

# DESIGN 1 - SYNTHESIS AND IDEATION

Interview clustering activity - Include high resolution photo or digital recreation



## Insight Statement

1. The campus waste ecosystem lacks a clear process and education about the afterlife of waste, prompting students to question how compost is used and to consider the outcomes of composting and reuse systems, according to interviews with students Hlawn and JJ. Only 27 percent of Stanford waste that goes to the landfill is actually intended for the landfill, and Stanford already diverts over 60 percent of waste. Furthermore, 38 percent of Stanford's landfill waste is compostable, with food scraps accounting for 24 percent. This reveals a disconnect between students' actions and their impact, which matters because motivation to engage in environmentally friendly behaviors is lost when systems are invisible or feel abstract.
2. The campus waste system relies heavily on individual sorting behavior, but space constraints and inconsistent availability of compost bins create barriers to effective sorting and foster feelings of guilt, according to interviews with Hlawn and JJ. Only 27 percent of Stanford waste that goes to landfill is actually intended for the landfill, and Stanford already diverts over 60 percent of waste. This reveals that the system assumes that users will always use the infrastructure correctly despite logistical constraints. This matters because when these systems rely on a concerted effort rather than procedural ease, students feel guilty when bins are inconsistent or when other factors, such as space, lead to missorted waste.
3. Student waste behavior typically reflects a path-of-least-resistance pattern, with reduced food waste when plates were smaller, and composting was easier, for example, with labeled biodegradable cutlery, according to an interview with Hlawn. Yet 38 percent of Stanford's landfill waste is compostable, with food scraps accounting for 24 percent. This reveals that sustainable behavior increases when barriers to entry are minimized. Design interventions that reduce both physical and cognitive effort are more effective than awareness campaigns that aim to shift users' intentions.
4. The shared design space culture in the d.school Bay Studio demonstrates how quickly collective norms can shift. When one student leaves the space 85% clean, it feels 100% messy and emboldens other students to contribute to the mess, according to Owen, the d.school facilities manager. This reveals that waste behavior is socially reinforced, and matters because sustaining zero waste requires reinforcing visible norms to prevent ripple effects.

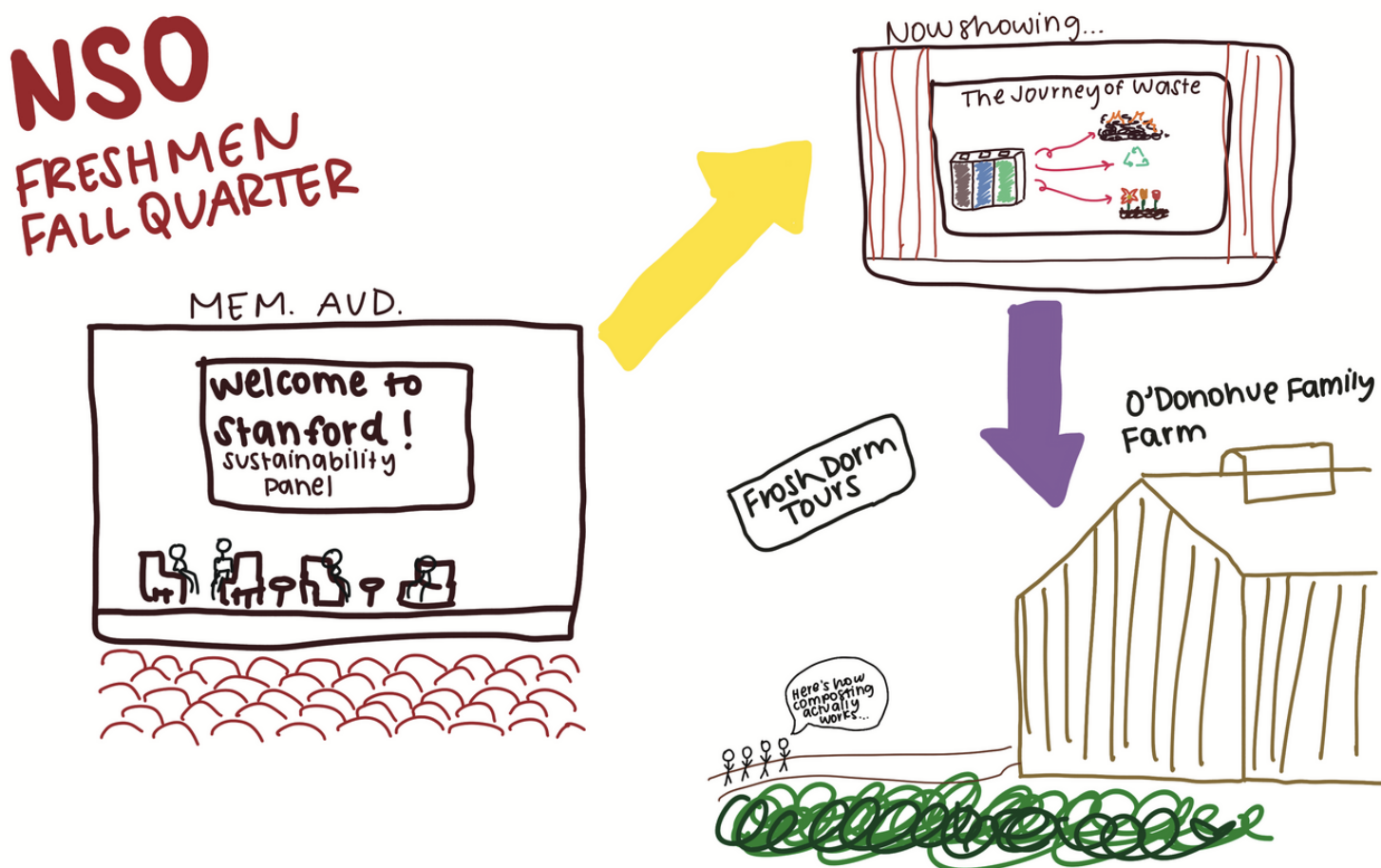
## HMW Question

- 1a. How might we make the journey of compost and recycled materials more visible so students can see the impact of their actions?
- 1b. How might we create tangible feedback loops/positive reinforcement that connect waste decisions to observable environmental changes?
- 2a. How might we redesign campus waste infrastructure so that correct sorting feels effortless?
- 2b. How might we standardize compost and recycling across campus spaces so that students do not have to adapt to different rules in different buildings?
- 3a. How might we redesign disposal systems so that the most sustainable option is also the easiest?
- 3b. How might we reduce physical and cognitive effort in composting, especially for high-volume waste like food scraps and compostable service items?
- 4a. How might we design shared spaces to reinforce correct sorting as the social norm?
- 4b. How might we prevent negligent waste behavior from devolving into disorder in busy collaborative spaces?

# DESIGN 1-Idea dashboard 2

Name your solution and draw a diagram/storyboard of how it works

## BEHIND THE BINS



### WHAT IS IT?

What is the gist of your idea? What insight and HMW did it come from and why did you choose it?

New Student Orientation is an annual event that every Stanford student is required to attend, and it is one of the few times when all students learn about campus-related topics from a centralized source. My first idea is to implement a new piece of programming into NSO that illustrates students' waste afterlife and how their actions make a difference (for better or worse) on campus and beyond. This idea stems from my insight into the lack of visibility into the waste afterlife and students' limited awareness of the impact of their actions (Insight 1, HMW 1a). I chose it because frosh, as impressionable new students on campus, will have waste literacy from day one, so they do not have to retroactively shift their behaviors later on.

### WHO WILL BE IMPACTED?

Who is the ideal target audience? What are they struggling with and how would this help them? How might this impact people differently based on their lived experiences or culture? What unintended consequences might occur if this idea takes off?

The ideal target audience is freshmen during New Student Orientation. Freshmen are brand new to our campus, and most are living on their own, quite autonomously, for the first time. The new waste-disposal system can be overwhelming and not motivating to learn, as frosh adapt to the many other new systems around campus. Above all, new students have no idea where their waste is going, so there is no better time than the beginning of their Stanford career to introduce them to the waste system. Students from places around the country without robust compost systems could find this eye-opening, and perhaps international students might be used to very different waste infrastructures. Engagement and active participation in the programming may skew toward students who are already environmentally conscious.

### HOW DOES IT WORK?

How will your idea work in the world? Be as detailed as possible. What technology or services are needed for this idea to function? How will people engage with your idea (during and after)? What resources are needed to make this work?

This programming is two-pronged. The first prong is a mandatory session in Memorial Auditorium, including a panel discussion with sustainability faculty, facilities members, and even farm staff. This session is one of the events for all ~1,500 frosh during NSO. In addition to the panel, a video demonstrating the waste pathway after disposal in Stanford bins will play, showing how waste gets diverted, the consequences of landfilling, and the consequences of mis-sorting. The second prong is optional: dorm tours to the O'Donohue Family Farm during NSO to see composting in action and learn about compost's afterlife in general. RAs can gauge interest from their frosh and sign up for small (<100 people) tours. For this idea to function, it requires coordination with the sustainability office, Stanford Farm staff, NSO coordinators, waste management services, and ResEd. No new technology or services are needed, but a video crew will be needed to produce the informational video. Students will engage with this idea as new frosh and ideally exit NSO with a clear idea of waste management and its afterlife.

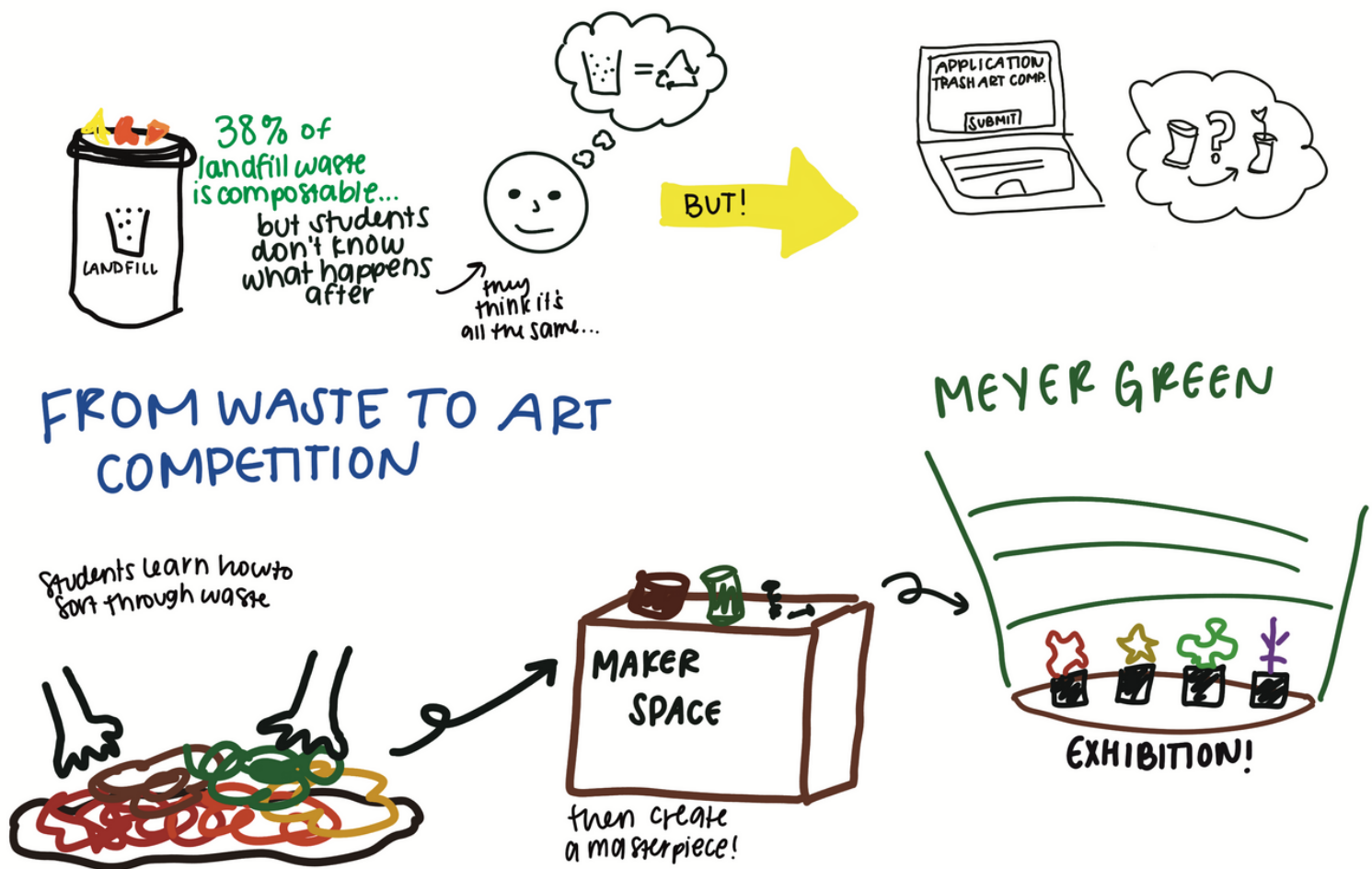
### IMPLEMENTATION PLAN

Walk us through how this idea will be implemented. Feel free to make a timeline. Who will be involved, and how long will it be ran? What organizations will take this work on? How much do you think it would cost to run?

During spring quarter, there will be meetings with the future NSO coordinators about scheduling and planning. Farm tour materials and information will be developed, and the connection with the Sustainability Office will be made. During the summer, the video will be created by hired individuals, and the panel members will be selected. Mock farm tours will be held. The start of fall quarter marks the pilot of the idea during NSO. The organizations involved are Stanford Sustainability, NSO coordinators, and the Farm. The cost will be no more than \$5,000 (stipends to staff members involved, video creation, and other materials).

# DESIGN 1-Idea dashboard 2

Name your solution and draw a diagram/storyboard of how it works



## WHAT IS IT?

What is the gist of your idea? What insight and HMW did it come from and why did you choose it?

This idea is an annual campus-wide waste art competition where students are tasked with creating large-scale installations using landfill-bound or compostable waste. Each art piece must visually represent the journey of waste, from disposal to processing to reuse (or composting or incineration), educating viewers about where their trash actually goes. This idea comes from the insight that the waste system lacks a visible journey, so students feel disconnected from the impact of their actions (Insight 1, HMW 1a). I chose this because an art competition is not only a fun way to get students involved, but it also makes invisible systems visible. Rather than a poster on a trash can telling students a statistic or two, students will see waste recontextualized.

## WHO WILL BE IMPACTED?

Who is the ideal target audience? What are they struggling with and how would this help them? How might this impact people differently based on their lived experiences or culture? What unintended consequences might occur if this idea takes off?

My target audience for the competition is Stanford undergraduates. Artists of any and all skill levels are encouraged to join, and ideally, all students will view the installations. Students are struggling to comprehend the impacts of their actions when they put something in a disposal bin. It disappears immediately after disposal, and I do not believe students understand the scale of missorted landfill waste. This idea makes waste volume physically visible, with the added component of the waste journey. Some students may find this competition uncomfortable or unsettling, while others may engage deeply with the task. It might only attract art/design students or those who are environmentally conscious. One unintended negative consequence might be that an art competition aestheticizes waste without actually changing student behavior, so pairing the art with data and helpful information can mitigate this consequence.

## HOW DOES IT WORK?

How will your idea work in the world? Be as detailed as possible. What technology or services are needed for this idea to function? How will people engage with your idea (during and after)? What resources are needed to make this work?

The competition structure is as follows: students, in teams of up to 3 or solo, apply to the competition with rough/crude proposals of their design (it will not be difficult to get a spot in the competition, just need to demonstrate true interest). Each piece of art must use reclaimed waste, represent at least 2 stages of the waste journey, and include a short explanation connecting to Stanford's waste data. They will have 5 weeks to create their piece, and they can apply for a small grant if needed. There are no constraints on size. The final installations will be displayed on Meyer Green for a few days, and a panel of judges will select a winner (a \$1,000 prize). This idea requires collaboration with the Sustainability office, waste management operations, and the Meyer Green programming staff. There needs to be an established protocol for safe waste collection, a storage space for materials, a prize fund, and a judges' panel, ideally composed of faculty members. Students will engage with the idea on the creator and viewer side. Creators will physically handle the waste and transform it into a way to visualize the journey of trash, so viewers can both appreciate the art and understand where their waste goes.

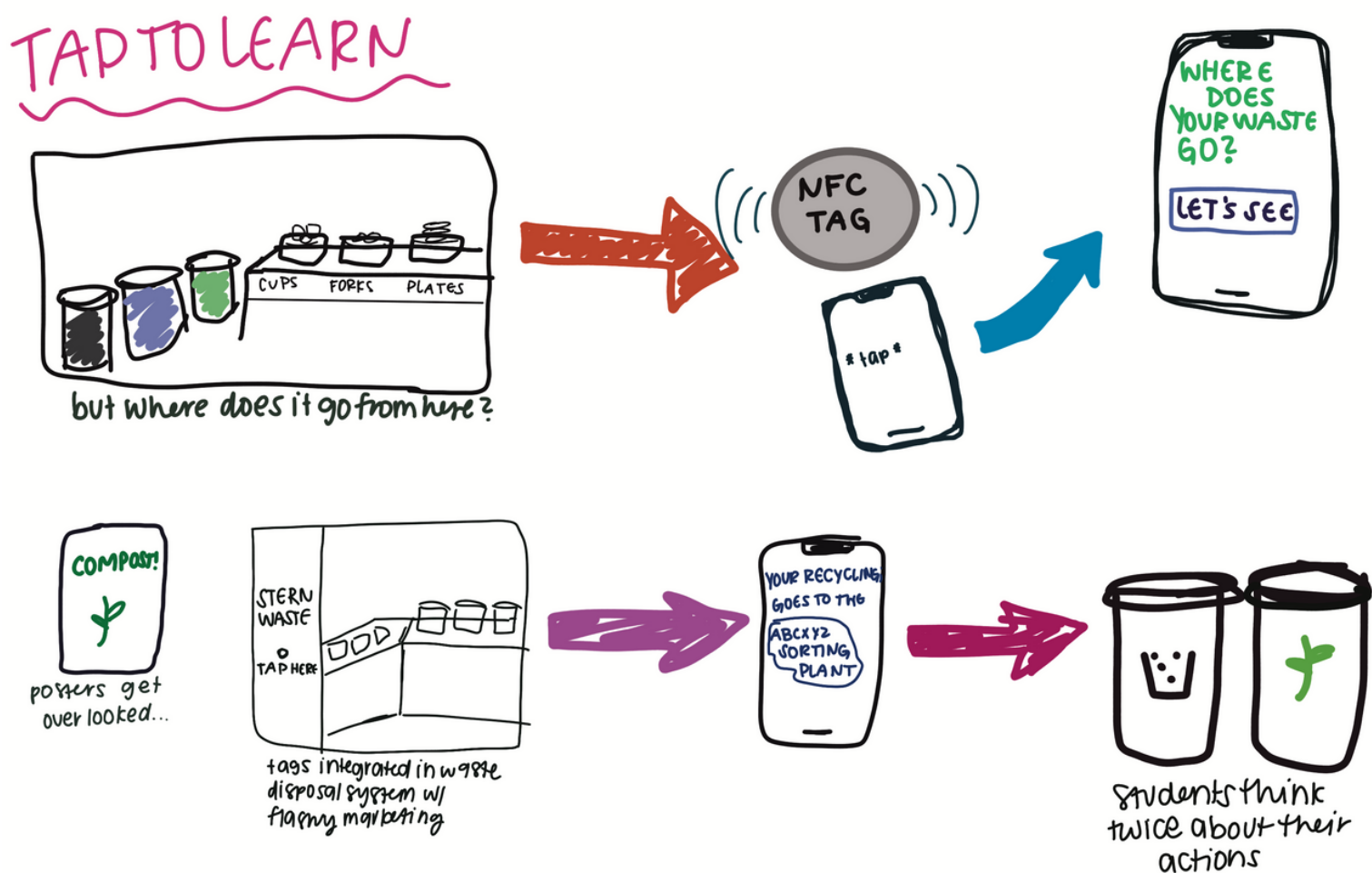
## IMPLEMENTATION PLAN

Walk us through how this idea will be implemented. Feel free to make a timeline. Who will be involved, and how long will it be ran? What organizations will take this work on? How much do you think it would cost to run?

During the winter quarter, we will secure funding and partners and open proposal submissions to undergraduate students. Teams or individuals will start creating their art installations at the beginning of spring quarter (end of March). Workshops can be hosted by partners in the sustainability and facilities departments about safe waste use and compost education. Finally, at the end of April, to round out Earth Month, the installations will be put on exhibition in Meyer Green for everyone on campus to see. The first day of the exhibition will feature an event in which the artists present their work and explain how it illustrates the waste afterlife journey for an open audience. At the end of the week, winners are announced. As this will be an annual event, social media content and articles promoting it can be created for the Stanford Sustainability website. The organizations involved are Stanford Sustainability and the facilities department. ASSU might come in use for grants. The overall budget is approximately \$5,000, including the prize money and operational costs.

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Name your solution and draw a diagram/storyboard of how it works



## WHAT IS IT?

What is the gist of your idea? What insight and HMW did it come from and why did you choose it?

This idea is an interactive dining hall technology that allows students to tap (like Apple Pay) a landfill, recycling, or compost bin before or after disposal to see where that specific bin goes, how it is processed, and what impact it has on the environment. The platform also contains important statistics and information about waste afterlife. This comes from my insight and HMW about the visibility of the waste journey on and off campus. (Insight 1, HMW 1a) Unlike my other two ideas, which are one-time annual experiences, this idea becomes integrated into everyday behavior.

## WHO WILL BE IMPACTED?

Who is the ideal target audience? What are they struggling with and how would this help them? How might this impact people differently based on their lived experiences or culture? What unintended consequences might occur if this idea takes off?

The target audience is undergraduate students in dining halls. They struggle to know where their waste goes after putting it in the bin. There is confusion about compost vs landfill and what recycled materials actually get recycled into. This helps by connecting their disposal to a visible consequence with a quick tap of the phone, making sustainability interactive. An unintended consequence might be that only environmentally inclined students will tap the NFC tag, so engaging marketing tactics can mitigate this. Additionally, students who come from environments where knowledge of the waste ecosystem compared to those who have no knowledge of the afterlife of waste will likely react very differently to the information presented. As Hlawn mentioned, this could also produce feelings of guilt rather than empowerment if implemented poorly.

## HOW DOES IT WORK?

How will your idea work in the world? Be as detailed as possible. What technology or services are needed for this idea to function? How will people engage with your idea (during and after)? What resources are needed to make this work?

Instead of a QR code that requires students to have their cameras out while disposing of their waste, there will be small NFC tags near the bins. These NFC tags work like Apple Pay: tap your phone to the tag, and it will open a pre-programmed website. This website contains a different pathway for each type of waste: accurately sorted landfill, compost, and recycling, and incorrectly sorted landfill, compost, and recycling. There will also be up-to-date statistics on diversion rates, missorted waste, and related metrics. Students will engage with this idea for a short but compelling time. Ideally, they only need to spend about a minute on the platform to get the intended effect of educating them on where their waste goes after they last touch it. The resources needed are frequently updated statistics from the Stanford Office of Sustainability and a website development team to actually create the educational modules about waste.

## IMPLEMENTATION PLAN

Walk us through how this idea will be implemented. Feel free to make a timeline. Who will be involved, and how long will it be ran? What organizations will take this work on? How much do you think it would cost to run?

During the spring and over the summer, the website will be developed in collaboration with UI/UX design students and professors, as well as HCI computer science students. Frequent collaboration and correspondence with Stanford Sustainability and R&DE is also crucial to the success of the idea. Just before fall, the NFC tags will be installed in each dining hall, and social media posts from R&DE or Sustainable Stanford perhaps will publicize the new addition. The fall will be important for gauging engagement and interest in the idea and can inform expansion plans to dorms or classrooms. Roughly \$10,000 will be allocated to website creation, NFC installation, and data collection, and R&DE and Sustainable Stanford will take on this work.