

MSUS Culminating Experience Report

Compost Competition



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with
Native American Connections
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1. Executive Summary

Greenhouse gas (GHG) emissions cause climate change, and if the world does not lower its GHG emissions soon, it will cause irreversible damage that will have overwhelmingly negative cascading effects on the entire planet (Mann & Kump, 2008). Up to 47% of the United States GHG emissions are the result of energy used to produce, process, transport, and dispose of the food we eat and the goods that we consume (US EPA, 2009). The linear-economy status quo does nothing to slow down climate change because it puts resources into landfills. This project promotes a circular economy which combats climate change by reusing resources that are at the end of their life cycle, e.g., food waste soil.

The project was a month-long compost competition at an apartment building in Phoenix, AZ that houses 194 residents. The apartment building, Urban Living 2 (UL2), is subsidized housing owned by Native American Connections (NAC), a non-profit organization.

The project's main objective was to increase waste diversion. This was done through composting and improving zero-waste capacity. The compost competition included activities to change community behavior such as private and public commitments, a community barbecue, a movie night (which replaced a planned field trip), and a visioning meeting.

By the end of the project, 22% of the tenants were composting. Over a year-long period, this equates to a diversion of, 6000 pounds from the landfill and 1.59 metric tons of Carbon Dioxide equivalent (MTCO₂E). The waste diversion increased from 28% to 38%. Tenant participation trended upwards during the project and as the social norm develops over time, more tenant participation is expected even after the competition is over. The six indicators that were used to determine the zero-waste capacity, collectively went up by 1.24 points on a five-point scale. This project will be used as a model for NAC for its other 16 properties in The Valley.

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2. Sustainability Problem

Nearly half of the world's municipal solid waste (46%) is produced by just over one-quarter of the world's people—those who live in high-income countries; the United States, with 1,851 pounds per person a year, leads the world (Hornweg et al., 2012). The City of Phoenix is a poster child for this extraordinary waste, generating "... one million tons of trash each year, enough to fill Chase Field [a 48,000-seat baseball stadium] to the top 14 times" (City of Phoenix Public Works Department, 2015, p.5). This translates to 1322 pounds per person per year. Even Pope Francis has criticized our current economic system saying we are in a "throw away culture" (Valley, 2015).

Waste is harmful over both the short and long terms because it squanders Earth's resources, contributes to climate change, and threatens human health. Landfills are often sited in or near poor minority neighborhoods, which is an environmental injustice (Been, 1994). Landfills not only lower property values by a significant percentage (Ready 2010), they are also unsightly, smell bad, and pose health threats. These effects last for decades, so they negatively affect future generations. We could avoid these effects by treating waste as a resource. Doing so would benefit present and future generations.

We don't need to stop landfilling tomorrow or next year because we lack space or resources. What we lack is time to reduce our GHG emissions, and that is an *urgent* problem. Up to 47% of US GHG emissions are associated with the energy used to produce, process, transport, and dispose of the food we eat and the goods that we consume (US EPA, 2009). If Earth's temperature increases by two degrees Celsius by the end of the 21st century, Earth's ecosystems will almost certainly suffer irreversible damage; climate change of that magnitude is expected to catalyze overwhelmingly negative cascading effects (Mann & Kump, 2008). We could significantly reduce GHG emissions if we stop landfilling waste — and this needs to happen immediately. We need to reduce consumption, reuse goods, recycle goods at the ends of their life cycles, and compost food waste.

3. Background and Context

If we are going to tackle this enormous waste problem, then we must start at home—where people live. In 2014, 54% of the world's population lived in urban areas; it is projected that 66% of the world's population will live in urban areas by 2050 (United Nations Secretariat, 2014). In the US, 80.7% of the population lived in urban areas as of 2010 (US Census Bureau, n.d.). As density increases in urban areas, more people are going to be living in multi-family buildings. For that reason, this project was designed for and implemented in a multi-family building. However, the project could be scaled up or down for implementation in other settings.

The project took place at a Native American Connections (NAC) property called Urban Living 2 (UL2), which is a subsidized multi-family apartment with 194 residents. NAC operates affordable housing units, permanent supportive housing, transitional housing for youth, transitional housing for adult women in recovery, and a 45-day rehabilitation and wellness

center. NAC was founded in 1972 and still operates today, serving over 10,000 community members daily.

I have been working with NAC since the Fall of 2015, in conjunction with Circle Blue, a company I cofounded. Circle Blue helps small- to medium-sized organizations transition from landfilling to zero-waste. In the Spring of 2017, NAC signed a two-year contract with Circle Blue.

Many multi-family housing units in the US still do not offer recycling, much less composting, which is an impediment to waste diversion (US EPA, 2011). In Phoenix, City Ordinance 21-27C prevents the City from hauling waste or recyclables from multi-family housing buildings with 30 or more dwellings. This is a problem because if the private waste-hauler who serves that building does not offer a recycling service, or the owner of the building cannot afford recycling service, the City cannot compete for the contract to serve that building. Thus, these buildings have virtually no access to recycling services. Although the City does try to provide recycling drop-off sites near the properties they are legally prohibited from serving, such sites are not nearly as effective as serving the property directly.

Non-profit housing is exempted from City Ordinance 21-27C. While NAC is a non-profit, it already had a contract with a private waste-hauler. Thus, the City of Phoenix could not offer recycling service to UL2. Circle Blue, a private company, can haul compost from UL2 and is not subject to the Ordinance. UL2's waste-hauler did offer recycling service, but not compost.

4. Analyzing the problem

I used the Systemic-Causal structure of sustainability problems developed by Wiek (2015) to analyze the problem. The Systemic-Causal Structure tool can be found in [Appendix I](#). The immediate causes of the waste problem in terms of actions, activities, and behaviors are: the purchasing of goods and disposing of goods. The first action is the purchasing of goods that are disposable. This leads to an increase in the waste stream because a single item will have to be continuously purchased and disposed of every time it is needed. E.g., a plastic water bottle will have to be purchased every time you'd like to drink water. The purchasing of these goods leads us to our second action: disposing of goods. Goods must be thrown away for them to get to a landfill. The technologies and structures that allow these behaviors to take place are the waste haulers and the landfills.

The waste haulers allow waste, which is really a resource and is now receiving wider recognition as such, to be picked up from the building with little work done by the managers or tenants. This contributes to one of the root causes, which is the desire for convenience and comfort. Each floor at UL2 has a recycling and waste chute. Tenants walk to the waste room on their floor and dump their resources into the waste or recycling chute. The chutes deposit into a waste or recycle dumpster on the first floor. The waste hauler picks up the resources in the waste and recycle dumpster twice a week and leaves an empty dumpster. The waste hauler then takes the resources to a landfill and the Materials Recovery Facility (MRF), where

recyclables are sorted. This whole process allows the tenants of this property to not have their end of life resources at their property, or their “backyard.”

The stakeholders in this project are: City of Phoenix, NAC CEO Dede Devine, NAC property managers, ASU students, and NAC tenants. There isn't a lack of capacity but there is a lack of urgency when it comes to finding solutions to the problem. Once it was brought to the attention of NAC, the problem was recognized and there was interest in solving the problem from multiple stakeholder groups.

The large corporate waste haulers are benefiting from hauling waste to the landfill because they are making a lot of money from it. The largest and 2nd largest waste haulers in the US generated \$12.9 and \$9.1 billion dollars in revenue respectively in 2015 (Waste 360, 2016). These companies do not want these services to go away because it will destroy their businesses.

Future generations and those who live near a landfill are negatively affected by this problem. Landfills decrease air quality and Phoenix already is one of the lowest air quality cities in the US (American Lung Association, 2015). Phoenix residents, which include UL2 tenants, already deal with this low air quality now and the status quo will worsen air quality into the future. Landfill's GHG emissions contribute to climate change which will negatively effect those in the Phoenix metropolitan area, and people across the world. Climate change and the urban heat island effect will increase temperatures in Phoenix to dangerous levels. UL2 tenants are in the heart of Downtown Phoenix and will be directly affected from this increase in heat. A throw away culture also increases cost for NAC tenants who live in subsidized housing where budgets are already tight. Reusable goods will lower costs in the long term for the NAC tenants.

The root causes of this sustainability problem can be found in the motives, assumptions, rules, capacities, resources, and external factors (Wiek 2015). What motivates individuals to continue to throw things away in the landfill is their desire for convenience and comfort. There is an assumption that consumption and waste does not harm the environment and have a financial burden on the tenants and property. There are societal norms such as the accumulation of goods increases status, which leads to more material consumption and more waste.

This property makes tenants sign a recycle commitment as part of their lease, this was a recommendation I made to the property in 2015. Time and financial constraints are the resources that are holding the community back to have the capacity to create change without outside help. Due to inflation, the USA's current economic system pays less then just a couple of decades ago. This leads to longer hours for lower wages. Because of this system, individuals who are working off minimum wage have less time and have tighter budgets. The most important resource at NAC is NAC itself. They are a nonprofit that really cares about the community and have shown that by the countless services they provide for the disadvantaged. This external factor is unescapable in a community that has subsidized housing. Longer hours at work prevents community members from coming together more frequently and tighter budgets increases their stress.

5. Project Objectives

The project had two objectives; to increase waste diversion through composting and to improve zero-waste capacity. Waste diversion will be measured through a baseline and post resource stream audit. The second objective is to increase zero-waste capacity. The baseline assessment of the six indicators will be compared to the final assessment. If an improvement is made to all six indicators, then this objective will be deemed successful. More on these indicators in the [methods](#) section.

6. Project Approach

The general approach for this project was to use evidence-based solutions and to avoid solutions that are known not to be effective in changing people's behavior. I reviewed the literature on behavior change and found the following pieces to be most influential in this project: *Educating for Sustainability: Competencies & Practices for Transformative Action* by Kelli Larson and Erin Frisk (now known as Erin Redman); *Fostering Sustainable Behavior: Community Based Social Marketing* by Doug McKenzie-Mohr; *Switch* by Chip and Dan Heath; *Nudge* by Richard H. Thaler and Cass R. Sunstein; *Solving Sustainability Problems – Tools for a New Generation of Sustainability Professionals* by Arnim Wiek; and the work of Robert Cialdini.

Declarative knowledge (how a system functions; e.g. understanding that waste goes to a landfill, that causes climate change) alone does not change people's behavior (Frisk & Larson 2011). Giving people an energy efficiency information session, will not lead to people being more energy efficient in their home (Geller, 1981). Just understanding something does not change behavior, e.g. cigarette smokers knowing smoking causes lung cancer, and continuing to smoke. To transform a community, declarative knowledge must be paired with the other knowledge domains, which are: procedural knowledge, awareness of how to undertake actions, e.g. food waste goes into the green bin, recyclables in the blue bin; effectiveness knowledge, views of the outcomes of certain behaviors, e.g. tenants understanding that food waste in the trash bin will go to a landfill versus food waste going in the compost bins goes to create better soil; and social knowledge, awareness of motives and intentions of other people or society, e.g. a tenant understanding that their neighbors care about recycling (Frisk & Larson, 2011). This project was designed to target all the knowledge domains.

Social knowledge, more specifically, social norms, are the unwritten rules of society that guide our behavior. This project wanted to create a new social norm in UL2 — composting. Note that I said composting and not zero-waste. The reason for this is because composting is easier to understand than zero-waste. Composting is an action, you put food waste into the green bucket; zero-waste is a lifestyle, e.g. *Masters of Sustainable Solutions (MSUS) graduate Alex Slaymaker's Zero-Waste Crib* (The Sustainability Review, 2016). Composting is simple, whereas zero-waste is a complex concept, "What do you mean no trash?" Ideally, we would like to get all the tenants in the community to be zero-waste — but, that is too large of a leap to make at once. We begin the zero-waste journey with composting.

We do not want to confuse the tenant, we want to *direct the Rider*. In Chip and Dan Heath's book *Switch*, they explain how the mind has two independent systems (Heath, C., & Heath, D., 2011):

"The conventional wisdom in psychology, in fact, is that the brain has two independent systems at work at all times. First, there's what we called the emotional side. It's the part of you that is instinctive, that feels pain and pleasure. Second, there's the rational side, also known as the reflective or conscious system."

They've dubbed the emotional side the *Elephant*, and the rational side the *Rider*. You can think about the human mind like this: The Rider is on top of the elephant, steering it, telling it to go fast or slow, left or right. That is until the Elephant gets too emotional and starts to stampede. The Rider loses all control of the Elephant and is just holding on for dear life. The reason why I focused on the simple concept of composting and not the more complex zero-waste, is because the *Rider* is more likely to take action when things are clear, the Rider does not like complexity. The Elephant has its preferences too, the elephant likes when the first step is easy and when there is a sense of progress.

The idea behind the compost competition was to target the emotions of the community. I wanted people to be competitive and try their best to win the competition, and the \$400 prize that came with winning. Participating in the competition was easy; go to the property manager's office, sign up, and receive your bucket. This was made clear for the Rider. Once you had your bucket, you will simply place it outside your door on Thursday nights and receive an empty bucket by Friday afternoon. Every time I emptied a tenant's bucket, I will leave a handwritten note with feedback and positive reinforcement; giving the Elephant a sense of progress and making this whole process feel human.

The more tenants participated in the competition, the more green buckets will be outside of tenants' doors on Thursday night. When tenants see this, they will begin to ask questions, and even more importantly, they will begin to accept the fact that green buckets are supposed to be outside of the door on Thursday nights — creating a social norm. Social norms are very powerful and people vastly underestimate how much their surroundings influence them. When signage suggested that *most* people are reusing towels in a hotel, more guests reused their hotel towel (Goldstein et al. 2008a). When language was changed on a sign suggesting that *most* people do not take wood from the Arizona Petrified Forest, fewer people took wood from the forest (Cialdini et al., 2006). All the activities that were done at UL2 had the intention of building the social norm. More on the activities in the methods section.

7. Methods

Assessment:

To design a strategic intervention, the baseline assessment was done before the competition. This assessment includes a resource stream audit and tri-blend score consisting of a visual observation, management interview, and tenant surveys. The tri-blend score determines the zero-waste capacity of the community and barriers. The tenant survey uses quantitative format, and the visual observations and management interview is qualitative. The tenant survey can be found in [Appendix II](#). The tri-blend's three components all have equal weight and are combined to determine the score. The score is based on a Likert scale, from one to five. The tri-blend score was created by Eric Johnson (2015), Circle Blue CEO. There are six indicators in the tri-blend score, which are:

- **Regulation:** *Written enforceable agreements or sanctions including fines or verbal/written notices for non-compliance.*
- **Incentives:** *Temporary initiatives designed to foster engagement through games or financial incentives for achieving goals.*
- **Community:** *How well the community members know each other, their willingness to engage in community activities, and their relative level of communication with each other and staff.*
- **Logistics:** *How easy it is for tenants to exhibit a desired behavior. An example of this is the distance between an apartment and the waste collection area.*
- **Education:** *The community's knowledge of composting and recycling.*
- **Social norm:** *The amount of expectation and peer pressure felt from community members to recycle and compost.*

The post assessment follows the same methods as the baseline assessment. The baseline and post assessment will be compared to evaluate the project's success.

The resource stream audit consisted of taking 6 samples from a 4-yard or 6-yard dumpster, using an 18-gallon container. This allows for an 80% confidence level in the data with a margin of error of 6%. Before the samples were collected, the resources were mixed up in the dumpster. Each sample is weighed for its total weight, then the different items inside are separated by category (food waste, cardboard, plastic, etc.) and weighed. The purpose of the resource stream audit was to determine the different items inside the dumpsters, the GHG impact, and the cost benefit of composting. The GHG impact is measured using Waste Reduction Model (WARM) version 14 from the United States Environmental Protection Agency (USA EPA, n.d.).

After the baseline assessment is complete, a meeting with management shall take place to discuss the results. Management’s input is used to finalize solutions and an event schedule is confirmed.

Flyers and posters:

Flyers and posters have a clean design with more visuals than text, unless more text is necessary. They are meant to be visually appealing to grab tenant’s attention and concise so the information can be absorbed quickly. Flyers will be placed outside of tenant’s doors.

There is a waste room for each floor at UL2, the compost competition poster hangs in all three rooms. The posters will have competition/compost/recycling information and an update section. The update section will provide tenants feedback on how there are composting and inform tenants who is in the lead of the competition. Tenants name or room number will not be shown, but the top three point totals will be shown.

A written compost commitment is signed by tenants when they sign up for the competition. Written commitments make tenants more likely to follow through with that commitment (Werner et al., 1995). The section where tenants sign is cut off and put on the compost commitment poster, which hangs in the highly visible mailbox area. Public commitments are known to be even more effective than written commitments for changing behavior (Pallak et al., 1980). The top section, which has compost information in pictures, is giving to the tenant with a magnet, so they can put on their fridge as a prompt.

The following flyers and posters can be found in [Appendix III](#).

Kick off Flyer	Movie Night Flyer
Compost Commitment	Waste Room Poster
Compost Commitment Poster	Update Flyer
Barbecue Flyer	

Kick off engagement:

The compost competition officially started by going door to door in the community and informing tenants about the competition. The “foot in the door” technique was used by asking, “Do you support community activities?” Research has shown asking tenants to agree and/or make a small commitment makes them more likely to make a larger commitment in the future (Schwarzwald et al.,1979; Freedman, Jonathan L and Scott C Fraser, 1966.)

Compost Competition:

Each tenant competes against one another in the one-month long compost competition. The winner receives \$400 off their rent, if there is a tie, the \$400 is split among the winners. The hypothesis is that the \$400 incentive should get those who are not interested in composting, to participate in the competition.

Tenants receive points by completing the following tasks: Signing up, referring other tenants to sign up, attending the community BBQ, attending field trip, attending visioning meeting, and other activities. First, tenants sign up for compost which is worth 30 points. Tenants go to the property manager's office and sign in by providing their name, room number, email, and referring tenant's information (if they were refereed). After, they sign a compost commitment, which will later be posted on a public poster. Once commitment is signed, tenants receive a green bucket and a compostable liner.

Tenants also receive 10 points for referring other tenants to sign up. There is no limit on the number of referrals a tenant can give. Referrals encourage tenants to invite their neighbors to participate.

Tenants receive 15 points for attending the community BBQ. Its purpose is to increase social norms by letting tenants interact with their neighbors, enjoy a free meal, and play compost bingo.

Tenants receive 10 points for signing up for the Green Nurture website. The Green Nurture website is sustainability platform where communities can come together online to set goals, share and receive information, and get community news; all in an interactive and gamified way. The homepage for Green Nurture can be found in [Appendix IV](#).

Tenants receive 30 points for attending the field trip to a local composting facility. The purpose of the trip is to take members of the community outside of the walls of their apartments to see where their resources go and how they are transformed. A bus picks up tenants from UL2, transports them to the compost facility, then transports them back to UL2. It is important tenants see that their actions at home are helping local farmers; when tenants throw out their food waste into their compost bucket after this field trip, they will remember that it is not just going into a bin, but it is going to help Phoenix local farmers to produce fresh, local food ([effectiveness knowledge](#)).

Community feedback and project manager's discretion determines if another community event needs to take place and when. This flexibility allows the project manager to respond to tenant's feedback and provide solutions quickly.

The project manager collects the sign in sheets for all the activities and records the data weekly. The project manager then puts updates of who is winning the competition, words of encouragement, feedback, and/or announcements on the waste room posters.

Visioning Meeting:

The visioning meeting pre-determines where tenants, staff, and managers sit. Participants are put into small groups, composed of no more than 6 people, including at least 1 staff member and/or 1 manager, 1 note taker, and 1 moderator. The note taker's job is to collect data on common themes brought up in discussion, and the moderator's job is to facilitate conversation in the small groups. Participants at the table may not know everybody so they will wear nametags to identify themselves. Youth participants will be included in the discussion, but will have their own table because they are less likely to volunteer their input in a circle of

adults. Youth participation is important because they are often tasked with taking out the trash, they are a catalyst for change within their home, and they will inherit the consequences of the community's actions.

The visioning meeting begins with an ice breaker; tenants will draw a moment in their personal history when they felt that anything was possible (Cloutier, 2016). This exercise makes the meeting more personal, lets participants reflect on their own lives, and provides motivation for when times get rough. Tenant's drawings and moments will be discussed and shared in their group. Participants are asked to keep the drawing in a safe place and to refer to that drawing whenever times are hard. When the ice breaker is complete, the three sessions will begin and the meeting will end with a game of compost bingo.

There are three total sessions; visual poster preference survey, visioning, and solutions. To end each session, the small groups will discuss amongst themselves their preferences and thoughts. Then all groups convene for a larger discussion to identify collective thoughts. A representative from each group will present their group's perceptions and preferences to the room.

In the first session, participants vote in the "visual poster preference survey (poster)." The poster is divided into four sections: Recycling, composting, sharing, and a blank section for write-ins. Each section outlines several zero-waste best practices. This session's purpose is to introduce zero-waste best practices to the participants while showing them that these practices are being done around the world. After all participants vote, they return to their group to discuss their thought process and final decision. After, the large group discussion takes place, then the next session begins.

In the second session, small groups brainstorm and envision UL2, without limitations, in its most sustainable state. This session's purpose is to let the participant's imagination run wild. "If the vision is motivational and inspirational enough, people will go above and beyond to make it happen" (Wiek, 2015, p.94).

In the final session, small groups set a goal and brainstorm action items to reach that goal. It is important for the Rider to *point to the destination* to create a change in behavior (Heath, C., & Heath, D., 2011). If participants make zero-waste their goal, then they will be on a mission to make UL2 the first zero-waste multi-family housing unit in the USA.

Once all three sessions are over, participants play compost bingo, which is just like a normal game of bingo, but instead of numbers, there are visuals of compostable items. This is an interactive and fun way for all participants to learn about what can be composted ([procedural knowledge](#)). Compost bingo materials can be found in [Appendix V](#). The winners of compost bingo, one youth and one adult, will receive a small prize.

As the meeting wraps up, participants are thanked for their participation and contact information is collected. Participants receive a magnet, which they can use to post their compost bingo card to their refrigerator. The information of compostable items combined with the good experience (hopefully) of the visioning meeting, creates a memorable prompt. Doug

McKenzie-Mohr writes, “The purpose of a prompt is not to change attitudes or increase motivation, but simply to remind us to engage in an action that we are already predisposed to do” (McKenzie-Mohr, 2013, p.26). A report of the visioning meeting is sent to the participants in an email once it is complete. When the compost competition is complete, participants will meet again to discuss their thoughts on the competition, next steps for the community, and sustaining zero-waste without outside help.

Compost Pick up:

Tenants were instructed to leave their compost bucket outside of their door on Thursday nights. This combined with the commitment posters will in theory, increase the social norm. A study done at the University of California showed that students ignored water conservation signs in the shower, but if they saw another student saving water they were 49% more likely to do so and 67% more likely if it was two students (Aronson, E., & O’Leary, M., 1983). Tenants seeing compost buckets outside of their neighbors’ doors is intended to have this same effect.

On Friday mornings, composting tenants got their buckets emptied and received a handwritten note. The note thanked tenants for composting and provided feedback. Receiving feedback is one aspect to becoming an expert; tenants got direct feedback every week when they were doing good, and when they were doing bad (Ericsson, K. A., 2016, p.16-17).

8. Results

Tri-Blend Score Results:

The baseline assessment surveys were compromised because some were turned in after the competition started. NAC requested to change properties last minute; the competition had to start due to urgency in the timeline. Manager interviews were not completed in the baseline and post assessment because of time constraints and scheduling conflicts. There were 23 responses to the baseline assessment survey compared to 11 responses in the post assessment survey. Upon reflection, an incentive for tenants to respond to both surveys should have been deployed, such as a gift card given to a randomly selected tenant for participating. The results of both assessments should not be taken as a scientific certainty, but the results still provide valuable insight into the zero-waste capacity of this community. The survey results can be found in [Appendix VI](#).

Regulation increased by 1.00 because tenants were asked to sign a compost commitment. Before the project, tenants signed a recycling commitment. There is also a fine for leaving bulk trash in the waste rooms.

Incentives increased by 4.00 because there was a \$400 reward for winning the compost competition. The financial incentive’s purpose was to entice those tenants who, presumably, were not interested in composting, but interested in the money. \$400 is a month worth of rent for most community members and UL2 is a subsidized multi-family housing apartment — so the money is presumably valuable to the tenants. The \$400 incentive did not have the desired

effect which goes to show that even for people on the lower end of the economic ladder, money is not the end all be all.

Community increased by 0.82 because the community events allowed tenants to interact with each other.

Logistics increased by 1.28 because compost infrastructure was introduced to the community. All tenants had to do was put compost in their bucket and place it outside their door on Thursday nights.

Social Norm increased by 0.74 because of the social norm building in the community events, the private and public commitments, and tenants seeing green buckets outside their neighbors' doors on Thursday nights.

Education decreased by 0.40, the only indicator to decrease. One reason for this is because there were less survey responses in the post compared to the baseline assessment, distorting the data. The survey question for measuring education asked tenants to circle all items that were recyclable/compostable; they got one point for each correct item they circled and three points deducted for each wrong item they circled. Responses lower than one were converted to one, the lowest possible score. The composting question increased by 0.15, from 2.61 to 2.76; showing tenants *did* better understand what is compostable. The decrease of the recycling question outweighed the increase in the compost question, which led to the indicator decreasing by 0.40 overall. Tenants did not receive recycling information.

People often *overestimate* their own capabilities. According to Switch by Chip and Dan Heath, "College students do a superior job predicting the longevity of their roommates' romantic relationships than their own" (Heath, C., & Heath, D., 2011, p.114). People also *underestimate* the impact other people's behaviors have on their own, and even deny it, although the evidence is clear that the behavior of others has a great impact on our own (Nisbett, R. E., & Wilson, T. D., 1977). Tenants were asked if they understood what goes into the recycle/compost bins. In the baseline, they responded 4.52 for recycling and 4.00 for composting; in the post, they responded 4.73 for recycling and 4.55 for composting, signaling that tenants grew more confident in their knowledge of what goes into the recycle/compost bins with an increase of 0.21 and 0.55, respectively. Unsurprisingly, there was a big difference between tenants *thinking* they knew what goes into the recycle/compost compared to what they *actually* knew, as evidence by the education questions in the previous paragraph.

In the post assessment, tenants were asked if they saw the waste room poster and the commitment poster, both responses came back 100%. This shows that tenants were aware of the weekly competition updates and of their neighbors' commitment to composting.

Collectively, the six indicators increased from 2.81 in the baseline, to 4.05 in the post, an increase of 1.24.

Resource Stream Audit:

The baseline resource stream audit was done on January 16th, 2017. UL2 at the time was sending 44,668.67 pounds of waste a year to the landfill; 17,698.91 pounds of recyclables to the Material Recovery Facility (MRF); and zero pounds to be composted. 76% of the material in the waste dumpster had either recyclable (38%) or compostable (38%) materials. The recycling dumpster had 37% contamination rate, which means 37% of the material in the dumpster was not recyclable. Waste industry standard for contamination is between 5-10%, anything over that cannot be managed effectively and efficiently. The 37% contamination compromised of 23% of compostable materials and 14% waste. Overall, UL2 had a 28% waste diversion rate. A more detailed data set can be found in [Appendix VII](#).

Theoretically, if UL2 sent all their resource to the landfill, it will have 15.19 MTCO₂E. With its 28% waste diversion rate, UL2's baseline is negative 16.54 MTCO₂E, a difference of 31.73. The reason why it is negative is because recycling x material is no longer producing GHG emissions in a landfill and recycling x material is more efficient than extracting virgin resources, thus providing a negative GHG impact. For example, a ton of aluminum cans will produce 0.02 MTCO₂E in a landfill, but will have negative 9.11 MTCO₂E if recycled (USA EPA, n.d.). If UL2 diverted all possible resources from the landfill, its GHG impact will be negative 51.83 MTCO₂E, a difference of 67.02 MTCO₂E compared to all materials going to landfill. This is equivalent to roughly 72,000 pounds of coal not being burned in a year (USA EPA 2016).

The post resource stream audit was attempted on April 3rd, 2017, on the last day of the compost competition. The audit was not completed because the waste hauler missed a week of pickup, causing the dumpsters to be overflowing with resources. The compost weighed in at 350 pounds for the month. Note, there were 15 composting tenants by the 3rd week. An entire year of 15 tenants composting would weigh roughly 6000 pounds.

Unfortunately, a comprehensive comparison between the baseline and post resource stream audit could not happen, but some assumptions can be made. Assuming all the compost was diverted from the waste dumpster to the compost bins, the waste diversion jumped from 28% to 38% and the MTCO₂E per year would have dipped by 1.59.

Kick off engagement results:

During the door to door kick off engagement, 19 out of 68 tenants (28%) answered their door. Of those 19 tenants, 68% seemed genuinely excited about the compost competition. The data set that includes information on tenants that answered the door, were genuinely excited, signed up, signed up and were genuinely excited, etc., can be found in [Appendix VIII](#).

It is not clear if there is a correlation between tenants being excited, and using that excitement to eventually compost; 6 out of the 19 tenants (32%) that answered the door did compost, but only 3 of those 6 were genuinely excited.

83% of tenants (5/6) that answered the door and signed up for the competition, eventually did compost; suggesting a strong correlation between face to face engagement, interest, and

eventual action. However, of those 5 that answered and composted, only 2/5 were genuinely excited. One genuinely excited tenant did not compost.

The “genuinely excited” data is flawed. No rubric for evaluating “genuinely excited” body language was used, making this measurement difficult to determine and too dependent on the sensibilities of the project manager. Overall, there is not enough data to draw a scientific conclusion, but this does provide insight.

Compost Competition:

24 out of the 68 tenants (35%) signed up for the competition, but only 15 out of 68 tenants (22%) were composting. Possible miscommunication in the sign up or tenants receiving a compost bucket but not composting is the reason for this.

As was mentioned before, the financial incentive did not pull tenants who presumably, weren't interested in composting, but were interesting in the money. Tenants were never asked if they were competitive. This competition wasn't your typical competition where you can see who you are facing with an immediate score. The scores were updated every week in the waste room posters, but without name. The Green Nurture site which was supposed to be used to share community information, composting best practices, and tenant scores, did not work due to technical errors on the site; leaving the tenants in the blind to who was winning. All activities just had to be attended to get points, there was no direct “winning” over another tenant, except for the compost referrals, which were not effective. There was only one recorded referral. Tenants may have been referring their neighbors, but their neighbors may have not wrote their name down as a referral when signing up. The competition aspect of this project was ineffective. Instead of a competition, a shared goal that the tenants worked towards every week would have had more buy in and would have been more effective. This was brought up in the visioning meeting, more on this later.

There was a four-way tie for the winner of the compost competition. The \$400 was split evenly between the four winners.

Community BBQ:

Although the competition was unsuccessful, the community BBQ, movie night, and visioning meeting were all worthwhile. The community BBQ brought tenants together over free food and a game of bingo; it was well attended (19 sign ins plus children). The purpose of the BBQ was to bring tenants together and have a good time, increasing the sense of community. Tenants could sign up for the competition and receive a bucket, if they didn't do so already. There was a stack of green compost buckets that were highly visible; there were compost buckets next to recycle bins for disposal; everything was either recyclable or compostable, it was a zero-waste BBQ. These elements increased the zero-waste social norm. This was the first zero-waste BBQ ever in the community and it was a new expectation. Nobody was forced to attend the BBQ, sign up for the competition, play compost bingo, or dispose of their resources; it was all done through the hidden power of social norms (and free food).

Field Trip Turned Movie Night:

Due to financial constraints, the field trip to a local composting facility was changed to a movie night. This idea was inspired by MSUS graduate Sambhram Patel (2016), who successfully used a movie in his Culminating Experience Project to increase waste diversion as well. Tenants watched “Trashed” a 2012 documentary by Jeremy Irons about the consequences of a throw-away society. The idea behind the movie was to [replicate the same emotions and benefits of the field trip](#), but in a cost-effective way. The movie was shown in UL2’s theatre room and was well attended. Although a field trip would have had a much more social norm, community, and emotional impact; the movie was an adequate substitution for the circumstances.

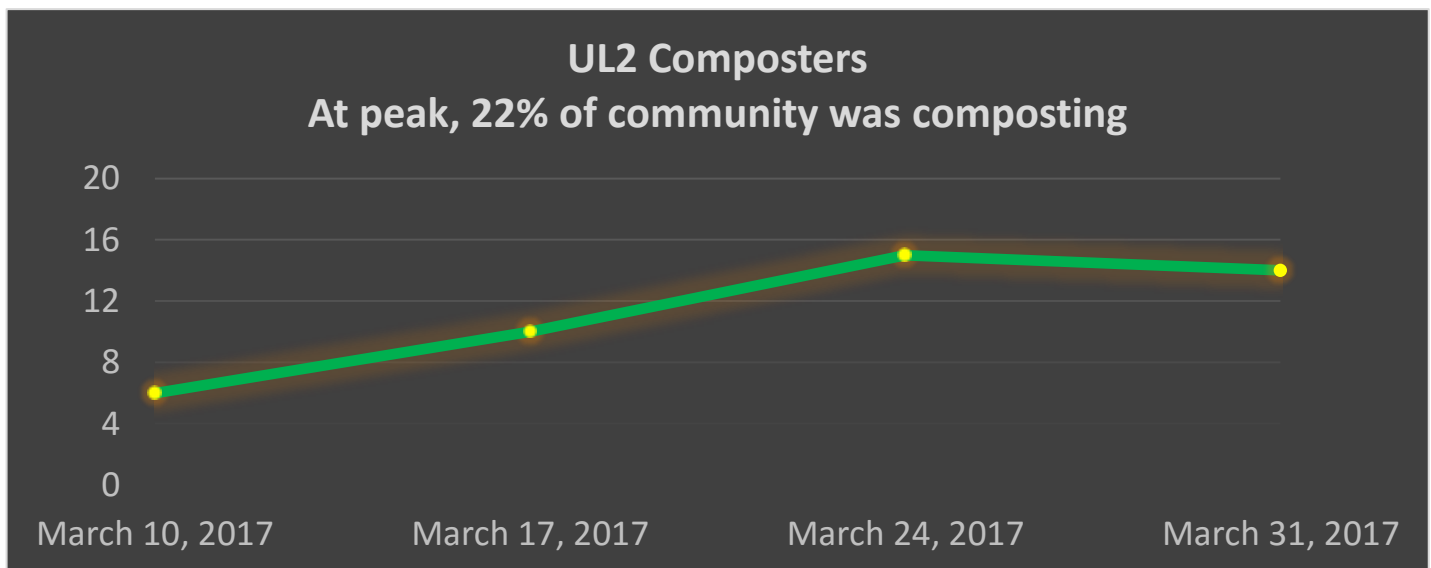
Visioning Meeting:

The visioning meeting did not take place before the competition due to circumstances explained earlier; it was pushed back to the last week of the competition. The baseline survey asked tenants if they wanted to part of the Green Team. If they said yes, tenants wrote in the best day and time to meet and their contact information. Tenants did not get points for attending the visioning meeting, which was originally planned. The meeting’s intention was to bring the people that care the most about “green” together and envision a better community. All the tenants, staff, ASU students, etc. were not invited due to time constraints. There were two visioning meetings, one in the morning and one in the evening; this was done to accommodate all tenants that said they wanted to participate. There were only a couple of tenants at each meeting; an impromptu decision was made to minimize the structure of the meeting and to have a more free flowing conversation. Tenants described a time they felt like anything was possible. After this ice breaker and getting to know each other, there was a brainstorming session for ways UL2 can become the first zero-waste property in the United States. Those posters and notes can be found in [Appendix IX](#).

When transforming a community, it should never be underestimated the quality of ideas that come from inside of a community. Communities struggle in execution because of varying levels of capacity, but it is their community and they know what they’d like to see. In the morning session, a tenant mentioned that they’d like to teach other tenants how to use Craigslist and the Offer Up app, so tenants can barter and/or share within the community. This idea later transformed into tenants teaching a series of workshops to their neighbors so they can all learn from each other. The most interesting idea came from the evening session, which was that the community ought to know that Phoenix is getting its butt kicked in waste diversion by other cities (the tenant that brought this up was upset that San Francisco at 70% was so much better than Phoenix at 20%), have a goal the community can strive, and letting tenants know the impact they are having. This was all brought up by one tenant and it is an excellent blueprint for behavior change.

Compost Participation:

	Week 1	Week 2	Week 3	Week 4
Activity	Kick off engagement	Community BBQ	Movie Night	Visioning Meeting
Day and Time	Monday evening	Friday evening	Friday evening	Thursday morning/evening
Composting Tenants by Friday's pick up	6	10	15	14



There is no concern over tenant participation going from 15 to 14. A tenant told me as I was leaving the property that she forgot. People forget or are out of town. If a tenant composts once, that means they are committed and are unlikely to stop, unless there is an obvious inconvenience such as fruit flies or their bucket breaking.

Compost pick up:

Week One's pick up had a tenant that treated the compost bucket as trash. They received a handwritten note that said, "You are off to a great start! Next time, make sure to leave out plastics and wrappers, those won't turn into soil :-(. You're doing a great job, keep it up!" In the next week's pick up, that tenant not only had clean compost, but they doubled their amount. The feedback was effective.

9. Conclusions and Future Directions

By the end of the project, 22% of the tenants were composting. Over a year-long period, this equates to a diversion of, 6000 pounds from the landfill and 1.59 metric tons of Carbon Dioxide equivalent (MTCO₂E). The waste diversion increased from 28% to 38%. Tenant participation trended upwards during the project. As the social norm develops over time, more tenant participation is expected even after the competition is over. The six indicators that were used to determine the zero-waste capacity, collectively went up by 1.24 points on a five-point scale.

The project was a success, but could be improved in many areas. The visioning meeting needs to be before the engagement begins. The competition should change to a co-created goal, set in the visioning meeting, that the community can work towards. The financial incentive should be vanquished and replaced with smaller rewards to: incentivize tenants to complete the baseline and post survey; reward winners of compost bingo. The green team should be established during the visioning meeting and given the opportunity to design and create their own activities, with the guidance of the project manager. The green team would be more invested and have a permanent impact. This project was done by one project manager, there is enough work to be done to justify two or three project managers instead. It would make for a smoother and better executed project. A small focus group of randomly selected tenants should have been used to better understand barriers and social knowledge. A budget should be made for child care. There are a lot of children at UL2 and providing child care would have allowed parents to attend more events/meetings.

The project was originally intended to be a two-month long competition between three apartment buildings, but unforeseeable challenges did not allow that to happen. Having three properties come together for a visioning meeting and creating a co-created goal (instead of a competition) should be the objective. Having more people invested and at meetings/events has a powerful social norm effect.

The recycling contamination was theorized to go down due to an increase in *compost*, even without any recycling engagement or education. If true, municipalities can better reach their waste diversion goals by switching their focus and resources from recycling outreach to composting outreach. Municipalities will then be able to increase waste diversion and decrease recycling contamination simultaneously — with *one* campaign. Unfortunately, this theory was not tested in this project, due to the circumstances. However, this presents an opportunity for future graduate students to work with professors on testing this theory, with the intent of publication.

The world is becoming increasingly urbanized and this project showed that it is possible to get tenants in multi-family housing to compost. This increased waste diversion, decreased GHG emissions, and slowed down climate change. This project did get 22% of the tenants composting diverting 6000 pounds from the landfill a year, but due to the post resource stream audit not being completed, it is unsure if that would be enough diversion to lower waste servicing costs, and use those savings to pay for the composting service. Circle Blue, the

company I co-founded, is in a unique position to make composting work at UL2 and other NAC properties. Circle Blue has a two-year contract with NAC to get them to zero-waste. NAC and Circle Blue will view the results of this project and create a plan for scaling to the other 16 NAC properties.

10. Acknowledgments

I'd like to thank my family for giving me the opportunity to live out my dreams. A big thank you to The ASU Office of Graduate Education for the Graduate Education Fellowship, which allowed this first-generation Latino to attend graduate school; without this financial help, I would not be here. My friends and business partners at Circle Blue, thank you. Native American Connections, which has been an awesome partner to work with and without them, this project would not be possible.

Thank you to the Stardust Foundation, ASU School of Sustainability, and the Pakis Center for Business Philanthropy for financially supporting this project. Thank you, Paul Prosser for understanding all the challenges I was going through, giving me the flexibility to work through them, and reviewing and editing this document. I'd also like to thank Kathryn Kyle, Ramanuj Mitra, and Whitney Love for reviewing and editing this very large document.

Lastly, I'd like to thank my friends on the 2nd floor of Wrigley Hall. I've learned so much rubbing elbows with the cohorts above, the cohorts below, and my lovely cohort. Instead of naming you all and making this document even longer than it needs to be, just . . . *thank you*.

11. Budget

Budget

Items	Cost
Uline	
Compost infrastructure	\$1,248.70
Amazon	
Compostable Liners	\$110.30
Magents	\$13.99
Shipping	\$-
Tax	\$8.93
Office Max	
Poster Lamination	\$99.21
Home Depot	
Bungee cords	\$8.70
CVS Pharmacy	
Scotch Tape	\$13.83
WriteyBoard	\$197.30
Walmart	
BBQ	\$125.23
BestBuy	
iPhone to HDMI	\$59.27
Apple iTunes: Trashed	\$10.80
NAC Compost Competition Winner	\$400.00
Total	\$2,296.26

Note: travel expenses not included

12. Appendices

I. Systemic-Causal Structure

Root Causes

Desire for convenience and comfort

Assumption that consumption and waste do not harm the environment

Accumulation of goods increases status

Garbage and recycling resources

Disproportionate economy especially for the poor

Immediate Causes

Buying disposable goods
Throwing away disposable goods

Waste Haulers
Landfills

Effects

Benefits

Large Corporate Waste Haulers

Effects

Future and current generations located near a landfill

Future and current generations that have to deal with the effects of climate change

Analyzing the problem

II. Assessment Survey



UL2 Community Survey

Instructions: Please circle one unless told otherwise

Is it ***important*** to recycle?

Yes

No

I know what ***composting*** is?

Yes

No

How often do you ***recycle***?

Never

Once in a while

Half the time

Most of the time

Always

Which of the following items can you ***recycle***? (Please circle all that apply)

Paper

Plastic
Bottles

Glass

Cardboard

Plastic Bags

Aluminum
Cans

Food

Which of the following items can you ***compost***? (Please circle all that apply)

Napkins

Banana
Peel

Egg Shell

Cardboard

Plastic Bags

Aluminum
Cans

Left over
food

I would walk ***this far*** for a recycling bin?

Not at all

10 feet

50 feet

100 feet

As far as I need to
go

Do you feel your family, friends, or community members will be ***let down*** if you don't recycle?

Yes

No

How well do you know your ***community members***?

Not at all

A little

We say hi

Very well

A lot are my best
friends

How well ***do you know*** your property managers, custodians, and NAC staff?

Not at all

A little

We say hi

Very well

They are my
friends

I understand what goes into the ***recycling***.

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

I understand what goes into the ***compost*** bins.

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

Recycling is ***easy*** at this property

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

I care that other community members are recycling

Strongly disagree Disagree Neutral Agree Strongly agree

I would like to receive more information on how to recycle/compost

Strongly disagree Disagree Neutral Agree Strongly agree

I get my community news by (Please circle all that apply. If other please write in answer)

Property manager	Community Members	NAC Newsletter	Twitter	Facebook	Instagram	NAC Website	Other:
------------------	-------------------	----------------	---------	----------	-----------	-------------	--------

How can this property improve recycling?

If there was a 2-hour event, what time and day would be best for you to attend?

What type of event would you like to attend? An example can be, community BBQ, movie night, community meeting, or anything else you would like.

I want to be part of the green team!

Yes	No
-----	----

If yes, what is your

Name _____

Phone Number _____

Room Number _____

Best time to for a green team meeting (Weekday and time) _____

Post Assessment Survey



UL2 Community Survey

Instructions: Please circle one unless told otherwise

Is it *important* to recycle?

Yes

No

I know what *composting* is?

Yes

No

How often do you *recycle*?

Never

Once in a while

Half the time

Most of the time

Always

Which of the following items can you *recycle*? (Please circle all that apply)

Paper

Plastic
Bottles

Glass

Cardboard

Plastic Bags

Aluminum
Cans

Food

Which of the following items can you *compost*? (Please circle all that apply)

Napkins

Banana
Peel

Egg Shell

Cardboard

Plastic Bags

Aluminum
Cans

Left over
food

I would walk *this far* for a recycling bin?

Not at all

10 feet

50 feet

100 feet

As far as I need to
go

Do you feel your family, friends, or community members will be *let down* if you don't recycle?

Yes

No

How well do you know your *community members*?

Not at all

A little

We say hi

Very well

A lot are my best
friends

How well *do you know* your property managers, custodians, and NAC staff?

Not at all

A little

We say hi

Very well

They are my
friends

I understand what goes into the *recycling*.

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

I understand what goes into the *compost* bins.

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

Recycling is *easy* at this property

Strongly disagree

Disagree

Neutral

Agree

Strongly agree

Strongly disagree Disagree Neutral Agree Strongly agree

I care that other community members are composting

Strongly disagree Disagree Neutral Agree Strongly agree

I have seen this compost commitment poster near the mailbox area?

Yes No



I have seen this posters in the waste room?

Yes No



I enjoyed the community BBQ and Movie night; I would like more community events

Strongly disagree Disagree Neutral Agree Strongly agree

Answer only if you were at the green team meeting

I enjoyed the green team meeting.

Strongly disagree Disagree Neutral Agree Strongly agree

I thought the green team meeting was helpful.

Strongly disagree Disagree Neutral Agree Strongly agree

III. Flyers

Kick Off Flyer



UL2 Composting Competition! **Tenant versus Tenant**

The tenant with the most points wins **\$400** off their rent!

(Only one tenant can win. If there is a tie, winnings will be split)

Competition starts **March 6th** and ends **April 3rd!**

How do I get points?

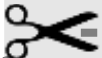
- 1. Sign up for compost (at property manager's office) - 30 pts**
- 2. Refer another tenant to compost - 10 pts**
(They must write your name and room number)
(You can refer an unlimited amount of tenants)
- 3. Attending a community BBQ - 15 pts**
Come to the BBQ Friday, March 3rd at 6:30pm!
- 4. Sign up for Green Nurture - 10 pts**
- NAC.GreenNurture.com
- 5. Other events and activities will be advertised later, so be on the look out! 🗓️**

COMPOST COMMITMENT

Compost

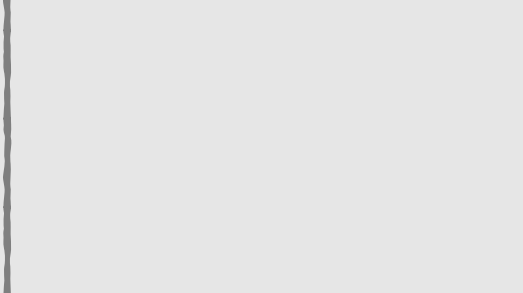


Put me outside
your door on
Thursday Night!



I, _____
promise to compost in
my home.
Signature:
X _____

Draw something funny:



Compost Commitments



Leave Compost Buckets
outside your door
every night!



Compost Commitments

<p>1. I promise to compost in my home. Signature: [Signature]</p>	<p>2. I promise to compost in my home. Signature: [Signature]</p>	<p>3. I promise to compost in my home. Signature: [Signature]</p>	<p>4. I promise to compost in my home. Signature: [Signature]</p>	<p>5. I promise to compost in my home. Signature: [Signature]</p>	<p>6. I promise to compost in my home. Signature: [Signature]</p>
<p>7. I promise to compost in my home. Signature: [Signature]</p>	<p>8. I promise to compost in my home. Signature: [Signature]</p>	<p>9. I promise to compost in my home. Signature: [Signature]</p>	<p>10. I promise to compost in my home. Signature: [Signature]</p>	<p>11. I promise to compost in my home. Signature: [Signature]</p>	<p>12. I promise to compost in my home. Signature: [Signature]</p>
<p>13. I promise to compost in my home. Signature: [Signature]</p>	<p>14. I promise to compost in my home. Signature: [Signature]</p>	<p>15. I promise to compost in my home. Signature: [Signature]</p>	<p>16. I promise to compost in my home. Signature: [Signature]</p>	<p>17. I promise to compost in my home. Signature: [Signature]</p>	<p>18. I promise to compost in my home. Signature: [Signature]</p>
<p>19. I promise to compost in my home. Signature: [Signature]</p>	<p>20. I promise to compost in my home. Signature: [Signature]</p>	<p>21. I promise to compost in my home. Signature: [Signature]</p>	<p>22. I promise to compost in my home. Signature: [Signature]</p>	<p>23. I promise to compost in my home. Signature: [Signature]</p>	<p>24. I promise to compost in my home. Signature: [Signature]</p>



Leave Compost Buckets
outside your door
every night!



Thursday

Compost Competition by Daniel Velez
April 10th, 2017



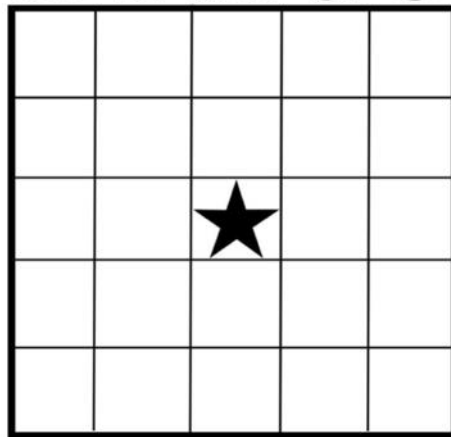
ASU Stardust Center
for Affordable Homes
and the Family
Arizona State University



UL2 BBQ!
Friday March 17th
@ 6:30pm
Food, Music, and Bingo!



B I N G O



Put me outside
your door on
Thursday Night!



**If you haven't already done so,
sign up for the compost competition
at Julia's office!**

Attending a community BBQ = 15 points

Movie Night Flyer



ASU Stardust Center
for Affordable Homes
and the Family
Arizona State University

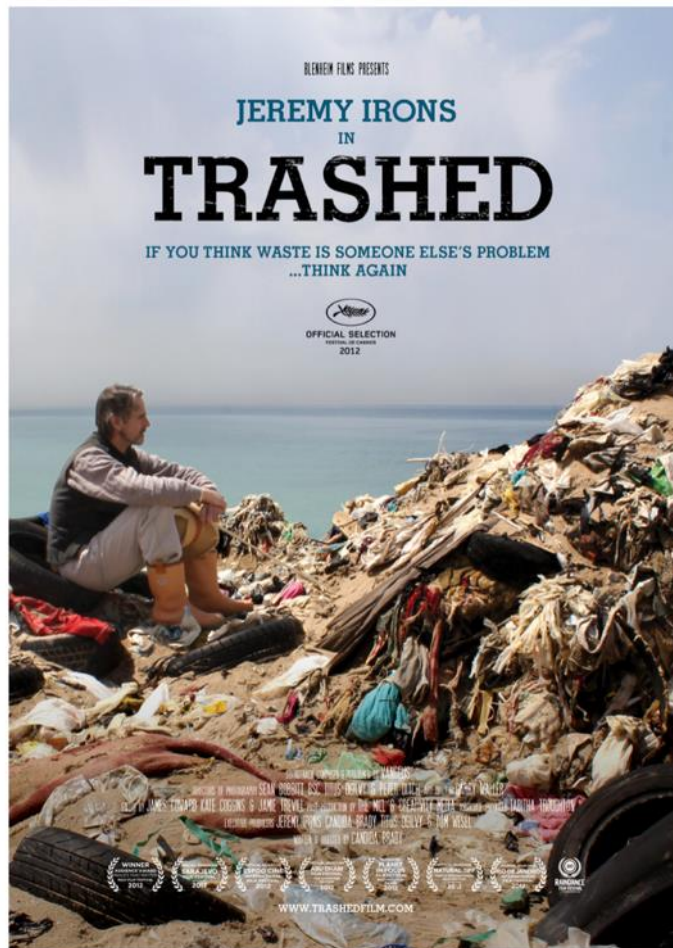


CIRCLEBLUE

Movie Night!

This Friday, March 24th 2017

- We will meet at the playground at 6:30pm, then walk to the Theater Room. (Worth 15 points!)



Compost Competition

\$400 winner!
Only one tenant can win.

Most points wins!
Get points by:

- Signing up for compost
- Referring friends to compost
- Attending events
- We'll tell you more!

Current Score

Ask where to get me!

Compost

ASU Stardust Center
for Affordable Homes
and the Family
Arizona State University

Recycle

NO Plastic Bags!

ASU Stardust Center
for Affordable Homes
and the Family
Arizona State University

CIRCLEBLUE



Compost Competition by Daniel Velez
April 10th, 2017

Update Flyer



ASU Stardust Center
for Affordable Homes
and the Family
Arizona State University



UL2 Score

3/29/17

**1st place
60 points (tied)**

**2nd place
60 points (tied)**

**3rd place
60 points (tied)**

**This week, you will receive 10 points if
you have clean compost in your green
bucket!**

Get points by:

- **Signing up for compost**
- **Referring friends to compost**
- **Attending events**
- **We'll tell you more!**

Current Score



UL2 Score

3/29/17

1st place
60 points (tied)

2nd place
60 points (tied)

3rd place
60 points (tied)

This week, you will receive 10 points if
you have clean compost in your green
bucket!

Ask where
to get me!



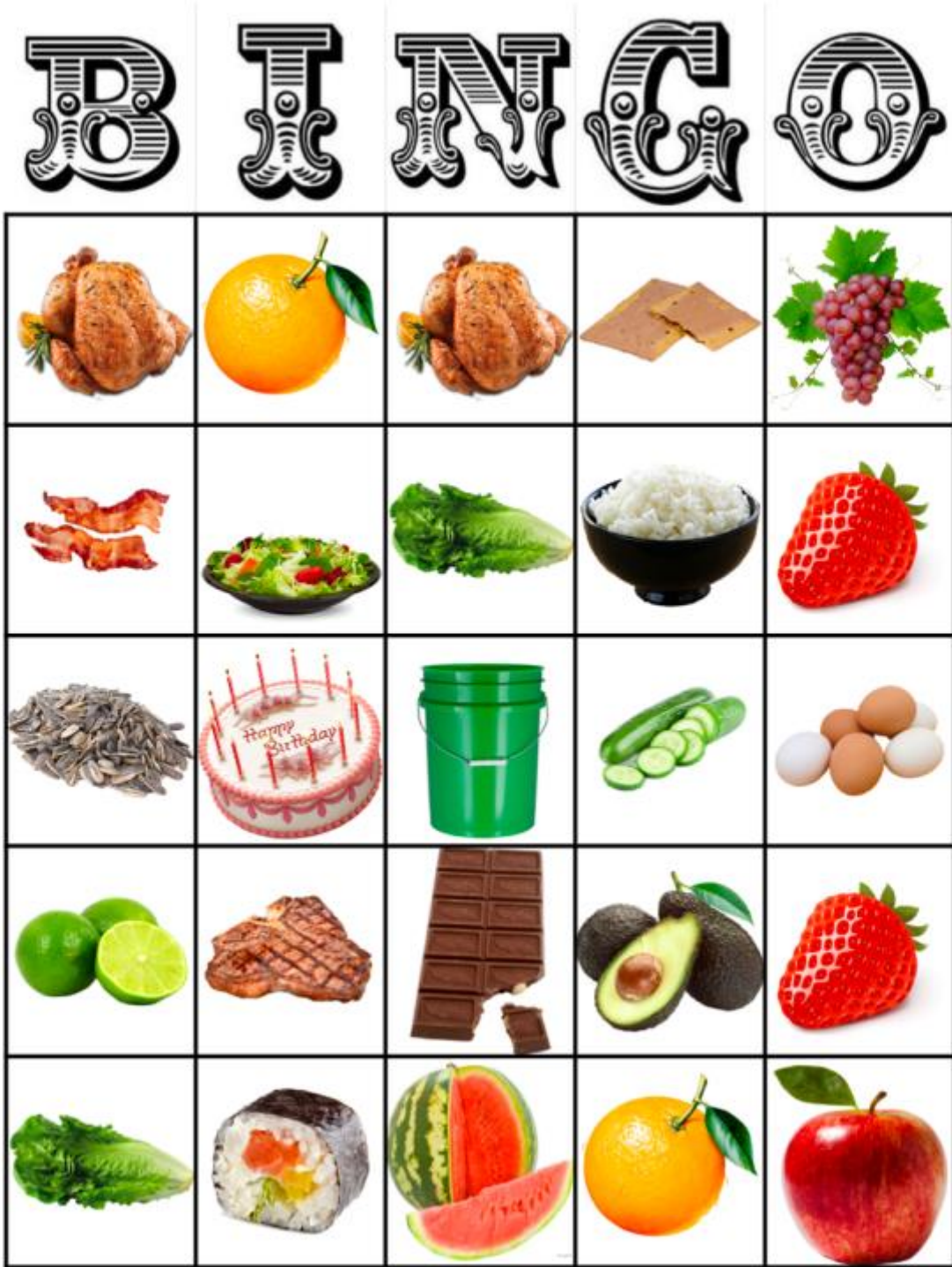
IV. Green Nurture

The screenshot shows a web browser window at nac.greennurture.com. The user is Daniel Velez, with 110 My Points and Rank 1. The dashboard is a grid of green widgets:

- Conversation:** A "Welcome!" message from "Circle Blue" dated MAR 21.
- Articles:** A section for articles with a "Please configure videos" message below it.
- Leaderboard:** Shows Daniel Velez with 110 points and Rank 1.
- Take Action:** A "I promise to Compost" button dated APR 12.
- Contests:** A section for contests.
- iHave.iWant:** A section for "iHave.iWant" items.
- Announcements:** A section for announcements.
- Scorecard:** A section for a scorecard.
- Calendar:** A calendar for April 2017.
- Commitment Meter:** Shows 0000 out of 0 Employees. "Number of Commitments Signed... Click here to sign".
- RSS Feed:** A section for an RSS feed.
- Useful Links:** A link for "Zero Waste Crib" dated MAR 21.
- Goals:** A "Zero Waste" goal progress bar at 29%.

Footer: © 2017 Green Nurture, LLC | Legal | Powered by GreenNurture | Site Map | Privacy

V. Compost Bingo



Compost Bingo Scorecard

1	Watermelon		21	Lasagna		41	Eggs	
2	Peach		22	Lettuce		42	Quesadilla	
3	Bacon		23	Hot Dog		43	Burger	
4	Cherry		24	Peanuts		44	Chicken Wings	
5	Corn		25	Sun flower seeds		45	Spaghetti & Meatballs	
6	Grapes		26	Chicken		46	Lime	
7	Pineapple		27	Steak		47	Lemon	
8	Chocolate Bar		28	Beet		48	Avacado	
9	Cake		29	Omelete		49	Tissue	
10	Crackers		30	Salad		50	Taco	
11	Cookie		31	Pizza		51	Bread	
12	Hashbrowns		32	Bagel		52	Burrito	
13	Fries		33	Sushi		53	Banana	
14	Shrimp		34	Donut		54	Orange	
15	Pancakes		35	Coffee		55	Eggplant	
16	Strawberry		36	Beans			Game 1	
17	Cereal		37	Rice			Game 2	
18	Pop Tarts		38	Tomato			Game 3	
19	Apple		39	Carrot			Game 4	
20	Gyro		40	Cucumber			Game 5	

VI. Tri-Blend Survey Results

Baseline (23 responses)				
	Survey	Visual Observations	Manager Interview	Final
Regulation		3.00		3.00
Incentives		1.00		1.00
Community	3.09	2.50		2.79
Logistics	4.43	3.00		3.72
Education	3.55	3.00		3.28
Social Norm	4.15	2.00		3.08
I understand what goes into the recycling bin		4.52	Total	2.81
I understand what goes into the compost bin		4.00		

Post (11 responses)				
	Survey	Visual Observations	Manager Interview	Final
Regulation		4.00		4.00
Incentives		5.00		5.00
Community	3.22	4.00		3.61
Logistics		5.00		5.00
Education	2.76	3.00		2.88
Social Norm	4.13	3.50		3.81
I understand what goes into the recycling bin		4.73	Total	4.05
I understand what goes into the compost bin		4.55		

Baseline - Post Delta	
Regulation	1.00
Incentives	4.00
Community	0.82
Logistics	1.28
Education	-0.40
Social Norm	0.74
I understand what goes into the recycling bin	0.21
I understand what goes into the compost bin	0.55

VII. Resource Stream Audit

Baseline Metric tons of CO2e

	If all went to landfill		All Landfil compared to Potential	
	Baseline	Potential emissions	Baseline	Potential emissions
Waste	7.08	7.77	1.90	-5.18
Recycling	8.11	-24.31	-36.46	-44.57
Compost	0.00	0.00	-2.08	-2.08
Aversion	0	0	0	0.00
Total	15.19	-16.54	-36.64	-51.83

Note: Used the EPA WARM v14 data

Baseline

	Pounds per year	Zero Waste Meter
Waste	44,668.67	28%
Recycling	17,698.91	
Composting	-	
Aversion	-	
Total	62,367.58	
Total in Tons	31.18	

Post Assumption Metric tons of CO2e

	If all went to landfill	
	Post	Baseline
Waste	6.03	6.72
Recycling	8.11	-24.31
Compost	1.62	-0.54
Aversion	0.00	0.00
Total	15.76	-18.13

Note: Used the EPA WARM v14 data

Post Assumption

	Pounds per year	Zero Waste Meter
Waste	38,668.67	38%
Recycling	17,698.91	
Composting	6,000.00	
Aversion	-	
Total	62,367.58	
Total in Tons	31.18	

VIII. Kick off Engagement Results

Note: the room numbers have been changed to letters to ensure tenant privacy.

Tenants that answered the door during kick off

Bold underline means they were genuinely excited about the compost competition

Yellow means they signed up for the competition

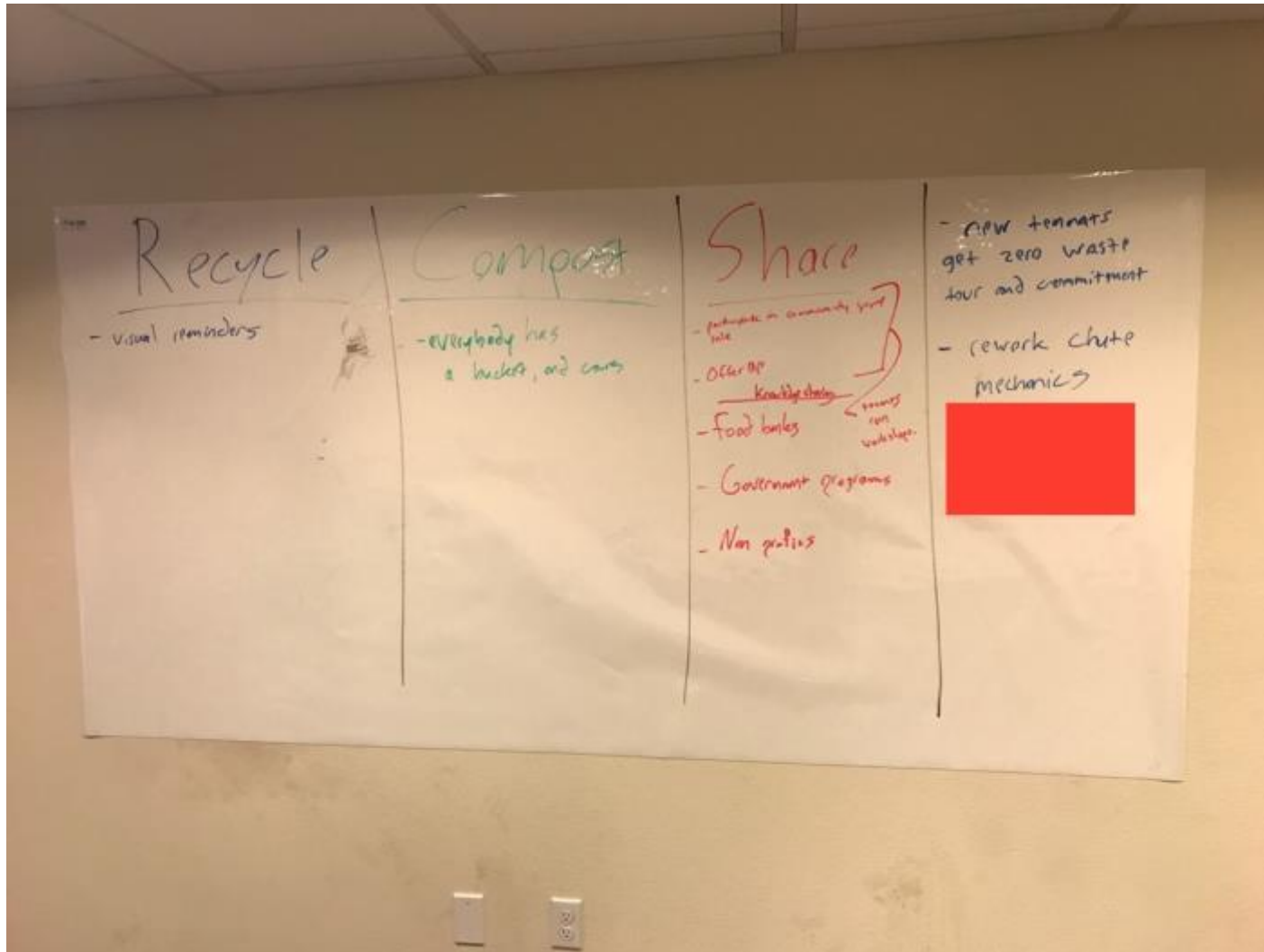
Green means they were composting

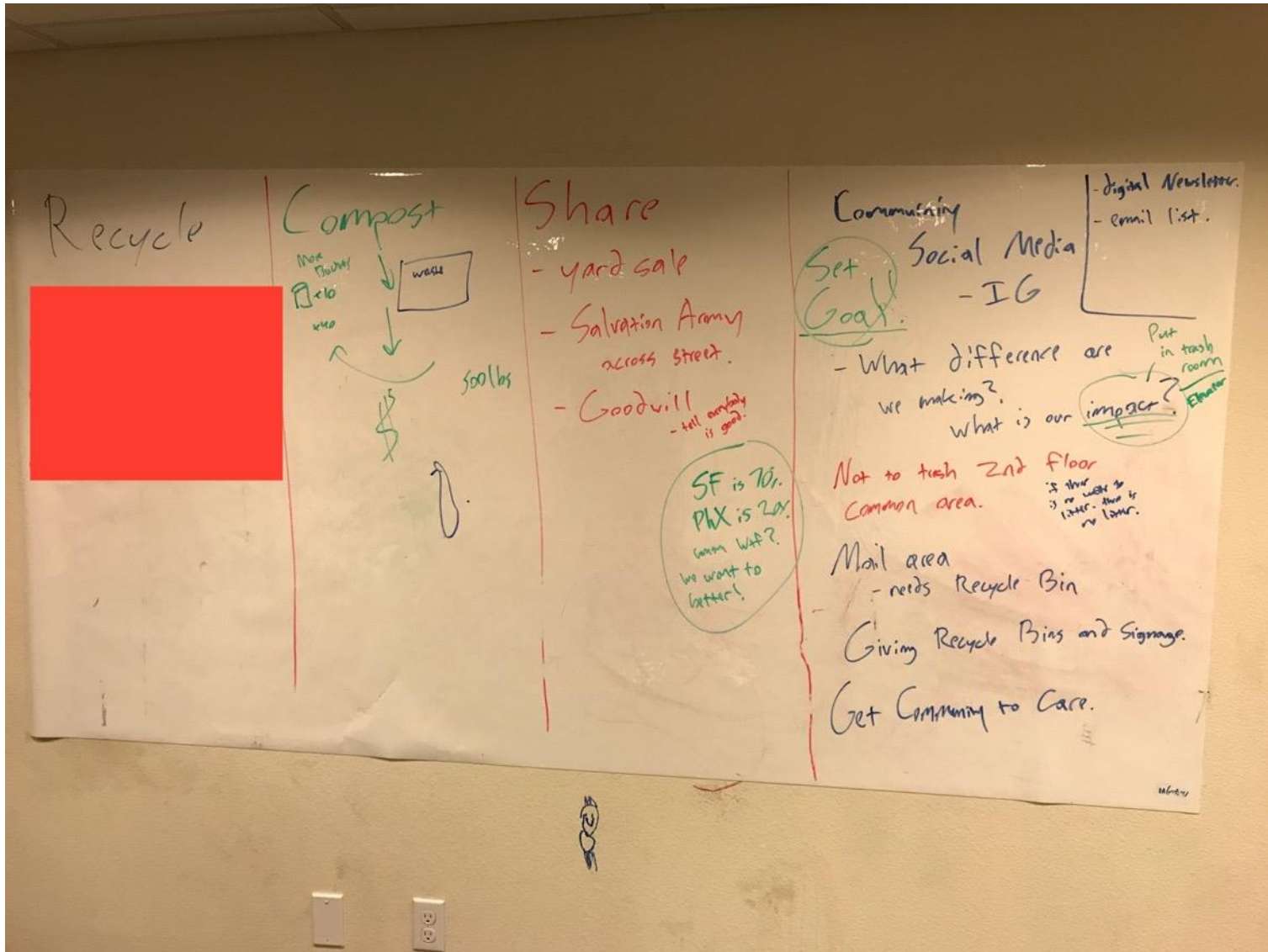
Blue means they signed up **and** were composting

abcdefg	Tenants that answered the door	19	
<u><i>abcdefg</i></u>	<u><i>Bold, Underlined, Italicized</i></u>	13	68%
<u>abcdefg</u>	Yellow	6	32%
<u><i>abcdefg</i></u>	<u><i>Yellow Bold</i></u>	3	16%
abcdefg	Green	6	32%
<u><i>abcdefg</i></u>	<u><i>Green Bold</i></u>	3	16%
<u>abcdefg</u>	Blue	5	26%
<u><i>abcdefg</i></u>	<u><i>Blue Bold</i></u>	2	11%
<u>abcdefg</u>	<u>Yellow turned blue</u>	5/6	83%
<u><i>abcdefg</i></u>			
<u>abcdefg</u>			
<u><i>abcdefg</i></u>			
<u><i>abcdefg</i></u>			
<u>abcdefg</u>			
<u><i>abcdefg</i></u>			
<u>abcdefg</u>			
<u><i>abcdefg</i></u>			
abcdefg			
abcdefg			

IX. Visioning Meeting Posters and Notes

Morning Session





UL2 Visioning Meeting Notes

March 30th, 2017

Morning Meeting

Attended by two community members.

Recycle

- Visual reminders

Compost

- Everybody has a bucket and cares

Sharing

- Yard sale
- Offer Up App
- Knowledge sharing workshops run by tenants
 - Food Banks
 - Government programs
 - Non-Profits

Other

- New tenants get zero-waste tour and sign commitment
- Rework chute mechanics

Evening Meeting

Attended by 3 community members and their children.

Recycle

Compost

- How UL2 affords this composting service was explained. Waste levels go down, save money, to pay for composting.

Sharing

- Yard sale
- Salvation Army is across street
- Goodwill

Other

- Digital newsletter with email list
- Community Social Media
 - Instagram

- What difference are we making? What is our impact?
 - Tenants should know these things so they are more motivated to be a part of something.
 - Put this information on the waste room posters
- Set goal for community to reach.
- San Francisco has 70% waste diversion and Phoenix has 20%
 - Tenant was upset at this stark difference. What can we do to do better?
- Not to trash 2nd floor common area.
 - If there are products that don't create waste, such as wrappers, then there would be no litter. Buying habits root cause of litter.
- Mail area needs a recycling bin
- Give recycling bin and signage
- Get community to care

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