

8th Annual Waste Audit

WPI Green Team and Office of Sustainability

Conducted on April 11, 2019

A waste audit of the Rubin Campus Center was organized by the Green Team and Office of Sustainability and completed on April 11, 2019, by 12 students and 3 volunteer faculty members. The goal of a waste audit is to separate the recyclables and the trash, determine recycling rates and identify areas in which WPI could improve its waste stream. Participants of the waste audit underwent safety training during the previous Green Team meeting, and those who could not attend were given a briefing at the event. In order to sort the waste, everyone needed to wear Tyvek suits, two layers of gloves, and safety glasses (see figure 1). The waste audit consisted of two parts, which were sorting the contents of the trash bags and sorting contents of the recycling bags. Bags were weighed before and after being sorted in order to calculate our percent error. The contents of the bags were sorted into 7 categories: trash, food waste, non-hazardous liquids, paper, plastic bottles, plastic/glass and cans, and cardboard.



Figure 1: Volunteers sorting through recycling bags

Recycling Rates

At the end of the waste audit, the Green Team calculated two recycling rates which can be used to compare the results to past and future audits. Formula A is the percent of waste items placed in recycling. This measure is reliant on how students, faculty, and other end users sort their waste. Formula B is the percent of waste found in both landfill and recycling bins that was actually recyclable. This measure depends on the types of trash consumers on campus generate. The recycling rate produced by Formula A is **19.23%** and the potential recycling rate produced by Formula B is **19.27%**. The recycling rate is nearly identical to that calculated during the 7th Annual Waste Audit (19%), though the potential recycling rate is much lower this year (previously was 29%).

Formula A

$$\frac{\text{Total Weight of items Initially in the Recycling Bins}}{\text{Total Weight of all Waste (Trash + Recycling)}} * 100\% = \text{Recycling rate}$$

Formula B

$$\frac{\text{The Total Weight of All Recyclable Items}}{\text{Total Weight of All Waste (Trash + Recycling)}} * 100\% = \text{Potential recycling rate}$$

Data

The following data were gathered and summarized during the waste audit (see Table 1). The charts in Figures 2 and 3 show the proportion of recyclables to trash.

Initial Waste

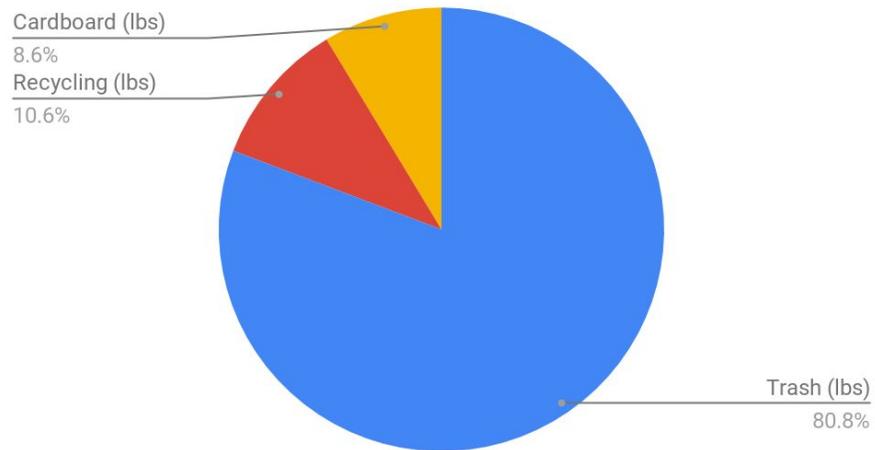


Figure 2: A pie chart of the weights of the initial bags of waste.

Sorted Waste

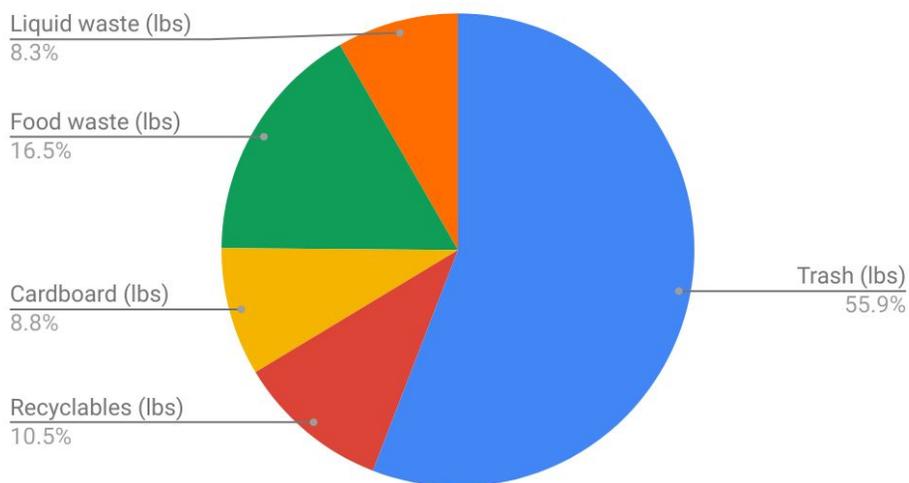


Figure 3: A pie chart of the weights of the sorted waste.

Table 1: Data from the 8th Annual Waste Audit

Unsorted		Notes
Trash (lbs)	477.2	
Recycling (lbs)	62.6	
Cardboard (lbs)	51	
Total waste (lbs)	590.8	
Recycling rate	19.23%	* Includes cardboard
Sorted		
Trash (lbs)	328.8	
Recyclables (lbs)	61.8	* Includes only paper, bottles, and plastic/glass/cans
Cardboard (lbs)	51.6	
Food waste (lbs)	97.4	
Liquid waste (lbs)	49	
Paper (breakdown) (lbs)	17.2	
Bottles (breakdown) (lbs)	19.6	
Plastic/Glass/Cans (breakdown) (lbs)	25	
Total waste (lbs)	588.6	
Recycling Rate (potential) (lbs)	19.27%	* Includes cardboard
Other information		
Recyclables in wrong bin (lbs)	30.8	* Includes cardboard
Recyclables in wrong bin (%)	49.84%	
Trash in wrong bin (lbs)	32.8	* Does not include food waste
Trash in wrong bin (%)	9.98%	
True recycling rate	14.03%	* Percentage of correctly recycled to total weight, includes cardboard
Waste correctly sorted (lbs)	72.65%	
Food in wrong bin (lbs)	97.4	* No food waste bags were provided, so we can't calculate percentage
Error		
Total error (lbs)	2.2	* This error was likely due to the precision of the scale (0.2 lbs precision)
Total error (%)	0.37%	* Calculated as a percentage of the total waste delivered

Analysis

Upon completing the waste audit, the following analysis was made based on the data.

1. There is a large quantity of trash compared to recyclables. Some items may have been recyclable at the time of their original disposal; however, after being placed in the trash, they were contaminated by other waste. As a result, these items were categorized as trash during the waste audit. However, a large portion of the waste is never recyclable even before contamination. This is a result of the packaging and material choices made by the organizations and individuals that create waste in the CC.
2. The recycling rate has not improved between this year and last year, although the amount of waste was more than halved. This finding may not be a good thing though because the contents of the food waste bins were not considered in this calculation, meaning compared to last year, the recycling rate has decreased. Unfortunately, we are unable to calculate how much it has decreased since last year as we do not have the weight of this year's food waste.
3. A sixth of the total sorted waste was improperly discarded food waste, as the Campus Center has dedicated food waste bins. This is half of what it was last year, which most likely indicates that a decent amount of food waste is being diverted from the traditional waste stream.
4. The recycling bins contained a lot of trash (50% of the recycling bin content was not recyclable), but the trash bins did not contain many recyclable items. This indicates that there is still confusion over what is actually recyclable, and it has increased since the last waste audit (previously was about 39%).

Recommendations

1. Research a solution to the problem of contaminated reusable plastic containers going into the trash
2. Eliminate compostable-ware products
3. Research the need to place food waste containers in common areas throughout the Campus Center, and temporary food waste containers in meeting rooms during events

Acknowledgments

The waste audit would not have been possible without:

- **Facilities** who collected and brought all of the waste bags, tables, and bins to our event location
- **WPI Environmental Health and Safety** who provided safety training and supplies
- **The volunteers** who participated in this year's waste audit
- **Liz Tomaszewski** who coordinated this event with the Green Team

