



DIVERTING WASTE FROM LANDFILL IN UNIVERSITY APARTMENTS

STAKEHOLDERS:

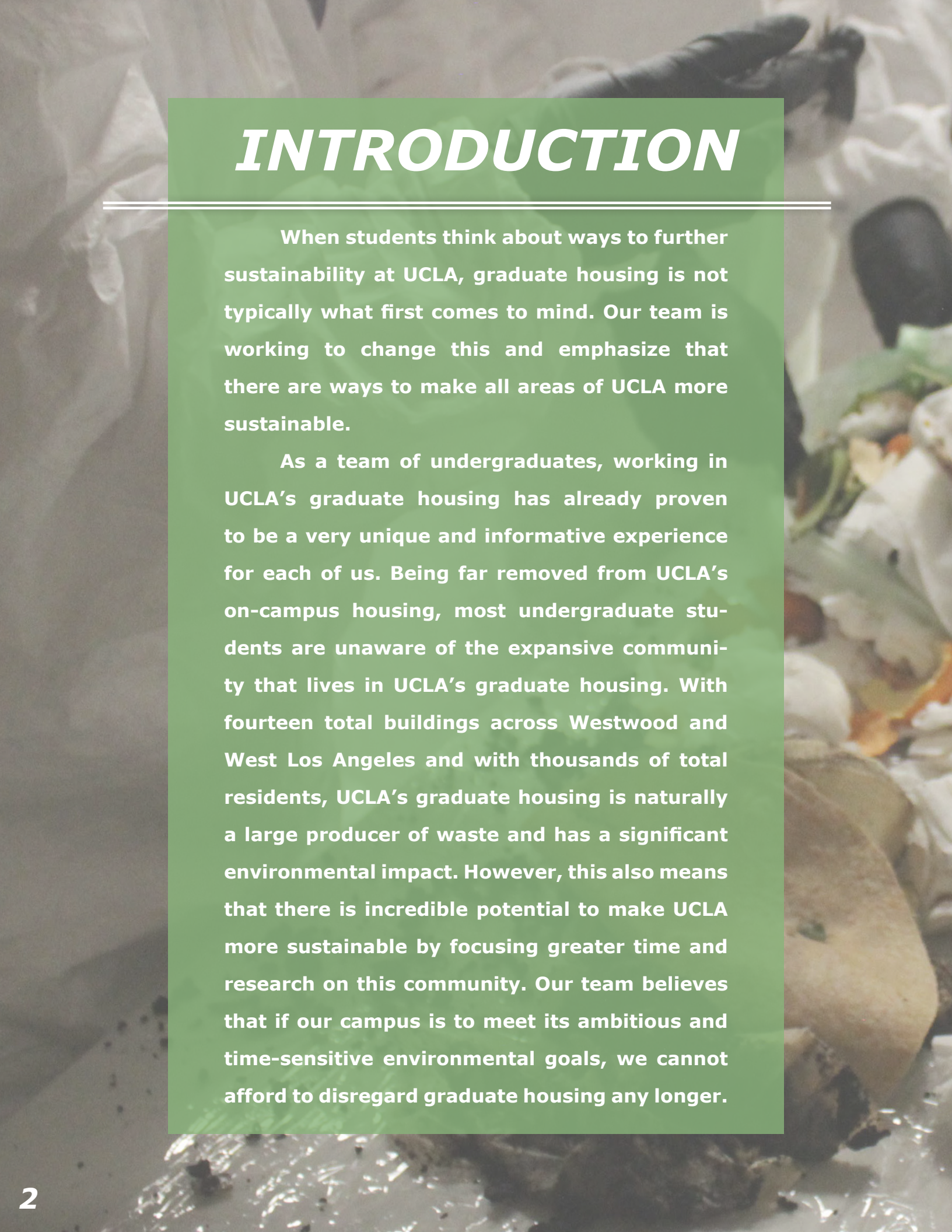
ADDAE JAHDAI-BROWN
DAISY OLIVER

LEADERS:

ELIAS PLATTE-BERMEO
VANESSA NGUYEN

MEMBERS:

RILEY COOKE
ZACHARY DEVEREAUX
RYAN HALLMAN
DIANA MARIA NGUYEN

The background of the page is a photograph of a landfill, showing various types of food waste such as vegetable peels, bread, and other organic matter being discarded. A semi-transparent green rectangular box is centered on the page, containing the title and two paragraphs of text.

INTRODUCTION

When students think about ways to further sustainability at UCLA, graduate housing is not typically what first comes to mind. Our team is working to change this and emphasize that there are ways to make all areas of UCLA more sustainable.

As a team of undergraduates, working in UCLA's graduate housing has already proven to be a very unique and informative experience for each of us. Being far removed from UCLA's on-campus housing, most undergraduate students are unaware of the expansive community that lives in UCLA's graduate housing. With fourteen total buildings across Westwood and West Los Angeles and with thousands of total residents, UCLA's graduate housing is naturally a large producer of waste and has a significant environmental impact. However, this also means that there is incredible potential to make UCLA more sustainable by focusing greater time and research on this community. Our team believes that if our campus is to meet its ambitious and time-sensitive environmental goals, we cannot afford to disregard graduate housing any longer.

The background of the page is a photograph of a recycling bin filled with organic waste. On the left, there are white plastic bags and some food scraps, including what looks like a banana peel. On the right, there are more white plastic bags and some clear plastic containers. The overall scene is a close-up of the waste being diverted from landfill.

Our specific focus has been on diverting organic waste from landfill in UCLA-owned graduate housing apartment complexes. By building on past student research, we have worked to perfect a waste diversion program implemented in Spring of 2017 at two of UCLA's graduate housing apartment complexes. We have focused on improving the infrastructure currently in place as well as fostering a stronger relationship with residents of the buildings we are working in. We have collected quantitative and qualitative data in order to track changes in program usage and effectiveness as we take steps to improve resident understanding of and engagement with the program. Most importantly, we have worked to identify the key components of a successful residential composting program and to develop a comprehensive waste diversion framework that can be applied to other university- owned housing to help the campus meet our "Zero Waste by 2020" goal.



2018

SUSTAINABILITY ACTION RESEARCH

GRAD HOUSING WASTE DIVERSION

THE TEAM



ADDAE JAHDAI-BROWN, stakeholder

Addae serves as Assistant Director for University Apartments. Addae is a Brooklyn native, a father of three and a life coach on the side. Addae is both personally and professionally dedicated to improving the lives of students and families in University Apartments, as they are a traditionally underserved demographic. Addae obtained both his BA in Psychology and his MSW from Stony Brook University in New York, and has just completed his 15th year as a Student Affairs professional.



DAISY OLIVER, stakeholder

Daisy Oliver is the Community Director of UCLA, Residential Life- University Apartments. She received her Master's in Social Work from USC, and B.A. in Psychology with a minor in Education from UCLA. Before receiving her MSW, she worked in UCLA Undergraduate Admissions as an Admissions Officer, and has served the UCLA students for over 8 years. In her spare time, she enjoys spending time with her family, reading, going to the beach, and traveling.



ELIAS PLATTE-BERMEO, *leader*

Elias is a third year studying Geography/Environmental Studies with a minor in Public Affairs. He is interested in environmental policy and the relationship between environmental issues and social equity. Elias worked on SAR's Grad Housing Waste Diversion team for two years--meaning he's collectively spent nearly 20 hours digging through graduate students' waste. He can be found hiking in Santa Monica Mountains, soaking up sun in the Sculpture Garden, or finagling swipes into Bplate.



VANESSA NGUYEN, *leader*

Vanessa just finished her third year majoring in Environmental Science with minors in Environmental Engineering and Atmospheric & Oceanic Sciences. Her passion lies at the intersection of sustainability and outreach - so naturally, working to implement a waste diversion program in a student community was right up her alley. Outside of composting, she loves encouraging others to reduce plastic waste and carbon emissions. Vanessa appreciates swimming, cooking, and traveling.



RILEY COOKE, *member*

Riley is coming off his third year as an undergraduate at UCLA. He is studying Geography & Environmental Studies and his interests range from water resources and policies to arts event planning - and, of course, waste reduction and diversion. He has enjoyed promoting and learning about compost implementation in SAR and he hopes to explore other sustainability-related projects in his final year at UCLA. In his free time, Riley enjoys cycling, walking dogs, and playing music.



ZACHARY DEVEREAUX, member

Zach is a third year studying Environmental Science with a concentration in Conservation Biology. Along with his work in SAR Zach takes part in various native habitat restorations and studies wildlife adaptations to an urbanized environment. Due to his love of the outdoors he often spends his free time gardening or backpacking.



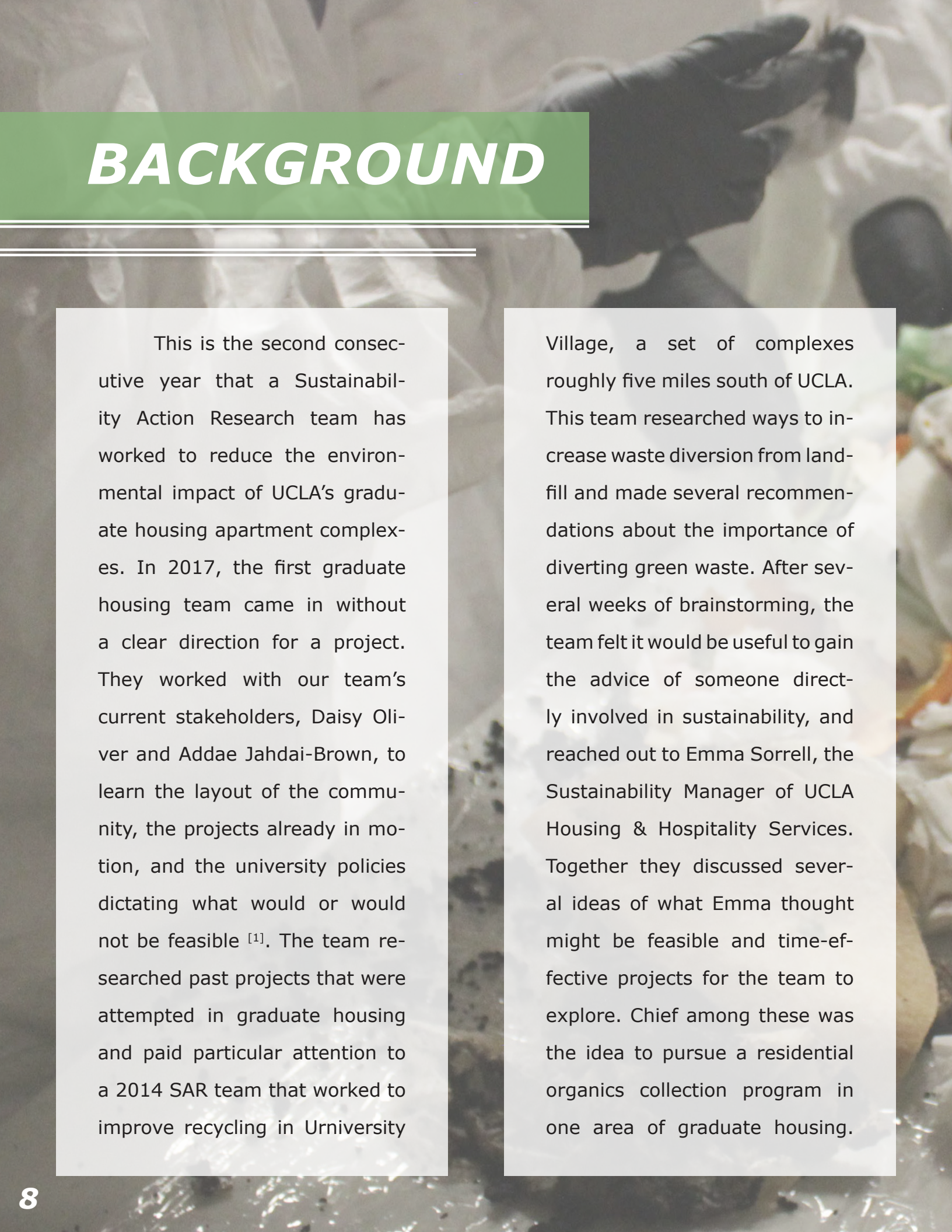
RYAN HALLMAN, member

Ryan is a third year studying Environmental Science with a concentration in Environmental Engineering. As a new member of SAR, Ryan appreciated the diverse challenges and real world experience achieved throughout the program. He was once naive to the importance of proper waste sorting, but his experience provided insight to the integral role of waste diversion in leading a sustainable future. In his free time, Ryan enjoys sketching, playing basketball and stepping out of his comfort zone.



DIANA MARIA NGUYEN, member

Diana is a sophomore majoring in Political Science while double minoring in Environmental Systems & Society and Statistics. Having resided in UCLA's Sustainable Living Learning Community for two years, she has witnessed the development of the composting program within her floor and residential building. She hopes to encourage others in her community to adopt sustainable practices by provision and education of accessible resources. Diana enjoys the beach and cooking with good company.



BACKGROUND

This is the second consecutive year that a Sustainability Action Research team has worked to reduce the environmental impact of UCLA's graduate housing apartment complexes. In 2017, the first graduate housing team came in without a clear direction for a project. They worked with our team's current stakeholders, Daisy Oliver and Addae Jahdai-Brown, to learn the layout of the community, the projects already in motion, and the university policies dictating what would or would not be feasible ^[1]. The team researched past projects that were attempted in graduate housing and paid particular attention to a 2014 SAR team that worked to improve recycling in Urniversity

Village, a set of complexes roughly five miles south of UCLA. This team researched ways to increase waste diversion from landfill and made several recommendations about the importance of diverting green waste. After several weeks of brainstorming, the team felt it would be useful to gain the advice of someone directly involved in sustainability, and reached out to Emma Sorrell, the Sustainability Manager of UCLA Housing & Hospitality Services. Together they discussed several ideas of what Emma thought might be feasible and time-effective projects for the team to explore. Chief among these was the idea to pursue a residential organics collection program in one area of graduate housing.

Emma explained that representatives from Athens Waste Services, the company contracted to collect all of UCLA's waste and recyclables, had recently expressed interest in expanding green waste services to more of UCLA's housing complexes. The team was immediately excited by the prospect of implementing a waste diversion program, and quickly got to work coordinating several meetings with Jessica Aldridge, the Sustainability Manager for Athens Waste Services. They recognized the potential significance of this project, and felt that it was an important step towards reducing campus-wide waste sent to landfill, especially as they approached the end date for UCLA's "Zero Waste by 2020" goal.

With the help of Jessica Aldridge and Emma Sorrell, the SAR team developed the concept and timeline for a pilot food-scrap collection program in two graduate



The 2017 Graduate Housing SAR Team is seen conducting one of their waste audits. The team's efforts pioneered Hilgard's composting program that year.

housing apartment complexes on Hilgard Avenue, which were chosen because of their relatively small size and their ability to accommodate a green waste bin in their central waste rooms. The team then got in touch with Global Green and EcoSafe, two environmental non-profit organizations with experience facilitating residential organics collection programs. They agreed to provide support and materials for the pilot program, including kitchen compost caddies for each unit at 720 Hilgard and 824 Hilgard, and a compostable bag dispenser for each building's waste room. The team pursued infrastructural

change by providing each tenant with a compost bin and educational change by sharing printed and digital descriptions of how the program was intended to operate. They hoped that this two-pronged approach would have a greater impact on the rate of waste diverted from landfill than simply adding infrastructure with the compost caddies.

This year, our team first became familiar with the past SAR team's project, and then aimed to develop our own plan for reducing the environmental impacts of the graduate housing community. In planning our research, we felt it was important to analyze similar programs on other campuses ^[2], the psychology at play in people's decisions when sorting waste ^[3], and university policies that might impact any project we pursued ^[4]. We learned the in-depth science behind composting ^[5] and the various steps to conduct a successful

survey ^[6]. With this knowledge, we felt confident in our ability to design a well-rounded plan of action to achieve our goals.

While our team recognizes that the previous SAR team's project was a monumental step in the right direction for UCLA, we focused on rectifying the various issues we found with this program and on exploring other avenues to improve sustainability in the graduate housing community.

[1] Hunter, Chris, et al. "Diverting Landfill Waste in University Apartments". Institute of the Environment and Sustainability, 2017, University of California Los Angeles. <<https://www.ioes.ucla.edu/wp-content/uploads/2017gradhousingReport.pdf>>.

[2] Schmidt, Chonsa. "Implementing a Composting System in the Villa Apartment Complex: A CSIF

Proposal." (n.d.): n. pag. Scu.edu. 2015. Web. 24 Jan. 2017. <[https://www.scu.edu/media/offices/sustainability/programs/investment-fund-csif/CSIFProposal-\(1\).pdf](https://www.scu.edu/media/offices/sustainability/programs/investment-fund-csif/CSIFProposal-(1).pdf)>.

[3] Menzer, Lauren, et al. "Behavioral Economics of Waste Management: Identifying Factors That Influence

Personal Waste Sorting Practices." UCSB Refuse and Recycling Research Center, 2014, pp. 1-36. <https://www.facilities.ucsb.edu/files/docs/UCSB_R3C_Behavioral_Economics_of_Personal_Waste%20Sorting_Practices.pdf>

[4] Nordby, J. Cully, et al. "UCLA Zero Waste Plan." UCLA Sustainability, University of California, Los Angeles, July 2012, <www.sustain.ucla.edu/about-us/publications-and-reports/>

[5] Cooperband, Leslie. The Art and Science of Composting. University of Wisconsin-Madison, 29 Mar. 2002, <www.cias.wisc.edu/wp-content/uploads/2008/07/artofcompost.pdf>

[6] Thayer-Hart, Nancy, et al. "Survey Fundamentals: A Guide to Designing and Implementing Surveys." University of Wisconsin - Madison, Dec. 2010, <oqi.wisc.edu/resource/library/uploads/resources/Survey_Guide.pdf>

RESEARCH

QUESTION

*WHAT IS THE POTENTIAL OF **DIVERTING ORGANIC WASTE FROM** LANDFILL TO COMPOST AT UCLA'S GRADUATE HOUSING APARTMENT COMPLEXES?*

OBJECTIVES

- 1) Increase the proportion of organic waste diverted from landfill by residents in 720 and 824 Hilgard
- 2) Develop methods and materials to more effectively educate residents of 720 and 824 Hilgard about composting in general and the details of the program in their buildings
- 3) Foster a shift in attitudes among residents towards waste sorting, waste diversion, and sustainability
- 4) Institutionalize components of a successful composting program to ensure the longevity of existing programs beyond the lifespan of our SAR team
- 5) Compile our quantitative and qualitative findings and create a realistic proposal for the expansion of pilot compost programs to other UCLA-owned housing

METHODOLOGY

In order to inform our research and help us achieve our goals, our team used a variety of both quantitative and qualitative methods that gave us a full picture of the problems to address and allowed us to develop a comprehensive plan for the future.

Hilgard Survey

Our first interaction with the residents of 720 and 824 Hilgard was an informal door to door survey to understand residents' knowledge and opinions of the composting program implemented last year. We received valuable feedback regarding specific problems students faced in the program which led to the development of an online survey to increase responses. This survey contained a variety of questions concerning possible improvements and possible methods to increase resident participation in

the program. To increase the amount of responses, team members tabled in the outdoor courtyard of the 720 Hilgard to market the survey and have personable interactions with residents.

WHRA Karaoke Survey

In early March, our team was fortunate to attend a social karaoke night hosted by the Weyburn-Hilgard Residents Association (WHRA). Throughout the event we collected valuable insight from graduate students regarding UCLA's overall perfor-

regarding UCLA's overallmance with green services. UCLA's progressive goal of Zero Waste by 2020 requires unanimous student support and asked students opinions on the feasibility of such initiatives.

Educational Materials

Using qualitative information obtained from the Hilgard survey and results, our team figured that the largest obstacle to tackle was residential awareness of the compost program, and how to actually sort waste. Perhaps the most important variable in our research, we introduced different pieces of educational material to inform Hilgard residents of the current composting program in place at the complexes, and how to best utilize it.

Our team designed a magnet (Fig.1) showing residents how to sort some typical items into either the landfill, compost, or recycling waste streams.



(Figure 1) A magnet designed for Hilgard residents to keep on the refrigerator and encourage proper waste sorting directly from their apartment unit.

The magnet designs were sent to UCLA Housing's media team to approve after which they were ordered in bulk by ResLife.

Concurrent with developing the magnets, our team also created an infographic specific to the Hilgard complexes (Fig.2). The graphic provided residents quantitative data from our first waste audit such as how much waste could have been diverted from their landfill containers, and detailed tips and tricks on how to compost successfully such as walking their compost caddies down to the waste room to avoid

LET'S TALK DIRTY....

HILGARD'S TRASH TO LANDFILL



TIPS & TRICKS FOR COMPOSTING

PROBLEM



**BAGS TOO THIN
AND TEARING?**



**DOES YOUR
COMPOST SMELL?**



**DOES YOUR BAG
RIP AND DRIP?**

SOLUTION



DOUBLE BAG IT
to add an extra layer of
protection



FREEZE IT
in your freezer to keep it out
of sight and smell



BRING YOUR CADDY
when bringing your compost
down to the waste room

Take the pledge to be zero waste & learn more at:
sustain.ucla.edu/MyLastTrash

(Fig.2) Infographic designed for distribution within 720 Hilgard and 824 Hilgard complexes. Along with the Hilgard survey, their questions and concerns about composting were answered with the following "Tips & Tricks for Composting".

ripping the compost bag and dripage. To ensure the legitimacy of our educational materials in the eyes of the residents, we made sure to include all official UCLA logos of those who aided in their development and distribution.

Waste Sorting Signage

In order to assist resident awareness with proper waste sorting, the previous SAR team posted diversion signs for compost, landfill and recycle in the Hilgard waste room (Fig.3). These signs were originally adhered to the dumpsters, but by January 2018 when we took over the project, these signs were severely damaged. We first consulted Athens disposal services to confirm that the previous signs were sufficiently correct, however our representative from Athens, Jessica Aldridge recommended that we make changes to the compost signage. Hand

wipes were illustrated as compostable by the previous team, but many contain plastic which deems it a landfill item. Unfortunately, approving new changes was much more difficult than expected, leading to us to only be able to recommend sign replacement. But instead of adhering signs to the dumpster, we recommended signs to be velcroed to the wall above each respective bin.



(Figure 3) Waste Sorting Signage that was distributed to Hilgard complexes in 2017. This year, we replaced damaged signs with velcro to stay on the walls.

PLEASE
DOUBLE BAG
FOR BAG
DURABILITY

(Figure 4) Double Bag stickers placed onto compost bag dispensers in waste rooms to remind residents to double bag their compost to avoid bag leakage and breakage.

Another issue residents faced was ripping compost bags as a result of their thin, biodegradable structure. Through surveys and conversations with residents, we realized this issue was very common so we recommended residents to use two bags. Above the bag dispenser in the waste room, we designed and taped a small sign encouraging residents to double bag their compost caddies (Fig.4). Apart from building specific educational materials, waste sorting and bagging signage will continue to be distributed in future expansion programs.

Focus Group

To gauge the effectiveness of the educational materials and other qualitative variables that our team implemented, we conducted a focus group at the larger Hilgard complex (720 Hilgard Ave.) Throughout our research, one of the major challenges our team encountered was retaining direct communication, interaction, and engagement with graduate student residents. Though we sent out an interest form to residents providing incentives of complementary pizza, refreshments, and meal vouchers for those who participated in the focus group and received six responses, only one person was in attendance. Thus, what we intended to be a collective method of feedback transformed into an intimate one-on-one interview. Still, the lone subject provided imperative feedback about the current waste diversion program and improvements for future programs.

Waste Audits

In order to evaluate the success of this program, we conducted two sets of waste audits within the Hilgard complexes. A waste audit would consist of...

- 1) assessing each of the complexes' three waste bins (composting, recycling, landfill),
- 2) sorting the waste the waste of each bin (i.e. organic waste within landfill),
- 3) weighing each of the sorted waste (i.e. __ pounds of organic waste within landfill).

These waste audits were conducted for both the 720 Hilgard and 824 Hilgard complexes during two separate times-- one in February during the beginning of the program and one in May to assess any successful diversion rates. The timing of these two waste audits intended for a passage of time before and after program developments. In preparation for our first waste

audit in February, we invited UCLA's Athens representative Jessica Aldridge to give us a rundown of Athens' services, what waste they take, and how to properly sort the waste for Athens' facilities. She facilitated our audit and advised the best way to assess the residents' waste. With the help of our friend Luis Muños from UCLA Housing and Hospitality, we were provided the tools for our waste audit: hazmat suits, gloves, tables, and weighing bins. In addition to this list, we had to purchase a weighing scale that would carefully and accurately measure our waste.

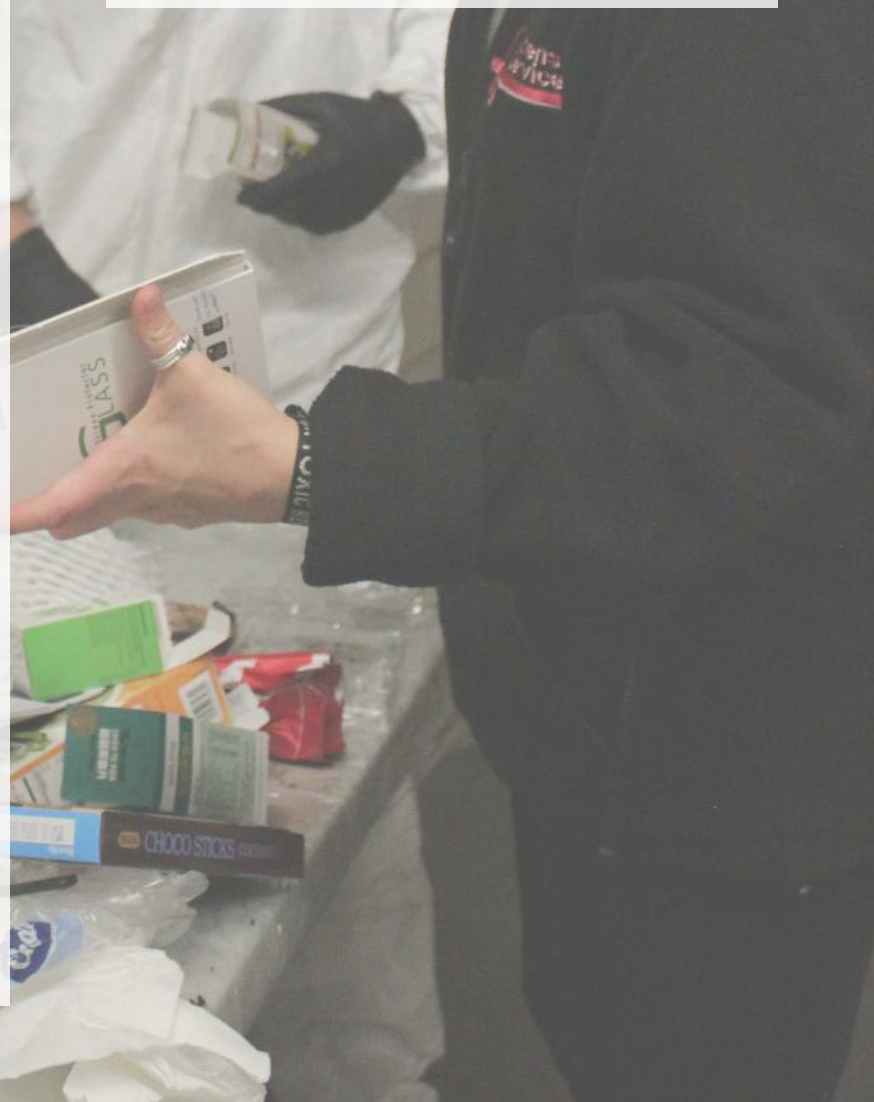
At the first waste audit in 724 Hilgard, we meticulously sorted and weighed the waste—sorting plastic #6's from plastic #7's and corrugated containers from glass—for almost 2 hours. During 824 Hilgard's February waste audit, we sorted and measured only half of the landfill and recycling bins to save time and effort, later multiplying our calc-

-ulations by two to make up for the unsorted waste. As the compost bin in 824 Hilgard did not have much waste, we measured all its contents. Even though this would affect bin composition accuracy, we did not have the man-power or enough hours of the day to do a fully-precise audit.

At our second waste audit, we decided it would be best and more time efficient to broadly sort within the three categories of organic waste, recyclables, and waste to landfill instead of each categories' specifics. We also only evaluated half of the recycling and landfill composition, later multiplying the weights by two to accommodate the full measurement of the compost bin.

After grueling hours in the dumps, we planned to evaluate our data in two different ways: landfill bin composition and organic waste diversion. Most of the time, residents do not sort their waste and throw most of their waste

in their trash cans. By analyzing landfill bin composition, we can study whether residents are participating in organic and recyclable waste diversion throughout the program or not. Likewise, by evaluating organic waste diversion, we can analyze changes in residents' participation with the compost program as to where they send their organic waste (to landfill, recycling, or properly to compost).

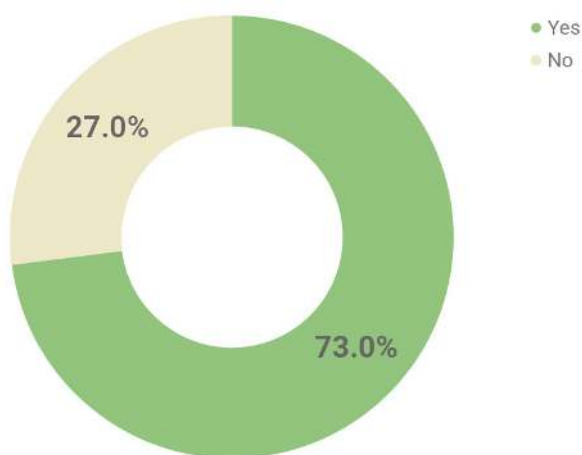


DATA & RESULTS

Hilgard Survey

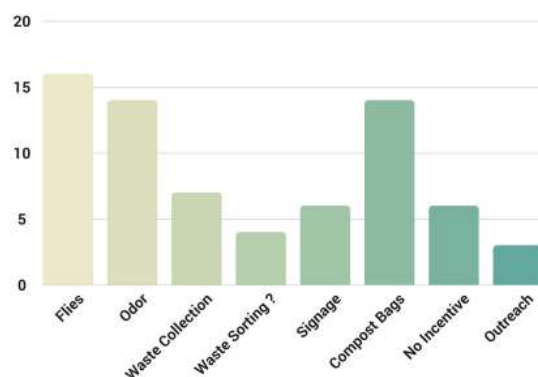
Following the survey, we learned only 50% of residents understood how to sort their waste while only 36% actively sorted their waste. Furthermore, over a quarter of residents were not provided a compost bin thus lacked access to the program (Graph 1).

I have been provided a compost bin in my apartment and have access to compostable bags.



(Graph 1) A donut graph displaying how many out of the 30 residents who filled out our Hilgard survey were provided with a compost caddy and were aware of the provided compostable bags.

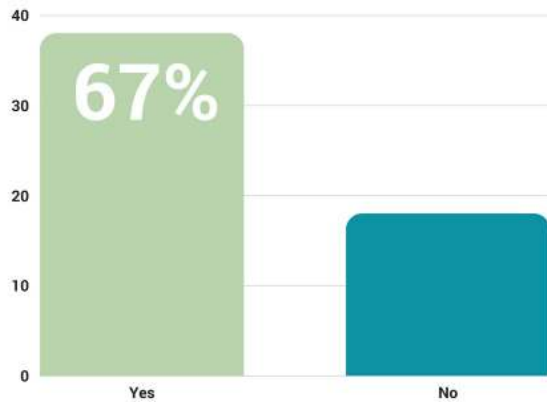
Issues with Hilgard Composting Program



(Graph 2) A bar graph displaying what areas of the composting program raises the most concerns.

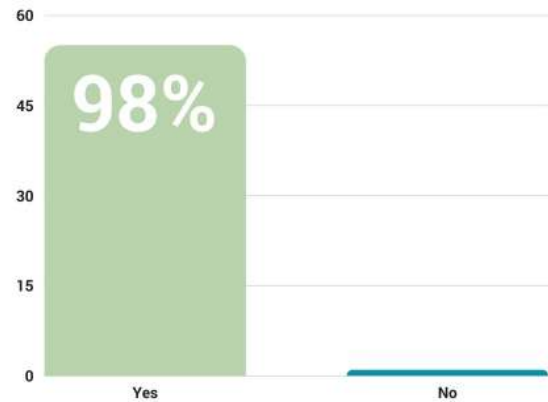
We were also able to identify several other problems with flies, odor, and a lack of access to compost bags being the most reported (Graph 2). Many residents suggested that the program could improve in three areas: signage, education, and outreach. From this data we decided access to program infrastructure and waste sorting education would be key objectives moving forward.

Are you aware of UCLA's "Zero Waste by 2020" Goal?



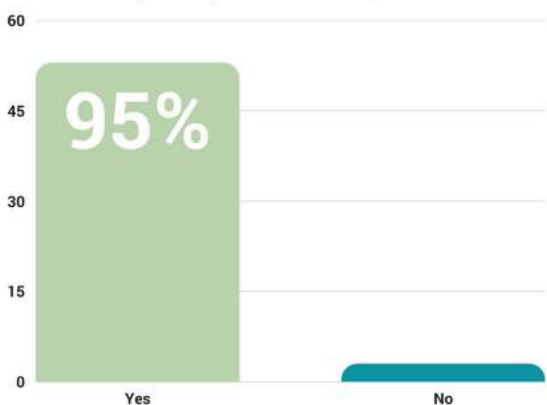
(Graph 3) UCLA "Zero Waste by 2020"

Would you appreciate greater efforts on behalf of UCLA administration to reach this goal?



(Graph 4) Efforts from UCLA Admin

Would you like to see a residential compost program in your apartment complex?



(Graph 5) Possible Compost Program

that implementing composting programs in residential apartment complexes were an important way to do so (Graph 4 and 5). With these statistics, it is clear that great potential for waste diversion resides in our graduate housing complexes. UCLA administration has to take initiative to institutionalize these programs if we are to reach our Zero Waste goals.

WHRA Karaoke Survey

Results showed that only 67% of students surveyed knew about UCLA's goal to reach Zero Waste (Graph 3). However, 98% of those surveyed wanted to see UCLA's administration do more to reach this goal, and 95% thought

Educational Materials

With the help of ResLife, the infographics were emailed out to all Hilgard residents, taped on the door of every unit, and

pinned on the central announcement board six weeks before our final waste audit. Shortly after, Housing & Hospitality entered every unit to redistribute compost caddies to those who did not have one, and stick magnets on every refrigerator. We hoped that providing these additional resources weeks before our final audit would help change residents' waste behaviors enough to notice a significant quantitative difference.

Focus Group

What do you know about the composting program in your own complex?

"So when I moved in, I kept seeing that there was a compost program but I didn't know what they meant... I saw that there was compost bins [in the waste room]... No one ever gave me a little compost bin so I just stole one from the trash room."

What do you think UCLA administration could better do to tackle waste diversion in residential complexes?

"... It's good that we have people like you [SAR team] but it would be more helpful if there was more clarification and instructions in the beginning of the year about this information."

With regards to educational materials like this [magnets and infographic], do you think these alone would be sufficient and helpful enough upon move-in? What else should we include for infrastructure and initial information about the program?

"Basic info like 'what is compost?', 'where do we bring our compost?', 'where can I get compost bags?' Info like this and the educational materials weren't given in the beginning of the year so it's a little confusing. And it seems like it was forced on people..."

Ultimately, the main take-away from this conversation was that it is imperative for UCLA administration to introduce the composting program at the beginning of the year when residents move in, providing all the necessary materials and information. Several UCLA departments must work together to institutionalize the waste diversion program in order to ensure and sustain its success throughout the years to come.

Waste Audit

720 Hilgard

Figure 5 shows that in 720 Hilgard's February waste audit, we measured 225.2 lbs of waste. 53.15% of that weight was made up waste from the recycling bin. The remainder 43.43% and 3.42% from the landfill and organic waste bins correspondingly. Within the recycling bin, 75.19% of the waste was properly sorted while the remaining 24.81% should have gone to landfill.

Data & Results from 720 Hilgard February Waste Audit

Weight of Different Wastes send to Different Waste Bins (lbs)

Type of Waste	Bin / Dumpster (location of waste)		
	Sent to Organics	Sent to Recyclables	Sent to Landfill
Organics	6.6	-	51.2
Recyclables	-	90	13.8
Landfill	1.1	29.7	32.8
Total Weight of Dumpster/Bin	7.7	119.7	97.8

Weight of Measuring Bin

large: 2.7 lbs

Cumulative Total Weight of Waste:

225.2

How much of landfill belonged in the landfill dumpster?

0.3353783231

How much of landfill could have been recycled?

0.1411042945

How much of landfill could have been composted?

0.5235173824

How much waste was diverted to recycling?

0.5315275311

How much waste was diverted to composting?

0.03419182948

(Figure 5) Data tables and calculations made assessing 720 Hilgard's February Waste Audit. Out of the 97.8 lbs of landfill, 33.54% of it actually belonged in the bin. The remaining 14.11% and 52.35% could have been diverted to recycling and composting respectively.

In the organics waste bin (composting bin), 85.71% of organic waste was properly diverted from landfill while the remaining 14.29% of the organic waste bin's weight should have gone to landfill. The latter percentage was often food-soiled recyclables or packaging that could not be recycled.

The landfill bin had a greater proportion of waste that was not properly sorted. The bin consisted of 33.53% waste that should be sent to landfill, 14.11% recyclables, and 52.35% of waste in the landfill bin should

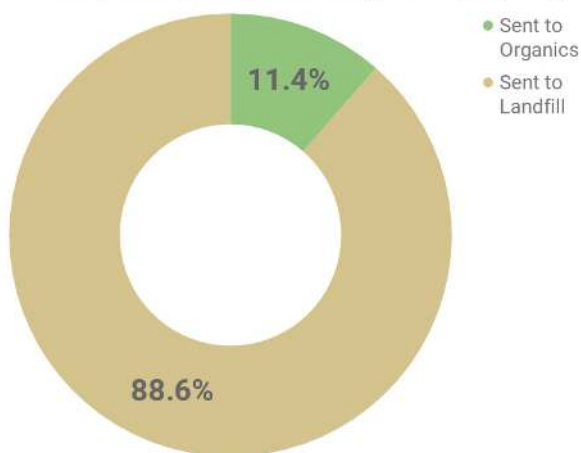
have been sorted into compost.

Overall, addressing the compost program, this February waste audit measured an 11.4% organic waste diversion rate; 88.6% of organic waste was improperly sorted and sent to landfill (Graph 6).

Fortunately, these numbers faced a positive change by the end of the program. This time, we measured 325.8 lbs of waste for 720 Hilgard's May waste audit (Figure 6). 48.0% of this waste came from the recycling bin, 43.03% from landfill, and the remainder 9.0% from the organic waste bin.

Within the recycling bin, 91.69% of the waste was properly sorted, 1.41% should have gone to landfill, and 6.91% should have gone to compost. In the organics waste bin (composting bin), 95.55% of organic waste was properly diverted from landfill. Only 1.37% and 3.08% of the organic waste bin's weight should have gone to recycling

Proportions of Organic Waste Sent to Organic, Recyclables, or Landfill Bins (720 Hilgard, Feb)



(Graph 6) A donut graph displaying organic waste diversion during 720 Hilgard's February waste audit.

Data & Results from 720 Hilgard May Waste Audit

Weight of Different Wastes sent to Different Waste Bins (lbs)

Type of Waste	Bin / Dumpster (location of waste)		
	Sent to Organics	Sent to Recyclables	Sent to Landfill
Organics	27.9	10.8	24
Recyclables	0.4	143.4	24.2
Landfill	0.9	2.2	92
Total Weight of Dumpster/Bin	29.2	156.4	140.2

Weight of Measuring Bin	large: 2.4 lbs	small: 1.5 lbs
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Cumulative Total Weight of Waste:

325.8

How much of landfill belonged in the landfill dumpster?	0.6562054208
How much of landfill could have been recycled?	0.1726105563
How much of landfill could have been composted?	0.1711840228

How much waste was diverted to recycling?	0.5071403692
How much waste was diverted to composting?	0.004528039011

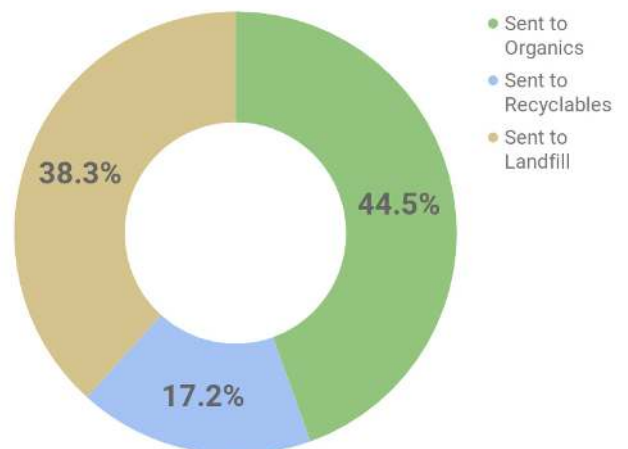
(Figure 6) Data tables and calculations made assessing 720 Hilgard's May Waste Audit. Out of the 140.2 lbs of landfill, 65.62% of it actually belonged in the bin. The remaining 17.26% and 17.12% could have been diverted to recycling and composting respectively.

and landfill. 65.62% of waste sent to landfill was properly sorted, 17.12% should have been composted, and 17.26% should have been recycled.

Comparing the February and May waste audits, the landfill bin composition showed positive waste diversion trends. The amount of organic waste sent to landfill dropped from 52.35% to 17.11% (Graph 7). In February, only 11.4% of organic waste was properly sorted to the compost

bin. However, in May, this percentage improved to 44.5%.

Proportions of Organic Waste Sent to Organic, Recyclables, or Landfill Bins (720 Hilgard, May)



(Graph 7) A donut graph displaying organic waste diversion during 720 Hilgard's May waste audit.

Based on these numbers, we can make the hopeful assumption that our efforts throughout the program encouraged residents to divert their organic waste from landfill and into compost.

824 Hilgard

Because 824 Hilgard is a smaller apartment complex with fewer units than 720 Hilgard, we only measured 68.1 lbs of waste during our February waste audit. From this total weight, a 3.45%

majority of it was from the landfill bin, 43.0% from recycling, and 4.55% from the organic waste bin (Figure 7).

The landfill bin consisted of 17.03% organic waste, 36.36% of recyclables, and only 46.70% of waste that was properly sent to landfill. Within the recycling bin, 68.53% of recyclables was properly diverted while the remaining 2.80% and 28.67% were organic waste and waste that should have gone to landfill. The com-

Data & Results from 824 Hilgard February Waste Audit

Weight of Different Wastes sent to Different Waste Bins (lbs)

Type of Waste	Bin / Dumpster (location of waste)		
	Sent to Organics	Sent to Recyclables	Sent to Landfill
Organics	1.2	0.8	6.2
Recyclables	0.2	19.6	13.2
Landfill	1.7	8.2	17
Total Weight of Dumpster/Bin	3.1	28.6	36.4

Weight of Measuring Bin

large: 2.7 lbs

Cumulative Total Weight of Waste:

68.1

How much of landfill belonged in the landfill dumpster?

0.467032967

How much of landfill could have been recycled?

0.3626373626

How much of landfill could have been composted?

0.1703296703

How much waste was diverted to recycling?

0.4199706314

How much waste was diverted to composting?

0.04552129222

(Figure 7) Data tables and calculations made assessing 824 Hilgard's February Waste Audit. Out of the 36.4 lbs of landfill, 46.70% of it actually belonged in the bin. The remaining 35.26% and 17.03% could have been diverted to recycling and composting respectively.

post bin had a meager 3.1 lbs of organic waste, of which only 40% actually belonged there.

During the May waste audit, we measured 89.5 lbs of waste (Figure 8). 64.80% of the 89.5 lbs consisted of waste from the recycling bin, 10.28% from waste sent to landfill, and 2.57% to compost. 86.64% of recyclables were properly sorted to the recycling bin. Only 12.67% of waste from the recycling bin should have gone to landfill and the last

0.68% to compost. Within the landfill bin, 46.94% was properly sent to landfill while the other 31.63% and 21.43% should have been recycled or sent to compost, respectively. Lastly, 80% of organic waste was properly sorted and sent to composting facilities.

Unlike 720 Hilgard, 824 Hilgard's landfill composition did not change much throughout the program. However, this does not mean there was not a successful diversion rate.

Data & Results from 824 Hilgard May Waste Audit

Weight of Different Wastes sent to Different Waste Bins (lbs)

Type of Waste	Bin / Dumpster (location of waste)		
	Sent to Organics	Sent to Recyclables	Sent to Landfill
Organics	9.2	0.4	4.2
Recyclables	1.1	50.6	6.2
Landfill	1.2	7.4	9.2
Total Weight of Dumpster/Bin	11.5	58.4	19.6

How much of landfill belonged in the landfill dumpster?	0.4693877551
How much of landfill could have been recycled?	0.3163265306
How much of landfill could have been composted?	0.2142857143

Weight of Measuring Bin	large: 2.4 lbs	small: 1.5 lbs
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Cumulative Total Weight of Waste:

89.5

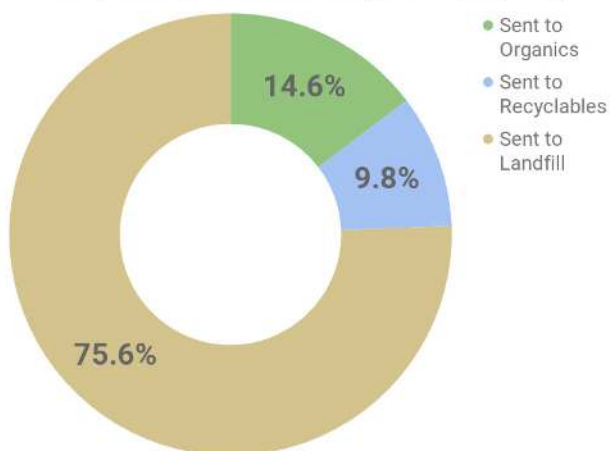
How much waste was diverted to recycling?	0.5315275311
How much waste was diverted to composting?	0.03419182948

(Figure 8) Data tables and calculations made assessing 824 Hilgard's May Waste Audit. Out of the 19.6 lbs of landfill, 46.94% of it actually belonged in the bin. The remaining 31.63% and 21.43% could have been diverted to recycling and composting respectively.

By the end of the program in May, 66.7% of overall organic waste was properly sent to compost compared to a 14.6% from February (Graph 8 and 9). The May waste audit revealed that about 30% of organic waste was sent to landfill that could have been better sorted. Regardless, this 50% organic waste diversion rate displays significant improvement in terms of 824 Hilgard residents' participation in the compost program. Perhaps they had a better diversion rate than 720 Hilgard as they were smaller in units.

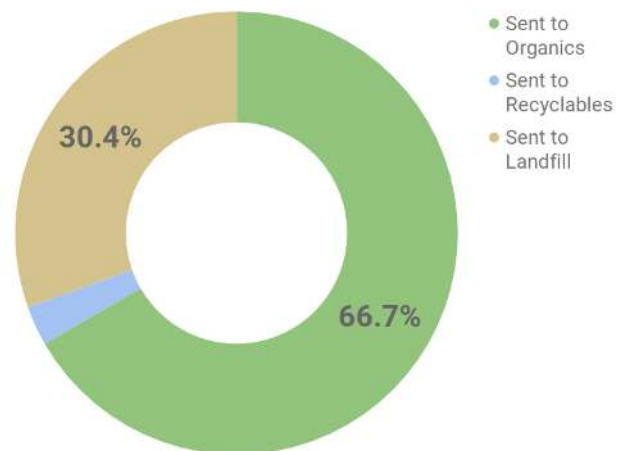
In both waste audits for both complexes, most of the total waste weight came from waste sent to recycling. Even though the primary goal of this program is to educate and encourage waste diversion within Hilgard to properly direct waste to composting, it is still refreshing to know that residents are making the effort to recycle—even if there are a few wrong proportions of waste that could have been sent elsewhere.

Proportions of Organic Waste Sent to Organic, Recyclables, or Landfill Bins (824 Hilgard, Feb)



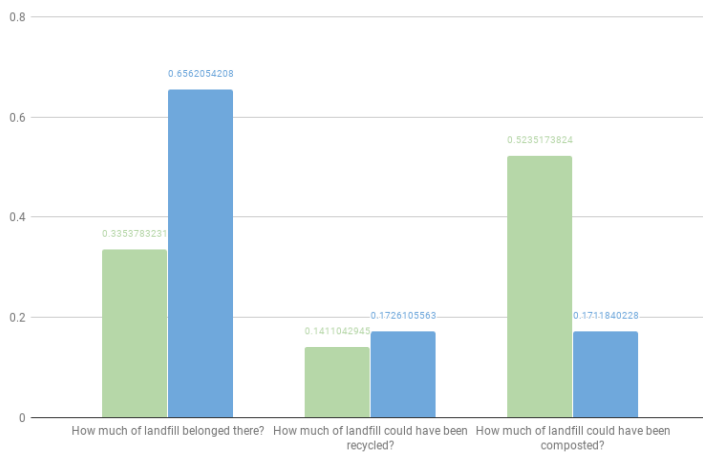
(Graph 8) A donut graph displaying organic waste diversion during 824 Hilgard's February waste audit.

Proportions of Organic Waste Sent to Organic, Recyclables, or Landfill Bins (824 Hilgard, May)



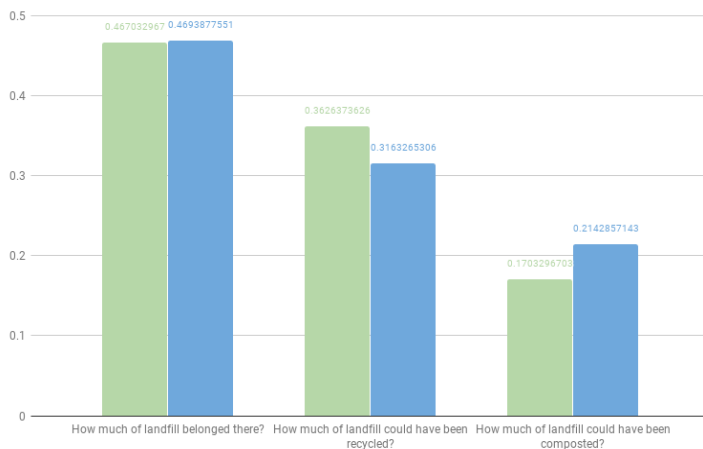
(Graph 9) A donut graph displaying organic waste diversion during 824 Hilgard's May waste audit.

Proportions of Landfill Composition in 720 Hilgard February vs. May Waste Audits



(Figure 9) A double bar graph comparing landfill composition within 720 Hilgard during February and May. Between these two time periods, there was an almost 30% increase in proper landfill waste sorting among residents. By the end of the program, there was about a 45% organic waste diversion rate from landfill.

Proportions of Landfill Composition in 824 Hilgard February vs. May Waste Audits



(Figure 10) A double bar graph comparing landfill composition within 824 Hilgard during February and May. Between these two time periods, there does not seem to be much difference of landfill composition, except a slight positive waste diversion rate for recyclables and organic waste away from landfill.

Apartment Assessment

After analyzing the results of our waste audits, we believed that they made a compelling case for the expansion of similar programs. Our team decided that our next step should be exploring the feasibility of laying the groundwork for implementation of compost programs in other university apartments in the near future. Even though our team had focused exclusively on graduate housing complexes up until this point, we thought that there was value in exploring the waste collecting systems of UCLA's undergraduate apartments which also house thousands of students and have a considerable environmental impact.

The first step of this plan required working with Luis Munoz and Silvia Coronel of UCLA Housing and Hospitality Services to schedule tours of all university-owned undergraduate apartments. This helped us better understand what waste systems

were already in place, how they compared to the Hilgard apartments, and how each building might realistically accommodate a third waste stream for organics.

From our assessment of these complexes, we found there are generally two overarching types of waste infrastructure; some buildings had only a single trash chute on each floor that handled waste to be sent to landfill, requiring residents to walk recyclables down to a large dumpster in the ground floor or underground waste room. We found that these centralized waste rooms had more than enough room for a compost container to be added inside. Since the residents of these complexes are already expected to walk downstairs to empty their recyclables, we believe that it is feasible to add an organics waste stream to their normal routine. The infrastructure of these buildings closely resembles the waste

collection model at 720 and 824 Hilgard where residents are already expected to walk down their garbage, recyclables, and organic waste and then place them in the corresponding bins. In these undergraduate apartments, residents would similarly receive a kitchen compost caddy to be emptied and re-bagged in their downstairs central waste room.

Most other undergraduate apartment complexes had smaller trash rooms on each floor with two chutes inside: one for recyclables and one for landfill. From our visual assessment and our discussion with Luis Munoz and Silvia Coronel, we believed that a number of the buildings we visited had floor-by-floor waste rooms with enough available space to accommodate a third waste stream in the form of a large 50 gallon bin.

Residents of these buildings could feasibly each receive a kitchen compost caddy that would be emptied in this bin in

their floor's waste room along with their recyclables and land-fill waste which would be emptied in the corresponding waste chutes. This waste collection model is similar to the program recently rolled out on The Hill by UCLA Housing, in which floor-by-floor roll-out compost bins now allow residents to properly sort waste into three streams without ever having to leave their floor. These floor-level compost bins would then be emptied by Housing and Hospitality Services custodial staff into a main compost dumpster that is stored in each building's central trash room on the ground floor.

After this initial assessment, our team felt that there was true potential to expand composting to undergraduate apartments in the near future. We decided to reach out to Jesse Alberti, UCLA Housing Maintenance Supervisor, to discuss our findings and talk through our initial plans for expansion. After

hearing our preliminary proposal, Jesse was intrigued and expressed interest in moving forward and further exploring possibilities in each building. With renewed hope, our team worked to develop a detailed proposal.

We returned to each undergraduate apartment complex to take measurements of the individual rooms and created scale room layout diagrams. From this, we were able to demonstrate how and where the compost bins could be accommodated in each of these buildings. We then designed two pilot programs, one for each waste infrastructure type, to be implemented in the late summer and early fall of 2018:

1. 510 Landfair Pilot Compost

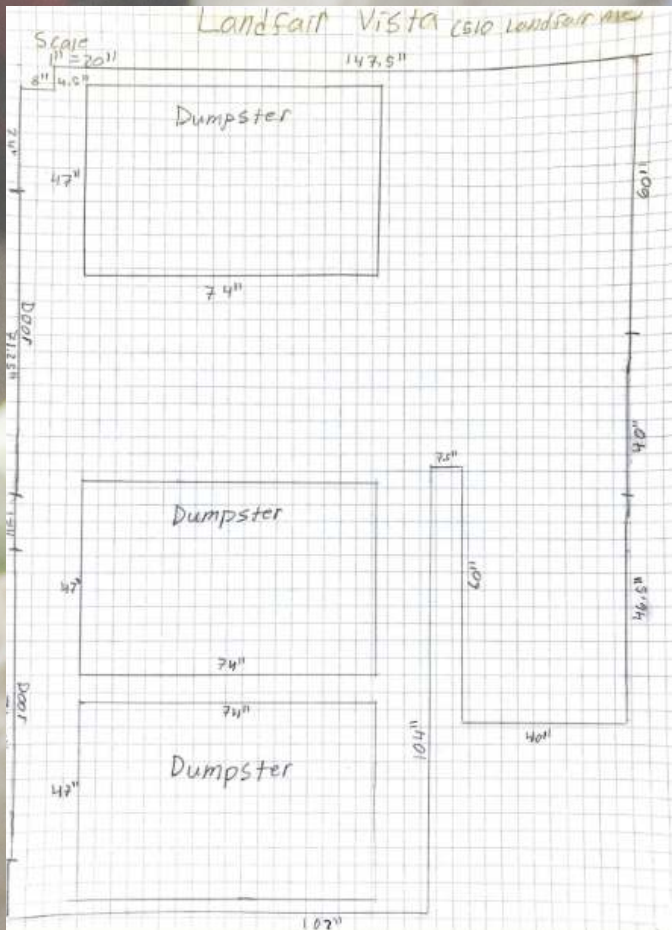
Program (Figure 11)

(complex with a central waste room)

2. 625 Landfair Pilot Compost

Program (Figure 12 and 13)

(complex with a central waste room and floor-level chute room)

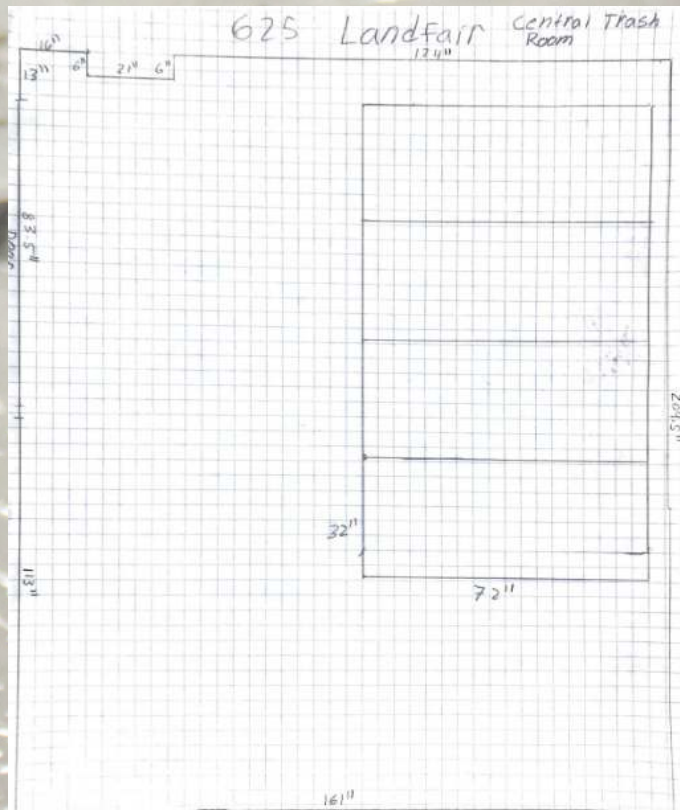


(Figure 11, shown above) Layout of 510 Landfair's Central Waste Room. In the upper right corner, there can be seen a space that would easily fit a compost bin shall a composting program be implemented.

(Figure 12, shown below) Layout of 625 Landfair's Floor-Level Chute Room. Along the left side of the sketch can be seen a row of trash chutes. A small compost container could easily be placed in the chute room.



(Figure 13, shown below) Layout of 625 Landfair's Central Waste Room. Following the sketch, there is enough room for a compost bin to be placed on the bottom right corner of the room.



CHALLENGES &

DIFFICULTIES

Although our team was able to make a number of noteworthy findings, working in UCLA's graduate housing forced us to confront several unique challenges over the past two quarters.

First, the lack of program upkeep in 720 and 824 Hilgard immediately presented several challenges that required our team to adapt our goals. We came into Winter quarter hoping to quickly expand composting programs to other graduate housing complexes, but quickly realized this would not be possible until the problems we found and that residents noted in each of the Hilgard complexes were addressed. This meant that all of Winter quarter and much of

Spring quarter were devoted to getting this program back on track, to a point where a student team was not needed to oversee upkeep.

Next, we quickly learned that the structure and organization of UCLA Administration posed several challenges for our team. It was difficult at the outset of our project to determine what we needed from various UCLA administrators. Last year, Housing Sustainability Manager Emma Sorrell was able to pro-

vide insight and guidance to the previous SAR team, and University Apartments Custodial Supervisor Javier Ayala had experience coordinating waste audits and resident outreach, which was a crucial part of the past team's success. Turnover in both of these positions this year meant that our team worked with new staff members in each of these roles who themselves were learning the ins and outs of UCLA Administration and graduate housing in particular along with our team.

We also quickly realized that the organization of UCLA Administration requires many people and departments to be involved in the implementation and upkeep of any successful waste diversion program. While we primarily worked with our direct stakeholders in Graduate Housing Residential Life, we also worked extensively with UCLA Housing and Hospitality Services and UCLA Housing Maintenance. Because our work has included

different infrastructural and educational components, we could not accomplish our goals without this large and diverse team. This is something that has directly influenced the course of our project and will be important for any student team to recognize moving forward. At times, it was difficult to coordinate between so many people across several departments, but with the support of our stakeholders we were generally able to navigate UCLA administration and get the help we needed.

Finally, working with graduate students was a challenging but informative experience for our team. As undergraduates, we did not necessarily know what to expect, but quickly found out that engaging and communicating with graduate students is much more difficult than we had anticipated. Unlike UCLA's on-campus housing where thousands of undergraduate students live in close proximity, the struc-

A background image showing a person in a white lab coat, possibly a chef or scientist, working with a plate of food. The person's hands are visible, and they appear to be carefully handling the food. The setting is brightly lit, with a strong light source creating a high-contrast scene. The overall tone is professional and focused.

ture Of graduate housing means that students live in low-density apartments and do not have the same opportunities to interact with each other on a consistent basis. We also found that there is not necessarily as strong sense of a sense of community in graduate housing; from our discussions with residents, it seems that many feel disconnected from their neighbors and to the greater community of graduate students, which, at times, made it difficult for our team to effectively communicate with them.

After talking with our stakeholders in Graduate Housing Residential Life, we learned that this likely has to do with these students' wide array of academic programs and hectic schooling and professional schedules, but that this is an ongoing concern that their department is working to address. The combination of factors--a smaller overall number of residents and less strong sense of community--made

it difficult for our team to get respondents and attendants for our surveys and outreach events at the Hilgard complexes, which is something we think would have been very different if we were working in undergraduate housing.

CONCLUSION

Notwithstanding the bevy of challenges that our team has dealt with in the past half-year, the quantitative and qualitative results of our educational efforts have reassured us of Hilgard residents' ability to sort their waste and we feel confident going forward that our goals for the implementation of compost infrastructures within select undergraduate apartment buildings and for continued efforts to maintain proper waste diversion in the graduate apartments on Hilgard Avenue are both feasible and necessary.

The coming weeks and months will require prompt and detailed communication between our team and the key stakeholders and staff within UCLA Housing, ResLife, and Facilities Management. The effectiveness of aforementioned

pilot programs will likely depend on when our efforts take place, and per our meeting with Housing Maintenance Supervisor Jesse Alberti, the best time for these pilots will be in September when most students move back into the apartment buildings en masse. Our team has compiled a list of materials and their associated costs that Housing and Facilities will need to order and implement in our chosen buildings - 510 and 625 Landfair - by this time (Figure 14 and 15). Among these items that we have listed are compost caddies for each apartment, compost bags and bag dispensers to be placed in each building's central ground floor waste room, and 50-gallon green bins to be placed in the rooms containing the trash and recycling chutes on each floor in

625 Landfair. While some of these items may need to be bought using Housing's budget, our team, as well as Housing Sustainability manager Erin Fabris, have prior connections to staff members at EcoSafe, an organization that donated Hilgard's caddies free of charge in 2017. We will explore these minimal-cost options with EcoSafe as we want these programs to come at a minimal financial burden to UCLA.

Additionally, we want the educational aspect of our efforts to be solidified and institutionalized. We will provide Residential Life with our remaining magnets and change the information on our infographics to take out Hilgard-specific information, so that these materials can be distributed at any select apartment. In order to minimize the amount of stray magnets casually discarded by residents, we will coordinate with ResLife to make sure the magnets are included within the mandatory inventory

on the move-in checklists when students move in at the beginning of next school year.

Secondly, in order to transfer the burden of educational work away from this year's SAR team, we will work with our stakeholders in ResLife to add an aspect of sustainability promotion to the job descriptions of the incoming Apartment Resident Assistants (ARAs) who will live in the buildings we have selected for pilot programs. Ideally, in addition to responding to students more immediate logistical and emotional needs, ARAs will ensure a proper awareness of the new compost programs and occasionally check on the new bins in the waste rooms and update their supervisors in Residential Life on any recurring problems, such as flies or odor. Additionally, ARAs will be able to distribute educational materials if and when they are needed throughout the year.

Detailed Inventory of Necessary Program Materials

	Location	Size	Supplier	Cost
Compost Container	Garage	Large	Athens	Included with Contract
Waste Room Compost Bin	Waste Rooms on Each Floor Level	50 gallon	webstaurantstore.com	\$105
Compost Caddy	Each Apartment Unit	Personal	EcoSafe	\$13 (on amazon)
Compost Bags & Bag Dispenser	Each Floor and Waste Room	TBD	EcoSafe	\$30 (cheaper in bulk)
Refrigerator Magnets	Each Apartment Unit's Refrigerator	4' x 6'	qualitylogproducts.com	\$0.91/ magnet

(Figure 14) A visual chart displaying a Detailed Inventory of Necessary Program Materials for program expansion to additional ULCA Apartment complexes. Included are items necessary for purchase along with the location of implementation as well as source of purchase.

Amount of Necessary Program Materials For Different University Apartment Complexes

	720 Hilgard Ave.	824 Hilgard Ave.	625 Landfair Ave.	510 Landfair Ave,
Compost Container	-	-	1	1
Waste Room Compost Bin	-	-	total number of units in complex	-
Compost Caddy, Recycling Bin, and Trash Can	-	-	total number of units in complex	total number of units in complex
Compost Bags & Bag Dispenser	-	-	total number of units in complex	-
Refrigerator Magnets	total number of units in complex	total number of units in complex	total number of units in complex	total number of units in complex

(Figure 15) A visual chart displaying the Amount of Necessary Program Materials For Different University Apartment Complexes. In order to expand the composting program to 510 and 625 Landfair Ave, the following is an inventory of items necessary per complex.

RECOMMENDATIONS

In order to maximize the scope of ongoing waste diversion efforts within the enormous enterprise that is UCLA, we recommend that a future SAR team explore instituting compost pilots within University Apartments South, as well as within the remaining undergraduate buildings at University Apartments North, the latter of which may require more creative logistical solutions, as some of the waste rooms within these buildings may not immediately accommodate a green bin or compost receptacle. Regarding UA South, a future team may be able to reconnect with our teams 2017 stakeholder Javier Ayala, the former Housing and Hospitality Custodial Supervisor who was instrumental in the success of the Hilgard pilots.

A future team, whose name may need to be changed in order to reflect the broadened scope of the project beyond just Grad Housing, may also want to explore other ways beyond door-knocking, surveys, and focus groups to engage residents and help raise their awareness of the importance of reducing waste. Perhaps a fun but educational video or more active social media campaigning would be appropriate in this endeavor. The end goal for this team would be to somehow creatively incentivize increased use of the compost pilots and existing compost systems.

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**THANK
YOU.**