

Andover High School Waste Diversion Program Operating Manual



From Start:



To Stage 2:



To Finish:

July 2013
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I. Overview

The waste diversion program started with the vision and inspiration of one student, Hannah Krieger, whose goal for "Senior Exhibition Project" was to start composting the food waste from the cafeteria. She had a teacher, Ms Cutler, as a sponsor who had already started a "Sustainable Garden Project" using the courtyard of the school. She got support from MassDEP through a Technical Assistance Project which enabled her to work with a MassDEP recycling staff person. Many others also contributed along the way. It took the year (2010-11 school year) to research, design a plan, build support and approval for the plans, find funding to purchase the equipment needed, and get the posters and equipment designed, delivered, and installed in time for the start of school in the Fall of 2011. The program was launched on the first day of school and ran throughout the 2011-2012 school year.

Phase 2 of the program expanded the types of food that could be diverted from just "fruits, vegetables, and brown paper bags" to all food from the cafeteria and from the kitchen as well as biodegradable paper trays, cups, and sandwich "boats".

Phase 1 of the program was successful in proving that the students could adapt to a new system and that the custodial staff could handle the removal of each type of waste. Custodians found it made the busiest part of their day, between lunch periods, a bit easier even if it meant there was more to do setting up before (due to the additional barrels) and more to do at the end of lunch. In the first year, the program won two state-wide awards for school recycling and environmental education, reduced waste from the cafeteria by 40-50%, and produced rich, brown compost that has been used in the Sustainable Garden for growing fruits and vegetables that are used in the school lunches and being sold at the local farmer's market. The main weakness of the program in Phase 1 was managing the on-site food composting system. The Environmental Club provided the bulk of the help but there were several periods of time (start of the school year, between semesters, and after the Seniors graduated) that were difficult to ensure continuous management of the compost barrels. The harvesting of the compost was also a significant challenge. As a result, the Town agreed to switch over to off-site composting, which would also allow an expansion of types of materials to be composted.

Phase 2 was to implement the expanded separation program and re-train the students and custodians. Additional equipment was added and the Town contracted with New England Solid Waste to haul the compostable materials to Brick Ends Farm in Hamilton, MA.

a. AHS overview:

Andover High School has 1800-1900 students in a single building. There is one cafeteria that serves breakfast and lunch.

- There are three 30-minute lunch periods.

- Approximately half of the students bring their own lunch.
- The cafeteria has two upper level entrances where students enter and come down a set of stairs to the cafeteria, three lower level entrances, and a set of doors out to a patio area used for eating outside in good weather. There is a shortage of seating space so students often eat outside when they can.
- There are eight waste separation stations that are on wheels. They are generally located near each of the exits and one or two sets are in the middle of the cafeteria near the exterior doors. One of those sets is often wheeled outside on days when students are eating outside.

b. Waste Diversion Program Overview:

- At the separation stations, waste is separated into four categories: liquids, recyclables bottles and cans, compostable food waste, and trash.
- Custodians empty the stations between lunch periods as needed (mostly they need to empty the trash) and empty everything at the end of the last lunch.
- Liquids are dumped down the slop sink drain on a daily or weekly basis, as determined by the custodians based on quantity and odor.
- Bottles and cans are collected in clear plastic bags and put into the recycling barrels provided by the recycling hauler. (The use of clear bags was approved by the recycling hauler.)
- Compostable food waste (all types from the cafeteria, all leftovers and prep waste from the kitchen and all biodegradable trays, polylactic acid cups, and paper sandwich "boats") are emptied into dedicated 64-gallon barrels lined with clear plastic and provided by New England Solid Waste (NESW). NESW replaces the clear plastic liner after emptying the barrels.
- Students were involved in the on-site composting process in the first year and could become involved again in the future, if there is an interest. In the second year, with the compostable material trucked off-site, there was no role for students.
- In the first year, weigh data was recorded each week. Waste diversion reduced the trash by 40-50% by weight and volume. The custodians found it slightly more work at the end of lunch but it also eased their work between lunch periods.
- Students easily adapted to the new program. Not all students participated in separation but those that wanted to participate did so quite well with only some inadvertent contamination.



Figure 1 – Phase 1 Separation Station at AHS Cafeteria



Figure 2 - Phase 2 Separation Station at AHS Cafeteria

II. How it Works?

- a. **Liquids** – with the red funnels in place, the students easily figured out that liquids go into that container. The questions were mostly about the “smoothies” and iced coffee drinks. All kinds of liquids were accepted.
- b. **Recyclables** - The recyclables section was mostly self-explanatory – empty bottles and cans. The most frequent questions were what to do with items that they could recycle at home but that were too covered with food to be recycled at the cafeteria (yogurt containers, plastic food containers). We discouraged them from putting those items into the recycling container because we knew the recyclables were collected only every other week.
- c. **Compostable Food Waste** – The food waste accepted was expanded in Year 2. Initially, the food waste accepted was only a very limited range of food because it was being composted onsite. In Phase 1, the food waste accepted was only fruits, vegetables, such as orange peels, apple cores, and brown paper bags. Excluded were meat, dairy, or greasy items (pizza). The main contaminant has been plastic baggies and snack wrapper left inside the brown paper bags. In Phase 2, the food waste allowed expanded to include all types of food, all meat, dairy, pizza, sandwiches, plus the biodegradable paper trays, the polylactic acid (PLA) smoothie cups, and the paper sandwich “boats”.
- d. **Trays** – Each separation station has a set of recycling bins for stacking trays. These are not the ideal container for the High School because students are tall enough that they tend to drop the trays into the bin rather than carefully stacking them but when it worked, it helped to consolidate the trays and use up less space in the compost container.

III. Who Does What?

- a. **Liquids** - The custodians empty the liquids bins as needed. They noticed that the containers didn't fill each day so they wait a few days before emptying them in the colder weather weeks. To empty them, at the end of third lunch, they would separate the liquids bins from each sorting station, align them all together and bring the whole group around to the slop sink area beside the kitchen. There, they would tip them over one at a time to drain them and then used the warm soapy water to rinse them out. See Figures 5-7.



Figure 3, 7, and 8 Emptying and Cleaning Liquids Barrels

- b. **Recyclables** – Before lunch, the custodians make sure each recycling container was lined with a clear plastic bag. When full or at the end of third lunch, they would pull out the plastic bag, put it into the gray wheeled cart used to transport all waste, and bring it outside to the recycling barrels. (If there is a recycling compactor in the future, they would go into that.) The recycling companies gave their approval to the use of clear plastic bags so the custodians could easily empty the barrels and it also reduced the problem of bees being attracted to the recyclables.
- c. **Compostable Food Waste** – For the compost, the custodians lined the section of the compost section of the separation station with clear plastic bags. Then, the custodians take the plastic bags of food waste to the dedicated food waste carts and *empty* the bags into the larger carts and discard the bags. A NESW truck collects and empties the carts on a twice-weekly basis. Composting will be done at a commercial facility where they can handle meat and dairy products.

IV. Managing the Compost

- a. ***On-site composting:*** For the first year at AHS, food waste was composted on-site. The Environmental Club students had primary responsibility for turning the food waste into compost. A student “team leader” recruited 2-4 other students, who usually worked in pairs. They came after lunch or after school usually every day (sometimes every other day) and removed the bags of compost from the barrels, emptied them into the composters, and added a layer of brown leaves from the supply of leaves sitting next to the wall. (Twelve bags of leaves were delivered in the fall by a friend of the program and that lasted the year.)
- b. ***Kitchen scraps composting:*** The Environmental Club students also usually collected the small (13-gallon) wheeled cart used to collect compostable food waste from the kitchen prep area (lettuce, coffee grounds, etc). When they had emptied the small green barrel, they returned it to the kitchen. Sometimes, however, it went back to a place where it wasn’t found for a while. A consistent storage location would help.
- c. ***Off-site composting:*** For the second year of its program, AHS switched to off-site composting to make sure that the system can continue to run smoothly regardless of the time of year, level of student involvement, and availability of adult oversight, etc. The primary difference will be that the food waste will go into barrels lined with clear plastic bags to be collected by a local hauling company at taken to a composting facility. The Environmental Club could still be involved in composting some of the food waste on-site, if there were interest, by taking some of the vegetable preparation scraps from the kitchen. Two compost bins remain at AHS for this purpose and they could supply compost for the Sustainable Garden.

V. Start of a New Year or New Program

At the start of a new year or a new program, the students need to be introduced to the new system. Key decisions to be made at the start of a new program include:

- a) ***What will change from last year?*** If there are no changes, then just a refresher and re-energizing is needed at the start of the school year. If there are to be changes in the system, the changes need to be emphasized.
- b) ***What materials will be collected as compost?*** If the material will be composted on-site in home-scale composters, the food waste needs to be limited to only fruits, vegetables and "browns". No meat, dairy, grease should be included due to the potential to attract rodents, cause smells, and biodegrade more slowly. If the material is going to an off-site composting facility, the meat and dairy products may be allowed but there should be more attention paid to eliminating contamination by cutlery, Ziploc baggies and other non-biodegradable items. Bread items can be composted but are often combined with meat or dairy (e.g., cream cheese on bagels, turkey sandwiches, etc). For a picnic or one-time event where the organizers can carefully limit the type of bread waste, it may be possible to include bread. In an on-going program in a school cafeteria, it may be something that is excluded from the compost. The main contaminant in the first year of the program was Ziploc bags and snack bags or wrappers. To minimize contamination, it is important to emphasize in the class meetings that students should be ripping the bags before crumpling them and putting them into the compost container.
- c) ***What recyclables will be collected and how will liquids be handled?*** If bottles and cans are to be collected from a cafeteria, they should be empty. This is mostly because liquids will attract bees and make a sticky, smelly mess in the recycling container. A liquids emptying station adjacent to the recycling station is ideal.
- d) ***How much space will be needed?*** The amount of space needed to handle food waste, liquids and recyclables compared to the remaining trash is a key question. This will be answered in part by an initial waste audit. It will also be likely to change over time and a new program should consider ways in which they can be flexible as needed to handle changes in the volume of each material. Having extra recycling stations at the start may be one option. The challenge is to balance the wish for additional trash disposal capacity with the desire to train the students to minimize the trash.
- e) ***Will there be biodegradable cutlery, plates, cups, etc?*** If the food waste is going off-site, there is additional potential to use compostable plates and cups. These items may cost more to purchase but may save on space in the dumpster and on cost for disposal fees. If the food waste is being composted on-site, the volume of compostable plates and cups may overwhelm the capacity of the on-site composters. It may also be challenging to ensure no contamination with meat and dairy products.

VI. Introducing a New System

The ways to introduce the system to the students include:

- a) **Signage:** For the first year of compost and recyclables sorting at the AHS cafeteria, we produced nice posters for all of the sorting stations (see Figure 1), for each of the pillars in the cafeteria (see Figure 2), and laminated signs on each of the tables (see sample in Figure 3). **Note: Before the end of the prior school year, there should be an inventory taken of all the equipment and signs to determine what needs to be replaced.**



Figure 4 Adult Volunteers Installing Posters in AHS Cafeteria Figure 5 Posters on the AHS Cafeteria Sorting Station

The "How To's" of making
BLUE + GOLD = GREEN
is Clean

LIQUIDS	RECYCLE	COMPOST	TRASH
<ul style="list-style-type: none"> • Milk • Yogurt drinks • Smoothies • Coffee • Water • Lemonade • Iced tea • Gatorade • Juice 	<p>***EMPTY!!!***</p> <ul style="list-style-type: none"> • Plastic Bottles • Aluminum Cans 	<ul style="list-style-type: none"> • All vegetables • All fruit (rinds, peels and cores) • <u>Crumpled up</u> brown paper bags <p>VERY IMPORTANT</p> <ul style="list-style-type: none"> • No meat • No dairy • No peanut butter • No dressed salad 	<ul style="list-style-type: none"> • Plastic utensils • Straws • Candy and chip wrappers • Plastic bags • Yogurt and yogurt containers • Pizza • Wax orange juice or milk containers • Styrofoam trays

Figure 6 Laminated Sign for Cafeteria Tabletops

b) 9th Grade Orientation: AHS holds a 9th Grade orientation during the summer for incoming students. During this orientation, the compost program leaders introduced the sorting system to the 9th graders by running small groups of them through a recycling relay as they toured the cafeteria. The recycling relay was organized by the students who were to be the compost team leaders for the fall as shown in Figure 4. Photos of various items were used to help the students practice sorting appropriately. See Attachment A for photos and relay instructions. **Note: Before the end of the prior school year, a student should be recruited to be in charge of this part of 9th Grade orientation. The student should be sure to contact the administrator in charge of orientation to ask to know when the date is set.**



Figure 7 First Year Recycling Relay (before actual sorting stations arrived)

- c) **Class Meetings:** The student leader for the year gave an introduction to the sorting system at each of the three class meetings (10th, 11th, and 12th grades) during the first week of school. Hannah Krieger was the speaker for the first year. She involved several other students to help “show and tell” how the sorting was supposed to be done, making it fun by using the balls again from the first day of school. **Note: Before the end of the prior year, the student leader should request time in the fall class meetings.**
- d) **First weeks:** It was also very important to have adult volunteers at as many of the sorting stations as possible for the first 6-8 weeks of school. During the first week, there were many students asking questions. After that, the role of the adult volunteers was more to provide encouragement and reminders. Volunteers were recruited from those who helped in the AHS garden, Andover Recycling Committee and friends.

VII. Checklist for Start of Subsequent Years:

- May/June of the prior year
 - Identify Student Leader and some additional interested students

- Inventory equipment, identify needs for new or replacement equipment and/or signs
- August
 - Student leader to plan and deliver 9th Grade Orientation
 - Parent/Adult liaison to recruit adult volunteers for initial weeks
 - Assemble and install any new equipment, signs, composters, etc.
 - Confirm that contracts are in place for hauling recyclables (weekly would be ideal), compostables (if being taken off-site).
- September
 - Student leader to prepare and deliver presentation at Class Meetings providing information about the separation stations and any changes for the new year at these meetings.
 - Train and organize schedule for adult volunteers, teachers or students to oversee the separation stations if a new program (just a few minutes before each lunch will suffice).

Contacts:

- Ms Cutler, Biology/Environmental Science teacher
- Al Cataldo, AHS Head Custodian
- Dr Valverde, Assistant Principal, usually in charge of orientation
- Sandy Gerraughty, DPW Business Manager
- Roy Ferreira or Wayne Ferreira, New England Solid Waste contacts.