Unsustainable Waste in University of California, Irvine

Henry Sue

June 1, 2017

In today's society, everything is sold, transported and arrives in some sort of packaging. Whether the packaging is plastic, paper, printed, all packaging of consumer products eventually adds up. University of California, Irvine is a University with over thirty thousand undergraduate students, and more than two thousand and five hundred academic staff. With many visitors and large daily pedestrian traffic along its two main walkways, there exists many trash and recycling receptacles distributed around the campus. Policies have been enacted to encourage reduction of waste and recycling of recyclable waste. Despite UCI being on the forefront of sustainable facilities, there are still actions that can be taken to improve campus awareness and waste reduction. A fraction of waste thrown in normal waste receptacles can be recycled, and a fraction of unrecyclable waste is thrown in receptacles designated for recycling. This problem may be a result of unaware, uncaring or negligent consumers, mislabeled packaging, or lack of easily usable recycling bins. Policies enacted may help to reduce these problems, but may also require additional help from volunteers, organizations, and community support to meet its goals. By investigating the fraction of packaging and waste, insights can be made to help understand which types of waste we can improve our total reduction or recycling for.

To begin to understand the waste from University of California, Irvine (hereafter referred to as the "Irvine Campus"), facility data may be consulted to create a snapshot of the campus state. According to the sustainability department, the campus diverts 81 percent of its total waste from landfill to compost and recycling facilities. The peak percentage of campus waste that is diverted from landfill is 84% In 2014, the office of Vice Chancellor and the Provost created an initiative to enhance education and awareness for Sustainability. Additionally, in 2016, the UCOP (University of California, Office of President) Issued a UC system-wide policy that details sustainable practices. Section F of the Sustainable policy prioritizes reduction, followed by reuse and recycling, respectively. Reduction of waste has the highest potential to lower landfill, as the less waste that is produced, the less waste can potentially go to landfill. Reusable waste and

packaging can also greatly reduce landfill mass, as despite a producing a volume of potential waste, maximizes the lifespan and use per unit volume. Recycling takes resources and although reduces the waste that ends up within landfill, also utilizes additional resources, time, and will sometimes ultimately still end up as landfill. Sustainable systems require community engagement in order to fully realize their plans and goals. For some areas of the Irvine campus, the goal is to become a Zero-Waste facility. some of these areas are the Anteater Recreation Center, and the Bren Events center. Zero waste facilities are defined as facilities that divert all of their waste away from landfill. For a building to achieve this, it must adopt a recycling and food compost system, as well as only use products that can be repurposed.

To further evaluate the conditions of the campus, the population that these policies affect must be identified. The primary population that these policies affect are consumers. Because of the nature of producing more sustainable products, consumers may face various unintended consequences. The most prominent is that to produce and use more sustainable ingredients and materials, the manufacturers of products may have to increase budget, and therefore increase the end cost for consumers. In addition to this, packaging and waste may also be less appealing to consumers, discouraging manufacturers from adopting more sustainable materials in the first place. Consumers will also face additional difficulty in taking advantage of applicable waste receptacles. While observing over an hour period of time outside of the student center on campus, 15 students hesitated to deposit recyclables in regular waste receptacles. 7 students relocated to another location to deposit their waste in a more appropriate bin. At least 10 students did not hesitate to deposit their recyclable goods in the waste receptacle. Students struggle to stay informed with sustainable practices. Some are not informed because of their negligence, while others just do not care about sustainable practices. Many student organizations around campus strive to inform students to follow sustainable practices, as well as employing strategies to help aid in divertion. One such organization is the Associated Students at UCI Sustainability Project Commission (ASUCI SPC). The organization, along with ASUCI, raise awareness for sustainable practices on campus. Sustainable practices also affect the institution that maintains the facilities. Comingled recycling bins require sorting and parsing to organize each category of recyclable. This sorting requires automated or human work, both of which must be funded somehow. Additionally, recycling products requires processes that cost resources. An estimate of recycling costs is approximately $50 net cost per ton, which considering the 7600 tons recycled annually, totals $380,000 a year to manage recycled goods in addition to the waste that goes to landfills. It is a small price to pay for a huge environmental and ecological benefit. Nevertheless, for other facilities that cannot afford such responsible policies, the price remains a factor when facility managers adopt sustainable practices.

An additional factor that facilities must take into is receptacles and awareness. The Irvine campus is decorated with comingled recycling bins, as well as designated compost bins. These bins cost a small sum of money to purchase, but continuing to spread awareness for proper usage and disposal is a process that may take additional resources that facility managers may not have. The last major stakeholder that is affected by the sustainable policy is the residents of the Irvine Campus' surrounding areas. Studies have shown that landfill decreases nearby property value by 12.9% with a gradient of 1.2% per mile. By reducing the weight of the waste that is deposited into landfills, there will be a reduction of property depreciation. Additionally, it is in the interest of the property owners to advocate for sustainable policies. Sustainable communities can attract potential buyers for property, as well as increase popularity and renown of a community. Sustainable communities also provide less strain on existing infrastructure, which property owners may want to seek.

The Sustainable practice policy enacted by the UCOP must be evaluated for effectiveness. According to the department of sustainability at the Irvine Campus, from 2005 to 2017, the annual percentage of waste that is diverted from landfills increased from 45% to its current percentage of 81%. Although waste increased from 8,000 tons per year (2005) to 10,000 tons per year (2015), the waste that entered landfill decreased from 5,000 tons per year to 2,000 tons per year. This 60% reduction in physical waste is a very large number. The 36% increase in waste diversion also indicates that the policy shows promise. The goal of the policy is to reach 95% diversion from landfill. If the current rate of diversion increase continues, the policy's goal of 95% will be reached within an additional 10 years. An in-situ study was also conducted by observing a waste receptacle outside of the UCI Student Center. This study was completed on May 26th, 2017. The waste receptacle was an unmarked trash receptacle that accepts waste from above. Students were observed and categorized by the type of trash that was deposited into the waste receptacle. In addition, the students were also tallied by their thought processes before depositing recyclable or compostable waste. Figure 1 1 shows the table of each parameter. The results were tracked for 100 students. Figure 2 2 shows the percentage of students distinguished by their actions and decisions. It is separated by the amount of hesitation prior to depositing a recyclable or compostable item of waste into the receptacle. A majority (64%) did not hesitate to deposit their waste into the receptacle, while a small fraction (25%) hesitated to deposit, and an even smaller fraction (7%)relocated to deposit their waste in a more suitable receptacle.

Sustainable practices are difficult to implement, as well as are a controversial topic for stakeholders. Although policies may be enacted, it is still up to the discretion of those it affects to carry it out. It is difficult to spread awareness for sustainable practices, and a large majority of students, when not presented with an easily identifiable receptacle will opt to ignore sustainable practices.

To the scourge of the policymakers and facility managers, the designated receptacles are still not used as extensively as would be liked.

1 Figures

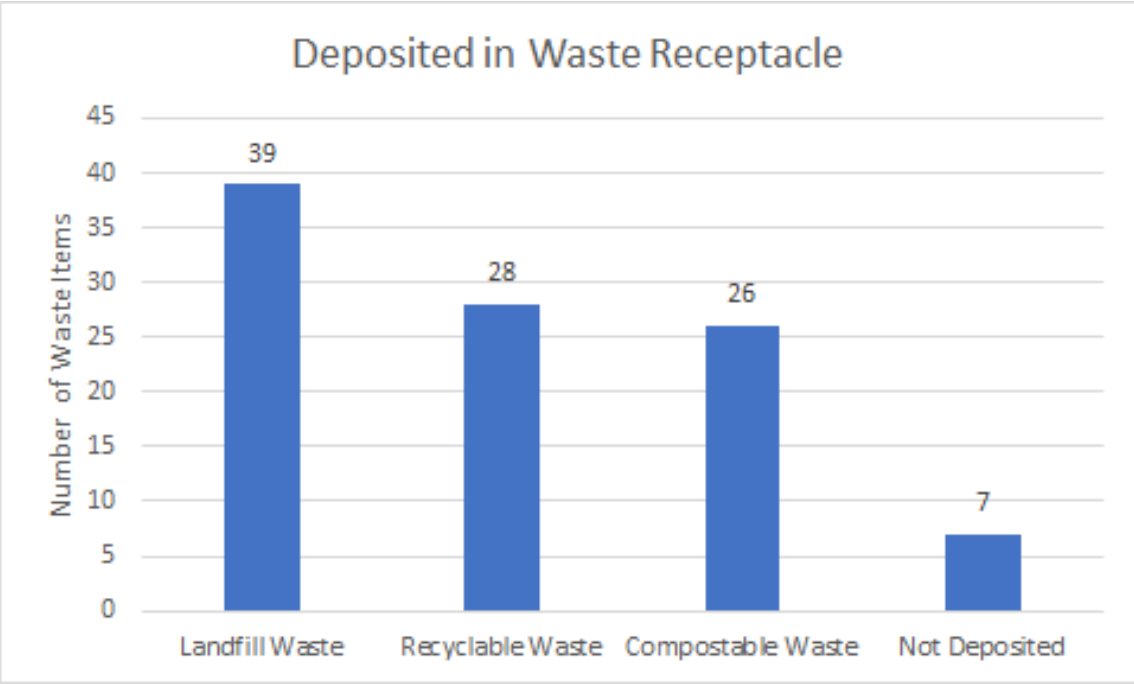

Figure 1: This plot details the number of each type of waste deposited into a single trashcan. Data was collected for 100 students.

References

[1] The Conversation. Are we recycling too much of our trash? page 1, 2015.

[2] UC Irvine. Uci college portrait. pages 1–6, 2016.

[3] UC Irvine. Recycling faqs. 1:1, 2017.

[4] Richard C. Ready. Do landfills always depress nearby property values? *The Northeast Regional Center for Rural Development*, 27(1), 2005.

[5] UC Regents. About - uc irvine sustainability. *UC Irvine Sustainability*, 2017.

[6] UC Regents. Asuci sustainability project commission - uc irvine sustainability. *UC Irvine Sustainability*, 2017.

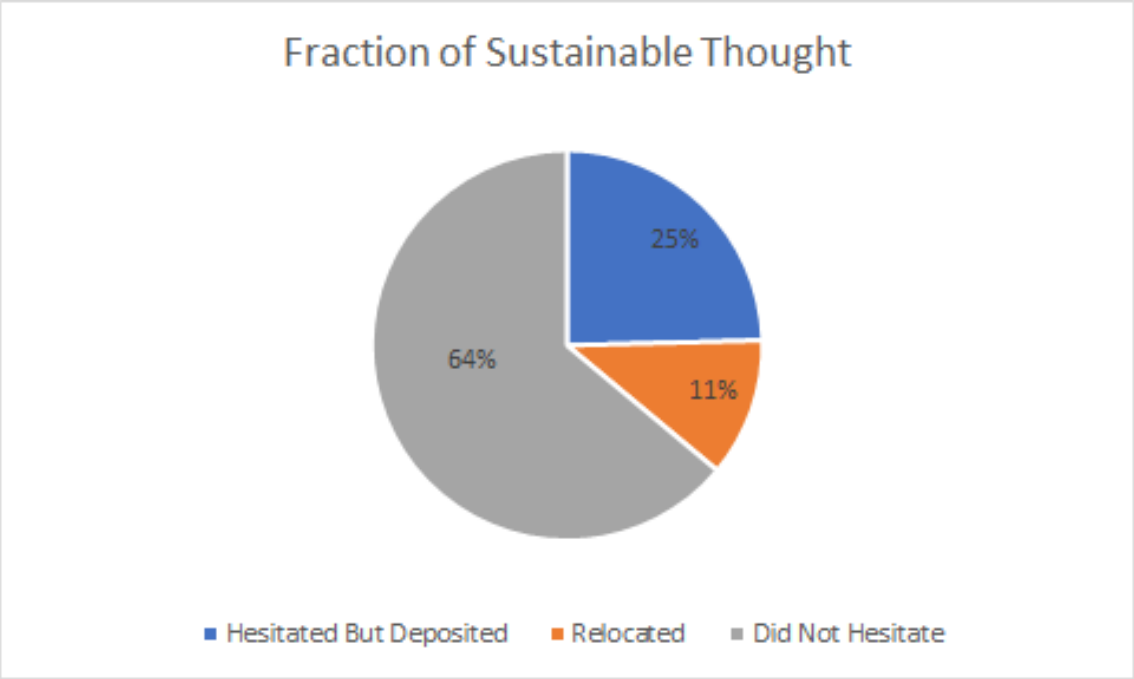

Figure 2: This pie graph shows the fraction of students who thought about depositing recyclables or compostables into a regular waste receptacle. A small fraction (7%) relocated.