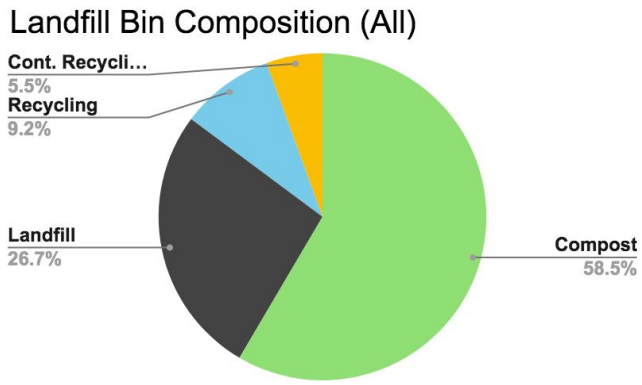
Waste Audit Report

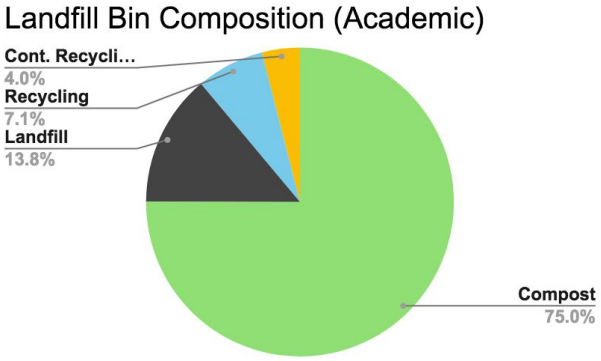
The sustainability office conducted nine waste audits between November 2019 and March 2020, collecting data on and sorting through 167.05 kg of waste, to gain granular data on and deeper insight into Vassar's waste habits. The waste audit team conducted audits in residential halls, academic buildings, and the common areas in Main such as express and retreat to try to get a representative picture of the composition of Vassar's waste stream and identify areas of improvement.

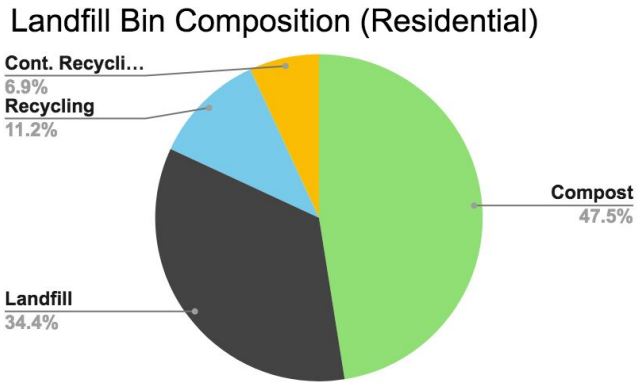
Procedure Overview:

The team collected bags of waste from landfill bins, recycling bins, and compost bins. The contents of each bag were then sorted into the following categories: landfill, recycling, compost, and contaminated recycling. Compostable plastics were categorized as compost, even though some are recyclable (as a #7 plastic, however, they are much less valuable than other plastics and are often deemed too expensive to recycle by recycling companies). Liquids were removed from bottles and other containers. Each category was then weighed in kilograms. All weights under 0.1 kg were originally recorded as <0.1kg and later converted to 0.05 kg for ease of performing calculations.

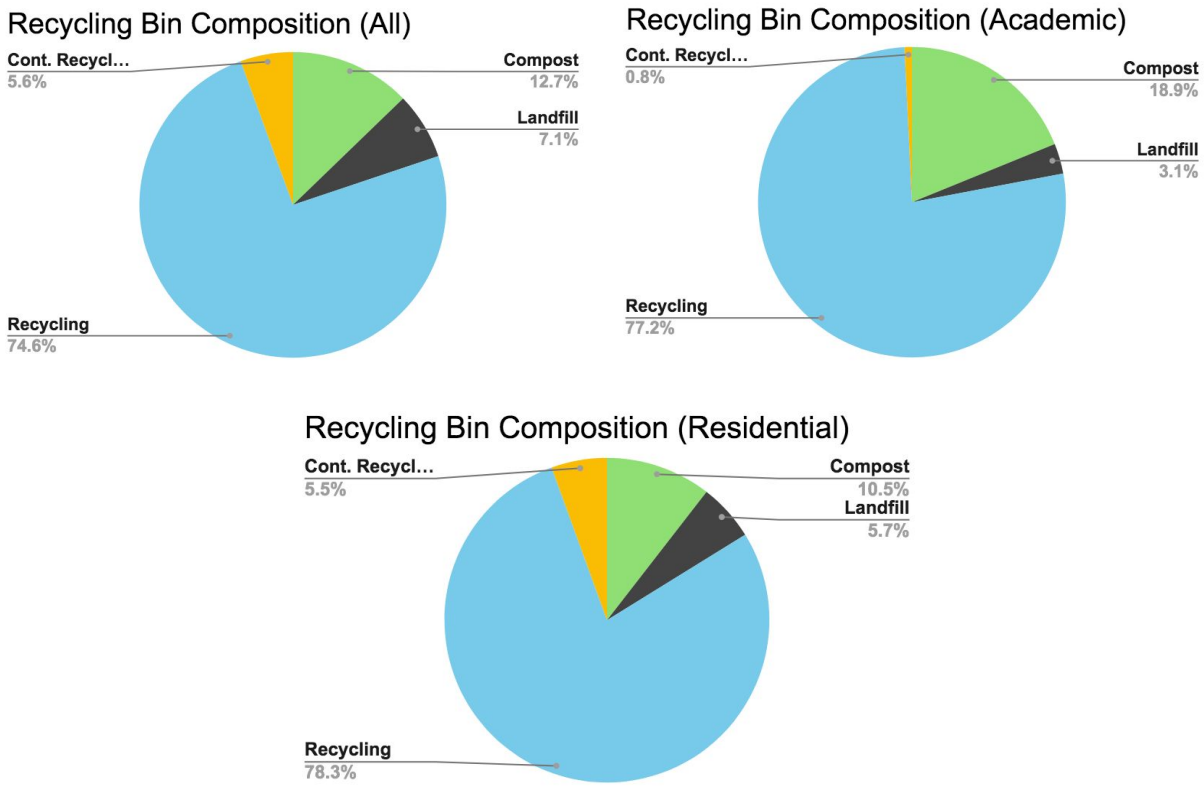
Findings



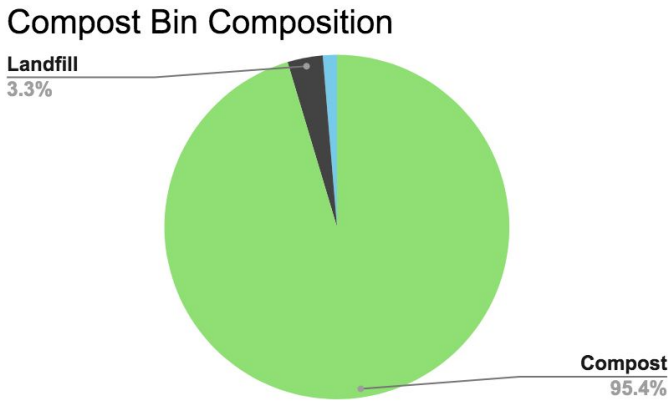




On average almost 75% of the waste in the landfill bins can be diverted if properly sorted. In academic buildings, this number is over 85%. In residential buildings, it is around 65%.



Unfortunately there is an extremely high rate of recycling contamination, averaging 32.69%. In academic buildings, contamination is 31.42%, and in residential buildings it is lower, at 26.39%. Counting compostable plastics as compost rather than recycling is a contributing factor to the high contamination rates. However, many of these were themselves contaminated with food residue. The lowest contamination rates were in paper-only bins, such as those in the printer rooms in dorms. Much of the landfill contamination consisted of non-compostable food containers, food wrappers (especially chip wrappers), gloves (from custodial staff), plastic bags, and other plastic film and packaging. Contaminated recycling either had food residue on it or, in the case of paper, was waterlogged, usually from people leaving liquid in bottles or cups.



The compost sample size is small (n=5), and more data points are needed to get a more accurate assessment of the composition of compost bins. The bags we sorted were from Express and Retreat. Contamination rates are on average less than 5%, far lower than that of the recycling bins. Common contaminants include sauce packets, non-compostable sauce containers from sushi/poke bowls, plastic utensils, and non-compostable food wrappers.

Overall, much work needs to be done to increase waste diversion and decrease contamination. Currently, 58.5% of the waste in the landfill bins is actually compostable. When looking at academic buildings, this number shoots up to 75%, as many students eat pre-packed lunches in classrooms. Unfortunately, there is also a high degree of food waste such as half or entirely uneaten sandwiches, unopened bags of chips, partially eaten salads etc. In **date,** Vassar switched much of its food packaging to compostable materials, yet failed to take the concurrent step of vastly expanding compost availability and effective educational materials such as signage. Thus, switching to compostable packaging in effect helped the Vassar population assuage their guilt more than it actually made any sort of positive environmental impact. It could actually be doing more harm than good, because the production of compostable plastics often has a higher environmental impact (although I do not have the data for the specific products Vassar uses). One of the best ways to increase landfill diversion rates would be to implement front-of-house composting and composting in academic buildings (and then residential buildings). However, there are challenges that would need to be addressed, namely contamination.

Currently, waste in the front-of-house compost bins at the Gordon Commons, Retreat, and Express is thrown out (either landfilled or incinerated). This is because the contamination rates in these bins are too high for Greenway–the composting facility we use– to handle, as they do not have the staff nor facilities to sort through the bags to remove possible contaminants. After arriving at the Greenway, the bags and contents are dumped on existing compost piles and left to decompose. Therefore, even the slightest contamination creates so much extra work that it renders the entire bag unviable. This means that Vassar would either have to get contamination rates down to practically zero, switch to a different (likely less local) compost provider (or retain our current provider for back-of-house composting and add a different provider for publicly accessible bins), or sort through the compost before sending it to the facility. To implement real front-of-house composting in dining facilities and additional composting in other buildings, Vassar would first have to come up with an effective messaging and educational

campaign that reached the entire student body, such as including it as a mandatory part of first year orientation. The appropriate information must also reach faculty, staff, and visitors.

This is especially necessary for dining staff, as currently back-of-house compost has extremely high contamination from visual examination, especially that from express and retreat. I frequently found foil-wrapped sandwiches, plastic wrap, gloves, and non-compostable containers in those bins which are only used by dining staff. Some of the back-of-house compost bins appear to have a much higher contamination rate than the front-of-house ones, which had an average contamination rate of less than 5%. Most of the front-of-house contamination is from sauce packets, wrappers, and plastic silverware (the non-compostable plastic silverware (why is that being used in the first place?) and the compostable plastic silverware are sometimes put out mixed together).

Unfortunately, Vassar's recycling rate is much lower than it could be. In 2019, only 12% of the waste stream was actually sent to the recycling facility, according to data from the waste hauler (Table 7). However, 27.9% of the waste present in the audits is recyclable. This disparity in amount of material that is recyclable and what actually gets recycled is partly due to the extremely high contamination rates: 64.3% of the recycling bins had contamination rates greater than 15 % (80% in academic buildings and 58.8% in residential buildings).

Lack of proper training for custodial staff also contributes to the low rates of material that actually gets recycled. According to some members of the custodial staff that I talked to, some of their colleagues indiscriminately combine bags from the landfill bin and recycling bin into one bag that ends up in the landfill dumpster. Multiple staff members concerned with sustainability mentioned that there needed to be better training, clearer instructions/protocols, classes, or semi-regular meetings. Another problem that repeatedly came up is liquid in trash and recycling bags. Making sure all liquids are emptied out of containers before recycling or landfilling them must be included in future educational campaigns.

According to the data from these waste audits and 2019 data from the waste hauler (Table 7) if Vassar's waste were properly sorted, an estimated additional amount of 109.13 tonnes could be diverted from landfill/incineration (approximately 82 tonnes of additional compost and 27 tonnes of additional recycling). This would drastically reduce Vassar's environmental footprint and potentially even save on costs (for example from contamination fines), and Vassar needs to take steps to head in this direction.

The best thing to do is to reduce the amount of all kinds of waste produced in the first place. I would argue it is more important to reduce the total amount of waste than to increase diversion rates while the total amount of waste produced remains static. Thus, in addition to increasing diversion rates, Vassar must work on reducing waste in general, especially food packaging and food waste, and implement a wide reaching and comprehensive "zero waste" or low-waste education initiative.

Add sample size (n=), fix table formating

Tables

Table 1: Landfill Bin Composition

All Audits	Total Bag	Compost	Landfill	Recycling	Cont. Recycling
Percentage	100%	58.46%	26.75%	9.25%	5.55%
Weight (kg)	110.85	64.8	29.65	10.25	6.15
Academic Only	Total Bag	Compost	Landfill	Recycling	Cont. Recycling
Percentage	100%	75.04%	13.84%	7.13%	3.99%
Weight (kg)	35.05	26.3	4.85	2.5	1.4
Residential Only	Total Bag	Compost	Landfill	Recycling	Cont. Recycling
Percentage	100%	47.49%	34.42%	11.18%	6.90%
Weight (kg)	68.85	32.7	23.7	7.7	4.75

Table 2: Recycling Bin Composition

All Audits (n=	Total Bag	Compost	Landfill	Recycling	Cont. Recycling
Percentage	100%	12.74%	7.09%	74.61%	5.55%
Weight	48.65	6.2	3.45	36.3	2.7
Academic Only (n=	Total Bag	Compost	Landfill	Recycling	Cont. Recycling
Percentage	100%	18.90%	3.15%	77.17%	0.79%
Weight (kg)	6.35	1.2	0.2	4.9	0.05
Residential Only (n=	Total Bag	Compost	Landfill	Recycling	Cont. Recycling
Percentage	100%	10.49%	5.70%	78.26%	5.55%
Weight (kg)	33.35	3.5	1.9	26.1	1.85

Table 3: Compost Bin Composition

All Audits	Total Bag	Compost	Landfill	Recycling	Cont. Recycling

Percentage	100%	95.36%	3.31%	1.32%	0.00%
Weight (kg)	7.55	7.2	0.25	0.1	0

Table 4: Average Recycling Contamination

	All	Academic	Residential
Percentage	32.69%	31.42%	26.39%
Weight (kg)	15.90	2.00	8.80

Table 5: Recycling Bins with greater than 15% contamination

	All	Academic	Residential
Percentage	64.30%	80%	58.82%

Table 6: Average Compost Contamination (retreat and express only)

	All
Percentage	6.47%
Weight (kg)	0.49

Table 7: 2019 Waste Hauler Data

Waste Tonnage	1,401.78
Recycle Tonnage	207.87
Compost Tonnage	107.66
Total	1717.31