CHAPTER 8: RECYCLING IN RESIDENCE LIFE COMMUNITIES
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8.1 Introduction

8.1.1 Overview
This chapter focuses on recycling and waste management in the First-Year Residence Life Community. The chapter assesses one individual project designed to test the impact of providing recycling bins inside of every residence hall room. The residence life mission states that through living in the residence halls students will develop “a sense of academic citizenship and membership into the Chapman community of scholars.” This statement reflects Chapman’s commitment to advancing the knowledge of students both inside and outside of the classroom. The recycling project aims towards building sustainable home habits, encouraging students to recycle while living in the dorms in hopes that they will carry these habits while on campus and past their time at the university, overall implementing the value of good citizenship in residents.

The data from this chapter comes from two waste audits carried out in Pralle-Sodaro hall. Prior to the audit, small waste bin containers were provided to residents on the second and fourth floors of the building, while the first and third floors were not provided bins. The aim of this method was to analyze how the rate of diversion varied between floors with bins and floors without. Two waste audits were conducted over a period of two months, one audit a week after the implementation of the bin system, and the second audit a month after the first audit. Analyzing this data allowed researchers from the Environmental Science and Policy Capstone Course to determine what methods best promote recycling in the dorms.

8.2 Background of Recycling in the United States

8.2.1 Analysis of Chapman Waste versus National Waste Data
In the US. In 2013, Americans generated about 254 million tons of trash and recycled and composted about 87 million tons of this material, equivalent to a 34 percent recycling rate. On average, Americans recycled and composted 1.51 pounds of individual waste generation of 4.40 pounds per person per day (EPA, 2016). On average, the residence life dorms accumulated an average a total of 103.15 pounds of trash, meaning that each individual resident generates on average a total of 3.94 pounds of trash per day, which is under the national average. However, the percent of recycling per day only equaled 25.2 percent of the total material disposed of, which is 9.1 percent below the nation's average.

8.2.2 Waste Management Practices in Higher Education Campus Housing
While Chapman University has made great strides towards becoming the more sustainable campus-wide, various other Universities have put unique waste management programs into placed that Chapman has yet to utilize. Harvard University implemented a program in residence calls called “Freecycle” which is a program aimed towards recycling goods in the dorms. Year round, residents have access to “Freecycle Shelves” which serve as areas for students to donate and swap unwanted goods and supplies. When these shelves get too full, the items are donated to a local charity center nearby. Other schools like Seattle University have placed the task of sustainability in the living-learning communities. As a result, residents have created the “Green Cup Recycling Challenge” which is an online quiz that tests residents’ knowledge of recycling practices. Every year, the residence life office hosts a competition to
see which residence hall can achieve the best participation rate over a three week period. These are two practices that could potentially be implemented in the residence halls with the support of staff and student leadership.

8.3 History of Residence Life Recycling at Chapman

8.3.1 Previous Audit Findings

The 2016 environmental audit explored the types of items that were frequently disposed of in the residence life area. This study focused on the impact of signage and informational tools near the points of disposal in the halls. It concluded that signage in the areas of waste disposal did not show an increased rate of correct recycling practices in the dorms. This lack of change in data is what lead the research team to implement the second part of the 2016 audit study. The team concluded that the signage might not have been effective because residents do not separate their trash in the trash rooms located on each floor, but in their rooms themselves.

In the 2016 audit, it was suggested that a recycling bin should be placed in each room with appropriate signage to help residents sort items correctly. One major conflict RLFYE has faced in the past were issues with recycling bin distribution and inventory. Dave Sundby noted that when trash cans are placed in rooms, it creates a job for an individual to have to collect bins at the end of the semester. In preparation for summer conferences, large trash bins are placed in each unit for the duration of the summer, but this still does not include the addition of a recycling bin. A system has not been implemented to redistribute and inventory bins back into the dorms for the new school year after summer conferences leave the residence life area. As a result, many of the bins are scattered throughout the residence halls. Conference coordinator Kelly Cooke noted a similar problem with the distribution of cans in the residence halls, explaining that the absence of recycling bins is not an intention of the summer conference program, but a byproduct of the fast transition of the two departments in between summertime and the semester. Cooke described that over the summer, it is uncommon for summer residents to be eating many meals in their rooms because of access to the cafeteria and their short term stay. In addition to there not being a huge demand from summer residents for the bins, he also noted that the larger trash rooms on each floor are utilized a lot during the summer. Neither department has been actively advocating against the implementation of a bin system, however the topic has not been treated a source of priority due to the quick turnaround time for the dorms between departments, and the need to keep other aspects of each program moving.

8.3.2 Previous Solutions

Chapman received a grant from the City of Orange in 2006 to buy and place small blue recycling bins in classes and offices. (2016 Audit) This grant placed all bins in classes and offices, which are still currently present in classrooms. However, the implementation of recycling bins in dorm rooms has been inconsistent due to the frequent disappearance of the cans. It costs the department $7.80 to replace each bin and a permanent solution has not been found to keep the bins in the room. With the disappearance of cans throughout the dorms, rooms with cans have become an inconsistent standard throughout each hall. There are some spaces that still have cans from previous attempts to place them in the rooms, while some halls have stored cans in trash rooms located at the center of each hall. This method gives students the option to take cans from the trash rooms but does not solve the issue of disappearing cans, as these cans are not included in their inventory. One of the solutions proposed in this project was a labeling system on the distributed cans. Each recycling bin was labeled with a “Property of Chapman University” ticket on the backside (Figure 8.1). The purpose of the sticker was to inform
residents that the bin is a piece of furniture that is distributed and owned by the school, similar to any other item that is present in the rooms during move in day.

8.3.2.1 Signage and Information

To promote recycling awareness, elements of the information found in the 2016 audit were applied to implement effective signage. Each bin was placed on the experiment floors with a note explaining the purpose of the recycling bin and how it will officially be reflected on the inventory sheet for each room. In addition to explaining the role of the bin, the letter also a visual diagram showing a variety of recyclable versus non-recyclable objects (Figure 8.2). As additional tools, signage from previous audits were left in the large trash rooms on each dorm floor. The signage was not manipulated in any way and varied in terms of visibility on each floor. A low number of the signs were clearly hung on the wall, while the majority of signage was placed on the floor behind the trash bins (Figure 8.3).

![Figure 8.2 Waste bin with pictures and captions informing residents about common recyclables implemented in the 2018 audit.](image1)

![Figure 8.1 Waste bins with “Property of Chapman University Residence Life and First Year Experience” placed in rooms during the 2018 audit.](image2)

![Figure 8.3 Current recycling signage located in large Pralle-Sodaro recycling rooms.](image3)

8.4 Current Status of Pralle-Sodaro Recycling

8.4.1 Pralle Waste Audit

To test the impact of recycling bins in the dorms, Pralle-Sodaro hall was given 80 recycling bins to provide recycling bins to each room on the second and fourth floors of the building. Prior to the distribution of these bins, each floor only had three large recycling bins located in one room on each side of the floor. The distribution of recycling bins added, 40 more points of recycling on each of the testing floors. The first waste audit was conducted on March 15th, 2018 and measured trash and recycling rates from all four floors collected over the span of two days.
Figure 8.4 The composition of waste in Pralle-Sodaro hall during the first waste audit. The category “garbage” represents the initial amount of pounds of waste produced prior to sorting. While the category “Recyclables in Trash” represents the amount of recyclable objects thrown incorrectly into the trash. The “Recyclables” category shows the amount of recyclables produced thrown away on each floor.

Figure 8.5 Rates of waste collected in the second waste audit of Pralle-Sodaro hall, a month after the first audit.

Figure 8.6 Survey response to the question “How often do you separate your trash from recyclable items in your room/office?” This question was asked exclusively to residents without recycling bins.

Figure 8.7 Survey response to a series of identifying questions. Six items were provided, and students without bins were asked to identify the recyclable objects. There were three total correct options. The data above represents the number of objects students mistakenly categorized as trash instead of recycling.

8.4.2 Audit Findings
8.5 Concluding Assessments

8.5.1 Areas Where Chapman Is Doing Well

While giving out recycling bins, the research team received a lot of positive feedback from residents upon the bins arrival. Many of the verbal responses indicated that the residents had been missing having the presence of a bin in their rooms. Based on their responses and willingness to participate, our team speculates that residents in the hall have a desire to be sustainable, they just have not been given all of the tools to do so. As indicated in Figure 8.6, 86 percent of students make an effort to always or recycle their trash most of the time. Showing that the desire to be sustainable is one that comes naturally to Chapman students. However, the rate of recyclable objects in the trash is high due to a high rate of incorrect recycling, as shown in Figure 8.7.

8.5.2 Areas in Which to Improve

In the past, students have been given recycling bins in each room. However, the disappearance of these bins has created a shortage that makes recycling harder for everyone. To improve the presence of these bins in each room, it is important that staff and faculty continue to stress the concept that the bins are Chapman University property. A majority of students reported that they would be willing to purchase their own bins, however if this is the method the school choses to take, it should be clearly outlined to residents on move in day that they will be expected to provide their own bin. Based on survey data, 70 percent of students reported that they would be willing to purchase their own bins. However, when asked if they had taken the steps to purchase their own bins no student reported having done so. This data supports the idea that asking students to supply their own bins may not be the most effective option to see results. Residence life provides students with all the furniture they would need to live comfortably in the dorms for a full school year, it should be set as a standard that the standard set of furniture include a recycling bin.

8.6 Recommendations

8.6.1. Low Cost/Effort

Survey data reflected that students would be willing to purchase their own recycling bins, however none had taken the steps to do so yet. This challenge could be improved if students were made aware that they will need to provide their own recycling bins. This can be implemented in the move in day informational email. When residents are given a list of recommended dorm room supplies products, a recycling bin would be added to the list. This process would be carried out by the RLFYE staff at the beginning of the semester. This could offer a cost free option to the department and eliminate the issue of missing inventory. However, leaving the responsibility to the residents alone might not offer any improvements to the growing issue of sustainability awareness on campus.

Similar to the programs implemented at Seattle University, programs about sustainability are incorporated into residence life programming. A main example of this would be putting sustainability and recycling questions in the annual “Hall Olympics” games, a program in residence life that offers a series of trivia and sports games for residents to participate in and earn points for their hall. Students will be able to add to the points for their hall by correctly answering dorm related sustainability questions. Incorporating questions about sustainability practices worldwide as well as questions specific to Residence Life. The role of this task would fall onto the Resident Directors that plan these programs, these line of questions could easily be put in place of another set of standard trivia questions.
8.6.2  Moderate Cost/Effort

Invest in custom recycling bins for the Residence Life department, with a onetime purchase of a “Property of Chapman University” sticker, similar to the label shown in Figure 8.2. In terms of a long term investment, the bins would be clearly marked as Chapman property and would have a reduced chance of going missing, in turn saving the department replacement costs. The addition of bins to each room would be a task carried out by both the RLFE and Summer Conference teams. A mutual agreement would need to be made between the two departments to inventory and keep the bins in the rooms year round. This would mean the bins would only have to be placed in each room and cleaned by facilities once a year, likely before the beginning of each academic year. Both department heads, have agreed that a mutual agreement needs to be made to resolve the issue. Director of institutional events, Kelly Cooke recommended that the two departments determine an inventory system that holds each group accountable for missing bins, in this system neither department would not be paying out of their budget to replace bins their residents did not take or damage. This inventory system would be a solution to implementing a year round program for recycling, but the two departments would have to mutually agree on the best fitting inventory system.

8.6.3  High Cost/Effort

To address the overall high rates of waste generated in the residence life communities, a system of in-house donation spaces can be put into place. Similar to the program at Harvard University, in each residence life building a shelf will be provided for residents to donate usable items instead of throwing them away. This could be very impactful in the apartment style housing units, where students accumulate more household objects, but still do not have the space to store everything. The shelves can be located in the trash rooms on the first floors of each buildings, allowing students the privacy to look through the shelves and take the objects they need. This program could be impactful to students that are having trouble supporting themselves through college, or do not have transportation to always go to the store. The idea would help to reduce the amount of usable items put into the trash each day, while helping to support every resident in the building. Because this is a program proposal that is aimed at helping students, a high amount of student involvement should go into running it. If residence life and facilities agrees to provide the space for these centers, it could fall under the job description of Hall Council to promote its use and run it. At the end of each month a designated member of Hall Council will be responsible for putting all of the extra donated items to the larger donation bin near the Davis Community Center.

8.7  Future Areas of Research

8.7.1  Future Audits

While the 2018 audit did not measure the rate of usable objects thrown in the trash, it was visibly clear during the audit that the rate of trash was abnormally high. Future research should aim to put numbers to this theory and conduct research on how to improve the system. If the in-house donation system is implemented, it would be useful to see how the program manipulates waste in the dorms.

8.7.2  New Building Research

With Residence Life expanding at such a fast rate, it would be a good time to study and implement permanent solutions to reduce waste. These solutions can range from a system of permanent signage throughout the building and an increased rate of trash rooms to make recycling more accessible, to more large recycling rooms throughout the buildings.
8.8 Contacts

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CHAPTER 9: DAVIS APARTMENTS WASTE MANAGEMENT AND RECYCLING HABITS

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9.1 Introduction

9.1.1 Overview
There are trash and recycling programs in many cities and each program has different items that are accepted. The company that currently services the city of Orange and Chapman University is CR&R. CR&R accepts many different types of materials that can be recycled. Being an institution with thousands of people, a lot of waste is created and a portion of this waste comes from the residence halls. Conducting waste audits helps the university understand what kind of and how much waste is being disposed of. It also provides a good idea of what the recycling habits of students are.

9.1.2 Proposal
My proposal involved conducting waste audits of the on-campus Davis Apartments and introducing educational signage on what can be recycled in order to see what impact it has on the recycling habits of students. This project includes an analysis of the recycling and trash waste before the signage was distributed and then after the signage was distributed. The distribution and/or communication of the signage was paired with an incentive in order to see its impact.

9.1.3 Recycling Practices in Residence Halls at Peer and Aspirational Institutions
Environmental and sustainability programs vary at different colleges and universities, and Chapman has identified peer and aspirational institutions in regards to the aforementioned programs. In this sense, one of Chapman’s peer institutions is the University of San Diego and one of Chapman’s aspirational institutions is Seattle University. Both of these happen to be in the top 50 on the Sierra Club’s Cool Schools 2017 list for their self-disclosed commitments to sustainability (Sierra Club, 2017).

The University of San Diego and Pepperdine are considered peer institutions of Chapman University. The University of San Diego provided all residential units with blue recycling wastebaskets for student use within the past two years of updating their Recycling section under their Facilities Management page. This page also has a list of conservation and recycling programs. They also have recycling for inkjet/toner cartridges in the residence halls as well as on campus (University of San Diego, 2018). At Pepperdine, all residence halls, classrooms, and conference rooms should have a recycling and trash can. These recycling cans are designated with a recycling sticker. The university also has handouts that specify what can and cannot be recycled (Figure 9.1). Pepperdine also states that “residents are expected to recycle materials as stated in recycling policies” in their Housing Contract Terms and Conditions 2018-2019 (Pepperdine, 2018).

Two of Chapman’s aspirational institutions are Seattle University and Claremont McKenna College. Seattle University has a history of recycling practices on the campus beginning in 1988. The university has a Green Living Guide which outlines sustainability
through conservation and waste reduction alternatives and resources. Page 3 outlines information “all about your recycling bin” (Figure 9.2) (Seattle University, 2017).

All About Your RECYCLING Bin

What to Recycle
- All clean paper, plastic, and metal
How to Recycle
- Use the small blue bin in your room to collect all of your recyclables
- Put them in the blue recycle bins in the recycle room on your floor
- You do not need to separate your recyclables. All recycling can be put in any blue bin on campus
- You do not need to remove tape or staples from paper.
- You do need to remove liquids and food from containers. Liquids go down the drain, food goes into your compost bin!

Figure 9.2. All About Your Recycling Bin page from Seattle University’s Green Living Guide.

Based on the institution’s future goals and strategies from their Climate Action Plan 2010-2035, increasing outreach and education about recycling as well as increasing the waste diversion rate, is in the plans. Below (Figure 9.3) are more details on the implementation of these strategies (Seattle University, 2011).

Strategy 3.5.1 Increase outreach & education about recycling and composting
The university will increase outreach and education about recycling and composting. Potential methods include increasing the availability and visibility of recycling and composting information, developing a recycling and composting newsletter, training student Residence Hall Advisors (RAs) on recycling and composting procedures, and increasing orientation for new employees.

Timeline: 2011 and ongoing
Responsible: Facilities Services
Outcome: Increased knowledge and awareness of recycling and composting

Strategy 3.5.2 Increase Waste diversion Rate
The university will expand its waste diversion successes to increase the amount of recycling, composting, and donations collected. Existing recycling containers will be replaced and additional containers will be installed. The compost collection program will be expanded to all facilities, and additional donation and reuse collection will be evaluated.

Figure 9.3. Some of the Future Goals and Strategies from Seattle University’s Climate Action Plan.

Claremont McKenna College also makes sure that each residence hall room, office, classroom, and meeting area has a “recycle only” container and a waste can. A list of what can be recycled is on the Recycling Program page on their website. The college also has a Green Guide that gives tips on living an eco-conscious lifestyle at the college. Some of the information on that guide includes top 7 tips to reduce, reuse, and recycle; a list of what are acceptable recyclables and non-acceptable materials; and things to
think about when moving out and items that are found in residence hall rooms and bathrooms that could possibly be recycled, reduced, or reused (Claremont McKenna College, 2017).

9.2 History of Davis Waste Audits

9.2.1 Sustainability Audit

Previous environmental science & policy capstone classes have looked into the environmental education aspect and what effect recycling signage seems to have on recycling behaviors and habits. In the 2016 Environmental Audit, signage was used in Argyros Forum on what could be put in the recycle, trash, and compost bins. However, it was noted that there does not seem to be a direct correlation between education and behavior based on the findings, stating that education is not enough to stimulate environmental behavior. The results showed that the amount of recyclables found in the trash were around the same the second time the researchers did the waste audit in Argyros Forum.

The Audit in 2016 also looked at waste in the on-campus Davis apartments, but the data was just used to compare it to the waste audits of the Henley Hall dorm. The first waste audit conducted in Henley Hall served to select items the researchers wanted to focus on. These five items were: plastic bottles, paper cups, paper, cardboard, and plastic utensils. The data collected was analyzed and categorized. Then educational materials were distributed to two out of the four floors in that building to see what impact it would have on their recycling behaviors. The results indicated that the educational materials did not have the expected impact (i.e. increased recycling rates from the floors that received the educational materials). Overall, the recycling rate of each floor did increase. The researchers then compared the data collected in the Henley Hall waste audits to the data collected in the Davis Hall waste audit. They found that Davis produced more food waste than in Henley Hall and that trash and recyclable materials ended up together in the trash a lot of the time (Chapman University, 2016).

9.3 Current Status

9.3.1 Recycling Practices in Davis Apartments Residence Life

Currently, students living in the Davis apartments take out their own trash and recycling and dump these into the respective dumpsters found in the parking lot adjacent to the apartments. Recycling bins are not part of the room inventory requirements, but if the apartment does have a recycling bin, there would only be one in each apartment. Educational materials on what can and cannot be recycled are not distributed in any form. However, the recycling dumpster does state some of the things that can be recycled, but a more extensive, clearer, and more accessible list can be shared with all via several means of communication.

9.3.2 Recycling Resources at Chapman

Chapman currently has a page on their website titled Recycling and Waste Management that has some information on their sustainability practices and includes guidelines on what can be recycled by our waste management service, CR&R. Unlike Pepperdine, Chapman’s Resident License Agreement (RLA) does not have any mention of recycling policies residents are expected to follow. The Davis Community Center, which is a study and meeting area central for students in the Davis Apartments, houses a small plastic container in which students can dispose of used batteries. This resource, however, is not well known. Resources and collection for electronic waste is handled by Chapman’s Environmental Health & Safety Department and is geared more towards staff and faculty.
9.3.3 Davis Waste Audits

Recycling and trash waste for the first and second waste audit of the Davis Apartments was collected for a period of two days. During the collection, the majority of the recycling (loose) and trash (bagged-only) waste found in the respective dumpsters was removed and transported to the sorting location. The first waste audit was conducted before the signage was displayed and distributed and paired with an incentive. The second waste audit was conducted after the signage was displayed and distributed and paired with an incentive. For reference, the setup of the Davis Apartments consists of a kitchen, living room, one or two bedrooms, and one bathroom. The materials found in the recycling were broken down into seven categories: paper/cardboard, glass, plastic (utensils, bottles, containers, bags, lids), steel-tin and aluminum cans, mixed recyclables, not recyclable, and recyclable if cleaned/emptied. The recycling coming out of the trash waste was broken down into two categories: clean recycling in trash and too dirty to recycle.

In terms of weight, the majority of recyclable material found in the first waste audit was glass (Figure 9.5) and the least amount was of mixed recyclables, which include bubble mailers and waxed milk and juice cartons (i.e. tetrapaks). However, bubble mailers were also found in the trash waste. This suggests one of two things: students do not purchase or have these types of mixed recyclables or they just don’t know that CR&R recycles them. One of the plastic items and two of the steel-tin and aluminum cans found in the recycling contained liquid, which had to be emptied by thee researchers. The non-recyclable materials included greasy pizza boxes, napkins, bar/snacks/candy wrappers, and receipts. While students may be trying to be active recyclers, more education is needed to establish proper recycling habits on what can and cannot be recycled. As for the trash waste, one of the bags was bathroom trash – which was discarded of – and one bag was full of high fashion brand clothes (i.e. Tommy Hilfiger, Calvin Klein, etc.) (Figure 9.4) that appeared to be in good use.

![Figure 9.4 and Figure 9.5. Bag of high fashion brand clothes from the trash waste (left) and some of the glass materials from the recycling waste (right).](image)

The data collected from the first waste audit helped inform what information should be shared with the students living in the Davis Apartments via the educational signage. It was decided that CR&R’s recycling guidelines that apply to Chapman University (Figure 9.6) should be displayed as well as a “Did you know: the following items are not recyclable?” flyer (posted along with some other educational materials from a fellow researcher) (Figure 9.7) in central, highly transited areas of the David Apartments.
community area. In order to ensure students were aware of these recycling guidelines, a slightly modified flyer stating these guidelines, provided by CR&R, was posted on the door of each of the 60 total apartments in the Davis residence area. Shown below the educational flyers is the flyer for the incentive (Figure 9.8) that was to be provided along with the distribution of the educational materials.

![Business Recycling Guidelines](image1.png)

*Figure 9.6. and 9.7. CR&R’s Business Recycling Guidelines as they apply to Chapman University (left) and educational signage developed by researchers that was based off of the 1st waste audit data.*

![Davu Flyer](image2.png)

*Figure 9.8. Flyer incentivizing students to show off proper recycling habits.*
In terms of weight, the majority of recyclable material found in the second waste audit was also glass and the least amount was of steel-tin and aluminum cans. Glass was the highest in terms of weight in both waste audits because it just weighs more than other types of recyclables. This time there were a few notable changes: for the mixed recyclables there were more bubble mailers and waxed milk and juice cartons and there were more clean pieces of pizza boxes. However, there were a few straws found in the recycling this time (probably because they were dumped along with the dirty Starbucks cups which the researchers labeled as recyclable if cleaned/emptied) as well as a bottle of lotion that was not emptied. Even though toiletries like lotion, soap, and shampoo bottles should be able to be recycled since CR&R takes all plastics #1-7, they must be clean and empty before recycling the container. As for the trash waste, a thin piece of computer hardware with wires and a few batteries were found (Figure 9.10). This signals that knowledge on the proper disposal of electronic and hazardous waste materials is still necessary.

![Figure 9.9 and 9.10.](image)

When asked to please describe what causes Chapman students, staff, and faculty to not recycle, half of the survey respondents (majority undergraduate students, some graduate students, some staff members, and a few faculty members) wrote in that the main reasons are: inconvenience, no recycling bin nearby or available, and don’t know what to recycle. From this sample, ten out of twenty respondents that said live in the Davis or Harris Apartments also responded that inconvenience, no recycling bin nearby or available, and don’t know what to recycle were some of the reasons why they did not recycle. In regard to residents living in the Davis Apartments, educational signage and investing in recycling bins to make sure these are available for each apartment would tackle two out of three of these reasons.

In conclusion, there was a slight improvement (Figure 9.11) in the proper recycling habits of students in the Davis Apartments area, but the educational signage needs to be widely distributed and displayed for a longer period of time before making any conclusions. It is also unclear whether or not the incentive had any impact on the recycling habits of the Davis Apartments residents. Researchers analyzed waste audit data to show a comparison for the weight amount of recyclables found in the recycling waste for each waste audit (Figure 9.12), the weight amount of recyclables found in the trash waste for each waste audit (too dirty to recycle and clean recycling in trash) (Figure 9.13), and the percentage of actual and possible diversion (Figure 9.14).
Figure 9.11. In the 1st waste audit, 18% of recyclable materials were not disposed of correctly and in the 2nd waste audit, 17% of these were not disposed of correctly. A potential explanation for this slight decrease can be a result of the educational signage displayed and distributed.

Figure 9.12. When shown side by side, the recyclables seem to have a consistent recycling rate. The item most commonly recycled (that also weighs the most) is glass.
Figure 9.13. Out of all the waste in the trash for the 1st waste audit, 14% of it could have been recycled. For the 2nd waste audit, 16% of the waste in the trash could have been recycled.

Figure 9.14. Increasing diversion rates is one of the goals and this shows that the rates could have been higher if recyclables were disposed of properly.

9.4 Concluding Assessments

9.4.2 Overview

Awareness and education help broaden perspectives to think about and consider what hasn’t really been thought about before. By generating awareness, the goal is to have a positive influence on the recycling habits of students by providing educational signage and making the recycling process easier and more accessible. Learning and practicing proper recycling habits now will have a long-term positive impact in the lives of students, and hopefully in the lives of others in their communities. By
conducting these waste audits and adding signage, consciousness can be created each time students dispose of something.

9.4.3 Areas of Progress

Chapman University’s Sustainability Department has done a good job of increasing receptivity and raising awareness of proper recycling habits by sharing tips on the Chapman Sustainability e-newsletter. The environmental club on campus, Mission Environment, has also created posters of what can be placed in the trash, recycle, and compost bins on main campus by making it applicable to the waste produced there and displayed several posters (one poster from April 2018 shown below) (Figure 9.15) in the student union, a highly transited area. The aim is to have these messages of information transfer over to people’s daily lifestyles, including considering the waste produced in living areas.

![Figure 9.15](image)

*Figure 9.15. Educational poster regarding proper disposal created by Chapman University’s environmental club, Mission Environment.*

9.4.4 Areas of Improvement

The waste diversion in the Davis Apartments was very low – not even close to 50%, which should be the goal when it comes to diversion. By improving waste diversion, more materials will be able to be repurposed instead of going to landfills that will eventually run out of space. CR&R offers a comprehensive list of items that are recyclable, and some are not even offered by other waste management services. Recycling, specifically in the Davis Apartments, should be accessible to all, and this can happen by implementing some or all of the recommendations mentioned in the next section.

9.4.5 Future Research

Because the signage that was distributed and displayed was up for a short period of time, the impact of educational signage on recycling habits is not yet very well known. The signage that was displayed was not durable enough (i.e. made out of paper) and it was affected by the weather conditions (i.e. blown away). This is why creating long-lasting signage and sharing it with residents to place inside of the apartments is a viable option that should be looked into. Looking more into the impacts of incentives could also be useful when it comes to motivating and encouraging students to recycle.
The formulation of effective environmental messages is also important in order to be able to easily get the message across and even encourage and motivate students to increase their proper recycling habits. There are studies that discuss different types of environmental messages and which ones would be effective for different types of situations. One study related to this project stated that according to the model used in that study, messages that can enhance a receiver’s sense of personal freedom and minimize a threat to personal freedom are preferable (Liang et al., 2018).

9.5 Recommendations

9.5.1 Low Cost and/or Effort
- Display and distribute physical and digital educational signage on proper recycling and tips

9.5.2 Medium Cost and/or Effort
- Create long-lasting recycling educational signage such as magnets for fridge
- Ensure each Davis Apartment has at least one recycling bin and at least one trash bin – residents should have these both available to reduce limitations on recycling and should be consistently and mandatorily placed (total cost = $1,260)

9.5.3 High Cost and/or Effort
- Have Residence Life provide mandatory sessions that inform Davis residents on proper recycling practices and provide them with resources to reduce, reuse, and recycle

9.6 Contacts

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9.7 References


9.8 Appendices

![Figure 9.16. When Chapman students, staff, and faculty were asked, “What statement are you most likely to have a more positive response to?” 53% of respondents preferred the Evidence of Recycling (ER) type of environmental message, contradicting the results in a previous, related study done on theories of reactance and planned behavior in a water conservation context.](image)

Below are the calculations for the cost of investing in blue recycling bins and black trash bins (both are already in some Davis Apartments and on campus, but are inconsistently placed). Purchasing black bins