



Swarthmore College
Office of Sustainability

2024
Zero Waste Report



Contents

Overview.....3

Background.....4

Results.....7

Looking Ahead.....12



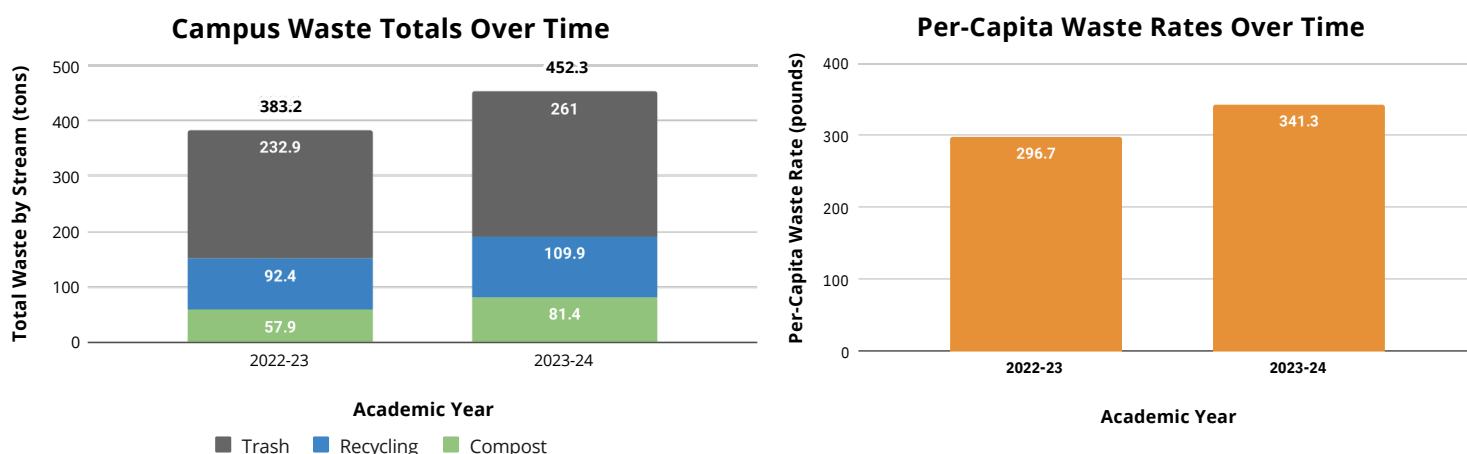
Overview

In June 2022, Swarthmore College adopted a formal [Zero Waste Plan](#), which outlines new goals that will lead the campus to become zero-waste by 2035. Our zero waste goals are as follows:

- Embed zero waste into **campus culture** through a series of behavioral, operational, and policy changes
- Reduce our per capita waste **15% by 2030** and **25% by 2035**
- Achieve **80% diversion by 2030** and **90% diversion by 2035**

Our Annual Zero Waste Report will allow us to benchmark and track our zero-waste efforts. Annual reports will be published each academic year and made available to the entire campus community.

Campus-Wide Waste Data



The 2023-24 academic year marked the second full year of utilizing Swarthmore College's campus-wide waste data tracking system. During the **2023-24 academic year**, the Swarthmore community produced **452.3 tons of waste** on campus. We diverted **81.4 tons of compost** and **109.9 tons of recycling**, but sent **261 tons of trash** to the ReWorld Incinerator (formerly known as Covanta) in Chester, PA, a rate of **341.3 pounds per person (or capita)**. Compared to the 2022-23 academic year, all of our waste totals increased significantly. We attribute this shift to data accuracy, as we were able to better track our waste through requiring consistent data on our trash and recycling stream amounts from our waste hauler, and through transitioning away from dumpsters to trash and recycling compactors. Greater capture rates of compostable items, particularly of paper towels and food waste, and overall greater waste diversion also contributed to this increase. We hope that our trash total decreases in the future as we divert more waste into the recycling and compost streams.

Please note that these totals only refer to waste placed in the tri-bin systems (compost, recycling, and trash) inside campus buildings and residence halls, as well as waste generated from the Dining Center. We plan to track additional sources of waste in the future. In addition, we updated our methodology in 2023-24 to subtract the weight of the totes used to haul compost from the compost waste total, which is why our 2022-23 waste numbers appear slightly different than in previous reports.

Waste Characterization Study

2024 Key Findings

In order to better understand our campus waste stream, the Office of Sustainability conducts annual Waste Characterization Studies (WCS) in collaboration with our campus partners in Environmental Services. This report highlights the results of our most recent study, which was held in October 2024. While we identified a number of interesting statistics during this year's WCS, our key findings focus specifically on data connected to areas for improvement found in our campus' waste system.

- Our 2024 Waste Characterization Study results indicate an **actual diversion rate of 50%**, a milestone towards reaching our 90% waste diversion goal since we began data tracking in 2016.
- Our study also shows a **potential diversion rate of 76%**, which is similar to historical rates.
- **Compost is the largest waste stream (51%)** with food waste (27%), other accepted compostables & bag liners (17%), and paper (14%) as the biggest sources of waste.
- **Properly disposing of waste into the recycling and compost streams** can be challenging for the campus community, particularly when correctly sorting plastic bottles and compostable takeout containers.
- **Dining locations divert the most waste away from incineration**, with academic and administrative buildings diverting nearly half of their waste. Student residence halls yielded a mixed result, with Wharton diverting almost half of their waste and Willets diverting about one-third. This is demonstrated by comparing the actual diversion rates in Eldridge Commons (71%), Trotter (54%) Wharton (46%), 101 South Chester (44%), and Willets (36%).

Background

Since 2016, Swarthmore College has been collecting waste data primarily through the annual Waste Characterization Study (WCS), along with other data sources. Through tracking, analyzing, and benchmarking zero waste data, we can see where we stand towards achieving our 2035 zero waste goals and how aggressively we need to progress forward to meet them. Reports from 2016 onwards are available to view on the Office of Sustainability's [website](#).

The WCS is completed each year by collecting bags of compost, recycling, and trash waste from five different locations across campus, tracking the contents of each waste stream, and then re-sorting items into correct streams as needed. Waste is categorized by the stream and different types of common categories, such as aluminum, paper, or food waste. This information allows us to learn about the diversion rate, the capture rate of recyclables and compost, and much more.

The 2024 WCS had support from thirty students, staff, and faculty, who sorted over 700 pounds of waste over the course of seven hours. This work would not be possible without the help of all of the people who assisted with this data collection.

Methodology

Diversion Rate

In this study, **diversion** refers to the amount of waste that was put in a waste stream other than trash, i.e. the compost and recycling streams. The diversion rate is calculated by adding up the weight of compost sorted into the compost stream with the weight of recycling sorted into the recycling stream and dividing by the total weight of all the sorted waste (including trash). We also calculate potential diversion, or the best possible diversion possible if all waste was sorted correctly, by taking the weight of all of the compost and recycling (including those improperly sorted) and dividing it by the total weight of the waste collected.

$$\frac{\text{actual diversion:} \\ \text{compost in the} + \text{recycling in the} \\ \text{compost bin} + \text{recycling bin} \\ \text{waste in all bins}}$$

$$\frac{\text{potential diversion:} \\ \text{compost in} + \text{recycling in} \\ \text{all bins} + \text{all bins} \\ \text{waste in all bins}}$$

Buildings

Since waste looks different in every building, we identified several "building types" that have commonalities in their waste streams, such as residence halls versus administrative buildings. This allows us to see how these categories differ in their diversion rates and track this over several years by maintaining consistency in selected buildings. The building types, along with the selected buildings, are as follows:

Willets Hall

residence hall, primarily
1st & 2nd years

Wharton C & D

residence hall, primarily
3rd & 4th years

Trotter Hall

academic building

Eldridge Commons

campus eatery

101 S. Chester

administrative building

For the 2024 WCS, we changed a few of the buildings we surveyed. As PPR Apartments' waste stream functions differently from the rest of campus, this year we switched our 3rd and 4th year residence hall to Wharton C & D, a building that more accurately reflects the waste makeup of most residence halls. Similarly, we substituted 101 South Chester with an amalgamation of smaller administrative buildings as the space is undergoing renovation.

Methodology

Categories

Within each of the three waste streams (compost, recycling and trash), there are categories that provide additional insight into where sorting issues exist and where zero waste efforts should be focused. The categories are as follows:

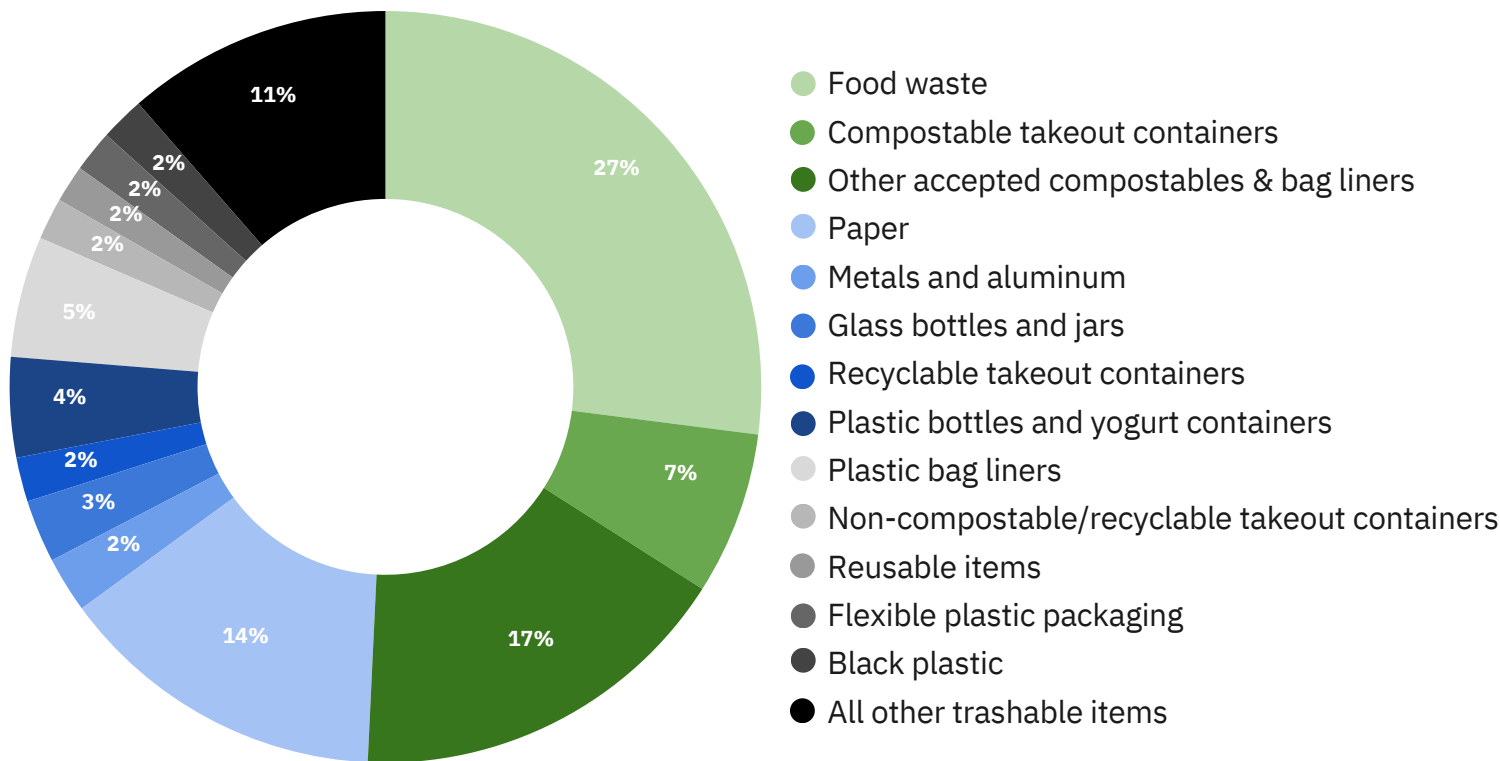
Compost	Recycling	Trash
<ul style="list-style-type: none">• food waste• compostable takeout containers & utensils• other accepted compostable items	<ul style="list-style-type: none">• paper & cardboard• metals & aluminum• recyclable takeout containers• plastic bottles & yogurt containers• glass bottles	<ul style="list-style-type: none">• flexible plastic packaging• non-compostable/ recyclable takeout containers• items to donate and e-waste• black plastic• all other trash items



Results

Waste Breakdown

2024 Complete Waste Breakdown by Category (All Streams)



Looking at the entire campus waste stream, our study finds that 51% of our waste is compost, 25% is recycling, and 24% is trash. The biggest contributors to our waste stream are food waste (27%), other accepted compostables (17%), paper (14%), and all other trashable items (11%).

In addition, this chart highlights two significant contributors to our waste stream: paper and compostable takeout containers, two categories we've identified as potential areas for improvement in the future. Paper, a category that includes printer paper, magazines, cardboard, and envelopes, constitutes 14% of our waste stream. As one of the biggest portions of our waste stream, this statistic illustrates the importance of reducing paper waste in order to achieve our 90% waste diversion goal, particularly through efforts such as [swipe-release printing](#).

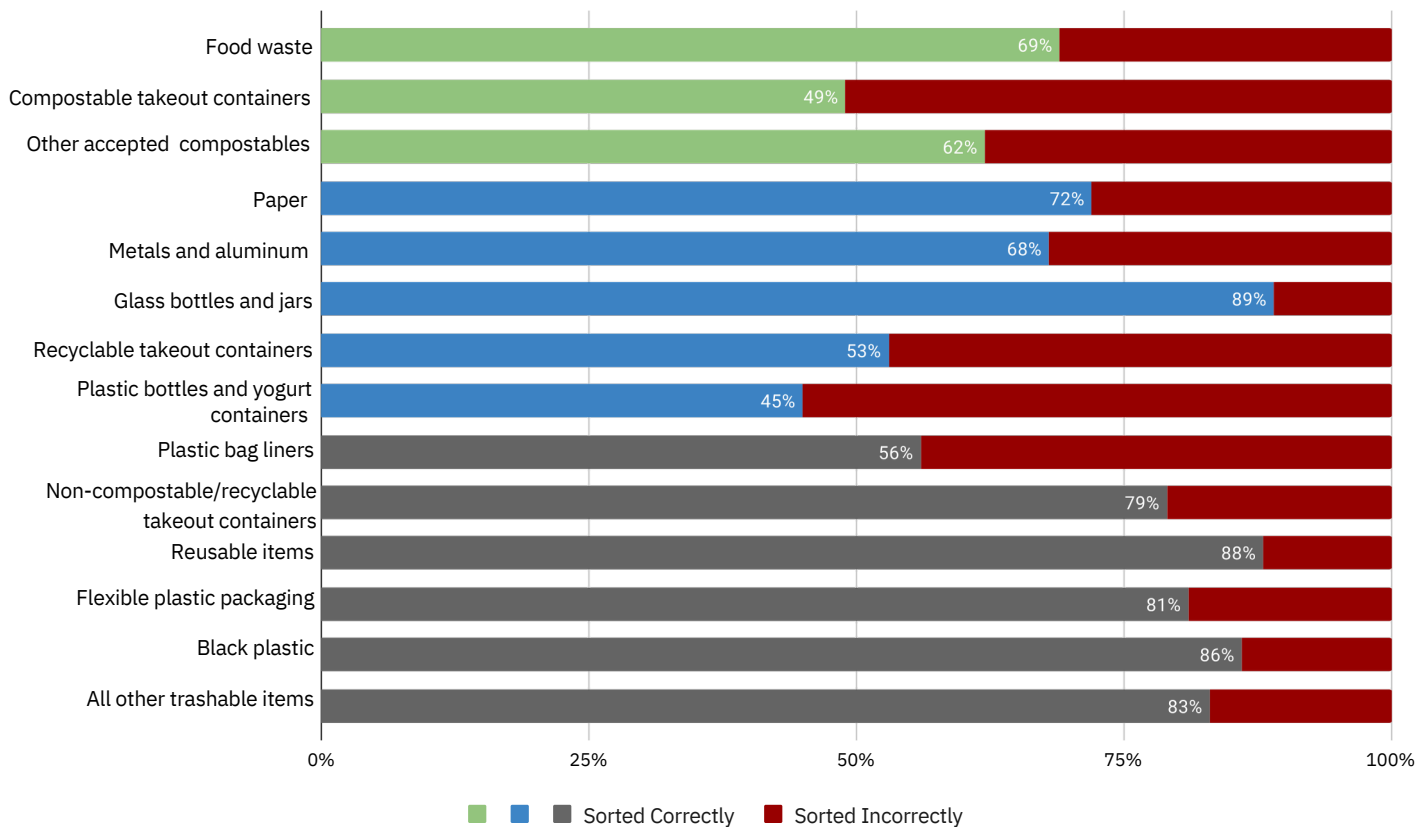
Compostable takeout containers, a category that includes compostable hot cups, cold cups, salad containers, clamshells, straws, wooden utensils, and additional to-go wares, comprise 7% of our campus waste stream. With the introduction of the [Reusable Takeout Container Program](#) in the Dining and Community Commons during the fall 2024 semester, we hope to see a greater reduction of these materials in the future.

Results

Sorting Accuracy

When analyzing sorting accuracy across all streams, results highlight that most trash and recyclable items were accurately sorted, while some recyclable and compostable products require further attention. In this year's study, we observed an increase in the sorting accuracy of recyclable products. Glass bottles and jars (89%) are almost always placed in the correct bin, while paper (72%) and metals and aluminum (68%) are sorted correctly nearly two-thirds of the time. However, plastic bottles and yogurt containers (45%) are placed into the correct bin less than half of the time, leaving room for further improvement.

Sorting Accuracy Across Different Waste Categories



In addition, most types of takeout containers, including those purchased from on-campus eateries and off-campus restaurants, were consistently missorted. Black plastic (86%) and non-compostable/recyclable takeout containers (79%) were placed correctly in the trash bin nearly 80% of the time. We attribute the sorting accuracy of black plastic to the success of our targeted zero waste behavior change initiative that we launched during the spring 2024 semester. Conversely, compostable takeout containers (49%) and recyclable takeout containers (53%) were only sorted correctly around half of them time.

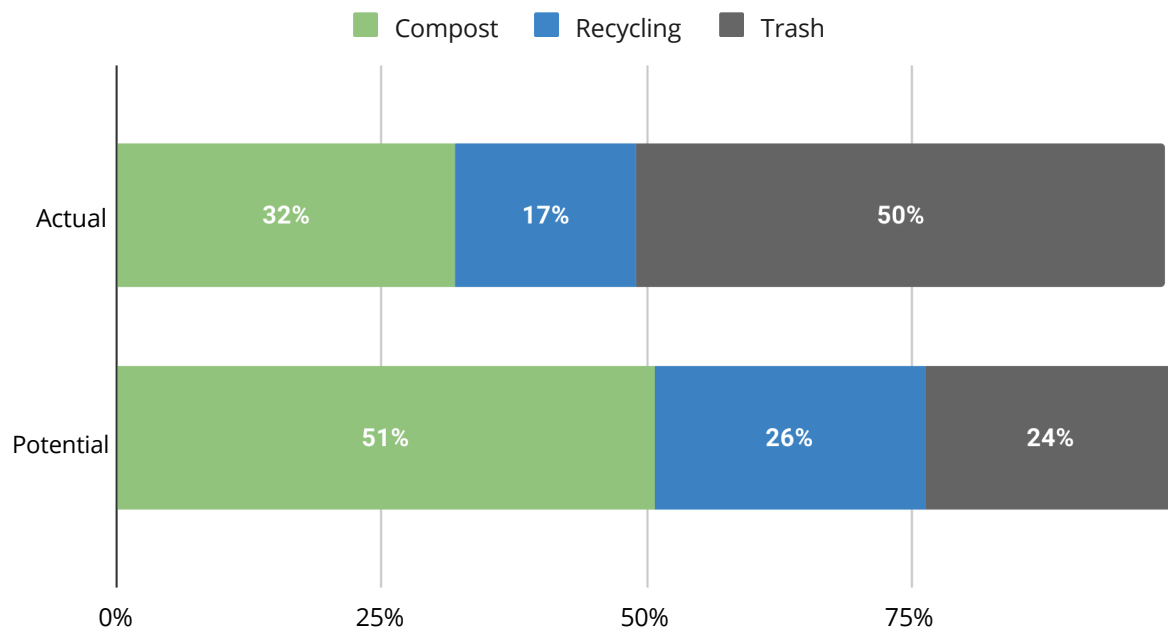
Overall, these findings illustrate the need for continued waste sorting education efforts, particularly concerning key recyclable and compostable items, as well as the need to eliminate black plastics on campus, as they contributes to our gap between 76% and 90% diversion of waste on campus.

Results

Diversion Rates

Looking at our campus waste stream, 50% of our total waste output was diverted away from incineration. 32% of that waste was hauled to our community composter, and around 17% was taken to our municipal recycling facility. The other 50% of our waste was sent to the incinerator. If properly sorted, 76% of our campus' waste could be diverted, increasing our total waste output to around 51% compost and 26% recycling. As we move closer to achieving zero waste through the implementation of new campus initiatives, such as the [Reusable Takeout Container Program](#), the [Food Recovery Fridge](#), and [swipe release printing](#), please note that our actual diversion rate might decrease in the future. However, our overall waste output will also decrease in tandem.

Actual vs. Potential Diversion Rate



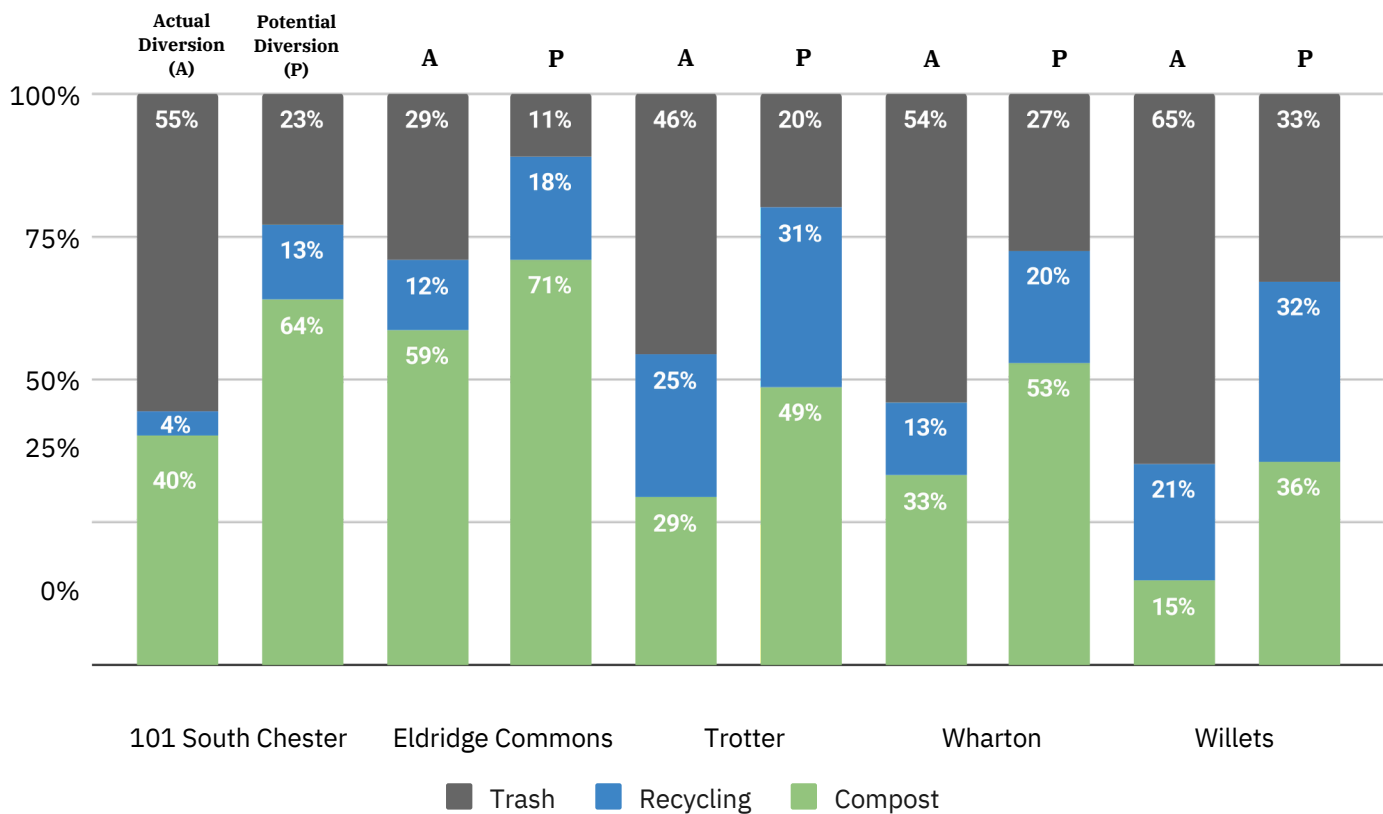
Please note that the numbers listed on this chart may not add up to 100% due to rounding.



Diversion Rates Across Building Type

Looking across five different buildings, Eldridge Commons has the highest actual diversion rate (71%), demonstrating the continued success of waste diversion efforts in our campus dining locations. Our academic building - Trotter (54%), residence hall - Wharton (46%), and administrative building - 101 South Chester (44%), are diverting nearly half of their waste away from incineration. These numbers differ from Willets (36%), a primarily first-year residence hall with the lowest actual diversion rate of the group. Across the board, all buildings could improve their actual diversion rate by increasing the amount of waste items being sorted accurately into their proper waste bins.

Diversion Rates Across Different Building Types



These different rates illustrate the importance of increased waste sorting education efforts that address the nuanced needs of various audiences on campus. The Office of Sustainability meets this demand through providing department-specific zero waste trainings, utilizing our Sort Smart poster and game, and fostering student zero waste advocates through Green Advisor program.

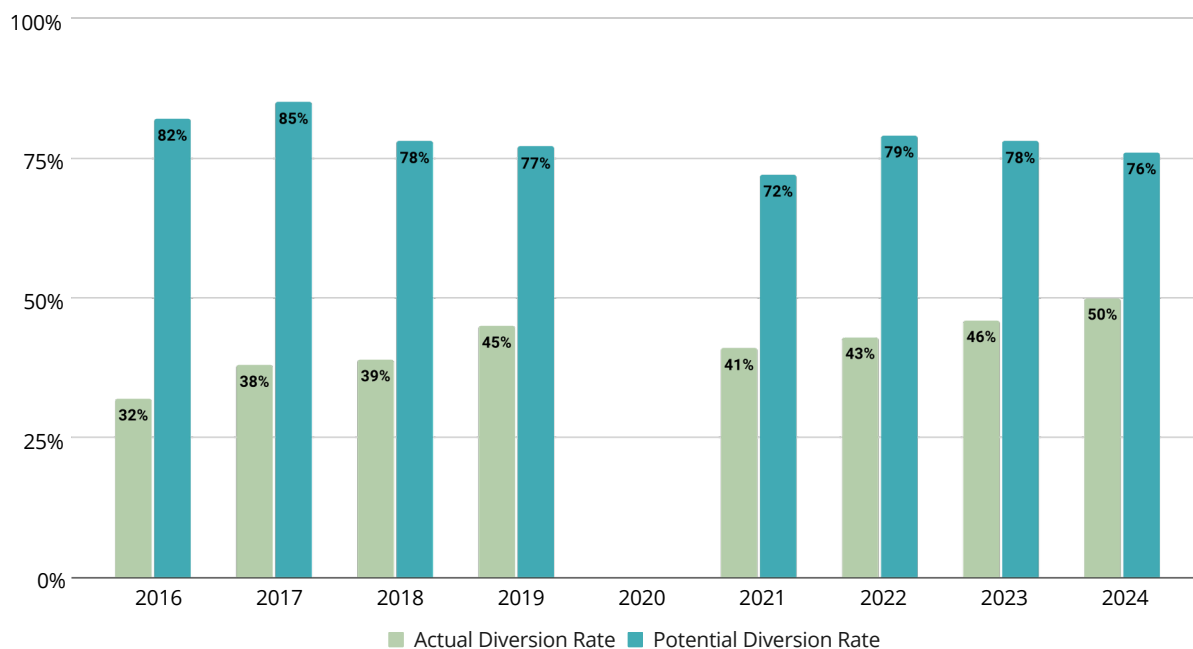
Please note that 101 South Chester’s diversion rates may appear differently than in previous studies. Due to ongoing renovations in the building, many staff members were relocated to alternative working spaces, causing many people to work from home during the time of the study. Given these circumstances, we collected substantially less waste from these departments than in prior years.

Results

Diversion Rates Over Time

Looking at our historical diversion rates from 2016 to 2024, this year's actual diversion rate (50%) is the highest it's ever been, surpassing our previous zenith of 46% in 2023. Although we experienced a slight drop in 2021 due to the COVID-19 pandemic (as discussed in the [2021 Waste Characterization Study Report](#)), since 2016 this rate has steadily increased over time. Our potential diversion rate (76%) slightly decreased this year, but is still on par with previous years. This trend has stayed fairly consistent over time.

Annual Waste Diversion Rates



Looking Ahead

Recommendations

To ensure that we continue moving toward our zero-waste goals, the Office of Sustainability has the following recommendations for the community:

- If you are eating food from an **on-campus dining location**, check to see if the item is **compostable** by seeing if the words **GREENWARE, ECO, ECOTAINER, PLA, Nature's PLastic, or #7** are printed on the item. Currently, all wooden cutlery, takeout clamshells, plates, bowls, straws, hot & cold cups, and lids used at campus dining locations or catered events are compostable.
- If you are ordering takeout from an on-campus eatery or an off-campus restaurant, check the bottom of the **plastic takeout container** for a recycling symbol with numbers **#1, #2, or #5**. If the container is made of clear or white plastic and has these markings, you can place it in the recycling. If not, place the container and any black plastic in the trash. We recommend taking these same steps when disposing of plastic bottles.
- **Use reusables whenever possible** and avoid single-use items. All Swarthmore community members are provided with a reusable utensil set at the beginning of their time with the college. In addition, the Dining Center offers reusable takeout containers that can be used to take food to-go from the cafeteria for anyone on the meal plan.
- **When planning events or tabling initiatives, be sure to refer to the [Green Event Guide](#)** when purchasing giveaway items. Compostable utensils and takeout containers can be purchased at the [Campus & Community Store](#), and all leftover food can be taken to the Food Recovery Fridge located in the lobby outside of Science Center 199.
- If you're unsure of how to dispose of a certain item, please **refer to the Office of Sustainability's [Waste Disposal Guide](#)**, which provides guidance on discarding hundreds of items that are commonly found on campus. Feel free to **reach out to the Zero Waste Working Group** at zerowaste@swarthmore.edu with any questions.



Achieving Zero Waste by 2035

In our efforts to achieve the goals outlined in our Zero Waste Plan, the Office of Sustainability and the Zero Waste Working Group have established ten main strategies to reduce our per capita waste, increase our diversion rate, and embed a zero waste campus culture over the next several years. Below you can find a list of these priorities, as well as actions we're taking now to help create a zero waste campus by 2035.

<p>Strategy 1: Participation Provide regular campus communication about waste updates and provide campus-wide zero waste engagement opportunities.</p>	<p>Strategy 2: Reduction & Reuse Encourage incentives for material reduction by providing reusable utensils, continuing the Worthmore Free Store and move-out program, and promoting initiatives like double-sided printing.</p>
<p>Strategy 3: Diversion to Recycling & Composting Create specific educational campaigns targeting the recycling of plastic bottles, aluminum cans, and paper, as well as the composting of GREENWARE and ECOWARE products.</p>	<p>Strategy 4: Data Tracking & Reporting Continue to publish zero waste metrics and implement a campus-wide data tracking system.</p>
<p>Strategy 5: Reusable Infrastructure & Systems Collaborate with campus partners on donation and repair programs.</p>	<p>Strategy 6: Diversion Infrastructure & Systems Cultivate sustainable operations by maintaining our waste-hauling contracts and developing efficient waste management systems.</p>
<p>Strategy 7: Staffing Regularly assess zero waste operations and address staffing needs when necessary.</p>	<p>Strategy 8: Institutionalize Zero Waste at Swarthmore Continue developing tangible, impact-based measurements for achieving zero waste.</p>
<p>Strategy 9: Policies to Promote Reduction First, Then Diversion Craft policies that incentivize sustainable purchasing, including regulating the use of plastic packaging and single-use plastics.</p>	<p>Strategy 10: External Community Engagement & Role in the Just Transition Work together with local, regional, and national stakeholders to build zero waste infrastructure and address environmental injustice.</p>

For more information about zero waste, please visit our website or email zerowaste@swarthmore.edu.