



Food Waste Recycling in Natomas Unified School District: Identifying Best Practices, Challenges, and Opportunities for School Cafeterias

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About CivicSpark

CivicSpark is an AmeriCorps program, administered by the Local Government Commission in partnership with the Governor's Office of Planning and Research. Sixty-eight fellows across California work with local government agencies for 11 months to build local government capacity to address climate change. CivicSpark fellows placed at the Sacramento Metropolitan Air Quality Management District have worked with Breathe to assist with school food waste recycling programs since 2015.



Meet the Fellows



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Executive Summary

Food waste is the single largest contributor to landfills, where it generates methane, a greenhouse gas 20 times more potent than carbon dioxide that contributes to climate change and poor air quality. Under a new state law, Assembly Bill 1826, commercial generators of organic waste, including food waste, are required set up recycling services for this new waste stream. Schools are particularly large generators of organic waste due to the sheer volume of students served each day. Diverting this waste from the landfill through recycling, or in some cases donation, provides a valuable strategy for schools to reduce trash disposal and associated costs, reduce greenhouse gas emissions, and educate the next generation of environmental stewards.

Breathe California Sacramento Region works with the Sacramento Metropolitan Air Quality Management District (SMAQMD) and other partners to implement organics recycling programs at schools. Seven campuses in Natomas Unified School District (District or NUSD) implemented food waste recycling programs between January 2016 and February 2017. CivicSpark Fellows conducted 26 interviews across the District to understand food waste recycling program perception, successes, and challenges. Fellows summarized interviews in this report to identify best practices, challenges, and recommendations for school food waste recycling. Key findings are summarized below.

Food Waste Recycling Best Practices

- Find and support program champions, both at an administrative and at the school level.
- Use color-coded food waste bins and create a logical waste disposal process.
- Incentivize student participation by recognizing student helpers with helper vests and prizes.
- Encourage staff participation to monitor waste bins by offering prizes.
- Empower staff to customize the food waste recycling program at each school site.
- Promote internal communication between staff.

Challenges

- Short lunches before recess contribute to bin contamination and a messy cafeteria.
- Students rush through the waste sorting dismissal process.
- Unnecessary Styrofoam and food waste is generated.
- Lack of funding is an obstacle to buying recycling bins and casters, and paying for staff time to coordinate programs.
- Lack of adequate staff capacity exists to monitor students during breakfast and lunch.
- Lack of administrative support and school leadership buy-in exists.
- There is a lack of interest and involvement from older students to participate.

Recommendations

- Consistently educate staff with refresher training sessions that are both informative and engaging.
- Host a tailored training assembly with food waste recycling demonstrations.

- Re-train students at the beginning of each school year.
- Repeat food waste recycling messages to students in the cafeteria and the classroom to reinforce recycling behaviors.
- Create larger food waste and landfill signs at eye-level.
- Continue providing incentives to both students and staff by offering prizes and promoting competitions.
- Eliminate Styrofoam and implement food recovery systems in the cafeteria to reduce waste.
- Provide additional funding mechanisms to support staff coordination, incentives, and material costs for program expansion.
- Extend the program beyond the cafeteria through utilizing teachers and parents.
- Add staff capacity in the cafeteria.

Programmatic and systemic challenges can hinder the ability of school staff to support the addition of food waste recycling to their daily routines in the cafeteria. However, with sufficient funding, training, and staff support, schools can implement food waste recycling and achieve environmental and regulatory goals. Both on-site and administrative staff support is crucial for sustaining the program. Once established, food waste recycling programs offer opportunities to engage students and staff with broader environmental goals, expanding impacts far beyond the cafeteria. Lessons learned from NUSD can serve as a guide for other schools implementing similar food waste recycling programs.

Introduction

This Report

Natomas Unified School District began recycling food waste in school cafeterias during lunch with the support of Breathe California Sacramento Region (Breathe). From the first pilot school launch in 2016, the program has expanded to seven campuses. CivicSpark Fellows assisted with implementation of the food waste recycling program at three schools during the 2016 - 2017 school year. In addition, to understand the program, Fellows conducted interviews with stakeholders across six of the seven NUSD schools that participate in food waste recycling. This report summarizes the interview findings, as well as the Fellows' own observations and analyses to explore the program as a case study for other schools interested in adopting food waste recycling. The report identifies successes, best practices, challenges, and recommendations for food waste recycling, which can be used as guide for future cafeteria programs.

Interviewees consisted of kitchen, custodial, and yard duty staff, teachers, students, and program partners. Interviews were conducted to understand the role of each participant, challenges they faced, and their suggestions for improving the program. Interviews were conducted between March and May of 2017 at each school before, during, or after lunchtime, and were recorded. Sample questions include:

- What does the program look like at your school?

- What materials and resources do you currently have?
- How do you see this program impacting the students/staff?

A full list of questions and stakeholders interviewed can be found in Appendix A and B, respectively.

Why Organics?

According to the National Resources Defense Council, Americans throw out more than 20 pounds of food per person every month, wasting money and the energy, water, and other valuable resources used to produce the food. Food waste is the single largest contributor to landfills, where it generates methane, a potent greenhouse gas that contributes to climate change and poor air quality.

When food waste is collected separately and diverted away from the landfill, it can be ‘recycled’ - not to be confused with conventional recycling (paper, plastic, glass, etc.) - through anaerobic digestion or composting. In this way, recycled food waste can produce renewable natural gas, electricity, or compost. These methods keep food out of landfills and have the potential to make large reductions in greenhouse gas emissions. Additionally, edible food can be recovered for donation and human consumption.

California passed Assembly Bill 1826 in 2014, which requires commercial businesses to begin recycling their organic waste, including yard waste, food waste, and food-soiled paper waste. The law is being implemented in stages based on total volume of waste generated per week. As of January 1, 2017, businesses that generate four cubic yards or more of organic waste per week are required to divert their organic waste. On January 1, 2019, businesses that generate four or more cubic yards of any solid waste will be required to divert their organic waste.

Schools, which are large generators of food waste, are required to comply with AB 1826. The Solid Waste Authority, which has regulatory authority over waste in Sacramento County, is working with waste haulers and other stakeholders to help businesses comply with the law.

Food Waste Recycling in Natomas Unified School District

Program History

A food waste recycling pilot program was first launched in Sacramento City Unified School District in 2014 through a partnership between Breathe and SMAQMD. After the initial pilot became unsustainable, program partners introduced food waste recycling to American Lakes Elementary School in Natomas Unified School District in 2016. With the support of NUSD’s Environmental Support Manager, Lori Lewis, the program expanded to seven elementary school campuses across NUSD.

Program Impacts

Over 4,500 students have been educated and engaged in food waste recycling since the start of the program. Over 290 tons of food waste have been diverted from landfills since the pilot launch in January 2016 through the end of the school year in May 2017. Waste diversion from each school is summarized in Table 1.

Table 1: Food Waste Diverted Since Program Implementation in Natomas Unified School District

School Site	Date Implemented	Student Population (2015- 2016)	Pounds Diverted per Week*	Per Capita Pounds Diverted per Week	Tons Diverted* through May 2017
American Lakes Elementary	1/11/2016	469	3704	7.9	109
Two Rivers Elementary	4/11/2016	666	1389	2.1	32
Natomas Park Elementary	5/1/2016	886	1389	1.6	30
Witter Ranch Elementary	9/20/2016	823	2778	3.4	44
Bannon Creek Elementary	10/25/2016	508	1389	2.7	18
Heron School (K- 8)	1/17/2017	1032	3704	3.6	33
Jefferson Elementary	2/15/2017	462	3704	8.0	25
TOTAL	-	4,846	18,057	Average: 4.2	291

*Calculated using data from weekly collection services and the EPA's food waste volume to weight conversion factor (463 pounds per cubic yard).

American Lakes and Jefferson Elementary Schools demonstrate how staff support and student engagement are critical to achieving effective food waste diversion. Jefferson Elementary School has the highest per capita diversion rate, at 8.0 pounds per week. American Lakes Elementary School also achieves a similarly impressive per capita diversion rate of 7.9 pounds per week. Both of these schools have highly supportive principals and yard duty staff that are involved in monitoring food waste bins and selecting student helpers. They also utilize school-

provided incentives to motivate student participation. Additionally, American Lakes Elementary School has an on-site program champion and group of engaged “Green Team” students that assist with recycling efforts. Both these schools have relatively small student populations, which may facilitate ease of implementation. However, Heron School also accomplishes relatively high per capita diversion of 3.6 pounds per week, despite being the largest campus with over one thousand students.

Natomas Park Elementary School, although similar in student population to Witter Ranch Elementary School, diverts far fewer pounds of food waste per week, at 1.6 pounds per student per week. Staff at Natomas Park Elementary lack capacity to monitor food waste bins, and there are fewer student helpers as well.

Program Progress and Reception

At the seven participating schools, the food waste recycling program has been incorporated into each school’s daily routine and teaches students lessons about themselves and the planet.

According to yard duty and kitchen staff, students mostly understand the program, but still need to be reminded or managed in the correct process. At Two Rivers Elementary School, the yard duty staff identify students who are motivated and effective at helping their peers to act as helpers. If yard duty staff catch students throwing the entire contents of their tray into one bin on multiple occasions, they will intervene by requiring them to clean the cafeteria during their recess for the rest of the week.

However, most students correctly separate their waste. At many campuses, students are highly motivated and enjoy participating. One kitchen staff member at Bannon Creek Elementary has witnessed that the program gives the students an opportunity to slow down and think about their actions at lunch time. She says, “Instead of just shoving and throwing their stuff in the garbage can, they take their time and they’re more calm about it [...] because they want to do the right thing.” The introduction of food waste recycling has also inspired the creation of student art, including a student-produced food waste rap and a set of three food waste films.

Staff have adjusted to the program and are now generally receptive and feel positively toward the program, despite acknowledging initial apprehension. Now, the program is “part of [their] routine”, as one custodian observed, and doesn’t negatively impact their workload. Additionally, the program positively influences staff. As one kitchen staff member said, “It’s a good thing for me. [...] It made me think differently of how I do things.”

In sum, the staff and students alike see value in the program. Lori Lewis comments that the program, “lets [students] see that their choices and their interests could be greater than themselves [by] making an impact on the world that they live [and] the air that they breathe.”

Implementation Process

The process of implementing a food waste recycling program begins long before the can. Breathe first identified a program champion, NUSD’s Environmental Services Manager, Lori

Lewis, to lead implementation at all participating schools. Breathe coordinated funding for internal staff time, recycling materials, and incentives. Each waste station typically added one food waste bin for every existing trash bin, bin wheel casters, bin liners, and a table for stacked trays. Breathe also provided an initial case of gloves, small prizes, and signs for the bins. NUSD contracted with Republic Services for delivery and collection service for outdoor food waste bins. On-site implementation takes an average of four weeks from the initial lunch assessment through the lunch sorting process once food waste recycling begins.

Strong partnerships between Breathe, SMAQMD, Republic Services, and NUSD provided multiple levels of program support and helped to reinforce the program. SMAQMD provided funding to Breathe, suggestions and recommendations, and staff support through two CivicSpark fellows to assist with program implementation. Involving SMAQMD and Republic Services staff in the cafeteria assessment and initial implementation brought “fresh eyes that [moved] the program in a nice direction,” commented Breathe’s Programs Director.

Breathe’s outline describing steps and the timeframe for implementing food waste recycling programs at school sites across NUSD can be found in Appendix C. This process was repeated at each school site.

Generating Staff Support

Before the wider introduction of food waste recycling at Natomas schools, Breathe and Lori Lewis built administrative and staff support and educated NUSD staff, principals, and kitchen and custodial staff. Lewis, Breathe, and Republic Services provided a program overview and discussed reasons for starting food waste recycling with custodial staff at district-wide meetings in 2016. This occurred at a meeting held after the American Lakes pilot began, and helped showcase the success of the pilot and the potential of the program to ease custodial workloads. One participant at this meeting recalled a custodian from American Lakes saying, “It’s very good! You’re going to like it, you don’t have to make too many trips to the dumpster. It’s very easy.”

Principals met with Breathe and Lewis one-on-one. Other staff were informed and encouraged to participate during all-staff meetings at each school, but this did not occur at every school. In most cases, cafeteria staff were introduced to the program through one-on-one meetings and during lunch at each school.

Staff diffusion of knowledge, rather than a top-down approach, can generate trust and openness towards the program. Some staff learned about the program from schools that had already started participating. One yard duty staff at Heron School heard about it from her daughter who worked at Whittier Ranch. Another at Jefferson Elementary learned about it through substituting for other schools.

Assessing Lunches

After educating and informing participants, Breathe staff and Lewis visited each site to assess the cafeteria, with assistance from CivicSpark fellows. Each site is unique and requires customization and input from all staff members. The program is flexible in that it can easily be

modified to incorporate specifics for each school. During an assessment, the following information was considered: the number and length of lunch periods, the amount of time between lunch periods, entry and exit points, entry and dismissal procedures, the number of current trash bins, and space limitations in the cafeteria. Breathe staff and Lewis solicited input on the current process and collectively brainstormed the best placement for and quantity of food waste bins. With this information and staff guidance, they worked to incorporate a new system within existing procedures with minimal disruption.

During this time, kitchen, custodial, and yard duty staff were also trained to separate food waste from landfill materials.

Presenting a School-wide Educational Assembly

After assessing the lunches, Lewis presented the final plan to the school principal for approval. At a school-wide educational assembly, a representative from Republic Services provided training for the students on the new protocol, and taught them about the harms of landfilling organics. Republic Services' presentation excelled at relating complex topics like methane gas in a digestible way that excites students. "Do we want methane gas?" asked the Republic staff member after explaining the havoc it wreaks on our atmosphere. The students answered loudly with an emphatic "No!"

Beginning Food Waste Recycling

On the same day as the assembly, food waste bins, gloves, and additional materials are delivered to the school, and food waste recycling begins in the cafeteria. Starting implementation on the same day keeps the training fresh for the students. Over the next two to three weeks, Lewis, with the additional support of Breathe staff and CivicSpark fellows, are present in the cafeteria during lunch periods to provide continuous training and staff support. They help students sort food waste, monitor bins, and answer staff questions and concerns. The location and number of waste stations are also assessed, and changes are made as necessary.

Lewis continued to visit sites with food waste recycling to check on program progress and provide further assistance as needed.

Food Waste Recycling Best Practices

Staff members were asked to discuss aspects of the food waste recycling program that are working well at each of their schools. Program successes across NUSD have been summarized into the following best practices for food waste recycling in school cafeterias.

Teamwork and Internal Communication

The program works well when there are strong relationships between kitchen, custodial, and yard duty staff members that then act as a team. Team members that are able to consistently repeat the same food waste recycling messages help students understand how to properly recycle and reinforce a school-wide commitment.

The staff at Two Rivers Elementary School are heavily involved with food waste recycling, and work well together as a team. The three yard duty staff are “really consistent with the rules. We’re a team,” expressed one of the yard duty staff. Similarly, kitchen and custodial staff at Jefferson Elementary share food waste recycling responsibilities. The lead kitchen staff member at Jefferson Elementary School created a list of students in each class to help the custodian track student food waste helpers.

At Bannon Creek, the staff in the cafeteria work together to enforce food waste recycling, despite limited staff capacity. The custodian explained that when the program first started, the yard duty staff “[didn’t] know what to do.” He explained that with time, he and the yard duty began talking about food waste recycling as team. He described the importance of this teamwork: “We’re a team, so we need to train the kids exactly what they need to do...We need to tell them same thing [so] the kids don’t get confused.”

Support from School Leadership

Communication between school staff members and administration is equally important. Lewis presented the program to each school principal and explained that if “they are supporting you and your efforts, it’s much easier to get into that school and get word [about food waste recycling] out [to staff].... I think that’s really vital.” At Heron, the principal informed staff and set expectations for the program. Staff were appreciative of the information and support. “It was nice to get the heads up,” remarked a yard duty staff member. At Jefferson, the principal was even present in the cafeteria during lunch to reinforce food waste recycling.

Finding a Program Champion

Champions are absolutely necessary for the continued success of the organics recycling program. Having a trusted spokesperson to lead the program on the ground at each school helps integrate the program into the existing culture and offers additional support for sustained success. While Breathe has direct connections to schools through their environmental programming, they are not a part of the school district. Finding and building relationships with on-site champions creates a direct line between management and implementation of food waste recycling. With a champion in place, Breathe is able to focus efforts on leveraging money to sustain the program and providing continued support to the champion. The champion is able to assume daily responsibilities of the program.

Lori Lewis was the main program champion for all schools across NUSD. By sheer force of personality, she implemented and supported food waste recycling at seven schools. At each school, Lewis monitored progress, continually trained staff, and provided incentives for the students at each school. During the first three weeks of food waste recycling at each school, she was present in the cafeteria to assist students and staff with separation efforts. She built strong relationships with staff at each school, and consequently, staff were able to go to her with questions or issues at any point in the implementation process and beyond. This has proved invaluable for staff: “When I had a question I could just turn to Lori and ask her, ‘Okay, Lori, what about this?,’ and she would explain it to me. If the yard duty had a question they would go to her and ask her,” explained one custodian.

Another program champion is Cynthia Westbrook, a teacher at American Lakes Elementary School. Westbrook is an effective school-specific champion who continued to support the program after Lewis' initial implementation support ended. Westbrook was inspired by her own students' interest in recycling and founded the school Green Team just over six years ago. She recruited students from her classroom to help recycle waste from not only her class, but the entire school. The students' role soon expanded from recycling paper and plastic after school to being the school's sustainability champions, including successfully supervising the food waste recycling program. To learn more about this group's contribution to their school's sustainability efforts, refer to Appendix D for a detailed case study.

Programs are more effective with both administrative and on-site program champion support. Lewis, a district-level champion, was able to coordinate programmatic aspects across schools, such as funding and materials. As a NUSD employee, she leveraged support from district superintendents and school board members. Her presence in the cafeteria eased implementation efforts at each school. However, she had limited capacity to monitor lunches as the program expanded to other campuses. The combination of Lewis' and Westbrook's support at American Lakes Elementary has allowed the program to excel. Westbrook has a higher capacity to monitor progress and champion the message than Lewis, who can only periodically check-in and retroactively correct mistakes.

Customizing Signage and Flow

Students and staff are able to better understand how to recycle food waste if the process is simple and can easily be incorporated into current cafeteria logistics. Signs with pictures can help students identify where to put items, especially if there are no student helpers or staff present. These signs are customized to the cafeteria waste stream. For example, the organics bin sign includes pictures of apples, chicken nuggets, and milk cartons. The landfill bin sign includes pictures of napkins, milk straws, sporks, Capri Sun pouches, and Lunchables. These signs are laminated for longevity and placed on the side of the waste bins. Color-coded bins create associations for students and staff that make waste sorting easier. NUSD uses blue bins for food waste and gray for landfill trash. Using differently sized bins, such as a large bin for food waste and a smaller one for trash, can further these associations.

At many schools, students are dismissed by table and dispose of waste as they exit the cafeteria. The waste bins are set up in a row with the landfill bin first, followed by the organics bin and a table for stacking trays. Students are able to dispose of all trash items first and then dump everything off their trays into the organics bin to avoid touching each food item. Lastly, trays are stacked to reduce volume in the waste bin. This process tends to work well at most schools in NUSD and adds minimal time to the dismissal process. Additionally, if students are able to open all plastic-packaged food items and remove milk straws while still seated, the waste-sorting process at the bins moves quickly and tends to be less contaminated.

Encouraging Student Participation

Encouraging students to help each other sort waste can normalize food waste recycling behaviors and encourage other students to recycle properly. Students can participate by actively sorting their waste correctly. They may also help their peers sort their waste by monitoring the waste bins during dismissal. As Lewis noted, the more students are engaged in the process, “the more inclined they will be to want to stick with it and want to make [an] impact.”

Students that help monitor waste bins are recognized for their efforts, which encourages them to participate. When students help, they wear vests that visibly distinguish them from their peers. “[The Kindergarten helpers] like the little vests they can put on, and they make sure their other little kindergarten friends know which can it goes in,” described a cafeteria employee at Jefferson Elementary School. Lewis echoed how much they enjoy the role of helping: “Being able to get up there and help and wear those vests, they just thought it was so cool to be able to do that.” Students are also given prizes for helping.

Students want to actively participate. “... the majority of the kids are [recycling food waste] by themselves,” remarked a custodian from American Lakes Elementary School. And sometimes there is more desire to help than needed. “I have a whole bunch of kids when they come into lunch, they say, ‘Can I help out? I wanna help out!’ A lot of times we have to say, ‘Woah, we’re full, we have too many helpers today, but hey, tomorrow get here and you can definitely help tomorrow,’” noted one custodian at Jefferson Elementary School.

Utilizing student helpers can also increase waste diversion. A kitchen staff member witnessed the food waste recycling first at Heron School, with students helpers, and then at Natomas Park Elementary School, without students. He said that “it would really help when students monitor the trash cans because then they help the other students do it. Here [at Natomas Park Elementary School] they don’t do that. So everybody gets up, they rush to throw everything away, and they just throw everything in both [bins]. I think [having student helpers] is much better because it’s more organized and structured.”

Students also benefit from participating in the program. One cafeteria worker at Bannon Creek noted that “It’s important for the environment, so then [the students] think they’re important because they’re separating [correctly].” Students understand it is good for the environment and develop a deeper understanding of food waste recycling. One student at American Lakes Elementary described succinctly, “Using gasoline causes pollution in the air, and [recycling] food waste is another way to get clean gas and clean air at the same time.”

A few yard duty staff have even taken the food waste recycling program as an opportunity to teach the students life lessons in hard work and responsibility. A yard duty staff at Jefferson Elementary shared, “I’ve taken some kids that are challenging, and given them responsibility to do this, and they really like it. It’s a way for them to turn around negative interactions into positive ones.”

Encouraging Staff Participation

Lori Lewis acknowledged that she cannot manage the whole program herself. Because she is only present in the cafeteria for the first few weeks, program continuity falls almost solely upon the shoulders of the cafeteria staff. Kitchen, custodial, and yard duty staff are crucial in the success of the food waste program, if not the most important participants. An effective food waste recycling program cannot operate without their buy-in. Staff participation demonstrates commitment to the program, ensures proper recycling, and encourages student participation.

Yard duty staff directly manage the students in the cafeteria and are the primary enforcers of the food waste program. This task is in addition to regular oversight of the students. Most yard duty staff stand near the waste stations during dismissal and give direction as needed to the students as they separate. “[The yard duty staff] will go over [how to recycle] over and over, and say, ‘What goes in this trash can?’ They’ll do that just as a reminder to make sure [the students] recycle properly,” said one custodian at Two Rivers Elementary. They maintain authority and exercise discipline in the cafeteria, enabling students to efficiently move through the waste sorting process. Yard duty staff select the helpers and give the students vests and rewards. Staff assisting with bin monitoring can also help avoid organic bins filling up too quickly and becoming too heavy to safely lift.

Some yard duty staff go above and beyond regular duties to correct mistakes. “[If] I see something that doesn’t belong in there, I will take it out. I’m not embarrassed to dumpster dive,” remarked one kitchen staff member at Bannon Creek. In some cases, yard duty staff have taken to personally tending the food waste bins: “I just get kinda disgusted when I find something that’s in [the food waste bin] that’s not supposed be, like, *that’s not supposed to be in there!*” said another participant at Heron School.

Aside from helping the students sort their waste at lunch, kitchen staff have employed their own food waste bins in the kitchen. This not only increases food waste diversion in each school, but also creates a sense of connectedness among the staff. One lead kitchen staff said, “We do as much as we can. We try to follow along with everybody else. [...] We can’t just have the kids [recycle their food waste] and nobody else, that’s not fair.” One custodian at Heron School perfectly summarized this shared sense of commitment: “We have to train our kids because it’s a matter of taking care of Mother Earth. It’s not just for us, it’s for the whole community.”

Another important component is involving staff not directly working in the cafeteria, such as principals and teachers. Principals serve as the gatekeepers of each school. Without their support, it can be more difficult to implement a food waste program. By demonstrating support for the program, principals provide direction for staff to do the same and further engage with the program. The administrator at Heron School, for example, told teachers about the program, explained what would change at lunchtime, and asked for staff participation.

Teachers, although not present at lunchtime, play an important role in educating students on the importance of recycling food waste. They can integrate lessons into the curriculum and further develop students’ understanding of the program. After an all-staff meeting at Heron School, a

videography teacher decided to create a set of short films on the program with his students. Students interviewed program partners and local food waste recycling experts, and engaged with recycling concepts and broader air quality goals beyond the initial program training. Students asked questions, including: How is the food waste processed to make fuel? If AB 1826 was required by all states, how would this affect air quality across the US?

Empowering Staff

Every cafeteria poses its own set of challenges to implementing a food waste recycling program. Allowing flexibility for each school to customize the program as they see fit gives staff ownership and allows a new system to be incorporated with minimal disruption. Lewis and Breathe staff are able to introduce and support the program, but as Lewis said, she “can’t be everywhere 24 hours a day in these schools. [The school staff] have to feel like they are a part of this. If I can get them to feel like that, it goes a lot smoother.”

Staff at select schools have customized tray-stacking to meet their needs. Some have eliminated the tray-stacking step in the waste disposal process, while other schools demonstrate that tray-stacking can reduce custodian workloads, conserve bags, and give custodians more time to complete other tasks, such as cleaning up floor messes or monitoring food waste bins. Staff at Bannon Creek, Heron School, and Jefferson Elementary Schools discussed challenges with tray stacking and expressed interest in eliminating this step. Supporting this change can give staff a sense of ownership in championing and sustaining their own program.

Staff have also customized initial bin placements in the cafeteria that were not well suited for their layout. At American Lakes Elementary, a Green Team student explained how using a single food waste bin proved difficult. “It didn’t work with one bin because there was a lot of people, so we used two food waste bins and we opened up two lanes.” The result was less “crowding” of the bin and more order. Custodians in particular were quick to change trash procedures when they witnessed them not functioning well. At Bannon Creek Elementary, the custodian shifted the food and trash bins on two separate occasions before finding a system that worked. “We moved the bins two times. First we had two stations set up and one in the back, and that was really disorganized. We moved it to they come in one way and go out the other way. Now it works a little bit better.” The custodian at Jefferson Elementary initially had a pair of food and trash cans at the end of each table. But he noticed this made it too easy for the students to simply lean over and dump their entire tray. By placing the bins in the middle of the cafeteria, he obliged them to stand and walk to the bins, which helped them make a bigger effort to sort their waste properly.

Additionally, source-separating organics requires additional bins both inside the cafeteria and outside, which schools may not have room for. Schools need flexibility in deciding where to place these recycling stations. As no additional waste is generated despite the increase in bin number, it may be possible to decrease the size of the landfill waste collection bins, decreasing service costs and creating space for additional organics bins.

Incentivizing Students

While students are motivated to participate partially because of environmental and social pressures, prizes also play a role. Prizes vary across schools, but mostly involve trinkets, treats, and experiences. “When you reward them, they’re excited about it because they get a prize at the end. They’re proud of it, and I think that rubs off on everybody else,” said one kitchen staff who has witnessed the food waste program at two schools, one with and one without an incentive system.

Breathe funds and provides prizes to Lewis, who distributes these prizes to the schools. Additionally, many schools have their own reward systems, such as Jeffy Jags or Step Ups. Many staff members reward students with these incentives for helping their peers sort waste or cleaning the cafeteria. Some school staff also fund and provide prizes out-of-pocket.

At Jefferson Elementary, students receive Jeffy Jags for good behavior. Jeffy Jags are small, color-coded coupons that students write their names on and give to their teachers for a chance to win prizes. Additionally, the custodian will reward students with an Applebee’s ice cream sundae certificate after they help in the cafeteria ten times.

The students at American Lakes Elementary also have a dual reward system utilizing both school and staff provided prizes. They first get to ‘shop’ from a prize cart in the cafeteria using Step Ups, the American Lakes equivalent of a Jeffy Jag. As a top prize, a student who earns 50 Step Ups can choose to eat lunch with the principal. Additionally, every Friday, the custodian at American Lakes pays for and provides M&Ms and Hershey’s chocolates for students who helped three or more times that week.

Dining with the principal is also raffled off at Two Rivers Elementary, where the students receive Otters. Otters are then given to the teachers, and very similarly drawn at random once a week for lunch with the principal at Burger King.

At Bannon Creek Elementary, students receive Beaver Bucks which enter them to win a prize, such as a pencil, eraser, or small candy. Heron School staff found that students were generally disinterested in small prizes like pencils and erasers, and instead give prizes such as slap bracelets, sticky hands, and other small novelties, which they find to be more effective.



Food waste contests are used to incentivize student participation in Natomas Unified School District schools.

Students are also motivated to participate through a monthly food waste contest designed by Breathe. The contest rewards the best class per lunch period that recycles their food waste properly. Class progress is tracked on a poster on the wall. Lewis or yard duty staff pick class winners, although each class is usually recognized at least once during the academic year.

Challenges

Interviewees were also asked to discuss challenges in implementing and sustaining the food waste recycling program. Common challenges recognized by stakeholders are summarized below.

Short Lunches, Rushing to Recess, and Making a Mess

Short lunch periods, combined with students rushing through lunch, make it difficult for staff to maintain control over the cafeteria, ensure students are eating all of their food, and keep the tables and floors clean.

Across NUSD, schools have anywhere between four and eight lunch periods per day, with each lunch period lasting between 20 and 35 minutes. In some cases, such as at Natomas Park Elementary, these lunch periods overlap with students exiting the cafeteria as others are entering.

In most cases, students transition from lunch directly to recess, so yard duty staff are split between monitoring the cafeteria and the playground. Students rush through dismissal and contaminate the food waste bin with landfill items because they are eager to go out to play as quickly as possible. As a result, they don't take time to properly sort trash from food waste. "When they try to go outside to play, the students try to do it the fastest they can and put the food in the trash, trash in the food", said one custodian. Even with supervised dismissal, such as lining up before being dismissed, the students still rush. "They're not going to get out of the cafeteria any faster [because they] have to line up anyways, but they want to be first in line. So they rush and they don't think, so then they don't really pay attention to what goes where, and they just want to get rid of it and get in line," remarked another custodian. One fifth grade student at American Lakes has even noticed this about his peers, especially his younger counterparts. "The younger kids rush to get outside to play a lot so they just kind of throw things."

Aside from contaminating the food waste bin, students rushing through dismissal makes the cafeteria messy. "They make a lot of mess because they only care about going outside to play so sometimes it's hard," noted one custodian at Bannon Creek. On days when foods with sauce are served, such as macaroni and cheese, nachos and beans, or sloppy joes, the cafeteria is noticeably messier than on days when drier foods, such as pizza or chicken nuggets, are served. Scraping food such as macaroni and cheese from the trays can fling sauce on the ground or waste bins, and slows dismissal. It also makes stacking trays difficult. At Heron School, this issue is compounded because the waste separation station is outside due to space

limitations inside the cafeteria, resulting in wind blowing trays off the sorting table and littering the campus.

Lack of Involvement from Older Students

Across nearly all schools, staff had a difficult time generating interest and involvement from older students. In general, fourth and fifth grade students are poorly separating their waste, do not volunteer to assist with waste sorting, and are messy. The yard duty staff at Jefferson Elementary explained that “as [the students] get older, they just don’t want to spend time [recycling food waste] because it’s uncool.” The custodian at Two Rivers explained that the “fourth and fifth graders are the worst” and that the “little [kindergarten students] do way better than them.” He thought that the older students may “purposely [act] lazy and not want to recycle properly.” In contrast, students in kindergarten through third grade are eager to help, and some of them think helping and wearing the vest are the “cat’s meow”, observed by Lori Lewis.

Heron School, the only school with sixth through eighth graders, noticed a profound difference in older students’ involvement compared to younger students. Second and third grade students volunteer on a continual basis, and there are often more volunteers than available opportunities. Conversely, there is only one sixth grade student helper. Additionally, older students are not required to eat lunch inside the cafeteria, and can sit outside on the blacktop. Because of their lack of participation, staff have decided to not add food waste bins outside, requiring students to return to the cafeteria to recycle their food waste. Most students do not take this extra step and instead dispose of food waste in the more conveniently located trash bins located outside.

Unnecessary Waste

Styrofoam trays and water cups make up the majority of waste in trash bins. These items quickly fill up the bins and are especially bulky when not stacked. Plastic packaging on certain foods, such as applesauce cups or sliced apple packets, poses additional challenges for recycling. Many students are unaware of how to properly sort these items, and so many intact packaged items are placed in the organics bin. Many students do not open these items prior to dismissal, thus slowing down the process at the waste bins. Yard duty, custodians and kitchen staff also don’t have time to unpack these items in back-of-house operations.

Additionally, there is a large amount of plate waste generated by students in the cafeteria. A large portion of wasted food is high-quality, locally produced “Farm-to-Fork” fruits and vegetables, highlighted by kitchen staff as a true waste. There are no food recovery systems in place to rescue edible food for donation. Whole apples and pears, unopened milk cartons, and other untouched packaged foods that could be recovered are regularly disposed of.

Lack of Funding

Inadequate funding for Breathe and the school to coordinate, implement, and support food waste recycling limited success at the first pilot at Sacramento City Unified School District in 2014. Funding is crucial because “you can’t just expect [food waste recycling] to happen on a shoestring”, explained a stakeholder at SMAQMD. At this school, Breathe paid collection service costs, consuming the majority of their budget. Consequently, Breathe was unable to

provide incentives, so school staff were left “scrambling trying to run [the food waste recycling program] on their own,” described Breathe staff. The school was unable to prioritize food waste recycling and did not include collection service in their budget. Without funding and administrative support, the program was discontinued. In NUSD, the school covers the cost of collection services and outdoor bins, so Breathe is able to focus more funding for staff time and prizes. However, funding is the main challenge for the continued support of food waste recycling in NUSD and expansion to other schools.

Initial start-up costs can be a barrier to food waste recycling program implementation. Renegotiating a waste-hauler contract to add additional outdoor food waste bins and collection service can be costly, as can purchasing indoor food waste bins and additional gloves for students helpers. Breathe currently covers some of these hard costs, and spends approximately \$2,600 per school on additional waste bins, bin casters, and gloves. This eases the pressure on schools, but is not a long-term solution.

Breathe also spends approximately \$1,000 per school on student and staff incentives such as small prizes, pizza parties, and gift cards. School staff also fund and provide additional prizes, such as candy, out of pocket to further incentivize student participation. Many school sites will often request additional prizes from Breathe or Lewis, but they do not have additional funding to provide these incentives.

Breathe also requires funding for internal staff time to coordinate food waste efforts. The initial coordination and implementation phase demands more staff time, and as more schools begin recycling food waste, more staff time will be required.

Lack of Staff Capacity

The role of the yard duty, custodians, and kitchen staff, is to safely and effectively usher students through lunch time. Staff help clean messes, dismiss students to use the restroom, defuse fights between students, and keep general order. Yard duty staff are part-time employees and are typically only present immediately before, during, and after lunchtime and recess. Usually, three yard duty staff are responsible for two to three grade levels at a single lunch, which translates to anywhere from 50 to 75 students.

Currently, yard duty staff lack capacity to successfully complete current job duties and monitor food waste recycling. Every school expressed the need for more yard duty staff to be present in the cafeteria and on the playground. Natomas Park Elementary School, for example, has only one yard duty staff for every lunch period and has struggled to implement the food waste program. A kitchen staff member from this site shared his thoughts. “...there is no structure here. As far as the food waste, nobody really monitors [the students sorting waste].” At Bannon Creek, the custodian explains that they only have two yard duty and an open position that remains to be filled. At Heron School, the custodian recently retired at the end of the 2016-17 school year, as did one of the yard duty staff. The cafeteria is already short a part-time kitchen staff at this location.

If yard duty staff don't pay attention to students during dismissal, there is a higher probability that the food waste recycling bin will be contaminated with plastic. One yard duty staff at Two Rivers Elementary aptly described, "While I'm over here releasing them and picking up two pieces of trash, a whole group gets up from over there and leaves all their stuff on the ground. You're dealing with numbers. We're loaded, we're at capacity." With limited capacity, yard duty do their best to monitor food waste recycling. One yard duty staff here creates what she calls a "circle of trash." She surrounds herself with students to catch trash as it goes into the food waste bins, although she misses other areas where students will leave their trash because she can't monitor them.

Chaos in the cafeteria contributes directly to contamination of the food waste bin and is further compounded by staff absences. If an unfamiliar custodian or yard duty staff substitutes in a cafeteria that recycles food waste, they might not understand the program or know how to properly handle dismissal with this added step.

Lack of staff capacity also limits the ability to incentivize student participation with prizes. Staff may not be able to track student helpers and implement the food waste contest designed by Breathe. Staff at Natomas Park Elementary were aware of the contest, but did not know who was responsible for implementing it.

Breakfast: A Case Study in Staff Capacity

The program initially included sorting waste at breakfast, in addition to lunch. The same procedures apply at breakfast time: students separate food waste from landfill materials into the appropriate bins upon dismissal. However, sorting waste at breakfast has been largely unsuccessful at Heron, Jefferson Elementary and Natomas Park Elementary, where bins are heavily contaminated, highlighting the importance of bin monitoring and staff capacity.

At Jefferson Elementary, the separation at breakfast was so unsuccessful that the custodian removed the food waste bins, reverting back to landfill bins only. "Breakfast time doesn't work because there's no one monitoring. They just mix the whole thing so it's not even worth having the cans out because they'll just throw whatever in there," he said. The lack of yard duty staff and few or no student helpers are key reasons why the bins aren't properly used. As a result, bin monitoring fell on the kitchen staff and custodian.

The same sentiment was echoed at Heron School, where yard duty staff do not arrive until after breakfast at 10am. Sometimes the food and landfill bins are still in the cafeteria from breakfast, and the yard duty staff can see they are heavily contaminated. "I look in the bins and there's trash in there," said one participant. Again, with no yard duty present, the responsibility for implementing the program falls on the kitchen staff and custodians, which often exceeds their capacity. "At breakfast time I have no assistance, so they're on their own. Breakfast is more of a problem because nobody's there to help them", said the kitchen lead at Heron.

However, Two Rivers Elementary has no trouble during breakfast, as they have a teacher and parent in the cafeteria to assist the students. The school custodian explains, "It's the same

[parent]. She's there only in the morning and helps during breakfast. She is pretty good. They've been doing it for a while so that's really nice of them."

Lack of Administrative Support

Recognition from administrative staff can foster positive opinions about the program from school staff. This type of buy-in can also help integrate the program into existing school culture. Without support, it can be hard for schools to prioritize food waste recycling, especially in face of diminishing budgets. Currently, few schools in the region recycle food waste. Schools outside of NUSD have contacted Republic Services to begin recycling food waste, but as Republic Services explained, "Without District support, it's not being done."

While Lori Lewis was able to implement food waste recycling at seven campuses across NUSD, district-level administrative support was limited from the start. Lewis continually persuaded school district leadership of the benefits of food waste recycling by showcasing the pounds of food waste diverted and student engagement. However, school administrators were initially apprehensive of impacting their staff with additional tasks. Despite funding collection service, NUSD did not assume the full costs of recycling bins or incentives.

Additionally, lack of support was the primary barrier at the first food waste recycling pilot school in Sacramento Unified School District in 2014, despite having an on-site program champion. In this case, the district administration was unwilling or unable to renegotiate waste contracts, leaving Breathe to fund new food waste collection services for the school. This left no budget for necessary program materials like bins or incentives, and as a result the program was unable to be maintained sustainably.

Recommendations

Staff were asked to share ideas for resources needed to improve and continue their food waste recycling programs. Key recommendations may be broken down into two categories, programmatic and systemic. Programmatic issues can be changed by those directly involved in the program. Systemic issues affect the food waste recycling program across NUSD and require district-level policy changes and administrative support.

Programmatic Recommendations

Consistently Educate Staff

Training exists at multiple levels but is not consistent across NUSD schools. Staff were initially trained through either district-wide meetings, all-staff meetings at each school, or one-on-one meetings with Lewis and Breathe staff during lunch assessments. Lewis typically spent up to three weeks after the first day of implementation at each school to provide training, answer questions, and support the program. After these initial trainings, Lewis provided additional training through follow-up visits to each school as needed to check progress and answer questions.

However, staff may still be unclear on how to properly recycle food waste, particularly the milk and juice cartons. One custodian explained, “When we first started, even for adults, [we were asking], ‘where does this go?’ We get confused by juice boxes. Kids want to throw them into the food waste.” Staff initially thought both milk and juice cartons could go into the food waste bin. However, Lewis later explained that juice boxes had a metal lining that could not be recycled with food waste.

Lewis was unable to be present daily in each cafeteria to provide the level of training needed for staff. Staff are often unclear to whom they can go with questions after Lewis, Breathe, and CivicSpark staff leave the cafeteria. More frequent and engaging staff training can help close these educational gaps. It can create school-specific stewards and stronger program champions. An on-site champion in the cafeteria can assist other staff and students and have more capacity than a District-level employee to monitor progress. Additionally, staff support and understanding at a deeper level is critical for demonstrating proper sorting behavior to the students. As one custodian at Bannon Creek explained, “I can teach the kids or let the yard duty staff know what we need to do. We can work together to try to show the kids the right way to [recycle].”

Repeat Food Waste Recycling Messages

Schools offer a unique opportunity for continually educating students both inside and outside the classroom. Generally, the same staff are present in the cafeteria every day. Teachers who see the same class every day for a school year have the ability to capitalize on reinforcing the food waste recycling program through repeated messaging. As one staff member said, “We need to tell them the same thing, same thing, same thing every day so they know what to do.” Kitchen staff can remind students as they line-up for food. Yard duty can remind students as they dismiss them from tables. Custodians can remind students as they help students clean the cafeteria. Staff members that participate as a team and repeat a consistent message can reinforce positive recycling behaviors.

Taken a step further, recycling messages that are repeated and reinforced outside of the classroom can both help students with proper recycling and deeply integrate the program into the school culture, not just the culture of the cafeteria.

Host a Reminder Assembly with Demonstration

Students benefit from the initial training assembly provided by Republic Services. However, there can be continued confusion about properly recycling certain items. For example, packaged food items, such as applesauce in plastic cups, have a tendency to cause confusion, especially if they are unopened. Some students mistakenly think the entire cup can be recycled in the food waste bin while others attempt to go through the correct process.

To teach incoming students of the new process, staff recommended hosting training assemblies at the beginning of every year. These assemblies could also retrain returning students, and could be an effective method to help retain student interest. Staff also suggested tailoring these assemblies for each school and actively demonstrating food waste sorting using the items actually served at each school: “Do an example, like when you’re standing there with the bins,

at each school, because it's different and they can visually see it." Another kitchen staff at Bannon Creek remarked that the students could use a food waste etiquette class, so that they could see firsthand adults sorting certain items properly: "Maybe show them the different things we serve so then they know. 'Oh okay, that goes there'. I know they get the concept, but it's harder in practice."

Peer-to-peer education can be another effective strategy, through student-driven videos or in-class projects. A film class from Heron School is creating a set of videos to educate students on food waste recycling. Similarly, students from the Green Team at American Lakes Elementary School created a skit to teach other students, featuring students and teachers and culminating with a call to action to participate in the program. These student-led productions, whether as skits or recycling posters, can be great tools to teach other students and encourage participation.

Create Better Signage

Color-coded food waste and landfill bins with visual signage benefit both students and staff. However, staff recommended creating better signs on bins to further clarify how waste should be sorted. One yard duty staff at Heron School recommended making the signs on each can bigger. These signs could potentially be more effective if placed at eye-level with students. Younger students especially might benefit from this, as they are unable to see into the bins to visibly distinguish where food should be placed. Additionally, there may be opportunities to create more colorful and creative signs, with mascots or characters, to engage students.

Continue Providing Incentives

Incentives reward positive behavior and motivate active student participation. Students are motivated to volunteer as helpers to assist their peers when they receive prizes. Some prizes seem to be more effective than others; perhaps not surprisingly, pencils, erasers, and bookmarks generate less interest while toys, food certificates, and small games elicit more of a response. There is a need for increased and prolonged access to these types of incentives for staff.

While Breathe currently provides some of these incentives, many school staff members are paying for extra prizes for students out of their own pockets. One potential solution could be to tap into existing student incentive programs at each school, such as Jeffy Jags, Otters, Beaver Bucks, and Step-Ups, rather than relying on Breathe or school staff to fund and provide them.

Systemic Recommendations

Reconsider Purchasing Decisions

To reduce the volume of waste being landfilled, NUSD could switch from purchasing Styrofoam water cups to wax-coated paper cups that could be recycled in the organics bin. A similar change could also be explored for Styrofoam trays. This would substantially streamline the recycling process by eliminating the third step, tray stacking, with students instead disposing of all trash first, then tossing the tray along with the remaining food contents directly into the food

waste bin. Alternatively, one stakeholder suggested installing dishwashers in the kitchens and switching to reusable trays.

Another way to evaluate purchasing decisions is to conduct a waste audit in each cafeteria to help staff assess what types of food are being wasted. Purchasing for such items could be adjusted accordingly. In cases where purchasing adjustments are not feasible due to school nutrition regulations, food recovery could be explored as a solution. For example, whole pieces of fruit and unopened milk cartons could be easily placed on a side table for hungry students to select from during lunch. The remaining items could be donated to a food pantry at the end of the lunch period. Some schools, like those in Oakland Unified School District, have successfully set up such “share tables” in their cafeterias to reduce food waste and feed hungry students. Students were also able to take food from these tables outside of the cafeteria.

Fund Organic Recycling Programs

Breathe has limited capacity to continue providing materials and incentives while also budgeting for staff time to coordinate food waste efforts. Because food waste recycling is required by state law (AB 1826), school districts will need to budget for collection services, additional bins, trainings, incentives, and additional staff support. Breathe currently provides additional bins, incentives, and staff support at no cost to the schools, which can ease school implementation efforts, but is not a long-term strategy for Breathe to fund all of these materials.

Providing prizes and other incentives work well to encourage student participation. Breathe has limited capacity to continue to fund and provide incentives, and school staff are incurring personal expenses to fund these prizes. One solution could be to utilize existing prize mechanisms, such as Jeffy Jags, or to utilize free incentives.

Integrate the Program Beyond the Cafeteria

The food waste recycling program presents an opportunity for integration into core school curriculum and for helping students build connections to broader environmental concepts. As Lewis says, the program is “educating the students to look at how their actions can impact their world.”

Teachers play an important role in reinforcing the program in the classroom. Teachers can, as one participant noted, “enthuse the students before the [initial food waste] presentation and then after the presentation as well.” Teachers can also connect students to broader waste diversion concepts. For example, one teacher was interested in arranging a tour of the landfill for his students.

Parents present an opportunity to create broader awareness around environmental issues by extending lessons from the classroom and incorporating them into students’ everyday lives. One custodian at Heron School explained, “We have to get the parents on what we’re doing here too. We have to educate the kids, and everyone. No exceptions.” Schools can support an active PTA, as one participant noted: “A lot of PTAs do coffee chats; they really are trying to get the parents more involved in the public education system. Lewis remarked that PTAs “like the idea of children being more in tune with what they’re eating and where it goes and recycling and the

environment.” Parents can also volunteer to monitor food waste bins, especially at breakfast, which lacks staff capacity.

Add Staff Capacity

Added staff capacity in the cafeteria will help alleviate pressure on current staff and could also make food waste recycling at breakfast successful. Yard duty staff, specifically, play a vital role in maintaining order and assisting students with waste sorting. Sites with strong involvement from yard duty generally have more successful food waste recycling programs. However, yard duty staff are at capacity and chronically short-staffed. More staff in the cafeteria “would solve most everything,” according to one yard duty staff at Two Rivers Elementary. “We need one more staff member. That’s the plain old truth,” said another at this school.

Ideally, additional staff dedicated solely to the food waste recycling program would help address capacity issues. Additional staff could serve as on-site program champions in each cafeteria to educate staff, monitor program progress, and provide incentives more frequently than administrative program champions could. When asked about what she would do with unlimited program budget, Lewis responded, “I think it would be nice to hire a person to stay and monitor all the time during lunch.” Breathe’s Programs Director echoed this sentiment: “Of course, it would be great if maybe each school site could have someone to coordinate this sort of effort on site, like a part time job would [...] maximize efficiency and effectiveness at the program site.”

Recent Changes, Current Status, and Near Term Direction

The Environmental Support Manager position was eliminated during summer 2017, and thus Lori Lewis no longer works for NUSD. With one less program champion and a lack of administrative support, the NUSD organics recycling program has an unclear future. School staff may continue to support the program, but it may be too challenging to continue without additional support and direction. American Lakes Elementary will likely continue with food waste recycling because they have a strong on-site champion. In addition, Breathe no longer has capacity to continue supporting NUSD’s food waste program and has no plans to expand the program to other campuses within NUSD.

However, Breathe has developed a relationship with Sacramento City Unified School District (SCUSD) and their Project Green Coordinator. Project Green supports student “green teams” with the development, design, and implementation of environmental projects. They also support curriculum and professional development components for each student. As the 2017-2018 school year theme is waste, Breathe, SMAQMD, and SCUSD are partnering to implement organics recycling programs in at least 15 schools across SCUSD through Project Green. Breathe is also pursuing funding to develop organic waste curriculum that could be used not only in SCUSD but across the state.

The design of SCUSD’s organics programs has elements that may help it succeed. Project Green is well established and has support and funding from the school district, providing a framework for program continuity. SCUSD has absorbed some of the hard costs and will

purchase waste gloves, bins, and bin casters. Breathe is able to expand their role in implementing food waste recycling programs across SCUSD with this administrative buy-in and additional support.

Appendices

Appendix A

Stakeholder Interview Questions

Standard Questions for all:

- What is your role in the food waste recycling program?
- What do you think about the program?/What has your experience been?
- What does a successful food waste recycling program look like to you?
- What were some initial reactions to the food waste recycling program?
- What does the program look like now compared to when the program was first implemented?
- What has your experience been?
 - What has worked well in this program?
 - What has been difficult?
- Has this program changed how you see or do things?
 - If so, how?
- Is there anything else you'd like to share, positives or negatives, or thoughts/experiences?

Additional Questions:

Natomas Unified School District Environmental Support Manager

- What did it take to start this program?
- What is the goal of the program?
- How many schools are currently participating?
- How much food is being recycled at (school/collectively) now that this program has started?
- How is this program impacting the students/school staff?
- If every school in Sacramento recycled their food waste, what would the impact be?
- What do you see as a barrier to every school in this district catching on?
 - What do you think the barriers are to that vision?
 - What would you need (in an ideal world) to accomplish that vision?
- How do the programs differ at each school? Is there anything that you have found works at all schools?
- What do the champions do?
 - Are these champions important? How and why?
- What does the program look like at each school?
 - Who are the stakeholders involved?
 - Who do you need buy-in from for the program to work?
 - How involved has the school staff been with the food waste recycling program? What level of involvement do you think we need from school staff to make this program work?
- What kinds of materials do you currently have/use?
- If you had unlimited funding for this program, what would you do?
- Where do you draw inspiration from for this work?

Republic Services, Recycling Coordinator

- What is your role at Republic?
- How do you see the students respond to your assemblies/program?
- How are the students at sorting their food from trash? Are there any contamination issues?
 - What might improve the sorting process?

- If there is contamination, what happens?
- What other recycling support are you able to offer?
- In the overall waste management landscape, where does a program like this fit in?
 - Is this program unique or similar to other programs you know of?
 - What other similar types of things is Republic involved in?

Breathe Staff, Programs Director

- What is the history of your organization?
- How long have you been involved in the food waste recycling program?
- How did BREATHE get involved?
- What was the impetus for starting this program?
- How has the program evolved over time?
- How is the School to Fuel program funded?
- If you had unlimited funding for this program, what would you do?
- Who are your project partners in what are their roles?
- What do you see as BREATHE's future role in this program?
- What is your hope for the program overall?

Breathe Staff, Programs Director Associate

- How long have you been involved in the food waste recycling program?
- How did BREATHE get involved?
- What was the impetus for starting this program?
- How has the program evolved over time?
- What is your hope for the program overall?

Division Manager, Sacramento Metropolitan Air Quality Management District

- What is the relationship between the Air District and Breathe?
- How did the food waste recycling program start?
- How does SMAQMD fund BREATHE (which programs, how much, how often?)
- What is CivicSpark's involvement with the food waste recycling program?
- What are some opportunities or options to grow this program?
- If you had unlimited funding to support this program, what might you do with it?
- How does this program relate to larger air quality goals in Sacramento?

Yard Duty Staff, Custodial Staff, Kitchen Staff

- Has your workload changed since starting the program?
 - How has your workload changed?
- What does the program look like now compared to when the program was first implemented?
- Has the flow of the cafeteria changed all since the implementation of this new program?
 - How?
- Are there any issues in keeping the program going after Lori/Breathe leaves? What are they?
 - What might help?
- How are the students at sorting their food from trash? Are there any contamination issues?
 - What might help?
- How do you see the students respond to this program?

Green Team Leader, American Lakes Elementary School

- How did the food waste recycling program start at American Lakes? What did it look like?
- What resources did you utilize to start the program?
- What resources do you utilize to sustain the program?
- What were some initial reactions to the food waste recycling program?
- Are there any issues in keeping the program going after Lori/Breathe leaves? What are they?
 - What might help?
- What resources might help the students and staff improve?
- How do the students respond to this program?
- Can you talk about the Green Team?
 - How did it start?
 - What activities do you do?
- Is the Green Team involved in food waste recycling? How so?

Green Team Student at American Lake Elementary

- Please introduce yourself; what is your name and what grade are you in?
- How did you get started on the Green Team?
- Why do you participate in the Green Team?
- What's your favorite part about being on the Green Team?
- What is something you've learned since you started working on the Green Team?
- Do you participate in food waste recycling at lunch?
- What's that like?
- Do you help other students sort waste?
- Do other students understand why they are separating their food?
- Do other students know how to separate their food well?
- What are some things that other students do a lot when they separate their food?
- What do you buy with your Step Ups?
- What happens to the food once it leaves your cafeteria?
- Why is it important to recycle food waste?
- What's your favorite part about recycling food waste?
- If you could tell your (friends/parents/classmates) one thing about food waste recycling, what would it be?

Appendix B

Stakeholders Interviewed

Name	Organization/School	Job Title	Date Interviewed	Type of Interview
Cynthia Westbrook	American Lakes Elementary School	4th Grade Teacher/Green Team Founder	5/8/2017	Recorded
Pepito Gonzalez	American Lakes Elementary School	Lead Custodian	5/8/2017	Recorded
Perry Ty	American Lakes Elementary School	Kitchen Staff	5/5/2017	Recorded
Marion	American Lakes Elementary School	Green Team, President/5th Grade Student	5/12/2017	Recorded
Cathy Espitia	Bannon Creek Elementary School	Kitchen Staff	4/28/2017	Recorded
Antonique Hawkins	Bannon Creek Elementary School	Yard Duty	5/12/2017	Recorded
Ricardo Gomez	Bannon Creek Elementary School	Lead Custodian	4/26/2017	Recorded
April Glaves	Heron School	Kitchen staff	4/27/2017	Recorded
Cynthia	Heron School	Yard Duty	5/10/2017	No direct recording; recorded CivicSpark summary comments
Julie Reyna	Heron School	Yard Duty	5/10/2017	Recorded
Maria Avila	Heron School	Kindergarten Assistant	5/10/2017	Recorded
Pablito Castillo	Heron School	Lead Custodian	5/10/2017	Recorded
Ruben Barajas	Jefferson Elementary School	Lead Custodian	4/24/2017	Recorded
Betty South-	Jefferson Elementary	Kitchen Staff	4/24/2017	Recorded

Gonzalez	School			
Sylvia Gutierrez	Jefferson Elementary School	Yard Duty	5/16/2017	Recorded
Jan Cortez	Jefferson Elementary School	Yard Duty	5/16/2017	Recorded
Natalie Craig	Jefferson Elementary School	Yard Duty	5/16/2017	Recorded
Darren Metzging	Natomas Park Elementary School	Kitchen Staff	5/3/2017	Recorded
Rob Mohoff	Two Rivers Elementary School	Lead Custodian	5/3/2017	Recorded
Anne Kitley	Two Rivers Elementary School	Yard Duty	5/5/2017	Recorded
Christie Garvin	Two Rivers School Elementary	Yard Duty	5/5/2017	Recorded
Andrea Morrow	Breathe California Sacramento Region	Youth Programs Associate	4/25/2017	Recorded
Katie Cox	Breathe California Sacramento Region	Programs Director	4/11/2017	Recorded
Lori Lewis	Natomas Unified School District	Environmental Support Manager	6/7/2017	Recorded
Annah Rulon	Republic Services	Recycling Coordinator	6/16/2017	Recorded
Tim Taylor	Sacramento Metropolitan Air Quality Management District	Division Manager	6/26/2017	Recorded

Appendix C

Breathe's Food Waste Recycling Process Outline

(Adapted from Andrea Morrow's Process Outline)

Necessary Steps before Implementation:

1. Build administrative and staff support
2. Identify a program champion
3. Work with waste hauler

1. Lunch Assessment (Week 1)

Gather the following information from kitchen, custodial, yard duty, and other cafeteria staff and from self-observation:

- How many lunch periods?
- How long is each lunch period?
- How much time does the custodian have to clean between each lunch period?
- What is the flow of the lunch? Where do the students enter and exit?
- Where should waste stations be set up so that they do not disrupt flow of students?
- How many trash bins are there?
- How many times does the custodian change each bin?
- What are some of the staff members' main concerns?

2. Determine what is needed to Implement a Food Waste Program (Week 1)

Use observed and gathered information to determine what you need to implement a food waste program. Each waste station typically includes two waste bins, one for trash and one for food, and a cart to stack trays.

Things to consider:

- How many waste stations will be set up?
- Will trays be stacked on a separate cart or discarded in the landfill waste bin?
- Will the cafeteria staff provide gloves?
- How many vests are needed for student helpers?
- Will there be a food waste contest in the cafeteria?
- Does the school want to sponsor a food waste contest?
 - See if the school will allow prizes and are possibly willing to supply them.

Example incentives and food waste contests:

- Food waste decals to be permanently displayed for students to visualize how well each grade is doing on a weekly basis.
- Witter Ranch Elementary: PTA offered to supply monthly prizes for the winning lunch
- Bannon Creek: Breathe awarded a winner after the first week of the program to engage students; subsequently, prizes were awarded monthly.

3. Train all Participants (Week 2)

Staff training for:

- Custodial staff
- Lunch aides
- Yard duty
- Kitchen staff

4. All-staff Meeting (Week 2)

Coordinate with principal to include Breathe on the agenda for the next scheduled all-staff meeting. Provide a short, concise presentation with take-away info cards at meeting.

5. School-wide Student Food Waste Assembly (Week 2)

Coordinate with Republic Services -- they will provide a speaker and PowerPoint presentation. Coordinate with school principal for time and date.

6. Implement Food Waste Program (Week 2)

Coordinate food waste program to begin the same day as assembly.

Coordinate to have all bins delivered by start day.

Set up waste stations.

Continue training custodian, lunch aides, and cafeteria staff.

7. Shadow School Lunches for at least Two Weeks (Weeks 2-4)

Attend lunches for at least two weeks to assist staff members and students with new program while creating a strong foundation for its continuity and success without daily supervision.

Important to be present, alert, and able to answer all questions about the process.

Appendix D

Case Study: The Green Team as Sustainability Champions

The Green Team started at American Lakes Elementary School under Cynthia Westbrook's direction about six years ago. Westbrook, a long-time fourth grade teacher, was inspired by her own children's interest in recycling. After finding the green paper and plastic recycling bin completely empty after school one day, she decided to engage her students. "I started taking pictures of it and showing the kids. 'What do you think?' I go, 'This is empty, what should this be filled with?' And we started talking about it, and they go, 'That's just not okay.'"

Westbrook decided she would begin recycling not only in her class but across the entire school. She recruited interested students from her class to help her and formed the Green Team. Every Friday afternoon they walk around to each classroom to pick up each teacher's recycling and sort it out.

The Green Team's role soon expanded from after school recycling to becoming the school's sustainability champions. They started collecting empty ink cartridges and shipping them back to be recycled. They even make an effort to recycle special items such as Capri-Sun pouches by mailing them to a recycling program run by TerraCycle. To date, they have sent back over 2,000 pouches.

When Lori Lewis approached American Lakes Elementary School to pilot the food waste recycling program, Westbrook and her Green Team were naturally a good fit to help with implementation.

"[Republic Services] came and explained everything really well on a big PowerPoint. We decided we're going to have to teach kids about this. We need to do a skit. So they'll be jingling as they leave the assembly, right? So they came and at first the kids said, 'can you do it kids?' And of course all the kids go 'Yeah!' And they're all screaming."

But as many participants have previously expressed, adults prove to be just as challenging, if not more so, to engage as kids. "What was funny is [that] it was the teachers that were giving us probably more grief than the kids." During the assembly, she decided to also challenge her fellow teachers. "Then the kids said, 'Come on, teachers, can you do it?' And they're like.. 'Yeah!' And then one of the teachers in the skit, Mr. Smith, comes in and he goes, 'That's not enough.' And then they went, 'Yeah!', and did it really loud."

Once the kick-off assembly had taken place, the Green Team, composed mostly of fourth and fifth graders, began helping to train the younger students at lunch time. Once most students understood the process, Westbrook helped them create a sign-up sheet to be hung in the cafeteria. Now students from each lunch write their names on the poster to show that they helped.

Westbrook brings the lunch helpers popsicles once every two months. She also uses the students' interest in joining the Green Team to motivate them to be good students. "They'll say, 'I want to be on the Green Team!' And I say, 'Well, I saw you walking with the principal the other day, I don't think you'll be on my Green Team. Unless you're not walking with the principal. I hope that was for a good reason. No? Then get ready!'"

As the Green Team helps collect recycling, they set aside all the bottles and cans. At the end of the school year, Ms. Westbrook redeems them for their bottle deposit value. With that money, she throws a 'splash party' for the Green Team, with nachos, a water balloon toss, and a trash monster contest. This year they are also going on a field trip to the Effie Yeaw Nature Center.

But it is not without effort. Westbrook is exceptionally dedicated to her students and to helping them learn about helping the planet. She spends an estimated four to five hours per week outside of teaching on coordinating the Green Team. “To get another teacher to do this work you’d probably have to have a couple partners.” “There’s so much trash! I started it and I knew it was going to be hard but if I’m not there, it doesn’t get done. If something happens, there is just nobody else.” she says.

Still, she shows up and models for them how to be the next generation of environmental stewards. “For some of my kids that are just having a hard struggle, it’s one thing they can do where they know they can just succeed. Everybody can succeed at this. We’re just sorting trash. And we’re saving the world.”