaces, public walkways, etc. Moreover, approximately 80 percent of public colleges and universities surveyed report pairing recycling bins with trash bins to some degree across campuses.

Participating schools employ a variety of waste reduction strategies like composting, hosting special events, having reusable food containers, utensils, and trays in dining spaces, and providing donation opportunities. Likewise, schools also use a range of education and outreach methods including bin labels,

signage, tabling, and education at orientation or through student groups. Among schools with the highest rates of diversion, they practice a few common best strategies:

Waste Reduction and Recycling Best Management Practices for Colleges and Universities

1. **Abundant outreach** – Most schools placed consistent signage or labels directly on bins, but the highest performing college recycling programs invested in educational materials beyond information at recycling stations. DEACS encourages public recycling systems to:

    a. Budget about $1 for outreach for every student and employee under its purview;
    b. Expand outreach efforts beyond signage at recycling stations; and
    c. Use clear and consistent messaging to avoid confusion.

2. **Work with your MRF operator** – Schools can work with the operator of their MRF to create a service contract for long-term stability for both organizations and create uniform messaging about recycling based on the accepted materials for the MRF.

3. **Twinned bins** – Twinned bins in public spaces have several benefits.

    a. People are more likely to recycle if given the opportunity. Recycling bins next to trash bins reminds people that certain items belong in the recycling container.
    b. People are less likely to treat a twinned recycling bin as a garbage can. If a recycling bin is left alone without a trash bin, people are more likely to throw garbage—food and non-recyclable waste—into the recycling container. Any contamination diminishes the quality of the entire recycling mix.
    c. Public-space recycling bins remind people to recycle. Seeing recycling bins next to trash bins in public may remind them to recycle at home too.
    d. For schools that operate food waste collection programs, pairing compost bins next to recycling and trash bins, as depicted in Figure 13, increases the likelihood of individuals participating in compost programs and diverting organic materials from the landfill.

4. **Recover non-traditional materials** – Much of the increases in collegiate recycling during the past several years stem from expansions in non-traditional recycling. Several public and private colleges have proven the effectiveness of on-site composting and partnerships with commercial composters. Colleges can also work with contracted food service providers to determine an organics management plan at their dining halls.

5. **Donation and reuse of materials** – Reusing commodities is more environmentally sustainable than throwing them away. Colleges and universities should use contracts and services available through the State Surplus Property Agency and Division of Purchasing and Contract to manage office furniture and supplies, equipment, vehicles, and special recyclables such as scrap metal, motor oil and filters, electronics, and fluorescent bulbs. Food banks also accept edible pre-consumer food across the state. DEACS encourages colleges to measure their tonnage of donations to better estimate their waste reduction progress.

6. **Peer-to-peer collaboration** – A key objective of DEACS is to foster inter-organizational collaboration for colleges and universities to encourage the employment of best management practices for waste reduction. One entity may face a challenging recycling problem, while another may have already solved a similar obstacle.

    a. **Collegiate Recyclers Coalition** – One opportunity for connecting is through the Collegiate Recyclers Coalition (CRC), a council of the Carolina Recycling Association. The CRC holds quarterly meetings and an annual workshop to share information and network with related partners. More information can be found by contacting DEACS, or by visiting the CRC website.
    b. **MRFshed collaboration** – A MRFshed includes all communities that feed recyclables to a single MRF. DEACS encourages colleges and universities to work with their surrounding community, haulers, and regional MRF to use a common set of educational recycling materials. This will help provide consistent messaging and reduce confusion for students, faculty and staff that live, work and spend time both on-campus and in the surrounding community. To understand which materials are accepted in your area, visit the NC MRFshed Map.