Post-Consumer Composting Pilot Program at Michigan League:

Final Report

Waste Reduction & Recycling Office
Plant Building & Grounds Services
University of Michigan
Executive Summary
In 2009, an effort began to implement a post-consumer composting program by a group of interested students. Soon after, a consultant was contracted to conduct a feasibility study on a campus post-consumer food waste composting program. In 2011, the results of this study were presented. The Waste Reduction and Recycling Office (WRRO) partnered with the Michigan League to pilot a post-consumer food waste composting program in Fall 2012. The pilot ran from September 4 through November 21, 2012.

Pilot preparation began the preceding summer with stakeholder communication, engagement and training. Stakeholders included staff from the Michigan League food service establishments, catering, custodial, Waste Management Services, the compost site, management and interested students.

The pilot generated approximately 900 lbs. of post-consumer food waste from the catering and cash operations.

The food waste collected from the catering operation had the least amount of contamination and required the least amount of training. Future post-consumer food waste composting efforts should target these types of campus operations.

Key lessons learned include:
• Bin and sign placement should be determined early in any food waste composting program rollout to allow for adequate time for hanging, posting, positioning and changing plans if necessary.
• Early stakeholder engagement will be imperative to the success of future efforts.
• Patron education is crucial to successful collection of post-consumer food waste from cash operations. Signage, peer-to-peer training and publicity campaigns are suggested.

If the University of Michigan is to incorporate post-consumer food waste composting into its waste reduction programming, lessons learned from this pilot should be incorporated into any rollout. Early stakeholder engagement, ample planning time and a comprehensive outreach program will be crucial to program success.
Introduction
The University of Michigan began composting pre-consumer food waste (i.e. vegetative waste that has not been served to consumers) in 1997. In 2009, an effort began to implement a post-consumer composting (i.e. organic food wastes from consumers) program by a group of interested students. Soon after, Resource Recycling Systems, Inc. (RRSI) was contracted to conduct a feasibility study on a campus post-consumer food waste composting program. In 2011, the results of this study were presented and the Waste Reduction and Recycling Office (WRRO) partnered with, Bob Yecke, director of the Michigan League, Dr. Michael Shriberg and students in his ENVIRON 391 Sustainability and the Campus class to develop a plan for a post-consumer composting pilot program in the Michigan League for Fall 2012. After reviewing both the feasibility study and the report created by the ENVIRON 391 students, a graduate student was hired to assist in planning a post-consumer composting pilot program at Michigan League beginning in September, 2012. The pilot was implemented and data were collected to assess the effectiveness of the pilot and identify required elements for future post-consumer food waste composting programs on campus.

Pilot Goals
The goals for the pilot were to:
1. Maximize the amount of post-consumer food waste collected for composting from the Michigan League’s Underground, Beanster’s Café and catering operation,
2. Identify and record components that contributed to the success of the pilot,
3. Identify and record components the detracted from the success of the pilot,
4. Track costs and
5. Synthesize lessons learned into required elements for successful adoption of a post-consumer food waste composting program across campus.

Project Timeline
Planning for the pilot began in May 2012, culminating in a September 4, 2012 go-live date. The pilot ended on November 21. Below is a description of work that was completed through each step of the planning, training, implementation, and observation phases of the project timeline.

Communicating to Stakeholders and Planning:
It was believed during the preparation phase that involving stakeholders early in the process was crucial to a successful pilot. The first step involved introductory and planning meetings with managers and staff from Beanster’s Café, Catering Services, the Underground (Wendy’s and Taco Bell), the Michigan League Custodial Services, U-M’s Waste Management Services, and WeCare Organics, operator of the compost site accepting the food waste. During these meetings, issues and questions that were discussed included:

- What kind of collection bins will be the easiest to handle by staff?
- How will the composting bins be incorporated into the existing dining room and dish room floor plans?
- How many bins will be necessary and where should they be located?
- What kind of training would be most valuable to staff?
- How can we integrate composting into existing operations and logistics?
- What are the daily routines of the staff and how would collecting compostables potentially affect their routines?
From these discussions, a list of action items for each cash operations business was generated and is listed below:

- The decision to place two (2) composting bins in Beanster’s Café was based on the number of existing trash receptacles in the dining area. These trash receptacles are located in the counters against the booth seating near the cash register at Beanster’s Café (See Figure 1 below, and Appendix A for bin cut out).
- The decision to place three (3) composting bins in the Underground was based on custodial staff recommendations given the volume of trash in existing trash receptacles. Bins were placed in areas with the highest customer traffic flow, under the assumption that the bins would be more visible in these locations (See Figure 2-4 below).
- Catering staff already had bins used for scraping plates; compostable liners were used in these for the pilot instead of the typical plastic trash liner. No bin purchase was necessary.

Although all targeted food service businesses were located within the Michigan League, it was important to hold separate meetings with each stakeholder group to understand their unique concerns and issues associated with the pilot. In each of these meetings, participants were introduced to the pilot program, the materials needed, potential placement of bins, and items that needed specific collaboration with the stakeholder (e.g. Beanster’s manager putting in a work order for the counter cutouts for compost bins).

*Figure 1 Beanster’s post-consumer composting locations.*
Figure 2 The Underground’s post-consumer composting bins at entrance nearby stairs of the Michigan League.

Figure 3 The Underground’s post-consumer composting bins near back exit.
Stakeholders also provided insight into required criteria for food waste collection bins. These included:

**Beanster’s:**

- Bins needed to fit inside the counter space in which they would be housed (See Appendix A). The bins used for Beanster’s were the 19-gallon Rubbermaid Rigid Liner #3563 (See Figure 5 below).
- Bins needed to utilize compostable liners (BioTuf compostable bin liners made by Heritage).
Figure 5 Beanster’s compost bin.

Underground:

- Bins needed to fit in spaces next to large trash bins. The bin used for the pilot program was the Rubbermaid FGR32EGLWH 15-gallon trash can. Please see Figure 6 below for images of the bins used for the pilot program.
- Bins needed to be fire proof and placed no closer than 3 feet from emergency exit paths.

Figure 6 The Underground composting bin.
Observations and Studying Behavior

Prior to designing signs and deciding where to locate the compost bins, it was important to understand waste disposal habits by patrons who visit the Underground and Beanster’s Café. Below are key takeaways from a month of daily observation of consumers at the Underground and Beanster’s Café.

The Underground

- A popular destination for undergraduate and dental students who often go here for a quick lunch.
- Some students bring and eat their own lunches in this area.
- Depending on the weather, some eat in the League’s garden. This could impact the amount of waste (garbage, recycling, compost) discarded in the Underground during warmer months.

Beanster’s Café

- A popular destination for students during lunchtime that is also used as a study space and meeting location. There is a tendency for students to bring outside food into Beanster’s.
  - Includes food brought from home, Wendy’s and Taco Bell from the Underground, Chipotle and Potbelly from South State, etc.
- Customers at Beanster’s Café also tend to preferentially use tables near the entrance, making it difficult for some to throw away their trash as the trash bins are blocked from view.

Sign Design & Publicity

Once planning was completed, sign design was the next step. Research on effective signage was first conducted. An interview with Susan Bluestone, Recycling Coordinator at the University of California at San Francisco, was helpful in identifying challenges associated with composting signage. Her suggestions included:

- Use the actual compostable items generated in each area for signs with as few words as possible.
- Use as many visuals as possible.
- Post a sign indicating items that cannot be composted, also using pictures and few words.

Additional suggestions and notes from the conversation with Susan Bluestone can be found in Appendix C.

Additional research was conducted on other universities who have active compost programs. These include University of California at Berkeley and University of Washington. Common suggestions for signage identified through this research include:

- Pictures on signage are more effective than words.
- Use Velcro to affix examples to signs so that items can be changed as necessary.
- Place signage at eye level.
Working closely with the University Unions Graphic Design, the posters and signs for this pilot used a combination of pictures and actual items acceptable for the composting pilot. Please see Appendix D and E.

In addition to promotion of the pilot within the Michigan League, an article was featured in the Update Record. A copy of this article can be found in Appendix F.

**Stakeholder Training before Pilot Launch**

Staff buy-in was essential to the success of the pilot program. To ensure all staff understood what was compostable and what was not, training sessions were held for each team. Training included:

- Overview of what is and is not compostable.
- The importance of avoiding contamination as bags with visible contamination would be left on the loading dock and not collected by U-M Waste Management Services.
- The storage and use of compostable liners in food waste collection bins.

For the comprehensive list of items discussed in each training session, please see Appendix G.

**Pilot Launch**

The pilot began on September 4, 2012, the first day of the fall semester. Signs and bins were placed in the Underground, Beanster’s Café and Catering Services.

A number of students volunteered to monitor compost bins and answer questions about the program during lunch hours throughout the pilot. The presence of students next to the composting bins was effective as they were able to help educate patrons on which items were compostable and introduce many of them to composting in general.

The post-consumer composting pilot ended on November 21, 2012, with bins and signs pulled from the Underground and Beanster’s Café. A total of 8,244.05 pounds of compostables and 107 40-gallon carts were collected during the pilot program.¹

**Observations, Lessons Learned, and Recommendations**

Communication was the primary task during the preparation phase for the post-consumer composting pilot. Stakeholders were engaged early in the pilot preparation. Lessons learned and observations from each of the Michigan League stakeholder groups are categorized and summarized below.

**Beanster’s Café**

- Signs were designed to help patrons sort wastes into the following categories: trash, recycling, compost. Posters were intended to be placed next to each other, hanging above the appropriate bin opening. Unfortunately, hanging the signs proved more difficult than originally anticipated.

¹ These numbers also include pre-consumer composting at Michigan League.
- **Recommendation:** Determine where signs will be placed 2-3 months prior to the pilot start date. Enlist assistance as needed to place signs and/or determine alternative posting locations.

- The bin openings in the booth dividers were very crowded, increasing the likelihood that patrons would mistakenly place their waste in the incorrect bin. Additionally, spacing between the checkout line and the bins is tight; during busy times, those waiting in line obscured the signage at the compost bins.
  - **Recommendation:** The existing placement of waste collection containers in Beanster’s makes it challenging to add another waste stream. Bins should be placed near one another, but slightly further apart than was possible during the pilot. Bin placement should be determined early in a post-consumer food waste composting rollout in order to procure collection bins, if necessary.

- Communication with managers and staff was relatively smooth because of early engagement in the pilot program. Issues arose, however, when inaccurate work orders were submitted to add holes in the counters for bin placement. As a result, too many holes were cut.
  - **Recommendation:** It is suggested that the appropriate stakeholder meet with the carpenter onsite to ensure that the desired work is done.

- Other observations and lessons learned:
  - Minimal training was needed for the staff as they had prior familiarity with composting from the Michigan League’s prior participation in the pre-consumer food waste composting program.
  - There was little food waste placed in the composting bins so liners were only pulled once each day or less. Unfortunately, this resulted in a fruit fly problem.
  - Many of the patrons at Beanster’s bring outside food into the café, resulting in waste items not addressed by signage.

### The Underground

- The signs made for the Underground were not placed in an effective way due to ceiling piping and textures on the walls within the Underground.
  - **Recommendation:** Determine where signs will be placed 2-3 months prior to the pilot start date. Enlist assistance as needed to place signs and/or determine alternative posting locations.

- Little compostable waste was generated within the Underground. Patrons who eat at the Underground usually eat all the food and place all wastes in the to-go bag prior to placement in the trash.
  - **Recommendation:** Work with Taco Bell and Wendy’s to provide patrons with the option to use trays versus take out bags.

- Other observations and lessons learned:
  - Training the custodial staff for the Underground included how to keep the compostable liners in good condition and which bins were being used for composting.
  - Feedback from Jeff Lockett, one of the custodial staff members, regarding high traffic areas helped guide bin placement.
  - Liners were not pulled often enough, leading to a fruit fly issue within the building.
Catering

- The compostable liners did not hold up when hot coffee grounds were placed in them.
  - **Recommendation:** During training, specify that hot foods will degrade the liners and should be allowed to cool prior to disposal.
- There were a few minor miscommunication issues with the manager of the catering staff, all from wording in an email.
  - **Recommendation:** Do not rely solely on email for communication. In-person meetings and phone calls can help ensure that all parties are on the same page.
- Other observations and lessons learned:
  - Training was minimally needed, especially since the primary source of waste from catering was from plate scrapings.
  - Given the high amount of food waste and low amount of contamination found at catered event, composting in the catering department was the easiest way to divert food waste from the trash at the Michigan League.
  - There were issues keeping the liners from falling into the collection bins when food waste was deposited. Michigan League staff created rubber band “daisy-chains” to correct this. Please see Figure 7 below.

**Figure 7 Rubber band chain used to hold up compost bin liners.**

**Key Takeaways**

**Signs and bins**— Bin and sign placement should be determined early in any food waste composting program rollout to allow for adequate time for hanging, posting, positioning and changing plans if necessary.

**Training, education & outreach**— Early stakeholder engagement was imperative to the success of the pilot. An area for improvement was patron education. Additional student ambassadors placed at the collection bins would help spread awareness of the program and educate users on how to properly participate. A student-led education team wearing quirky shirts with catch phrases such as “Stash Your Trash/ Team Trash” or “Wolverines Compost” could garner more awareness and support for composting programs (See Figure 8 below).
Communication—Involving managers and stakeholders early in the process made the rollout of the pilot seamless. Communication to the customers, however, could have been improved. A larger effort should have been focused on publicity and partnerships with student groups or campus organizations should have been better fostered.

Data Collected
Food waste collected during the pilot included both pre-consumer and post-consumer waste. In order to determine the amount of post-consumer food waste that was collected during the pilot, pre-consumer food waste data from the same time period the year before were compared to 2012. The difference in weight is assumed to be the amount of post-consumer food waste collected.

<table>
<thead>
<tr>
<th>Year</th>
<th>Type of Material Collected</th>
<th>Number of 40-Gallon Carts</th>
<th>Pounds of Compost</th>
</tr>
</thead>
<tbody>
<tr>
<td>9/1-11/27/2011</td>
<td>Pre-consumer food waste</td>
<td>94</td>
<td>7345.5</td>
</tr>
<tr>
<td>9/1-11/27/2012</td>
<td>Pre- &amp; post-consumer food waste</td>
<td>107</td>
<td>8244.05</td>
</tr>
<tr>
<td>Difference between 2011 &amp; 2012</td>
<td>Post-consumer food waste</td>
<td>13</td>
<td>898.55</td>
</tr>
</tbody>
</table>
Pilot costs include:

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beanster's bins (2, $75 each)</td>
<td>$150.00</td>
</tr>
<tr>
<td>Underground bins (2, $124.87)</td>
<td>$372.62</td>
</tr>
<tr>
<td>Compost signs (design and print)</td>
<td>$470.61</td>
</tr>
<tr>
<td>&quot;Food Waste&quot; Bin labels</td>
<td>$20.00</td>
</tr>
<tr>
<td>Compost Pickup ($16.30/bin)</td>
<td>$1,744.10</td>
</tr>
<tr>
<td>Labor ($10/hour, 221.5 hrs)</td>
<td>$1,568.43</td>
</tr>
<tr>
<td></td>
<td>$4,325.76</td>
</tr>
</tbody>
</table>

Unaccounted for costs include the cost of compostable liners (the liners were already at Michigan League from the existing pre-consumer composting program) and administrative costs. Future costs could include wages for a full-time employee, costs for compostable bag liners, and professional sign design and printing services.

**Conclusions**

If the University of Michigan is to incorporate post-consumer food waste composting into its waste reduction programming, lessons learned from this pilot should be incorporated into any rollout. Early stakeholder engagement, ample planning time and a comprehensive outreach program will be crucial to program success.
Appendices

Appendix A: Compost bin cut out in Beanster’s Cafe.

Appendix B: Beanster’s compost counter cutouts.
Appendix C: Notes from conference call with Susan Bluestone at UCSF.

The following notes were taken from a conference call with Susan Bluestone, Recycling Coordinator at the University of California at San Francisco (UCSF) on 7/5/2012:

- Composting at UCSF started in 2004, as an effort to meet campus sustainability goals in diverting 75% of waste from landfill by June 2012.
- UCSF was able to receive a grant from the San Francisco City Department of the Environment to initiate a composting pilot for the university.
- Involving stakeholders was very important from the beginning of the project, and the UCSF Office of Sustainability worked with food court vendors and other cash ops businesses to remove materials that were not recyclable or compostable from their businesses. Other ways the Office of Sustainability helped to ensure the buy-in from kitchen employees were:
  - Visiting each kitchen and helping with spacing and placement of bins,
  - Providing various options of sizes and kinds of bins kitchen staff would find most useful,
  - Individually collecting composting regularly from kitchens to ensure there was no contamination of the composting substances.
- After the kitchen was able to successfully implement composting into their kitchen operations, the Office of Sustainability was ready to take on post-consumer composting. For UCSF’s post-consumer signs, the UCSF Office of Sustainability suggests:
  - Using the same, actual materials being used in the food courts as an example of how to discard waste properly,
  - Making as many visuals as possible,
  - Having one side of the poster showing pictures of items that do not belong in composting bins,
  - Designing the signs to be hung, and have the sign hover at around eye-level.
- For the bins, it is important to keep in mind certain habits consumer have when discarding waste. It is essential to have an easy-access bin opening to encourage consumers to discard their waste correctly. This includes:
  - Not having flaps for the composting bins, because it could lead to individuals refusing to compost because of cleanliness,
  - Making sure the bin openings are big enough for consumers to discard their compost without having their waste get caught in the bin opening,

More information on UCSF’s composting program can be found on their instructional video, seen here: https://www.youtube.com/watch?feature=player_embedded&v=4Epl-kfoHo
Appendix D: Beanster’s compost sign.

Appendix E: The Underground compost sign.
University launches post-consumer food composting pilot

By Dana Budzaj Elger
Public Affairs

Students, faculty and staff dining in the Michigan League can skip the trash cans and choose to compost food waste as part of a pilot program exploring post-consumer food composting on campus.

Led by the Waste Reduction and Recycling Office, the pilot program measures the amount of post-consumer composting occurring in several restaurants including: Beansters, Wendy's, Taco Bell and University Catering. The program began at the start of fall semester and ends Nov. 21.

"We are exploring post-consumer composting for a number of reasons," says Tracy Artley, sustainability program coordinator with Plant Building and Grounds Services. "Most importantly, the pilot is in response to student inquiry to see if it's feasible on our campus — to determine the challenges we would face in rolling out campuswide — as well the true financial costs."

Post-consumer composting involves collecting leftover food after it has reached the consumer. Offering people on campus the opportunity to compost leftovers is another effort supporting the university's goal to reduce waste sent to landfills by 40 percent.

While the pilot marks the first time post-consumer food composting has been implemented institutionally on campus, the university has participated in pre-consumer composting since 1998 and has collected nearly 870 tons of waste.
As part of the pilot, restaurant customers can find compost collection containers alongside trash cans in each of the participating restaurant areas, with signage indicating accepted items.

University Catering staff is responsible for sorting collected food waste into the proper bins from events. Compostable items include any food leftovers plus non-food items that include napkins, toothpicks, tea bags made from a paper material without staples, wooden coffee stirrers and compostable cutlery.

Collected compost is picked up by Waste Management Services crews and taken to the City of Ann Arbor’s composting site, operated by WeCare Organics, a New York-based residual waste management company. The university is tracking the volume of post-consumer composting in conjunction with pre-consumer composting.

"We need to collect 'real data' to determine the feasibility of post-consumer composting," said Robert Yecke, director of the Michigan League. "The League is a great location to collect that data as we have a variety of food areas within the facility."

Commenting on the progress so far, Yecke added that employees have embraced the pilot, but there's still a great deal of confusion among customers as to what is trash, recyclable and compostable, indicating it will take time to educate people about proper sorting.

The pilot is a result of recommendations from a 2010 study to explore the feasibility for an on-campus, post-consumer food waste composting program, as well as student recommendations from the ENVIRON 391: Sustainability and the Campus course.

http://www.ur.umich.edu/update/archives/121025/compost
Appendix G: Training Agenda

Introduction to post-consumer pilot program:

- Will start on Tuesday, September 4, 2012 (first day of school). Pilot will last until Wednesday, November 21, 2012.

Items that are compostable:

- Food items (including meat and dairy products)
- Wooden toothpicks without plastic
- Wooden coffee stirrers
- Non-plastic teabags
- Coffee beans and filters
- Paper napkins

Items that are not compostable:

- Plastic
- Glass
- Styrofoam
- Shrink wrap
- Aluminum-lined drink containers (e.g. soy milk cartons)

Procedures for pilot program:

- Examine to see if there is contamination. Bags with visible contamination will be left on the loading dock and not collected.
- Special bag liners (will be distributed to respective managers and are colored green) to be used for compostables will be provided. The bags will need to be kept in a cool location.

Questions/Comments