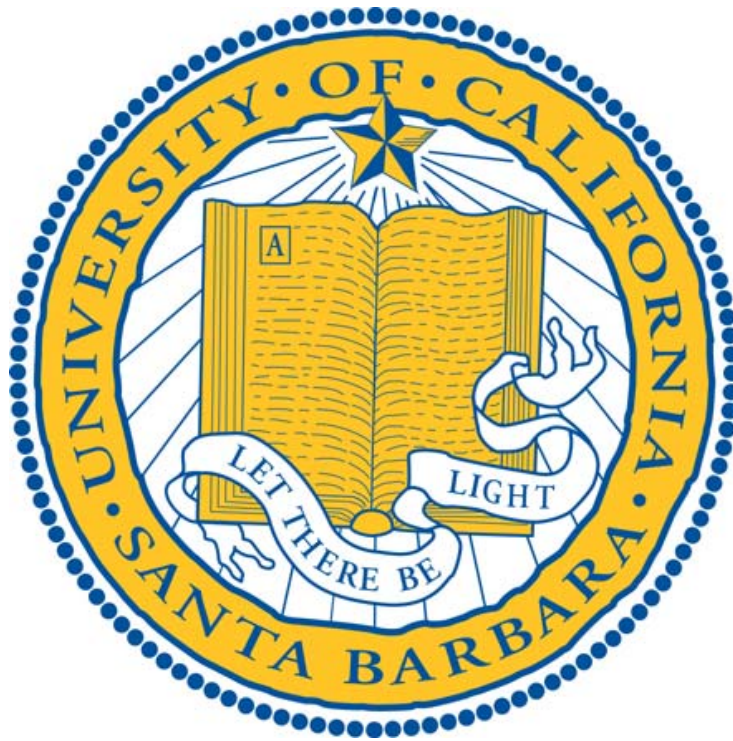


Waste Audit for the
University of California, Santa Barbara
Davidson Library



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1.0 INTRODUCTION

1.1 BACKGROUND

In 2011, the University of California, Santa Barbara (UCSB) Facilities Office commissioned GreenProject Consultants (GPC) to conduct a Waste Audit of the Davidson Library (Davidson) on behalf of the University. The purpose of the Audit was to gather data and information about the weight, volume, and composition of waste placed in the containers made available to building occupants and visitors. This report will describe the information and results gathered during the Audit.

1.2 Site Use and Associated Cost

Davidson is located on the UCSB campus. The campus is located in southern Santa Barbara County, between Goleta, CA and Isla Vista, CA.

Davidson is a large scale library that is open to the entire student and faculty of UCSB from 8am to Midnight, Mon- Thurs, 8am – 9pm Fri, 9am – 9pm Sat and 10am – Midnight Sun. Davidson averages 49,000 visitors per week.

At Davidson, wastes and recyclables are collected on a daily basis, accrued in designated dumpster areas which are then collected by the local hauler, MarBorg Industries. Data was unavailable for the weekly pick up schedule.

2.0 AUDIT

2.1 Waste Audit Objectives

For this Audit GreenProject Consultants will gather information and categorize waste types by weight, volume, composition and type of waste that was placed for collection in the containers made available to building occupants and visitors. The purpose of this Audit is to establish baseline data that can be used by the UCSB facilities office to begin monitoring the university progress in waste management. With this data, recommendations will be made which will help improve waste diversion efforts.

2.2 Procedures

The Waste Audit was conducted on Friday, March 4th, 2011 by GreenProject Staff. In order to perform a waste audit for Davidson, GPC had the custodial staff hold aside three days worth of waste from inside the building, which included trash and recycling.

Once the waste sample was collected GPC sorted each stream (trash, recycling) into material types (metal, paper, plastic, glass, cardboard, trash and foodscraps).

GreenProject Consultants weighed all of the sorted materials by type (see figures 2.1 to 2.9). All weights were in pounds. Weights were added together for total generation. GPC also measured the volume of the materials using 32 gallon containers to ascertain volume generated and diverted.

For example:

266lbs mixed paper in recycling + 20lbs mixed paper in trash =
286lbs total mixed paper generated; or 266lbs mixed paper
diverted. Same reasoning applies to volume.

2.3 TIMING AND RATIONALE

The waste stream from Davidson is well varied due to the varied use of the space, and includes general trash, recycling, and foodscraps. During the three days from which the audit sample was captured, this building was operating at normal capacity and activity; therefore, were a good representation of typical waste generation here.

2.4 MAJOR WASTE STREAMS

The following are the major components found to comprise Davidson's waste stream (see Figure 2.9).

- Mixed paper
- Office paper (office pack)
- Wet Waste (foodscraps & trash)
- Plastic
- Subway wrappers
- Coffee cups

3.0 SUMMARY

3.1 FINDINGS

The audit started with an unsorted sample of waste that consisted of 1287 gallons (650.3) of trash and 577 gallons (310.5 lbs) of recycling (see Figure 3.1 and 3.2). However, once the sample was sorted, we showed a much different waste distribution of 665.5 gallons of trash and 1198.5 gallons of recycling (see Figures 3.3 & 3.4).

Figure 3.1
Total Waste Composition (Unsorted) By Volume:

Trash: 1287 gallons
Recycling: 577 gallons
Total: 1864 gallons

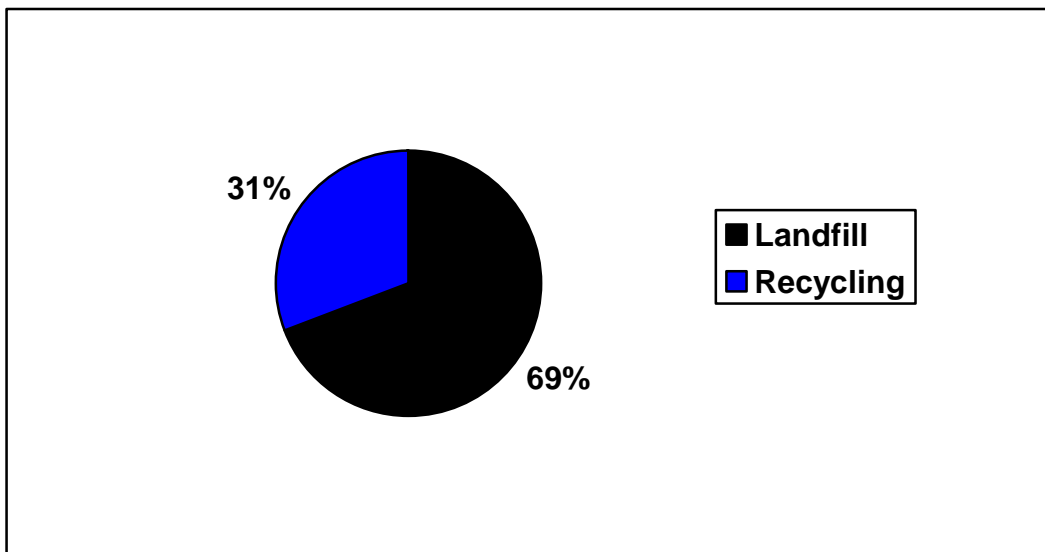


Figure 3.2
Total Waste Composition (unsorted) by Weight

Trash: 650.3 lbs
Recycling: 305 lbs
Total: 955.3 lbs

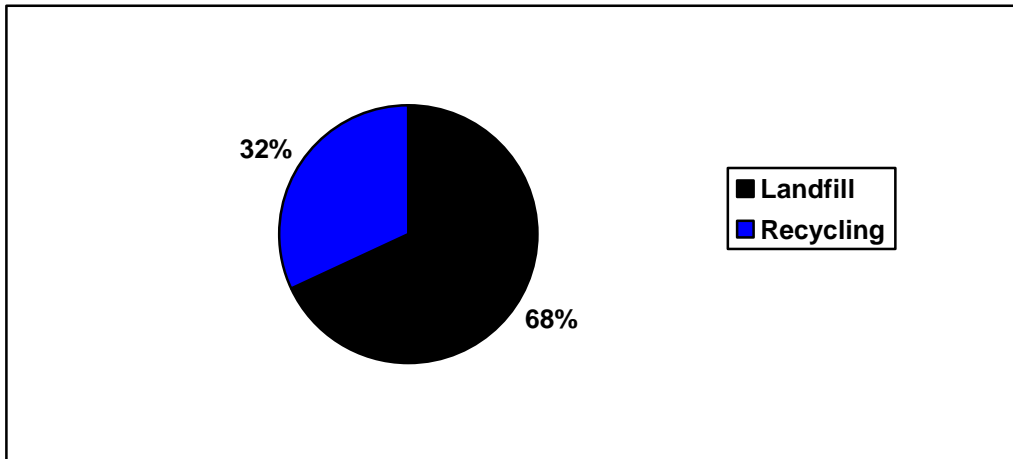


Figure 3.3
Total Waste Composition (sorted) by Volume

Trash: 665.5 gallons
Recycling: 1198.5 gallons
Total: 1864 gallons

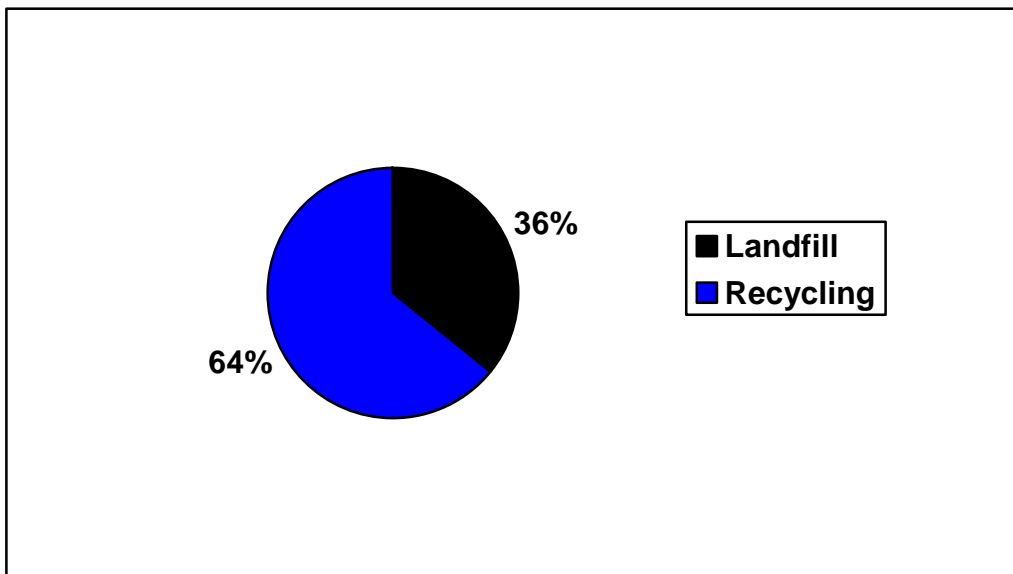
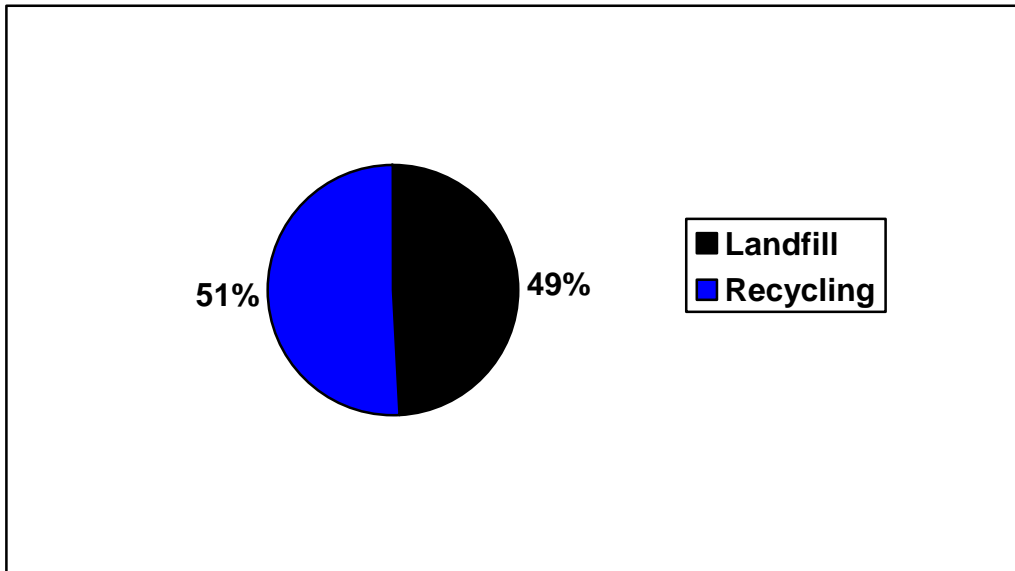


Figure 3.4
Total Waste Composition (sorted) by Weight

Trash: 470.3 lbs
Recycling: 485 lbs
Total: 955.3 lbs



The waste audit showed definite potential for improvement of diversion rates. The Recycling stream only showed contamination; however, it was the trash stream that suffered from the most contamination (see figures 3.5 & 3.6). This indicates a possible lack of infrastructure or education. Section 3.3, Recommendations, will delve further into beneficial infrastructure changes.

Figure 3.5
Recycling (unsorted) by Volume:

Trash: 154 gallons
Recycling: 423 gallons
Total: 577 gallons

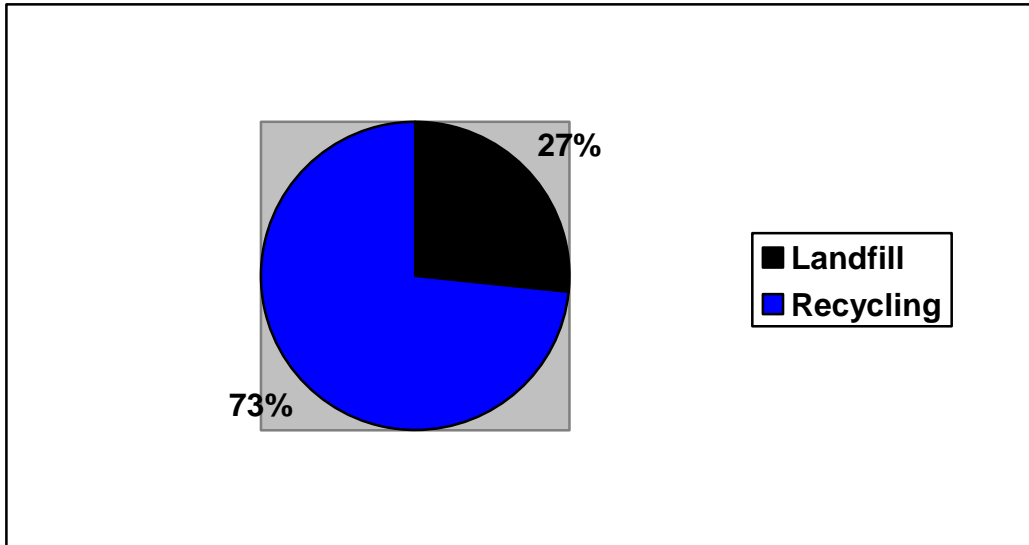
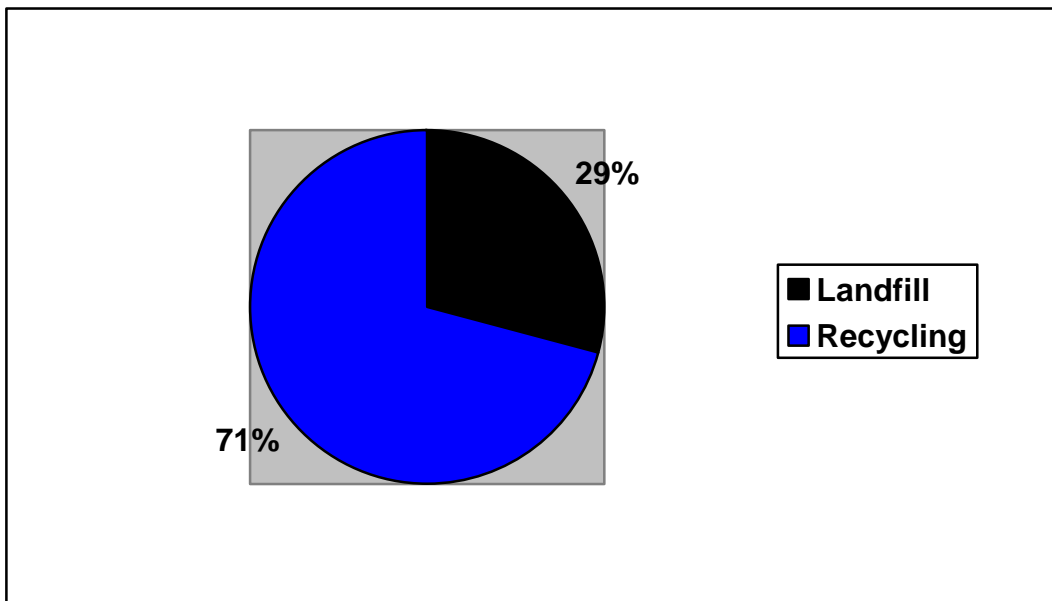


Figure 3.6
Recycling (unsorted) by Weight:

Trash: 89 lbs
Recycling: 216 lbs
Total: 305 lbs



The trash collection showed that there is either a minor lack of understanding of what can be put in the recycling, or a lack of willingness or motivation to do so. The trash collection contained over 37% recyclable material, by volume that had been wrongly placed. This indicates a large opportunity for improvement in diversion.

Figure 3.7
Trash (sorted) by Volume:

Trash: 511.5 gallons
Recycling: 775.5 gallons
Total: 1287 gallons

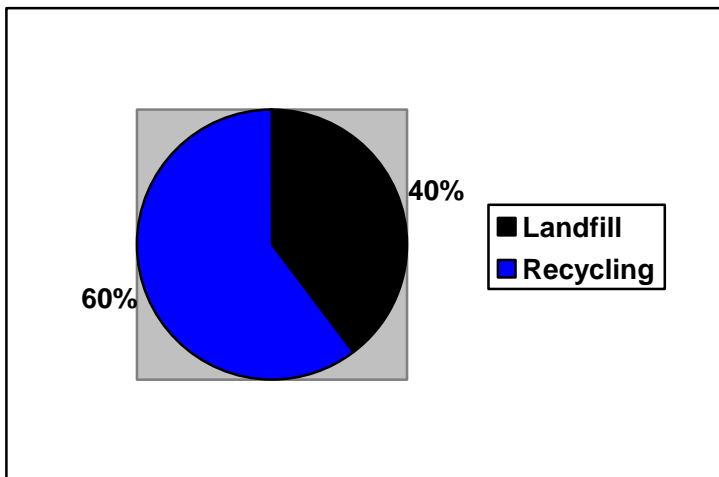
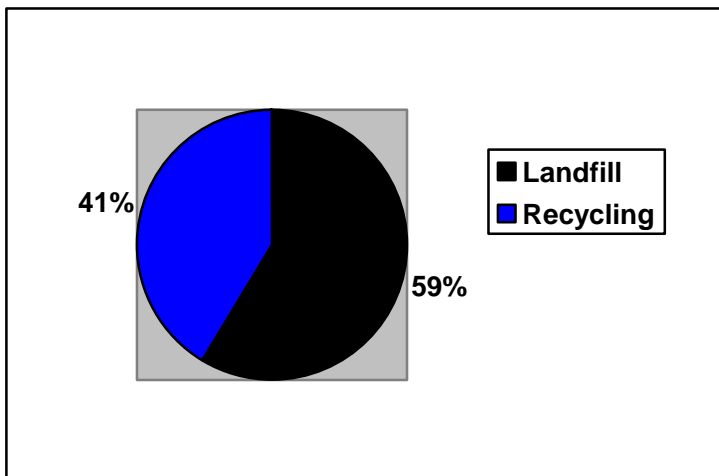


Figure 3.8
Trash (sorted) by Weight:

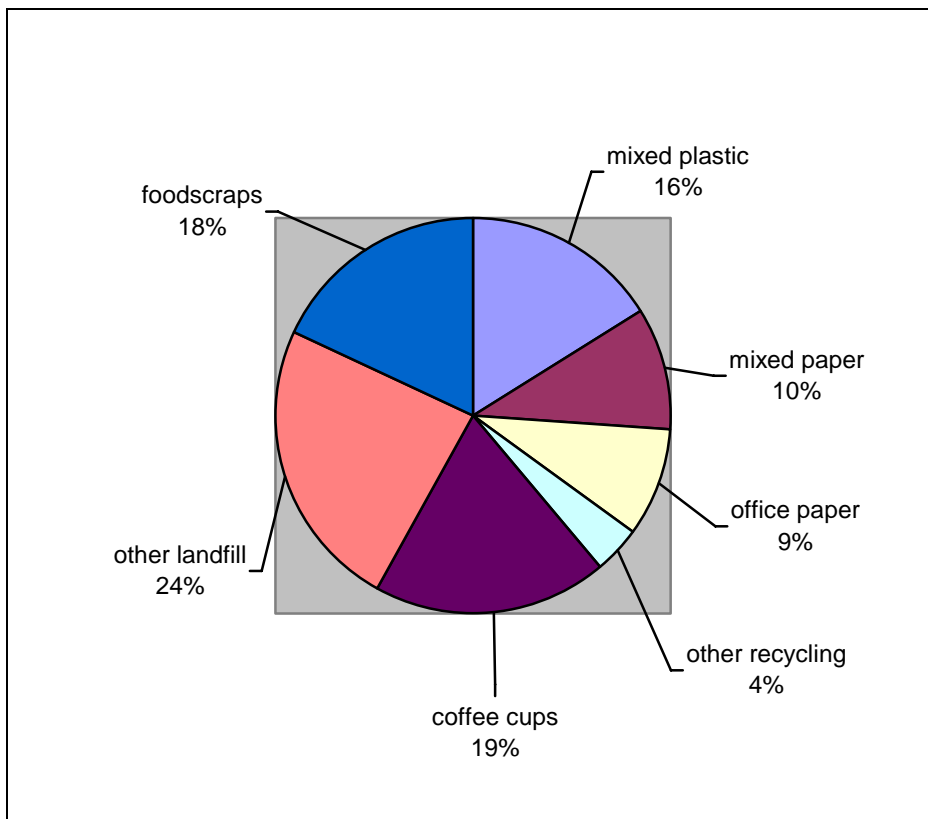
Trash: 381.3 lbs
Recycling: 269 lbs
Total: 650.3 lbs



The major waste types in Davidson’s waste stream were office paper, mixed paper, mixed plastics, coffee cups and foodscrap material (see Table 3.1, figure 3.9). This categorization will assist in future waste management efforts by giving insight into key target areas. Table 3.2 and 3.3 give insight into specific material source types found in Davidson’s trash and recycling. This information could be used to better direct recycling and diversion efforts by source type.

Figure 3.9

Percent by Waste Type (volume)



3.2 POTENTIAL FOR SAVINGS

The financial data was not available to us for use in calculating cost savings at the time of this audit. However, it is safe to assume that the cost of recycling service costs less than trash service (as is the case in Santa Barbara County) hence, if Davidson could improve on its current diversion rate, cost savings would ensue.

3.3 RECOMMENDATIONS

The results from the 2011 waste audit clearly indicate that some training involving the importance of waste diversion and what items can actually be placed in the recycling container and what should not be placed in the trash bin would greatly benefit Davidson's overall diversion efforts. These improvements can be in the form of changes to the infrastructure, increasing education and awareness for building visitors and occupants, and finding new and innovative solutions.

The following recommendations aim to increase the effectiveness of Davidson's waste management system:

- Place a co-mingled recycling bin next to every trash bin available for use. Ensure that there is both a trash receptacle and recycling receptacle in every room.
- Phase out paper coffee cups and encourage building occupants to bring their own mugs, or containers. Don't use bio-based cups* in the absence of a foodscrap program.

*Organic (including foodscrap and bio-based items) material buried in the landfill undergoes anaerobic digestion and results in methane production. Therefore, using "compostable" or "biodegradable" items and disposing of them in the landfill has a greater negative effect on the environment than using a plastic or paper cup that can be recycled.

- Develop posters for every common area in the buildings to explain UCSB's waste management system, sustainability initiatives, and reminders to "bring your own container"
- Implement a shared-use library of items that are not used often, but are used by more than one person, to reduce the amount of material brought on site (dishes, silverware, electronic equipment, durable goods).
- Continued presentations from the Environmental Coordinator/ Waste Management Staff to all new programs, as well as all returning employees
- Implement new outdoor waste management stations that include recycling and compost bins
- Consider incentivizing each office's waste management efforts with prizes and rewards
- Expand the existing cafeteria foodscrap program to Davidson, or implement a "backyard" composting system to capture, at a minimum, coffee grounds and non-animal related food waste. Almost 20% of Davidson's waste stream was comprised of food-related material and so this is a very large opportunity for overall diversion.
- Continue to regularly audit waste to assess progress

4.0 FUTURE

4.1 GOAL

The audit also took into consideration the amount of organics and foodscraps present in Davidson's waste stream. Foodscrap diversion programs have become high profile in recent years as one method for mitigating the emission of the potent greenhouse gas, methane, into the atmosphere.

Davidson and many other UCSB buildings have the distinct advantage of having an existing foodscrap program in place on some parts of campus. This makes it much easier to expand the program further.

One suggestion that the audit team would like to provide to Davidson is to begin talking with their waste hauler about the possibility of expanding their existing foodscrap collection program. Implementation of foodscraps at Davidson would increase the building's diversion rate by 19%, furthering the amount of material diverted from the landfill and offsetting significant greenhouse gas emissions annually.

COFFEE CUPS

During the audit we recovered over 9,250 (105 lbs) single-use cups. This is a staggering amount over a three-day period and indicates a significant opportunity for waste diversion.

Some of the cups recovered were paper-based cups, while others were made of plastic (hot vs. cold cups). All of these are now recyclable in the local recycling infrastructure.

The best solution would be to phase out single-use cups and encourage or incentivize building occupants to bring or use reusable cups.

Tables

Table 3.1 Major Waste Streams by Weight and Volume

Material Type	Weight (lbs)	% by Weight	Volume (gallons)	% by Volume
Mixed Plastic	87.8	9	264	14
Office Paper	103.5	11	156	8
Mixed Paper	73.5	8	171	9
Foodscraps & Soiled Paper	263	28	335	19
coffee cups	105	11	330	18
Total	632.8	67	1256	68

Table 3.2
Total Waste Categorization from Audit Trash Waste Collection

Material	Weight (during audit period) (lbs)	Volume (during audit period) (gal)	Percent of Total by weight (%)	Estimated Annual Amount* (lbs)
Office Paper	40.5	69	6	4,603.5
Newspaper	0	0	0	0
Other Mixed Paper	157.5	573	24	17,902.5
Plastic	41.3	111	6	4,694.4
Glass	17.7	7.5	3	2,012.6
Aluminum	12	15	2	1364
Other Metal	0	0	0	0
Electronics	0	0	0	0
Trash going to a Landfill*	165.3	247.5	26	17,789.1
Food	216	264	33	24,552
Other	0	0	0	0
Total	650.3	1287	100	73,917.4

Table 3.3
Total Recycling Categorization from Audit Recycling Waste Collection

Material	Weight (during audit period) (lbs)	Volume (during audit period) (gal)	Percent of Total by weight (%)	Estimated Annual Amount* (lbs)
Office Paper	63	87	21	7,161
Newspaper	18	15	6	2,046
Other Mixed Paper	21	93	7	2,387
Plastic	46.5	15	15	5,285.5
Glass	55.5	30	18	6,308.5
Aluminum	12	45	4	1,364
Other Metal	0	0	0	0
Cardboard	0	0	0	0
Electronics	0	0	0	0
Trash going to a Landfill*	42	116	14	4,774
Food	47	71	15	5,342.3
Other	0	0	0	0
Total	305	472	100	34,668.3

* Trash going to a landfill does not include the “food” category, which would currently be included in that waste stream, due to lack of foodscrap program

* The estimated annual amount is based on the assumption of 341 actively occupied days at Davidson.

Auditor Information

This audit was performed by GreenProject Consultants, LLC.

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Trash Collection - unsorted



Recycling Collection - Unsorted



Subway Wrappers



Coffee Cups – Approx 2/3 of total collected



Trash - sorted



Recycling - sorted