

WASTE AUDIT ANALYSIS

Las Positas College

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Project Background

Las Positas College secured the services of Race to Zero Waste (R20W) to perform a waste audit and analysis of key campus buildings during the Spring 2026 semester. The recommendations from the analysis will be used by the CA Climate Action Fellows, with guidance from R20W, to improve waste diversion systems at Las Positas College.

After an initial facility walk-through that included photos of bins, signage, and material collection areas, the study was conducted in three distinct segments: (1) Custodial staff set aside material from each waste stream across key campus buildings (2) Custodial staff, Fellows, and R20W staff performed an audit of the material and recorded the data (3) R20W wrote and submitted this final report presenting the data, analysis, and recommendations for improving waste diversion systems.

The waste composition analysis focused on a total of four days of waste generation, but broken up into two separate audits to get a two-day average. The audit days were May 6th and May 8th. The objective was to determine the composition of each waste stream by material type (12 categories were used).

The recommendations for improving waste diversion systems were made based on both the observations from the initial walk-through and analysis of the data gathered during the study. They draw upon R20W's years of experience pursuing zero waste efforts at buildings and campuses across the wider Bay Area.

The study design, supervision, and final report were executed by Evan Belk, Zero Waste Manager at R20W.

Methods

The methods that were used to determine the composition of each waste stream were as follows: **(1)** Collect a sufficient quantity of material from each waste stream across key campus buildings **(2)** Separate the material into 12 categories per waste stream and building/building group **(3)** Record the weight of each category of material collected.

Collecting Material from Key Buildings

The buildings targeted for the study were Buildings 1000 (Classroom Building), 1600 (Student Services & Administration Building), 2000 (Library), and 2100 (Academic Support & Office Building).

The Custodial staff collected material on Monday-Tuesday (to be audited on Wednesday, May 6th) and on Wednesday-Thursday (to be audited on Friday, May 8th). During these days, all bags of material from the targeted buildings were collected, labelled (to indicate building of origin), and staged near the audit sorting area.

During the audit week, green, blue, and clear bags were used for compost, recycle, and landfill bins respectively. This allowed the audit team to tell which stream each bag of material was coming from.

Sorting Material Into Categories

On the audit days (May 6th and 8th), the material collected was divided into two groups. One group was the material from Building 1600, which contains the Cafeteria and thus most of the food-related waste. The second group was the material from Buildings 1000, 2000, and 2100, which contain classrooms, offices, and study spaces.

For each material stream (compost, recycle, or landfill) and group, the goal was to sort through a 200-pound minimum sample on each of the audit days. Round garbage containers and a scale were used to measure out at least 200 pounds of bagged material for each sample. If 200 pounds of material was not present, the sample was still sorted and a note was made.

In summary, the goal was to sort through the following samples on each audit day:

- Building 1600 (Cafeteria)
 - Compost (200 lbs minimum)
 - Recycling (200 lbs minimum)
 - Landfill (200 lbs minimum)
- Buildings 1000, 2000, and 2100
 - Compost stream not considered; no compost bins in these buildings
 - Recycling (200 lbs minimum)
 - Landfill (200 lbs minimum)

On the audit days, each sample was hand-sorted by Custodial staff, Fellows, and R20W staff into 12 categories between the hours of 10am-4pm, under the supervision of an experienced R20W staff member.

The 12 categories used were the following:

1. Glass
2. Metal
3. Plastic Bottles, Tubs, and Containers
4. Mixed Paper
5. Cardboard
6. Batteries
7. Dairy and Juice Cartons (including aseptic)
8. Compostable Food Service Ware
9. Food Scraps
10. Paper Towels
11. Miscellaneous
12. Landfill

Each of the 12 categories corresponded to a labelled round garbage container. Before sorting began, the tare weights of each container were recorded and written on the container. During the sorting process, labelled bus tubs were also placed strategically on the sorting table, to make the sorting process easier. When a bus tub became full, it was emptied into the corresponding round garbage container.

Recording Material Weights by Category

After sorting a sample, the full garbage containers were all staged near the scale and each material category was weighed. The gross and tare weights of each full container were entered into a spreadsheet by R20W staff, and the spreadsheet subtracted the two weights to find the weight of the material. After the material had been weighed, it was emptied into the proper dumpsters or receptacles by facilities staff.



Image 1: Audit sorting area at Las Positas College

Results and Analysis

The data from both audit days was combined to produce the graphics and analysis in this section; the phrase “[building/buildings] sample” generally refers to the average of the samples from both audit days of the building or buildings in question. Throughout the section, Building 1600 is referred to simply as “cafeteria,” and Buildings 1000, 2000, and 2100 are referred to simply as “classroom/office buildings.” As a reminder, the compost stream was only considered for Building 1600, not for Buildings 1000, 2000, and 2100.

Compost Composition Analysis

Building 1600 (Cafeteria)

The compost sample was almost entirely composed of food scraps and paper towels (Figure 1). It was therefore made up almost entirely of material that is meant to be in the compost stream, and very little that is meant to be in the recycling or landfill streams (Figure 2). The compost samples for both audit days were easily above the 200-pound target, with food scraps and paper towels each weighing more than 100 lbs on both of the days.

Figure 1: Cafeteria compost sample composition by material category

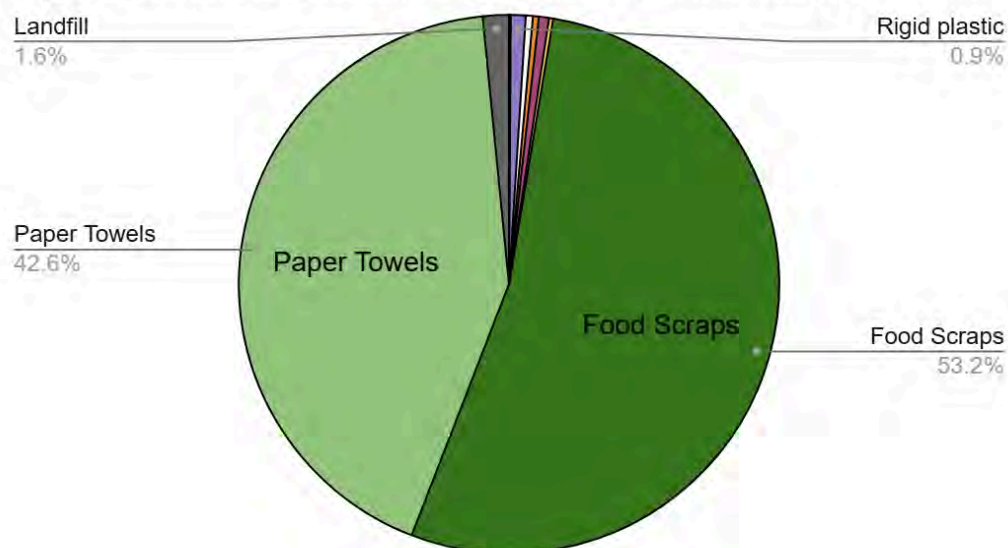
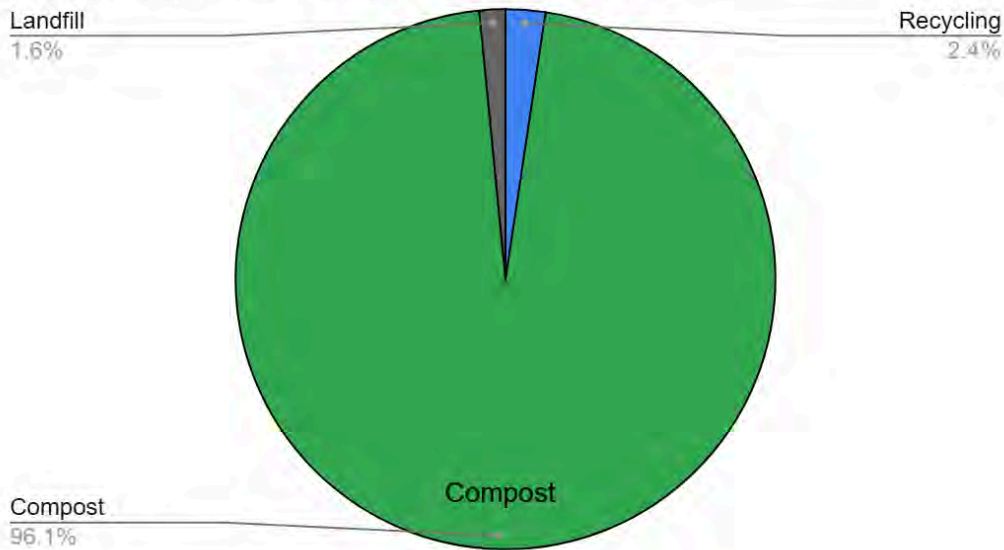


Figure 2: Cafeteria compost sample composition by stream



The food scraps portion of the sample was held in totes from behind the cafeteria kitchen, and was sorted by shoveling material from the toter into the labelled food scraps garbage container (weighed when full) and pulling out any contaminants along the way. Generally, the food scraps were free from contaminants, aside from some dairy/juice cartons and bits of saran wrap or gloves. This suggests that the cafeteria kitchen staff mostly understand what can go into their kitchen compost containers.

The paper towels all came from green bags that had been collected from the cafeteria bathrooms. In fact, all of the green bags that were sorted as part of the compost sample appeared to come from the bathrooms, suggesting that the regular compost bins in the cafeteria seating area were not lined with green bags. Since there was no way to tell which of the clear bags from the cafeteria came from the compost bins, the clear bags were all still considered as part of the landfill sample. There was a small number of green bathroom bags from classroom/office buildings as well, which were sorted as part of the compost sample for the cafeteria.

Because the system of color-coded bags was new to the campus and facilities staff on the week of the audit, it is understandable that it was not universally applied. However, this does skew the data for the compost stream, suggesting that it is 96.1% clean (Figure 2), when there would certainly have been more contamination if the compost bins in the cafeteria seating area had been lined with green bags and thus considered as part of the sample.

Recycling Composition Analysis

Building 1600 (Cafeteria)

The largest percentage by far of the recycling sample from the cafeteria was the cardboard (Figure 3), which appeared to come mostly from deliveries to the kitchen. Figure 4 shows that the recycling sample composition by material stream was 97.7% recycling, driven mainly by the large amount of cardboard.

Figure 3: Cafeteria recycle sample composition by material category

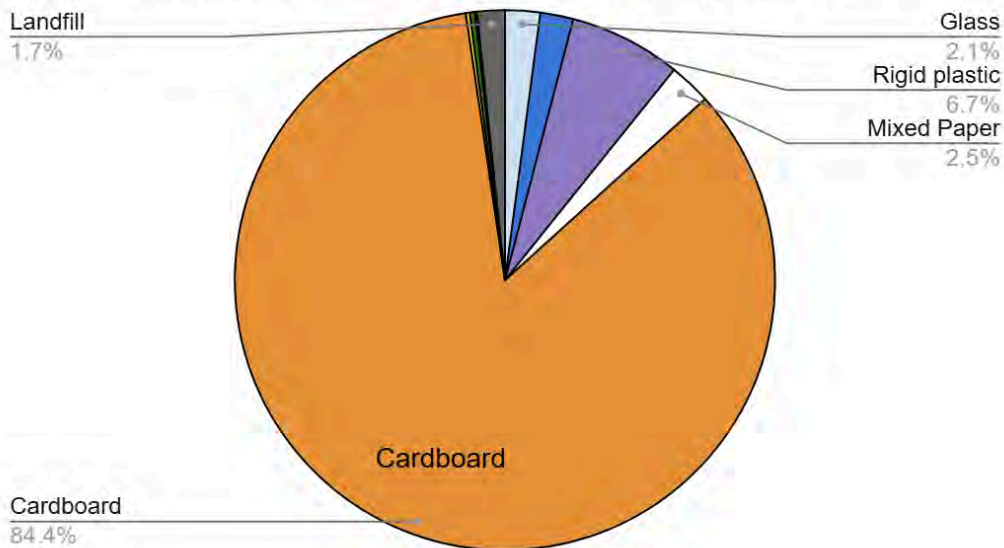
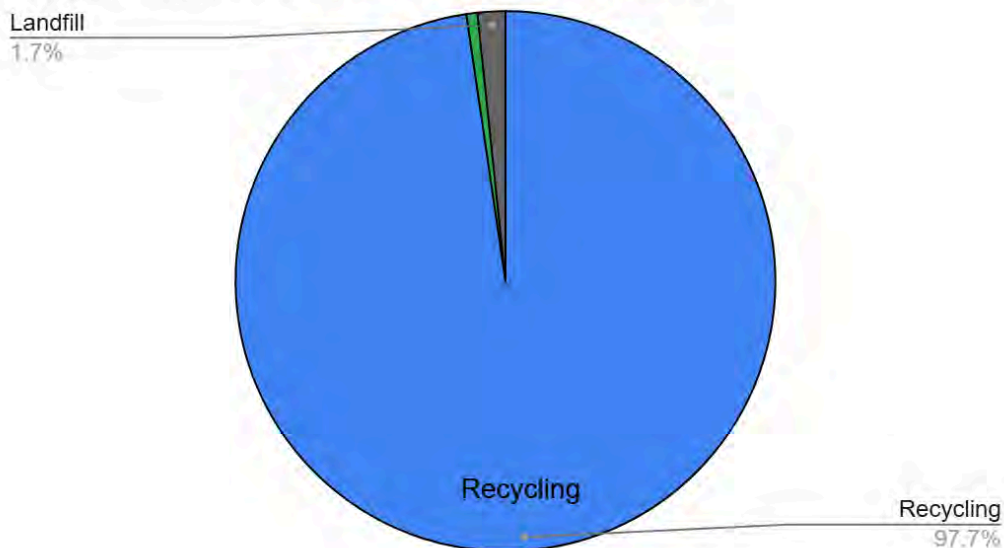


Figure 4: Cafeteria recycle sample composition by stream



To provide a better idea of the contents of the recycling bins that students, faculty, and staff use in the cafeteria, Figures 5 and 6 show the same information as Figures 3 and 4 but with

the cardboard removed from the analysis. In other words, they show the contents of the bagged recycling. Material that should have been landfilled made up just over 10% of what had been put into the recycle bins, and together with compostable material, nearly 15% percent of what was in the bagged recycling portion of the sample was contamination. This is not an extremely high number, but as the last paragraph of this section will explain, it likely would have been higher with a larger sample size of bagged material.

Figure 5: Cafeteria recycle sample composition by material category (excluding cardboard)

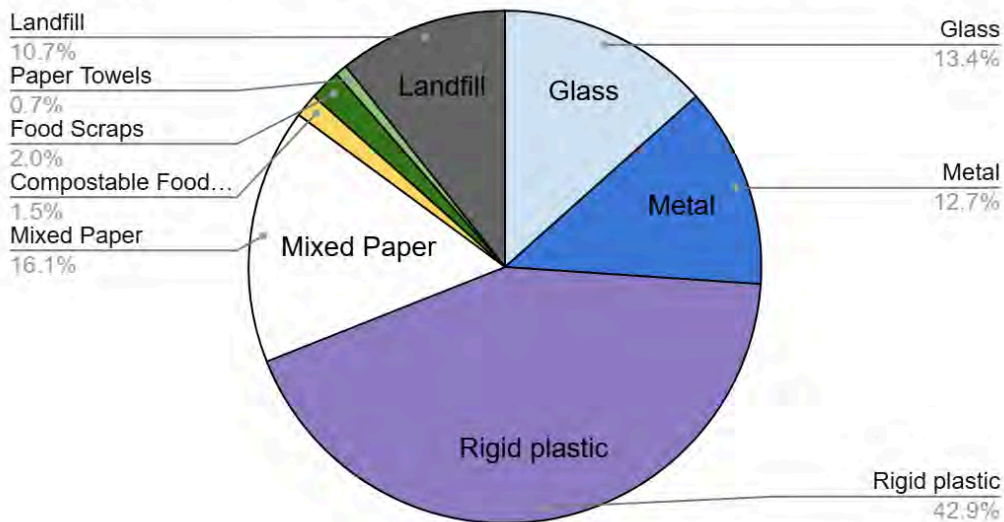
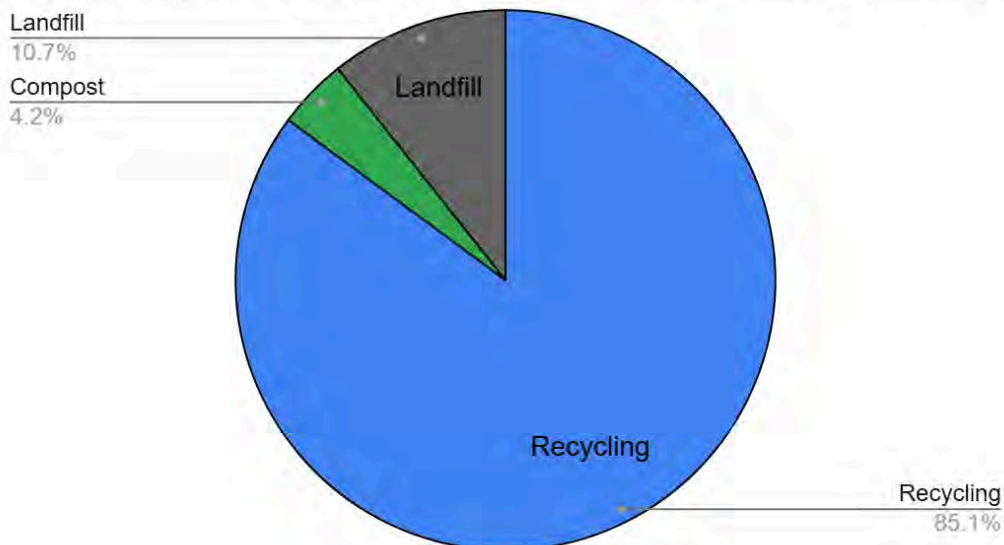


Figure 6: Cafeteria recycle sample composition by stream (excluding cardboard)



The bagged portion of the sample contained a large percentage of rigid plastic (Figure 5), reflecting the fact that the bags came from the cafeteria, where food and drink are consumed out of plastic cups, bottles, and containers. During the sorting process, no distinction was made between recyclables that were too dirty to be recycled and those that were sufficiently clean. The emphasis was on material type, as under ideal circumstances the containers would be rinsed before being placed in the recycling.

An important factor in the consistently low contamination rate of the bagged portion of the recycling sample was that the sample was very small. The bagged recycling was nowhere near the 200-pound target on either of the audit days, coming to 53 lbs on the first audit day and 27.6 lbs on the second (cardboard alone was 259.8 lbs on the first and 175.8 lbs on the second). The small number of blue bags suggests that some of the recycle bins in the cafeteria were not bagged using blue bags, as would ideally have been the case.

Buildings 1000, 2000, and 2100 (Classroom/office buildings)

Figure 7 shows the composition of the recycling sample by material category for the classroom/office buildings, which did not contain the large volume of unbagged cardboard that the cafeteria sample did. Compared to the bagged portion of the cafeteria recycling sample (Figure 5), the percentage of mixed paper was much higher for classroom/office buildings, given that they are mainly used for classes, studying, and work, rather than for eating. Also of note is that the percentage of compostables (Figure 8) was much higher than in the cafeteria recycle stream (Figure 6), likely due to the lack of compost bins in the classroom/office buildings.

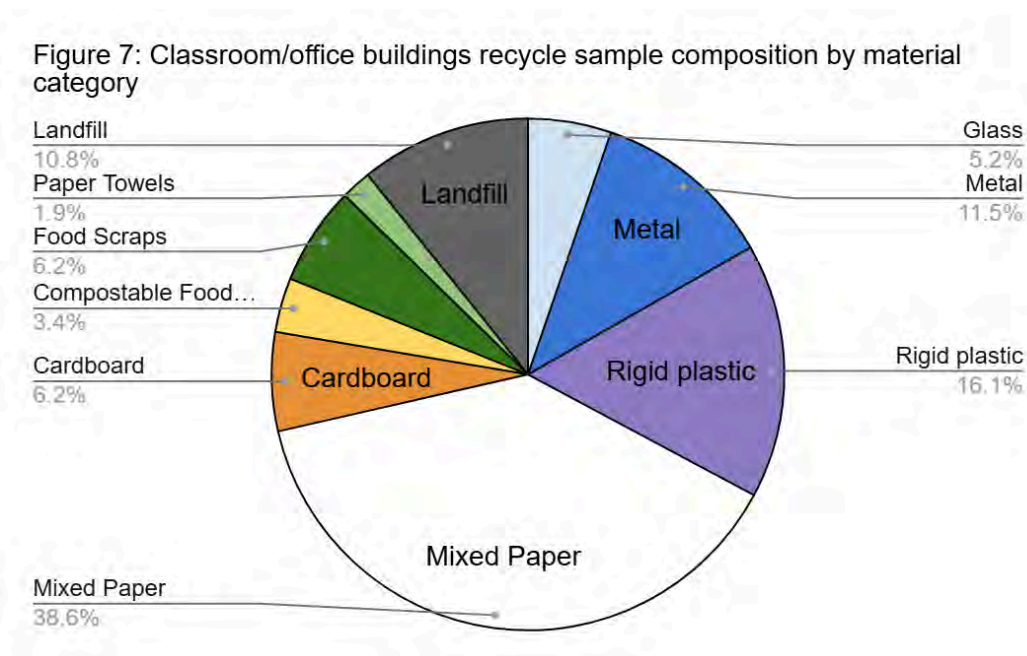
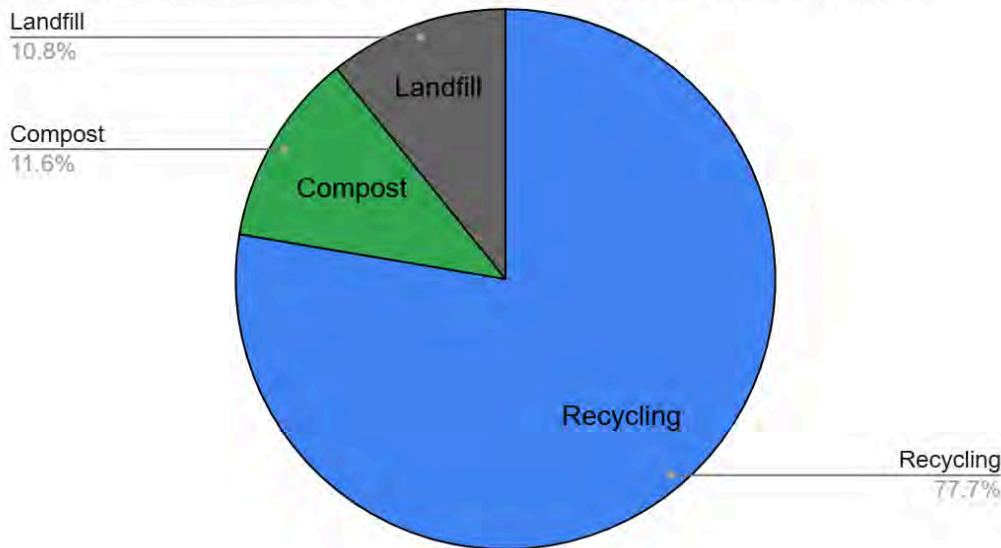


Figure 8: Classroom/office buildings recycle sample composition by stream



As shown by Figure 8, the sample was over 20% contaminated, with a roughly even split between landfill and compost (10.8% and 11.6% respectively). The increase in overall contamination rate compared to the cafeteria recycling sample (which fell closer to 15%) was driven by the increase in compostables described at the end of the previous paragraph.

While 20% is still not a particularly high contamination rate, especially given the lack of compost bins in these buildings, the classroom/office building recycling samples (like the cafeteria recycling samples) did not reach the 200-pound sample weight target. They were, however, much heavier than the cafeteria bagged recycling samples, at 139.4 lbs for the first audit day and 81.6 lbs for the second one. Therefore, more recycling bins were bagged using blue bags across the classroom/office buildings than in the cafeteria, though certainly not all of them, given the quantity of landfill bags from the classroom/office buildings (discussed in the following section).

Landfill Composition Analysis

Building 1600 (Cafeteria)

The landfill sample from the cafeteria was 80% contaminated, meaning that only 20% of the sample was composed of material that should have been sent to landfill (Figures 9 and 10). This is a very high contamination rate. The largest category of contaminants was compost, making up more than half of the sample weight, given that it came from the cafeteria building. Recycling made up just under 30% of the sample weight.

Figure 9: Cafeteria landfill sample composition by material category

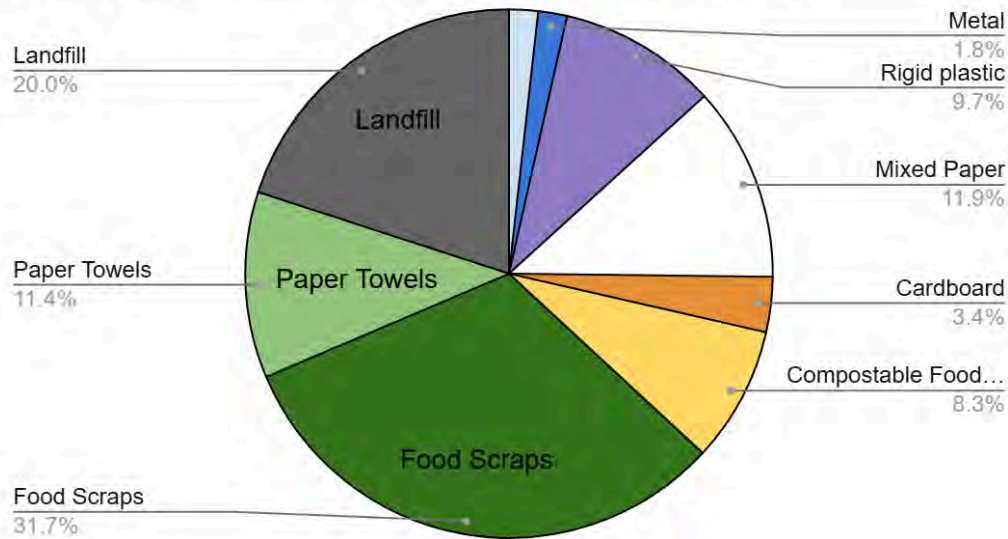
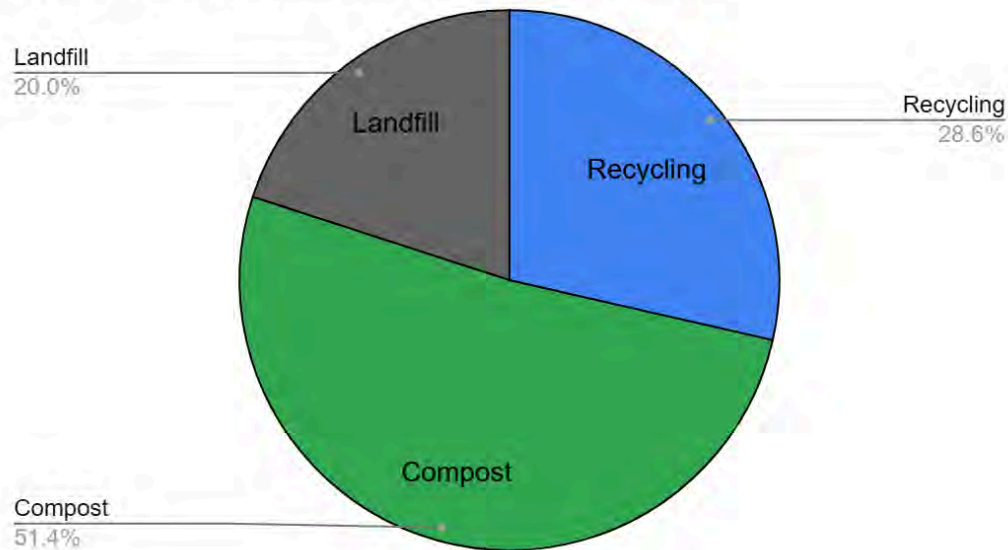


Figure 10: Cafeteria landfill sample composition by stream



The bagged landfill material from the cafeteria was much closer to meeting the 200-pound target sample weight than the bagged compost and recycling that came from the same building. On the first audit day, the sample was 191.4 lbs, and on the second it was 147.6 lbs. However, as discussed previously, some of this “landfill” material likely came from compost or recycle bins that mistakenly had clear bags instead of blue or green ones. This would also have contributed to the high contamination rate for this landfill sample.

Even if some portion of the clear bags that comprised the cafeteria landfill sample were from compost or recycle bins, the level of contamination present demonstrates a clear need for increased education and clear signage in the cafeteria building. It is possible, for instance, that some students and faculty are not aware that in addition to food scraps, paper towels and certain foodware items are able to be placed in the compost. Paper towels and compostable foodware together accounted for nearly 20% of the landfill sample (Figure 9).

Buildings 1000, 2000, and 2100 (Classroom/office buildings)

The landfill sample from the classroom/office buildings was nearly 70% percent contaminated, meaning that only 30% of the sample was composed of material that should have been sent to landfill (Figures 11 and 12). This is slightly less contamination than the cafeteria landfill sample, but still very high. Similar to the cafeteria sample, recycling made up around 30%. The percentage of compost was slightly lower at around 40%.

Figure 11: Classroom/office buildings landfill sample composition by material category

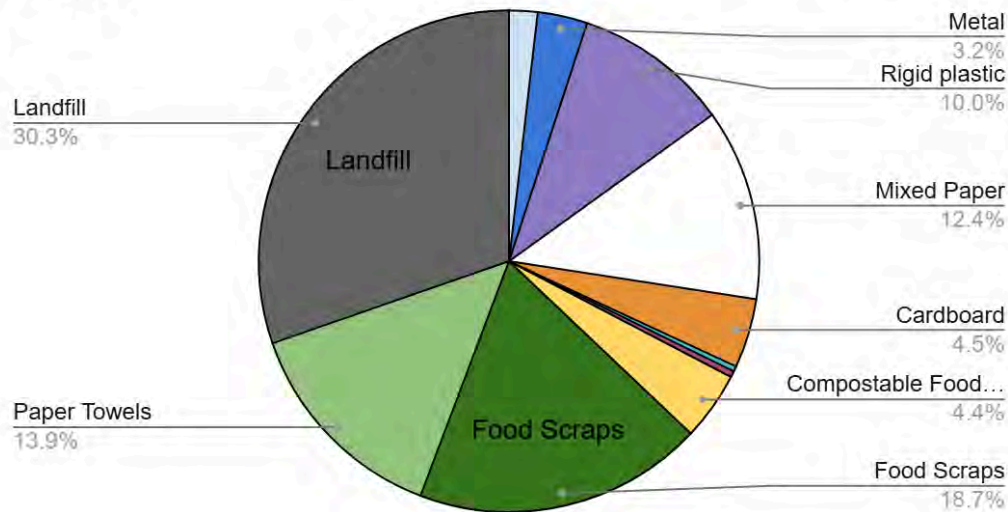
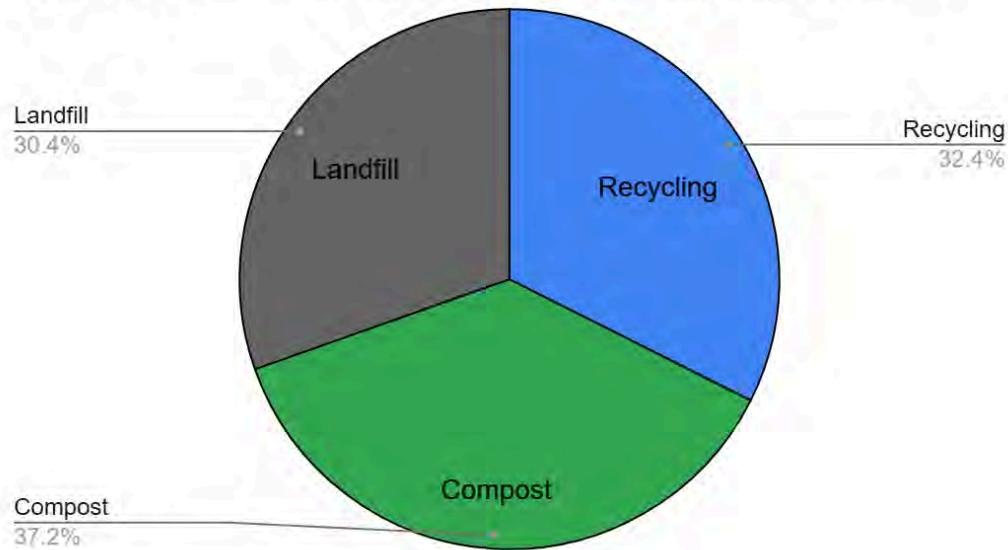


Figure 12: Office/classroom buildings landfill sample composition by stream



The persistently large presence of compost in the classroom/office buildings landfill sample is not as concerning as in the cafeteria, as there are no compost bins in the classroom/office buildings. Thus, compost in the landfill was not due to student or faculty error, but rather a lack of suitable bin options. The significant presence of recycling in the sample, on the other hand, does demonstrate a need for further education and clearer bins/signage, especially around rigid plastic and mixed paper, which made up the largest percentages of the recycling present in the sample (Figure 11).

There was no trouble reaching the 200-pound target sample weight for the landfill material from the classroom/office buildings, and the large quantity of remaining bags was put directly into the landfill compactor after enough material for the sample had been weighed out. The very large volume of clear bags from classroom/office buildings compared to the relatively small number of blue bags from those same buildings (discussed in previous section) does suggest that many of the recycle bins in the classroom/office buildings were not bagged using blue bags, affecting the data for both the recycling and landfill samples from those buildings.

Recommendations

As with the Results and Analysis section, this section refers to Building 1600 simply as “cafeteria,” and to Buildings 1000, 2000, and 2100 simply as “classroom/office buildings.”

Consistent Bins and Signage Across Campus

As the initial walk-through conducted at Las Positas College made apparent, there are a variety of bin and signage types employed across the campus (Image 2). Particularly in the classroom/office buildings, there were an assortment of bins of various sizes, colors, and labels spread across the buildings, often existing as standalone bins. The cafeteria also had some inconsistencies in terms of bin type and signage.

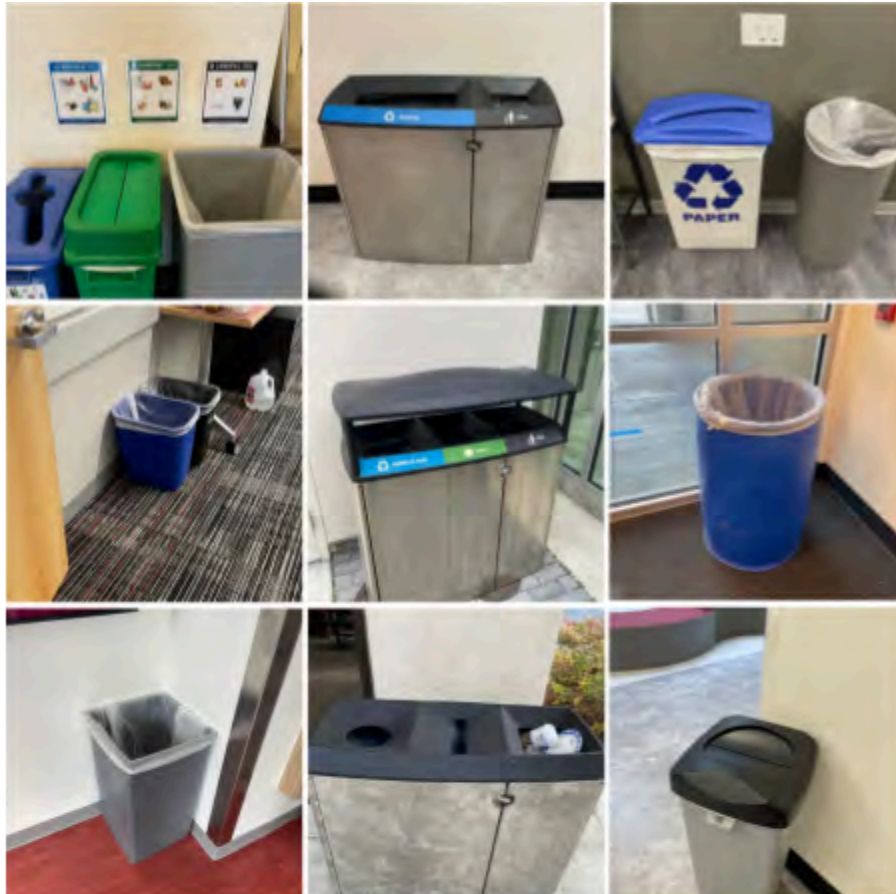


Image 2: Some of the bin/signage types at Las Positas College

This type of inconsistency makes it harder for faculty and students to do the right thing, because what they see at the bin changes depending on where they are, or maybe the right type of bin isn't even available at a given location. The more consistency across campus, the better the source separation outcomes.

It is therefore recommended that the Fellows implement consistent 3-bin systems (compost, recycle, and landfill) and signage across the campus in strategic high-traffic areas to minimize confusion. The bins should be ordered the same way from the perspective of the user at every station (compost left, landfill middle, recycle right). These changes will be especially impactful in the classroom/office buildings, due to the variety of bins described above, and the fact that there are currently no compost bins, resulting in higher compost contamination in the recycling (discussed in Results and Analysis).

Ideally, these 3-bin systems would replace all existing bins, and all smaller or standalone bins (such as in the classroom/office buildings) would be eliminated in favor of centralized collection at the new 3-bin systems in high-traffic areas. In addition to improving student and faculty sorting behavior, this system makes it easier for facilities staff to separate the material correctly.

Full Implementation of Color-Coded Bags

As described in the Results and Analysis section, Las Positas College has not yet fully implemented a system of color-coded bags for its student- and faculty-facing compost, landfill, and recycle bins. Ideally, all compost bins would have green bags, all landfill bins would have clear bags, and all recycle bins would have blue bags.

Using color-coded bags in this way would help the material from campus buildings get to the right place after it is hauled on carts back to the maintenance yard (behind Building 3000) by Custodial staff. Green bags would then be emptied into the compost dumpster or toters, blue bags would be emptied into the recycle dumpsters, and clear bags would be placed directly into the landfill compactor.

Color-coded bags would also make it easier for future waste audits to accurately track the progress that Las Positas College is making toward its zero waste goals, and would help with the challenges that this audit faced in getting sufficiently large sample sizes for each stream (discussed in Results and Analysis).

Replacing Paper Towels With Electric Hand Dryers

The large amount of paper towels that were weighed as part of the cafeteria compost sample (240.4 lbs of towels in total) makes clear the significant opportunity for reducing this specific category of waste. Electric hand driers are a viable alternative and could be implemented in the highest-use bathrooms first to maximize impact.

The fact that bathroom paper towel bags from the cafeteria compost sample were almost entirely clean (only occasional landfill or recycling items) demonstrates little need for any kind of waste receptacles in bathrooms where electric hand driers are installed and paper towels are eliminated.

Student and Faculty Education

Due to a high student turnover rate and variable levels of familiarity with Livermore's waste sorting rules among students and faculty alike, ongoing education efforts by current and future Fellows are essential to Las Positas College's improvement of their waste diversion systems.

This could involve:

- Recruiting students as bin-side educators in high-traffic areas such as the cafeteria during peak hours
- Hosting a “what-goes-where” training for Custodial and other relevant staff
- Including a “what-goes-where” introduction to students as part of their campus orientation
- Providing informational pamphlets on the sides of certain waste stations
- Displaying additional information about zero waste concepts and current sustainability efforts in high-traffic areas for interested students or faculty
 - Perhaps updating the sustainability-themed educational board that exists in the cafeteria

Any creative and engaging education methods are encouraged, and the examples given above are only a few of many possibilities. Approaches that are simple, positive, and fun will tend to garner the best responses.

Ensuring Proper Back-of-House Systems Exist and Updating Website

For any of the above recommendations to be meaningful, it is essential that Las Positas College has the proper receptacle capacity and hauler service to handle the compostable and recyclable material that is separated from the landfill material.

The Las Positas College website’s “Las Positas Goes Green” page has a link at the bottom related to recycling and composting efforts. The link takes the viewer to a page that says “Las Positas College stopped composting AND recycling because it cost money.” If this is *not* the case, the page should be updated as soon as possible. If this *is* the case, then this should be addressed alongside the other recommendations in this final report.

The page in question can be found at this link:

<https://www.laspositascollege.edu/green/recycling.php>

During the initial walk-through and subsequent waste audit, the following final collection receptacles were observed for each stream:

- Compost
 - No visible dumpster in the maintenance yard, but a few empty toters
 - Two toters behind the cafeteria full of kitchen food scraps that are picked up regularly
 - These did not contain any compostable foodware, napkins, or items that that students would have been composting in the cafeteria
 - A “brush pile” composed of plant and tree trimmings from around campus located behind the fence of the maintenance yard
- Recycle
 - Stacked bales of cardboard (from onsite baler) awaiting pickup
 - Two blue metal dumpsters
 - Mostly empty at the time of walk-through, with just a few cardboard boxes

- Landfill
 - Compactor is used

Reusables in Cafeteria (long-term goal)

A huge upstream way to cut back on the amount of waste generated at Las Positas College would be to move from single-use foodware (Image 3) to reusable foodware that is washed onsite. Aside from cardboard from deliveries, rigid plastic was the largest portion by far of the cafeteria recycle sample (see Figure 5 in Results and Analysis), likely driven in part by the single-use plastic foodware used there.

A shift to reusables would require on-site industrial dishwashing capacity, which would be a significant expense, but it is a good long-term goal to consider in making Las Positas College a more zero waste campus. A beneficial course of action in the near-term could be to replace existing plastic bowls, plastic utensils, and lined paper plates with fiber-based alternatives that can all be placed in the compost.



Image 3: Single-use foodware used in the cafeteria

Conclusion

In short, R20W determined via waste audit the composition of Las Positas College's compost, landfill, and recycling streams, and used this information in conjunction with observations made during the initial campus walk-through to provide recommendations for improving waste diversion systems.

The recommendations included standardization of bins and signage, pursuit of student and faculty education, and modification of waste collection and hauling infrastructure as necessary. R20W can provide guidance to the Fellows on implementing these recommendations. Follow-up audits conducted by R20W using the same methods can be used to track improvements over time and set future goals.

R20W wants to sincerely thank the CA Climate Fellows, the Custodial team, William Tandongfor, Owen Letcher, and everyone else who made this project possible.