

Implementing a Composting System in the Villa Apartment Complex: A CSIF Proposal

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I. Introduction

Santa Clara University reduces their carbon footprint by diverting waste to recycling and composting. All over the main campus are bins next to trash cans with directive signs to help members of the community sort their trash properly. The Villas are a university-owned living option for upperclassmen at SCU. Currently, they have a simple recycling program so students can separate recyclables and landfill items; however, the individual apartments lack a composting option. Each apartment has a full-functioning kitchen, so students have the freedom to cook meals as they please. Since these kitchens are being used multiple times a day, their extra food waste is going straight to the landfill. SCU can majorly reduce the overall carbon footprint by diverting food waste in these facilities alone. Our goal is to implement a functional composting system that is easy for students to use (like their recycling system) by Fall of 2016.

If the project is implemented, there would be one composting pail or bin in each unit, so students would share the responsibility for caring for the bins. They can use the bins as much or as little as they need, and it would not require extra work from facilities throughout the school year. Students would fill up the bins within their units, then dispose of their waste outside in a communal dumpster that would be sent to an industrial facility for composting. This would put the responsibility on the students, but since they already have the same process for their own landfill and recycling waste, it will not be a demanding burden. The project requires a one-time investment for the composting bins. If students are irresponsible and damage the bins, the university could implement fines to cover any additional costs. Composting is already picked up regularly from the university complex, so there would not be additional costs for pick up either. Once students move out of the units, the composting bins or pails can be stored with the landfill and recycling bins the students already have.

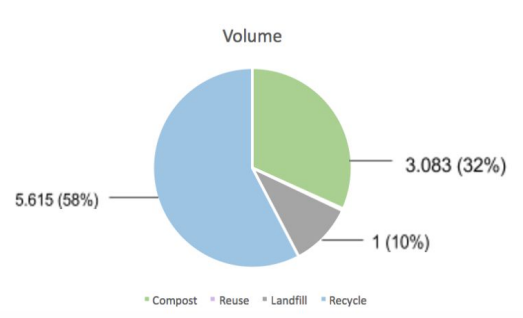
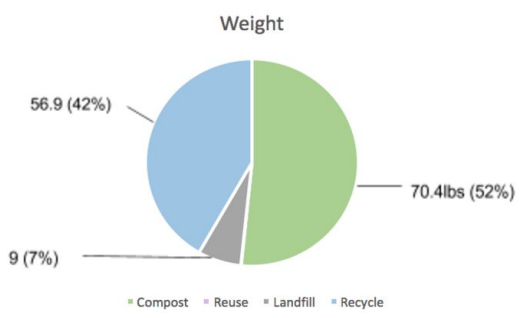
II. Greenhouse Gas Emissions

We estimated the emissions avoided would be 1.63 Metric Tonnes of CO₂ equivalent. We calculated this by assuming each unit will produce 2 pounds of compost a week. (This is a rough underestimation because each unit's amount of residents will vary from 2-8 people. Some units may not use the bin, some units may have all 8 people using the bin). We also assumed students will live in the units for 35 weeks of the year. With these estimated numbers, 5.25 tons of compost will be diverted from the landfill each year.

This project addresses SCU's waste production by diverting landfill waste to composting. A waste characterization for the Villas was done to collect data on what was being thrown out that could've been diverted. The most abundant was food waste. By volume recycling seems larger, but plastics naturally have more volume than condensed food waste. Villa residents are throwing out many materials that are recyclable and compostable into the landfill. Some reasons recycling is going into the landfill improperly is partially due to students lack of knowledge. Most students think they can only recycle glass, aluminum cans, cardboard, paper, but most do not know to recycle all plastics #1-7. Some of the improper sorting is undoubtedly due to laziness or not caring, which is a behavioral issue. The data is also heavily affected by the amount of items that are recyclable compared to the few that are compostable. For composting, the residents do not have an alternative option for their food waste. We can guarantee that not every single resident will use the available pails, but if one person in the entire unit uses it, then an impact is being made.

TOTALS			
MATERIAL	VOLUME	WEIGHT	CATEGORY
paper	0.75	5.3	RECYCLE
cardboard	1	5	RECYCLE
thin-film plastic	1	6.2	RECYCLE
glass	0.333333	19.8	RECYCLE
plastic #1-7	2	14.4	RECYCLE
aseptic	0	0	RECYCLE
terracycle	0.041667	1.7	RECYCLE
const/demo	0	0	RECYCLE
e/univ waste	0.03125	0.1	RECYCLE
metal	0.333333	3.6	RECYCLE
paperboard rolls	0.125	0.8	RECYCLE
reusables	0.03125	0.1	REUSE
biodegradables	2	16	COMPOST
paper towels	0.25	1.1	COMPOST
food	0.833333	53.3	COMPOST
styrofoam	0	0	LANDFILL
landfill	1	9	LANDFILL

	VOLUME	WEIGHT
RECYCLE	5.614583	56.9
COMPOST	3.083333	70.4
REUSE	0.03125	0.1
LANDFILL	1	9
TOTAL	9.73	136.40



Note: Reuse is not seen in the pie chart because it is a negligible amount (about 0%)

III. Amount Requested

We found a few options to consider with varying sizes, benefits, and costs. There are 150 units in the Villas complex, so calculations were done assuming this project is approved as proposed.

Option 1 is a 2.7 gallon pail. It is a more expensive option, but it is made of recycled materials which corresponds with SCU's sustainability focus. It is also dishwasher safe, so students could conveniently clean their bins as often as needed. This would encourage better care for the bins, hopefully making them last even longer. The link leads to the wholesaler's website, and this bin's informational page. The price listed is the wholesale price.



Option 2 is a 2.4 gallon pail that is smaller, but significantly cheaper. Overall, these bins are small, but cost effective. The wholesale price is listed. This option is meant to be used with a carbon filter, meaning that instead of being a one-time purchase, money will need to be spent on the filters as time passes. However, the bins will still function without the filters, so the decision to purchase them could be left to the students and they would therefore be buying the filters themselves.

For Option 3 the wholesaler was not found. Option 3 is also a 2.4 gallon pail, but from a different manufacturer, so the wholesale price could be cheaper than Option 2. Note: this option also has a filter.



Option 4 is a highly suggested option for larger units. Anywhere from 2-8 people could be using the bin, thus one unit may have more food waste and need a larger pail. It is also more expensive, but the retail price is listed. The wholesale option is available, and the wholesale link is attached. This bin has more features with additional costs for upkeep, but are not necessary. These bins we suggest also providing liners for students because the large size makes it difficult to wash. The university does buy small liners for students in residence halls that need them, so more could be ordered from that contact. Note: this option has a filter.

Item	Cost per Item	Quantity	Estimated Tax	Total Cost
Option 1	\$28.98	150	\$326.03	\$4,673.03
Option 2	\$10.98	150	\$123.53	\$1,770.53
Option 3	\$19.99	150	\$224.89	\$3,223.39
Option 4	\$39.99	150	\$449.89	\$6,448

Note: This does not include shipping. We were not able to find costs for buying in bulk for all bin options. For Option 1 and 2 the wholesaler website is linked (their number is 1.877.760.8500).

We believe that option #1 would be best because it does not require a carbon filter and is made from recycled plastics (further aligning with the university’s sustainability vision). We are asking for the full \$4,673.03 because we want every apartment to have a composting bin (just how every apartment has a recycling bin). However, we are aware that plans for Measurable Behavior/Culture Change projects are limited to \$2,000. For this reason, we are willing to compromise for only 60 bins as a pilot, which would cost \$1,869.21 (including California sales tax, but not including shipping).

IV. Measuring Change at the Villas

In the CSIF guidelines it says, “Measurable Behavior/Culture Change projects (those without a measurable Return on Investment) must have a way of measuring a shift in our campus culture of sustainability”. Our project does not have a measurable ROI, but we can measure culture change on campus. We can survey students again asking about how frequently they compost, any issues they’ve been having, and their thoughts on the program. We can also do more waste characterizations to see if there is a downward trend in compostable material in the landfill. We can also take the data from future waste characterizations and estimate the positive impact occurring from diverting waste.

V. Case Study - Tuft’s University

At the beginning of this school year, Tufts University implemented a project called On-Campus Apartment Composting with a very similar model to our project. They have small bins that students empty them into communal dumpsters that are picked up by an outside contractor.

They do not provide every apartment with a bin automatically, like our project aims to. Instead, students have to sign up individually for the bins and pick them up from their office. This would create more unnecessary work for our project, and having the bins already in the apartments may encourage students that wouldn't go out of their way to get the bins to compost their food.

Our project learned from the Tufts project how to educate students. They held a workshop at the beginning of their semester to educate students on how to care for the bins. We want to hold a workshop like this as well, and attach a few tips about composting to the bins (like the signs picturing what can be composted on the big bins on campus). We would include recycling knowledge as well, since the waste characterization came back with so much recyclable material. There are also additional accessories students could buy for their own bins, like compost deodorizer and carbon filters. In our workshop, we would tell students about these options and where to get them. This would help to ensure the compost bins are properly cared for throughout the year.

VI. Consultants and Endorsements

Cara Uy, Sustainability Coordinator, Center for Sustainability

Cara was one of the first people we consulted for this project.

Kayla Wells, Center for Sustainability Intern, Waste Diversion Intern

Kayla organized the waste diversion event and organized the data. She is also familiar with waste diversion issues all over campus. She supported the project from beginning to end.

Miranda Bartosz, Junior Villa occupant with a composting pail

We interviewed Miranda about the current difficulties she's having with her bin, and how we could make the program easier for students. The more convenient it is for the students, the more likely they are to compost often.

VII. Stakeholders

Villa residents would be impacted as we ask a behavioral change from them. This project would support a culture of sustainability on campus and as a lifestyle by providing an alternative option for food disposal and waste diversion; however, the extra work of cleaning and taking it to the dumpster could deter residents from participating.

The University would be impacted by paying for the initial cost of purchasing new bins, and trusting students to care for them properly. The project will benefit the University by helping us reach the zero waste goal by 2020, and by supporting a sustainable culture on campus.

VIII. Additional Comments

We conducted a survey of Villa residents, and only received minimal responses; however, the responses give our project positive feedback. Students talked about their current recycling and garbage habits, and their interest in getting a compost option. A few students have even taken the initiative to compost in the Villas now!

You can read the results from the survey by clicking [this link](#). (Here is the link if you need to copy and paste it:

https://docs.google.com/a/scu.edu/forms/d/16c-uMf8TQ0tE9PI4cbGqrocYal-sd_E3ggPL-XjTkcQ/viewanalytics)

Kim and Chonsa are available to come in between 12:15-1:15pm to discuss any unanswered questions or to clarify any confusing aspects of the proposal.

Thank you for your time and consideration.