



MINNEAPOLIS
PUBLIC SCHOOLS
Culinary & Wellness Services

TRUE FOOD NO WASTE

A Food Waste Action Plan for Minneapolis Public Schools

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MPS FOOD SERVICE AT A GLANCE

Serves an average of **40,000** meals per day across **70** locations

Serves a district population of **34,570** MPS students, of whom
22,350 qualify for free and reduced lunch.

Cooks on-site at **33** of **70** MPS schools.

Serves **FREE** breakfast for all students.

Provides no-cost meals and snacks to children in more than
75 after-school programs at schools and community sites throughout the city.

Provides food without high fructose corn syrup, trans fats, artificial colors
or preservatives under their "**TRUE FOOD**" program.

Regularly offers food from small, sustainably-oriented farmers in the region
and features a locally sourced lunch once per month.

Works with area chefs to develop recipes and engage students.

Conducts taste tests with more than **20,000** elementary
and middle school students three times per year.

Provides a daily fresh fruit or vegetable snack in more than **700** elementary classrooms.

Offers self-service food from **67** "Market Cart" salad bars.

Features Offer versus Serve, a provision in the National School Lunch Program and
School Breakfast Program that allows students to decline some of the food offered.



FOOD WASTE ACTION PLAN FOR MINNEAPOLIS PUBLIC SCHOOLS

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A. INTRODUCTION

In the last five years, Minneapolis Public Schools (MPS) has revolutionized its food service operations. Having operated through a centralized kitchen that sent packaged food to schools for re-heating since the 1970s, MPS Culinary and Wellness Services has shifted aggressively toward on-site cooking at many of its schools. This has included major kitchen renovations at 33 of the district's 70 school sites.

By embracing on-site cooking, the district has greatly reduced the number of school meal items that are wrapped in plastic and introduced many healthier, freshly-prepared foods. In addition to improving food quality, this shift toward on-site food prep has catalyzed growth in meal program participation, with revenue increasing 49 percent from 2011 to 2018.¹ MPS now plans to have on-site cooking at all MPS schools by 2025.

MPS Culinary and Wellness Services has also been taking steps to minimize the amount of food that goes unused. That has included efforts both in its back-of-house operations (such as its central warehouse, central commissary, and school kitchens) and front-of-house losses from student trays, serving lines, and salad bars.

The district was recently awarded a \$50,000 Hennepin County School Recycling Grant that began in September 2018. It also has a Minnesota GreenCorps member starting in October 2018 to expand recycling and composting at 10 schools and create a student-focused food waste prevention campaign. This makes it an opportune time for MPS to identify high priority strategies for additional food waste reduction and plan upcoming efforts. This plan was funded by the Natural Resources Defense Council and developed in collaboration with the Minneapolis Public Schools. JoAnne Berkenkamp at NRDC would like to thank MPS Culinary and Wellness Services staff for their creativity and commitment to food waste reduction, as well as Jonathan Bloom for his consulting services in crafting this plan.

Why reduce food waste?

Wasted food has significant ethical, environmental, and economic implications. As much as 40 percent of the U.S. food supply goes uneaten every year.² At the same time, about one of eight US households are food insecure.³ Food insecurity affects one of 11 people in both Minnesota as a whole and in Hennepin County.⁴

Environmentally, wasted food generates greenhouse gas emissions at each stage of the food system from farm to fork to landfill. About 21 percent of agricultural water, 18 percent of pesticides, and 19 percent of fertilizers are used to grow food that goes uneaten.⁵ Approximately 20 percent of U.S. cropland is used to grow food that isn't consumed.⁶

1 Revenue for fiscal year 2011 was \$14,659,158. Revenue grew to \$21,885,637 for fiscal year 2018.

2 Hall, Kevin, et al, The Progressive Increase of Food Waste in America and its Environmental Impact, 2009. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0007940>

3 USDA, Household Food Security in the United States 2017, <https://www.ers.usda.gov/publications/pub-details/?pubid=90022>

4 Feeding America, Hunger in Minnesota, <http://www.feedingamerica.org/hunger-in-america/minnesota/>

5 NRDC, Wasted, 2017, <https://www.nrdc.org/resources/wasted-how-america-losing-40-percent-its-food-farm-fork-landfill>

6 Ibid.

Economically, an estimated \$218 billion is lost annually in the U.S. on food that goes uneaten.⁷ At the level of individual school districts, food waste reduction offers the opportunity to optimize use of food purchasing dollars and reduce the cost of food disposal.

For all of the above reasons, sensitizing kids to avoid waste is a vital part of their food education. Schools are well positioned to communicate that message as school cafeterias and school gardens can foster lifelong food habits among students. Just as MPS' Culinary team is expanding students' exposure to fresh, healthy foods, they can also engage students in valuing their food and reducing waste, while minimizing food losses in foodservice operations.

MPS' efforts to develop this plan

MPS Culinary and Wellness Services' commitment to developing and implementing this Food Waste Action Plan comes at a time when wasted food is gaining unprecedented attention nationally as municipalities, businesses, and consumers commit to cut their waste. The design of this plan is rooted in the Food Recovery Hierarchy, a tool developed by the U.S. Environmental Protection Agency for prioritizing efforts to reduce food waste.



As shown in the diagram, efforts to prevent food from going to waste in the first place (e.g. "source reduction" or "prevention") are the most beneficial. With food waste prevention, the potential for cost savings and environmental benefits are both maximized. The next best outcome is to redistribute surplus food to people in need. After that, the preferred steps are to use remaining food scraps to feed livestock or compost it. The least attractive strategy from an environmental standpoint is to landfill or incinerate wasted food. In the U.S., approximately 95 percent of wasted food is landfilled or incinerated.⁸

⁷ ReFED, <https://www.refed.com/?sort=economic-value-per-ton>

⁸ EPA, Advancing Sustainable Materials Management: 2015 Fact Sheet, https://www.epa.gov/sites/production/files/2018-07/documents/2015_smm_msw_factsheet_07242018_fnl_508_002.pdf

The MPS Food Waste Reduction Plan follows that same hierarchy. In order of importance, it addresses food waste prevention, redistribution of appropriate surplus foods to those in need, and then recycling of remaining food scraps over the coming three years.

The plan aims to position MPS for decisive action to reduce wasted food, building on MPS' strong foundation of innovation and commitment to quality nutrition services. While there's no panacea for reducing wasted food, there are many important steps MPS can take. Progress under this plan will make MPS an even healthier school system—ethically, environmentally, and economically.

B. MPS' CURRENT FOOD WASTE REDUCTION PRACTICES

As it embarks on this Food Waste Action Plan, MPS' Culinary and Wellness Services department has a solid base to build from, having already instituted a number of strategies to reduce wasted food. Current practices include:

- Preventing food waste at MPS' Culinary Center through detailed inventory management for purchased foods and careful planning to avoid overproduction.
- Maximizing student food choices through salad bars called "Market Carts." These enable students to choose the type and amount of food items they want.
- Encouraging enough time to eat lunch. MPS policy now affords primary school students 50 minutes for lunch and recess combined (up from 30 minutes previously). Secondary students have at least 30 minutes for lunch.
- MPS Wellness policy suggests scheduling recess before lunch, a widely recognized best practice. In 2007, seven percent of schools held recess before lunch. By 2015, 66 percent of schools scheduled recess before lunch.
- Incorporating locally grown imperfect produce in the Farm to School program to reduce losses of fruits and vegetables on local farms.
- Implementing bulk milk service. In the summer of 2018, MPS began to pilot a system that allows students to take the amount of milk that they want. That strategy will be implemented at five schools in the 2018-2019 school year and could assist in curtailing milk waste.
- Conducting "True Food" taste tests three times per year to gather student input on potential new meal options. This helps MPS provide foods that suit student taste preferences and provides a platform for student engagement.
- Employing Share Tables at the majority of elementary schools, enabling the exchange of unwanted whole fruits and wrapped foods.
- Re-serving food that goes unclaimed on the Share Table at a subsequent meal period.
- Composting food scraps from 35 of 70 schools. At participating schools, students separate uneaten food from other material on their trays at the end of the meal, enabling food scraps to be collected and composted rather than incinerated. At some schools, standardized waste-sorting tables have been installed to facilitate separation of waste into compost, recycling, and trash.

C. OBSERVATIONS

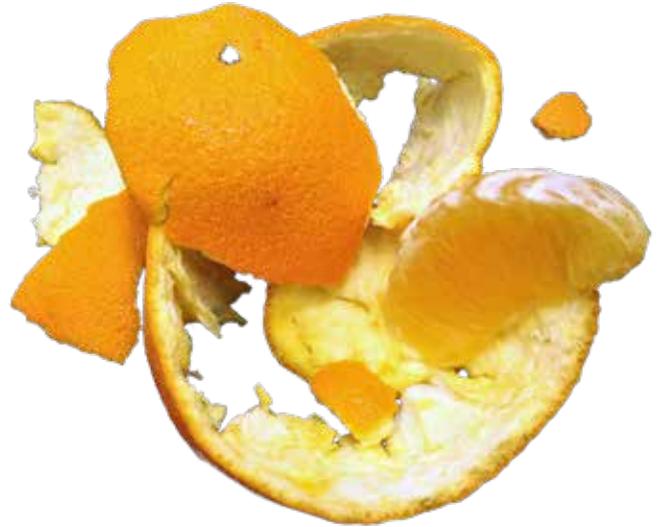
To inform this action plan's development, the consultant interviewed 15 MPS staff from Culinary and Wellness Services, cafeteria supervisors, custodial staff, teachers, and parent volunteers; observed breakfast, lunch, and dinner service at two elementary schools, one middle school, and one high school; and measured food thrown away by students during five meal services. Key observations include the following:

- **Culinary staff can play a positive role in encouraging kids to eat their food rather than let it go to waste.** Staff who know students' names and tastes can help students select foods that they prefer and are more likely to eat. Thereafter, cafeteria staff can encourage students to eat their food through gentle reminders. During our observations, this was most noticeably achieved at Lyndale School, where staff engaged with students by circulating with water pitchers, refilling their cups and reminding them to eat.
- **Food cooked on site is generally deemed to be more appealing to students and is wasted less,** according to Culinary and lunchroom staff. That bodes well for the future, as all MPS schools are slated to have on-site cooking by 2025. At the same time, minimizing waste may be more challenging at schools without on-site kitchens in the intervening years.
- **Milk is a major area for improvement.** We observed students discarding significant quantities of milk. MPS is now working to address the common misconception that a carton of milk must be taken with every meal in order for it to be reimbursable under the National School Lunch Program. More messaging is needed here, as we observed some teachers, in an effort to expedite service, handing milk cartons to every student receiving lunch. Some schools had signs advising students to take milk only if they wanted to drink it, but those signs can be easily missed. Establishing water stations in cafeterias has helped reduce milk waste and should lead to further reductions as water stations are installed in more schools in the near future.
- **More food appears to be wasted at lunch than breakfast, on a per-meal basis.** At the two elementary schools where "weigh the waste" activities were conducted as a part of this plan's development, the lunch waste per meal was roughly triple that of breakfast. Further observation is needed to determine why and to assess what kinds of food are wasted most. (See Appendix A for more detail.)



In addition, we also observed the following:

- **The importance of menu selection:** During our cafeteria visits, we asked many people the same question—“How can we reduce how much food goes to waste?” The near-universal answer was “Serve food that kids like.” To some responders that may mean less healthy options that are inconsistent with MPS’ commitment to provide fresher, healthier choices. Yet, the universality of the comment communicated the sheer importance of menu selection. Finding menu items that are both popular and healthy at multiple grade levels is not easy, although MPS now serves many such items and will continue to seek more.
- **Engaging students:** Getting students invested in avoiding wasted food is key. Schools that had found ways to communicate about waste prevention and empower students with more choice had less food waste.
- **Cafeteria environment:** Creating a positive eating environment is also important. While we observed that some students had plenty of time to eat their meal we know that adequate meal times is not consistent across all students’ meal experiences. As with most school cafeterias, the noise and youthful energy at MPS cafeterias are palpable. At one school visited —Windom School— the teachers dimmed the lights and requested quiet during the last five minutes of each lunch period to refocus students’ attention on finishing their meal. That kind of deliberate attention to cafeteria culture and atmosphere can be very instrumental in minimizing wasted food.
- **The benefits of choice:** We observed that MPS students have many choices when it comes to the food they select, mainly through the Market Cart salad bar and two main course options. We noticed that many students enjoy designing their own meals. When students had enticing options at the Market Cart—including, in some schools, being able to create an entire reimbursable meal from the Cart—they were more likely to leave little food behind.
- At times, though, the opportunity to choose can create bottlenecks in the cafeteria and we observed students being rushed to make their selections. And occasionally, to expedite lines, staff members served younger students from the Market Cart, reducing the sense of agency that students feel when choosing the amount and types of food to take. Similarly, when students were told they must take an item, it was more likely to be discarded. With prepacked meals, especially dinner service, we noticed that students may have to take a bundle of pre-packaged food to get one desired item.



- **More opportunities for Share Tables:** When students don't open certain pre-packaged foods, they can leave them behind on Share Tables for others to take. We observed that the location of Share Tables within cafeterias varied greatly, as did their effectiveness. Overall, when Share Tables were clearly marked and along students' path from lunch service to where they eat they served as useful receptacles for share-able food. Leveraging Share Tables to their full potential should be a key component of MPS' plan because they can improve nutritional intake for students taking the shared items while reducing waste of fresh fruit, milk, and other healthy items.
- **Placing breakfast food at the edge of the Market Cart** helps younger kids adequately see their food choices and, hence, take food that they want to eat.

Drivers of Waste

MPS' Food Waste Action Plan aims to address conditions that lead to good food going to waste. Key drivers include the following:

- Requirements that students take certain foods they may not want in order to meet the definition of a reimbursable meal under the National School Lunch Program. Ramped up efforts to avoid providing milk to students who don't want it should help.
- Fruit served whole (like uncut apples and oranges) can be difficult to eat or too much food for smaller children. Peels provide a barrier to eating, and round fruits can be temptations for tossing.
- Share Tables not being optimized. Share Tables at some schools are not located centrally or close to the cafeteria service lines. Additionally, the physical makeup and signage for Share Tables could be standardized to increase effectiveness.
- Some cafeterias having significant back-ups at the Market Carts. This can adversely affect the time students have available to eat.
- In some schools, culinary and school staff not being engaged with students, missing an opportunity to encourage students to select and then eat foods that they enjoy.
- Some cafeterias having high noise levels, making them a less pleasant place for students. This may prompt them to leave as soon as possible, without finishing their meal, especially in schools where students can leave the cafeteria when they've finished eating.
- Custodial staff not being present during lunchtime in some schools, leading to a messier, less pleasant eating environment that may also contribute to students rushing through their meal.

D. THREE YEAR ACTION PLAN

Below we outline a three-year plan for MPS to further reduce the amount of food that goes to waste. The plan begins with a “Setting the Stage” component to lay the foundation for action. For each of the coming three years, actions are recommended for preventing food from going to waste, ensuring that any surplus foods are re-directed to people in need, and recycling food scraps through composting or other means.



Year 1

Setting the Stage

1.1 - Gain support from MPS senior district leadership for this Food Waste Action Plan.

1.2 - Develop an internal communication strategy to enlist principals' support and foster coordination between school staff, administrators, and culinary staff. This should include identification of school-level champions who will support implementation of this Food Waste Action Plan.

1.3 - Provide additional training to school culinary staff on food waste reduction issues including:

- The social, environmental, and financial impacts of wasted food.
- Orientation to this Action Plan and goals/expectations for implementation.
- An overview and brainstorming of practical strategies that culinary staff can use to reduce food waste in their school through food waste prevention, food donation / Share Tables, and food scrap recycling. This staff input should inform the Menu of Options discussed below.
- Correct portion sizing and the importance of not over-serving.
- Identification of age-appropriate cut sizes for fruits and vegetables.
- Messaging that staff can use to explain the National School Lunch Program requirements to teachers, cafeteria volunteers, and others, particularly that students do not need to take milk for the meal to be reimbursable.

1.4 - Determine the feasibility of measuring or estimating post-consumer food waste (i.e. from students' trays and Market Carts) and pre-consumer (kitchen) waste in schools. Develop a baseline estimate of current MPS food waste from which progress can be tracked over time. Explore how data from MPS' composting hauler can inform estimates of current food waste generation and reductions over time.

1.5 - Hone and commit to a set of one-year food waste goals for the adoption and expansion of waste-reducing practices, with assistance from the GreenCorps Member. Recommended one-year goals include:

- Provide food waste training to all Culinary Staff members.
- Develop a “Menu of Options” for school level action (discussed below)
- Institute Share Tables at five additional schools.
- Establish best practices for providing food samples on the serving line and implement at all schools.
- Conduct taste tests for four new menu items at five schools, aligning with the introduction of new Farm to School menu items where feasible.
- Track sales of milk to monitor how sales change in relation to staff training on milk not being mandatory and the introduction of water stations.
- Identify a composting champion at ten schools to oversee food scrap sorting as part of the Hennepin County recycling grant.

1.6 - Develop a “Menu of Options” and related resources for staff highlighting food waste-reducing practices to be adopted at the school level. This suite of best practices should provide easy-to-use guidance on steps staff can take to foster less food waste. Because every school is unique, schools should select at least two options of their choosing for implementation during the first year this plan is adopted. While this list is not intended to be exhaustive, the Menu of Options should include strategies such as:

- Installation of cafeteria signage to help students align the food that they take with what they actually want to eat.
- Expanding student choice in meal selection, where possible.
- Optimizing Share Table location, signage, and practices.
- Adoption of best practices for the cafeteria environment, including the practice of dimming the lights at the end of meals, where appropriate.
- Installation of sorting tables so that food scraps may be composted.



Prevention of Wasted Food

1.7 - Deploy a student-oriented communications campaign to engage and empower students in keeping food from going to waste. This could include an array of communication tools as well as challenges and/or contests, such as weigh-the-waste competitions between schools or grades within a school for the lowest amount of food waste per pupil. The Resource appendix to this Plan provides helpful tools and examples of existing campaigns that could potentially be deployed by MPS.

1.8 - Develop the framework for a new district-wide student committee on food waste prevention. Such a student group could brainstorm strategies for preventing waste, provide a sounding board for potential changes, and increase student buy-in.

1.9 - For Market Cart service, use shallow pans to limit amounts wasted during the meal period, where feasible. This can help keep food from being weighed down and damaged, discourages over-production, and minimizes wasted food when students scoop through a larger amount of food. With the youngest elementary grades, move food to the edge of the Market Carts so that shorter students can adequately see the food choices available to them.

Redistribution of Food Surpluses

Expand and optimize school Share Tables

1.10 - Standardize the appearance of Share Tables at schools that have them to increase their impact and visibility. As part of the Menu of Options provided to schools, include guidance on Share Table design and location within the cafeteria. Schools should be encouraged to locate tables as centrally and prominently as circumstances allow so that it is easy for students to leave or take food from the table.

1.11 - Increase communications about Share Tables with students and staff. This includes providing sample cafeteria signage and messaging for staff reminders and in-school announcements on Share Tables. Engaging students and staff about the purpose of Share Tables can prompt better participation—both in sharing and taking.

1.12 - Formalize MPS' protocol for utilization of Share Table food to ensure that foods are deployed optimally. Use by students should be the top priority, followed by utilization in subsequent meal preparation (as is currently done at many MPS schools). Such re-purposing of surplus food should be expanded where feasible.

1.13 - Create food donation protocols for all manner of food surpluses, including unclaimed Share Table items, excess food from the district Culinary Center, and unserved pre-packaged and prepared foods from school kitchens. This should include protocols for types of food that can be donated, proper packaging and storage procedures, food safety protocols, and tracking systems. Identify a food rescue partner to regularly pick up surplus food that cannot be re-purposed within the district for distribution to community members in need.

Recycling of Food Scraps

1.14 – Deploy MPS’ Hennepin County School Recycling grant to expand recycling (e.g. composting) of food scraps. At present, 35 of 70 MPS schools separate their cafeteria waste into food scraps, recycling, and trash, enabling food scraps to be collected for composting off-site. MPS should expand its food waste recycling effort through the following steps:

- Establish food scrap sorting at ten additional schools so that food scraps can be composted.
- Standardize waste-sorting protocols across schools that have a composting program.
- Create signage for sorting tables to clarify for students, teachers, cafeteria staff, and parent volunteers what should and should not go in the food scrap composting bin to avoid contamination of compostable material. This could be displayed using hanging bars and metal hooks above waste sorting tables.
- Make educational materials on composting available to teachers interested in enhanced learning opportunities on composting.

1.15 – Monitor the tonnage of food composted on a monthly basis in schools that have implemented sorting tables. MPS’ waste hauler, Advanced Disposal, is contractually obligated to report when less-than-full trash and composting bins have been collected, with the goal of preventing customers from overpaying for unnecessary bin volume. This data can help MPS monitor its progress and manage costs. Advanced Disposal has been positively engaged on this topic to date, although a more focused effort by MPS to monitor and interpret hauler data on a regular basis is needed.

Year 2

Prevention of Wasted Food

2.1 – District wide, implement best practices on food waste signage, serving strategies, student involvement, Share Table placement and protocols, food donation procedures, food waste reduction competitions, and food scrap recycling improvements that were developed in Year One. In addition, continue to monitor the generation of wasted food and track changes against the baseline estimates.

2.2 – Launch the district-wide student committee on food waste prevention planned during Year One.

2.3 – Re-affirm with Culinary staff and cafeteria volunteers the importance of serving the correct portion size to students, particularly at the elementary level and that students are not required to take milk if they don’t want it.

2.4 – Expand food sampling in lunch lines district-wide, allowing students to try entrées before taking them when coming through the serving line.

2.5 – Existing MPS policy endorses the practice of allowing students to take food out of the cafeteria, but operational concerns have often inhibited implementation. Coordinate with facilities staff to develop guidelines for allowing students to take food outside of the cafeteria,

where appropriate. This could potentially include taking unfinished fruit from lunch and allowing breakfast to be consumed outside of the cafeteria on a broader basis.

2.6 - At the MPS Culinary Center and school kitchens that prepare food on-site, explore the possibility of adopting a platform to track pre-consumer waste (such as the LeanPath system or a manual system, if appropriate).¹ Consider implementing such a system in Year Three, potentially making it a standard component of the process when school kitchens are renovated to enable on-site cooking.

2.7 - Utilize the results of food recycling data to gauge progress on prevention of wasted food.

Redistribution of Food Surpluses

2.8 - Optimize the location, visibility, and communications related to Share Tables at schools that have not already done so, employing the lessons learned during Year One.

2.9 - Establish Share Tables at all additional schools that can support them, identifying and addressing any school-specific policies or space constraints that may be a barrier.

2.10 - Implement food donation through a local food rescue partner for surplus pre-packaged foods, foods prepared on-site and other surplus foods.

Recycling of Food Scraps

2.11 - Explore opportunities to divert some discarded foods to an area hog farm, particularly for schools that do not yet compost (as this may be less expensive than composting). For instance, Barthold Recycling collects food scraps from nearby St. Anthony and Eden Prairie Schools Districts that is used to feed hogs.

2.12 - Establish composting champions at 10 additional schools to oversee food scrap sorting at each school. Potential champions could include administrators, parents or students at the middle school and high school levels. At Lyndale School, the Green Team trains students to collect compost from each classroom. They also won a grant to pay a parent to oversee and weigh their breakfast compost collection, providing a compelling model for other schools.

2.13 - Apply for the 2019-2020 Hennepin County School Recycling Grant or other sources of funding to further expand composting efforts. Install sorting tables for compostable food scraps at an additional ten schools as part of the district's existing plan for upcoming kitchen renovations.

2.14 - Include waste minimization assistance as a condition in the Request For Proposals for the next MPS' waste hauling contract. MPS' current contract expires in June 2020. Enlisting MPS waste haulers' collaboration in supporting food waste minimization through data sharing, lower pricing for diminished waste, and expanding composting will be vital. When developing the RFP and considering bids, consult with nearby school districts that have already secured such terms.

¹ LeanPath food waste prevention system, <https://www.leanpath.com>

Year 3

Prevention of Wasted Food

3.1 - Refresh the student and staff engagement campaign based on lessons learned in Years One and Two.

3.2 - Update culinary staff training based on lessons learned in Years One and Two and hold refresher training.

3.3 - Provide tools and resources to schools that want to expand food education and extracurricular learning opportunities. These could include class visits from culinary staff, cafeteria demos, targeted in-class snack programs, school assemblies, and in-school “field trips” to school kitchens to see how food is prepared on-site. Promote existing resources (see the Appendix for examples) and enable MPS teachers to access the “Waste in Place” curriculum promoted by Minneapolis Public Works Clean City Classroom program. Linkages with Farm to School programming could also be useful in connecting students’ experience in the cafeteria with their experience in the classroom.

3.4 - Expand the reach of garden and composting education to support reductions in wasted food. Encourage expanded garden education at MPS schools that currently have gardens (roughly half of schools). Help establish gardens at additional schools through grants and/or working with local youth organizations. Increase the number of Garden to Cafeteria sites where schools grow food that Culinary Services purchases for use in MPS cafeterias. Link sorting of food scraps for composting at the cafeteria level with gardens’ use of compost and connect schools with the MPS Urban Education Farm plan to enhance student food literacy.

Redistribution of Food Surpluses

3.5 - Increase repurposing of surplus food in school meal programs based on lessons learned in Years One and Two, and identify additional opportunities for unused food to be donated to community partners, where appropriate.

Recycling of Food Scraps

3.6 - Install sorting tables in ten more schools to enable composting of food scraps. Ensure that schools that compost food have uniform sorting tables and messaging to encourage proper sorting of discarded foods and other compostable materials.

3.7 - Identify a composting champion at all remaining schools.

3.8 - Install sorting tables for food scraps and other compostable materials at all remaining MPS schools.

APPENDICES

A. Data Gathering

To inform development of this plan, the consultant, MPS staff, and dietetic interns conducted a scan of relevant operational practices, stressing food going to waste in school cafeterias, food redistribution opportunities and composting of food scraps. We also conducted observations of food service operations, share tables, sorting tables (for composting), interactions between adults and students, and other aspects of the cafeteria environment at four schools.

In-person interviews were also conducted with a variety of Culinary and Wellness Services staff at MPS' central facility and on-site at schools, lunchroom supervisors, teachers, volunteer parents, and students to get a range of perspectives on opportunities to reduce wasted food.

Additionally, we measured food waste at three separate schools on three days. Despite limited time and resources, we were able to measure lunch at three schools and breakfast at two of those three. Discarded food (along with compostable food service items, mainly napkins and trays) was separated into a barrel and weighed on a bathroom scale (with the weight of the barrel subtracted). We divided the total weight of the compostable material by the number of students receiving lunch that day to arrive at a figure for compostable waste per student. One school does not have a composting program and it was not feasible to separate discarded food for measurement. Instead the weight of all trash discarded in the cafeteria was tracked.

While the figures for these three schools are not necessarily representative of other locations and they do not reflect discarded food exclusively, they provide a window into the amount of food discarded during the observation period.

Lyndale Community School

Lunch = 0.38 lbs compostable material/student receiving lunch (144.6 lbs compostable material / 381 lunches served)

Breakfast = 0.11 lbs compost/student receiving breakfast (18.6 lbs compost / 167 breakfasts served)

Windom Dual Immersion School

Lunch = 0.37 lbs compost/student (140.8 lbs compost / 382 lunches served)

Breakfast = 0.09 lbs/student (16.4 lbs compost / 181 breakfasts served)

Note: A smaller portion of Windom's compostable waste was food because they also composted trays, which Lyndale did not.

Anwatin Middle School

Lunch = 0.73 lbs trash/student (122.6 lbs trash—all materials / 167 lunches served)

Note: This figure included all materials, as there was no separating of trash, compostable materials, and recycling at Anwatin.

B. ADDITIONAL RESOURCES

Cornell Composting: Composting in Schools compost.css.cornell.edu/schools.html

Do Good, Save Food www.fao.org/fileadmin/user_upload/save-food/PDF/Events/web_Flyer_Do_good_Save_good.pdf

Food Too Good to Waste www.epa.gov/sustainable-management-food/food-too-good-waste-implementation-guide-and-toolkit

Food Waste Warrior Toolkit www.worldwildlife.org/teaching-resources/toolkits/food-waste-warrior-toolkit

Guide to Conducting Student Food Waste Audits www.epa.gov/sites/production/files/2017-04/documents/guide_to_conducting_student_food_waste_audit.pdf

International Food Waste Coalition SKOOL Pilot internationalfoodwastecoalition.org.webhosting.be/wp-content/uploads/2016/12/IFWC_SKOOL-Report_EN2016.pdf

The Journey of Wasted Food: A Teachers' Tool Kit for Grade 4-6 docs.wixstatic.com/ugd/715473_2908f14a411e400da1bdacc19fdd0254.pdf

K-12 School Food Recovery Map (Oakland Public Schools and San Diego USD) www.biocycle.net/2018/03/12/k-12-school-food-recovery-roadmap/

Leanpath - The Leanpath food waste tracking platform is widely used to track and manage pre-consumer food waste in commercial settings. www.leanpath.com

Minneapolis Public Works Clean City Classroom - http://www.ci.minneapolis.mn.us/solid-waste/cleancity/solid-waste_CleanCityClassroom

Reducing Waste to End Hunger - <https://www.reducewasteendhunger.com>

Rethink Your Waste Activity Booklet (not specific to food waste) - <https://www.niagararegion.ca/rethink/pdf/rethink-waste-booklet.pdf>

Save The Food consumer education campaign - <http://www.savethefood.com>

Smarter Lunchrooms Movement - <https://www.smarterlunchrooms.org>

USDA Creative Solutions to Ending School Food Waste - <https://www.fns.usda.gov/school-meals/creative-solutions-ending-school-food-waste>

USDA Farm to School Planning Toolkit - <https://fns-prod.azureedge.net/sites/default/files/f2s/F2S-Planning-Kit.pdf>

Waste in Place Curriculum - <https://www.kab.org/our-programs/education/waste-place>