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# Recycling Study Project Summary

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Recycle More


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# Previous Efforts

## 1. Verdis Group

### 1.1. Recycling Rate and Weight of Waste per Weighted Campus User

USD's recycling rate for fiscal year 2015 was 6.9 percent, which is relatively low in comparison to some other institutions studies, including South Dakota State University (19.8%), university of Nebraska at Omaha (23.0%) and University of Nebraska at Kearney (12.0%). The reason is that USD does not have a formally-sanctioned recycling program

UDS's annual weight of waste per weighted campus user is 0.168 for fiscal year 2015, which is better than four other institution studies (South Dakota State University (0.2); Black Hills State University (0.19); University of Nebraska at Omaha (0.173); and University of Nebraska at Kearney (0.19))

### 1.2. Waste Profile

According to the recycling study by Verdis Group in 2016, the largest share of waste was compostable materials (43%) and approximately 20 percent of produced waste was recyclable. The remaining material (almost 37% of the generated waste) was not recyclable or compostable. Figure 1, shows the USD waste audits results.

### 1.3. Infrastructure Assessment

According to 2016 Verdis group survey, there are many more waste containers than recycling containers in campus. Table 1 shows the waste/ recycling inventory assessment summery.

### 1.4. Survey Summary

In 2016, Verdis group conducted a Survey with USD students and employees to measure their perspective and experiences regarding recycling and sustainability at USD. According to the

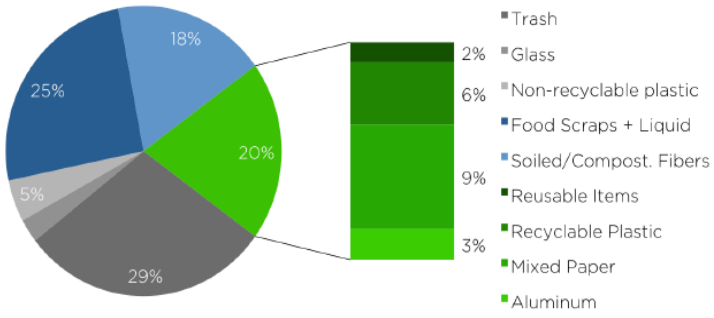


Figure 1: USD waste audits results

results, 80% of respondents believed that recycling at USD is important to them, 80% stated that sustainability is important and 60 % indicated that sustainability at USD aligns with USD's mission and values.

USD's Sustainability Engagement Score is 53, which fares well compared to other mentioned universities or similar institutions for which similar data exists.

Table 1: The waste/ recycling inventory assessment summery

| | W1 | W2 | W3 | R1 | R2 | R3 |
|---|---|---|---|---|---|---|
| Current | 103 | 399 | 2,173 | 36 | 92 | 52 |
| Future | 78 | 366 | 460 | 46 | 248 | 70 |
| Variance | -25 | -33 | -1,713 | 10 | 156 | 18 |

W1 = A nice, common-area waste container similar to those found in the MUC
W2 = A common area waste container, but not as nice as those found in the MUC
W3 = A small, below-the-knee waste container
R1 = A nice, common area recycling containers similar to those found in the MUC
R2 = A common area waste container, but not as nice as those found in the MUC
R3 = A small, below-the-knee recycling container - often a cardboard box

### 1.5. Recommendations

Verdis group has offered two alternatives for moving forward: a phased approached and an aggressive approach. The phased alternative is intended to provide an iterative approach that would minimize the resources (financial and

human) necessary to make changes and allow for the newly designed system to be refined as it grows. If resources are plentiful, an aggressive approach would make more sense and would certainly grow excited and engagement on campus around the steps being taken.
The alternatives have been summarized in table 2.

## 2. Capstone Course Recycling team (2016)

### 2.1. Survey

After Verdis group assessed the University of South Dakota's Sustainability Engagement Score and recommended better recycling initiatives on campus, it was then that the Sustainability Capstone Class of 2016 started their own recycling venture. First, the Sustainability Class of 2016 worked with Verdis group to produce and send out, via campus wide email, a survey about status and attitude towards recycling on the University of South Dakota's campus. The capstone class received more than 2,000 responses which made it evident that recycling and sustainability were important to the university faculty, staff, and students (Figure 2).

### 2.2. Dumpster Peek

A dumpster peek involved locating, numbering, and mapping, specifically, all the dumpsters on campus. They did so to record the efficiency usage of the dumpsters around campus. Their results showed that the majority of the dumpsters on campus were being over collect by waste management. This means that the dumpsters were never completely full yet were still being dumped on a regular basis. It is important to point out that the Sustainability Capstone Class of 2016 was searching dumpsters for overall waste management. The Capstone Class recycling group of 2018 focused our work on recycling bins and the amount of recycling in them.

### 2.3. Floor Plans

After doing dumpster peeks, the Capstone Class students made floor plans of campus. They determined the location and type of waste receptacles around campus. The purpose for this was to find more effective and efficient locations for dumpsters and other waste receptacles

### 2.4. Waste Audit

They took the most popular waste bin out of every building on campus, opened it up, and separated it contents into groups. The students wanted to get a better idea of what exactly USD students, faculty, and staff are throwing away. With the help of Verdis group, it was concluded that the University of South Dakota only recycles 6.9% of everything thrown away. Some of the other breakdowns are as follows: 28% of trash was recyclable materials improperly disposed of, 29% was non-recyclable, 21% was food scraps, 15% compostable fibers, 7% glass.

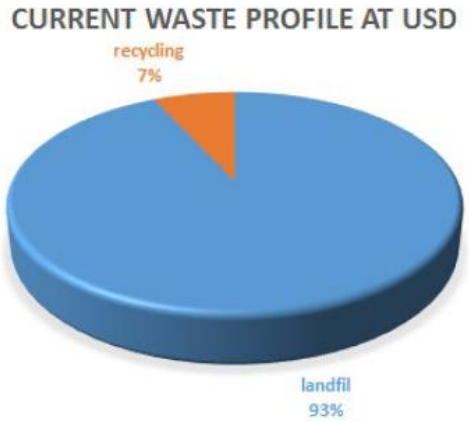


Figure 2: Current waste profile at USD

# Previous Efforts

Table 2: Alternatives

| | | |
|---|---|---|
| Phased Approach | Phase One | Transition small, desk-side and classroom waste containers to paper recycling containers;<br>Relocate centralized waste containers;<br>Add centralized recycling containers;<br>Pilot Residential Hall Recycling;<br>Hire students to move recyclable material & monitor effectiveness;<br>Obtain equipment for & establish centralized retention of recyclables;<br>Hire Missouri Valley Recycling Center to haul more recycling;<br>Improve access to centralized paper recycling stations;<br>Add small recycling containers in common areas of residence halls;<br>Explore new alternatives for Dakota Dome and new sports complex recycling;<br>Overhaul communication efforts, including bin signage;<br>Pilot Schedule. |
| | Phase Two | Explore a reduction in the number of waste dumpsters. |
| | Phase Three | Move to a more centralized waste dumpster/toter system;<br>Explore a solution for diverting biodegradable waste from the landfill. |
| Aggressive Approach | Within buildings, the following recommendations apply | Eliminate all desk-side waste and recycling containers;<br>Purchase and install all new centralized waste and recycling containers throughout campus;<br>Establish recycling stations for paper, plastic, and aluminum on every floor of every building;<br>Continue current practice of taking cardboard to key locations. |
| | When transporting recyclables, the following recommendations apply | Two vehicles are secured to transport containers: cube van and truck with a lift;<br>Containers are wheeled out of buildings;<br>Lifts are used to put containers onto trucks;<br>Once the truck is full, staff drives to MVRC where lift is used to take containers off of truck;<br>Staff empties contents of containers into relevant place at MVRC;<br>Staff returns to campus and returns containers to their original destination within the building. |
| | Implications on Facilities staff | Add staff to Grounds and give them sole responsibility for moving waste and recycling station materials;<br>Custodial staff no longer responsible for waste and recycling station materials but retains responsibility for cardboard. |

# Current Efforts

## 1. Recycling Locations

Currently, there is recycling located in three buildings on campus. Those locations include Slagle Hall, The Muenster University Center, and the Law School. In each building there are recycling toters for mixed office paper, newspaper and magazines, and plastics and aluminum. In Slagle Hall three recycling toters for the different types of recycling are located on each floor: basement, first floor, second floor, and third floor near the stairs. In the Muenster University Center, three recycling toters are on the first floor underneath the staircase, and on the second floor across from the Diversity and Inclusiveness offices. In the Law School, at the beginning of the Spring 2018 semester there was only recycling for plastic and aluminum, but now there are three toters located on the first floor in a hallway to the left of the main doorway.

## 2. Collecting Data

The 2018 Sustainability Capstone class took part in collecting data on the current recycling efforts at USD. Data was collected on how often the recycling toters were utilized by students and faculty by determining the fullness of the toters. Figures 3 and 4 show the recycling materials by type in Slagle and MUC. The results of the survey of recyclable materials in Slage shows that on average almost 60 percent of the plastic, and newspaper and magazines toters have been filled, while the mean filling fraction is lower for mixed office paper toters. In MUC, the highest amount of recyclable materials goes to mixed paper and the lowest fraction belongs to newspaper and magazines. A comparison between an average mixed office paper collected in MUC and Slagle shows that almost 95 percent of the mixed paper toters have been filled in MUC, but this amount decreased to 55 percent in Slagle. So there usually is more mixed office paper material for recycling in MUC, so the mixed paper toters need to get emptied more frequently (Figure 5). According to figures 6 and 7, there is no significant difference between the mean filling fraction of plastic, and newspaper and magazines toters in MUC and Slagle, which is almost 60 percent.

## 3. Activities

This semester in the Sustainability Capstone class our group did a variety of things in order to promote our recycling mission on campus, beyond collecting recycling data. To begin, we decided to make educational flyers to distribute to people on campus. We made a general flyer with information on the location of the recycling bins, what can be recycled, and what cannot be recycled. We hoped that with the distribution of our flyer we could better educate campus and encourage correct recycling. We intended our flyers to be accessible to everyone on campus, with an emphasis on incoming freshman students. In April, the group presented on a panel during Ideafest. Our presentation covered assessment methods for solid waste management, environmental impacts of municipal waste disposal, pay as you throw as a waste reduction program, and finally our work and past work with the campus recycling program.

# Current Efforts

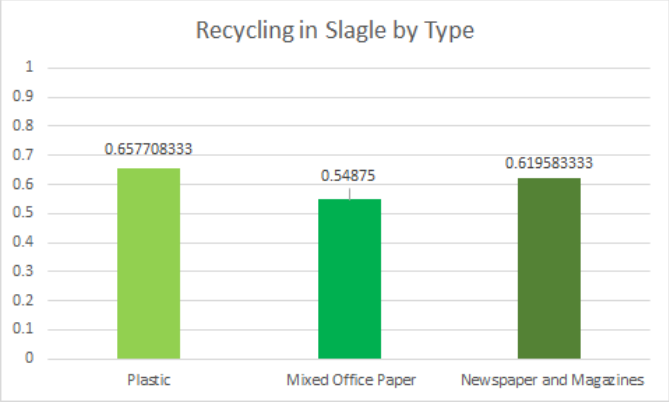


Figure 3: Recycling in Slagle by type

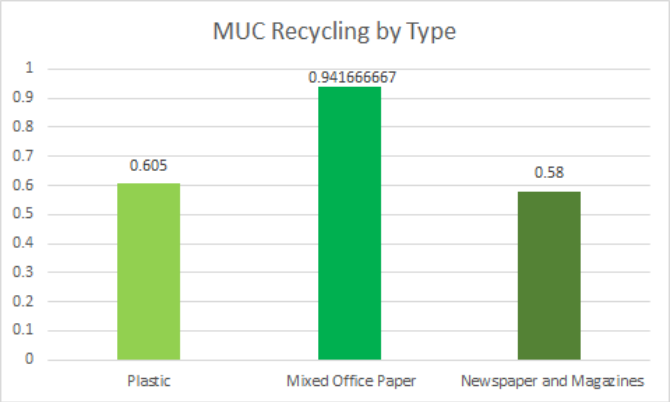


Figure 4: Recycling in MUC by type

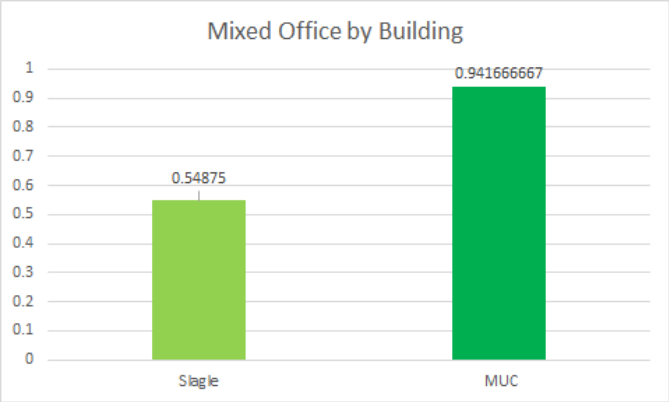


Figure 5: Mixed office by building

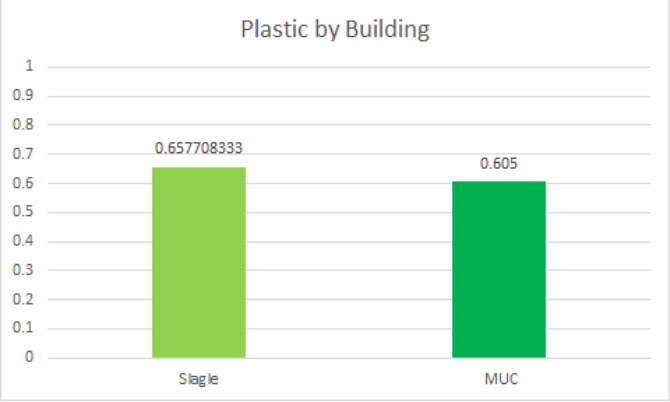


Figure 6: Plastic by building

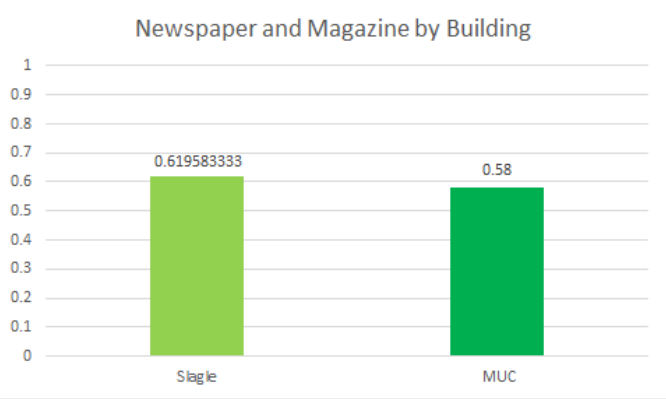


Figure 7: Newspaper and magazine by building

# Recommendations

As we move forward with recycling at the University of South Dakota, our group had a list of recommendations for the future:

- New recycling locations in more buildings across campus and the dorms
- Easier to locate recycling locations in the MUC
- Recycling managed by facilities management instead of a student led program
- Changing campus to single stream recycling to increase the recycling rate and make it easier to collect
- Mandatory recycling training for students and faculty so that people know what they can recycle and feel confident in doing so
- Opportunities for students to get University credit by taking a sustainability practicum class involving recycling on campus and oversight by a graduate assistant
- Better involvement from students with SGA -- sustainability representation


Figure 8: Single Stream Recycling

# Appendix

## Data Collection Sheet


| Date | Basement | First floor | Second floor | Third Floor | MUC First floor | MUC Top floor |
|---|---|---|---|---|---|---|
| Magazines & Newspapers | Empty ☐ | Empty ☐ | Empty ☐ | Empty ☐ | Empty ☐ | Empty ☐ |
| | 0.25 ☐ | 0.25 ☐ | 0.25 ☐ | 0.25 ☐ | 0.25 ☐ | 0.25 ☐ |
| | 0.50 ☐ | 0.50 ☐ | 0.50 ☐ | 0.50 ☐ | 0.50 ☐ | 0.50 ☐ |
| | 0.75 ☐ | 0.75 ☐ | 0.75 ☐ | 0.75 ☐ | 0.75 ☐ | 0.75 ☐ |
| | Full ☐ | Full ☐ | Full ☐ | Full ☐ | Full ☐ | Full ☐ |
| Plastics & Aluminum | Empty ☐ | Empty ☐ | Empty ☐ | Empty ☐ | Empty ☐ | Empty ☐ |
| | 0.25 ☐ | 0.25 ☐ | 0.25 ☐ | 0.25 ☐ | 0.25 ☐ | 0.25 ☐ |
| | 0.50 ☐ | 0.50 ☐ | 0.50 ☐ | 0.50 ☐ | 0.50 ☐ | 0.50 ☐ |
| | 0.75 ☐ | 0.75 ☐ | 0.75 ☐ | 0.75 ☐ | 0.75 ☐ | 0.75 ☐ |
| | Full ☐ | Full ☐ | Full ☐ | Full ☐ | Full ☐ | Full ☐ |
| Mixed Office Papers | Empty ☐ | Empty ☐ | Empty ☐ | Empty ☐ | Empty ☐ | Empty ☐ |
| | 0.25 ☐ | 0.25 ☐ | 0.25 ☐ | 0.25 ☐ | 0.25 ☐ | 0.25 ☐ |
| | 0.50 ☐ | 0.50 ☐ | 0.50 ☐ | 0.50 ☐ | 0.50 ☐ | 0.50 ☐ |
| | 0.75 ☐ | 0.75 ☐ | 0.75 ☐ | 0.75 ☐ | 0.75 ☐ | 0.75 ☐ |
| | Full ☐ | Full ☐ | Full ☐ | Full ☐ | Full ☐ | Full ☐ |

| Capacity | M&N (gal) | P&A (gal) | MOP (gal) |
|---|---|---|---|
| 0.25 | | | |
| 0.50 | | | |
| 0.75 | | | |
| Full | | | |

| Total ( gal) | Basement | First floor | Second floor | Third Floor | MUC First floor | MUC Top floor |
|---|---|---|---|---|---|---|
| M&N | | | | | | |
| P&A | | | | | | |
| MOP | | | | | | |

Note:

## Recycling Form for Everybody

University of South Dakota

### Campus Recycling Initiative

### What can't be recycled?

**Mixed Office Paper**

- Fluorescent paper

**Plastic and Aluminum**

- Yogurt containers
- Coffee Cups
- Styrofoam

### Where?

- MUC first floor under the stairs
- MUC second floor in the main hallway
- Slagle each floor near staircase
- Law school

### What can be recycled?

**Magazine and Newspaper**

- Newspapers
- Magazines

**Plastic and Aluminum**

- Plastic #1
- Plastic #2
- Bottles, tubs, jugs
- Aluminum cans

**Mixed Office Paper**

- Computer Paper
- Printouts
- Index Cards
- Photocopies
- Letterhead

### Tips

When you recycle, others see you recycling and are more inclined to do so themselves. Take the initiative and get recycling!

# Pictures

Figure 9: Law school, First floor

Figure 10: MUC, First floor

Figure 11: MUC, Second floor

Figure 12: Slagle, Third floor

Figure 13: Slagle, Second floor

Figure 14: Slagle, First floor