

Final Report for Penn Eco-Reps Housekeeping Project 2021-2022

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Abstract

This project intends to provide recommendations for how the University of Pennsylvania can improve its waste-management practices and how waste data can be utilized more efficiently. Two major problems were apparent from the start: a lack of communication about waste stemming from a lack of purpose for the existing waste data. By coordinating tours with local universities, such as Drexel University, and large sports venues, such as Lincoln Financial Field and Citizens Bank Park, new methods for dealing with waste in both residential and recreational settings came to the fore, illuminating innovations in signage and waste communication from which Penn could greatly benefit, such as new signage initiatives and more-open and widespread communication about recycling.

Introduction

Staff in the Housekeeping and Urban Park divisions of Facilities & Real Estate Services (FRES) have identified pitfalls in the way Penn collects data on waste-management practices and utilizes that information to drive more-sustainable waste practices. While Penn does maintain some data on waste-management practices from waste audits, practical implications for said data have been hard to find. Collaboration with peer institutions and local venues could provide insight into how Penn could better collect its waste-management data and then use that data to drive improvements in the way the university communicates about waste. The problem is twofold: use and communication of waste data should be improved. Data is available, yet there are no concrete uses for it, and as such, there is little to be communicated about waste-management practices at Penn. Recommendations generated in this report will aim to advance progress toward achieving the goal of increasing Penn's overall waste diversion rate and minimizing waste that ends up in landfills from Penn, as outlined in the University's Climate and Sustainability Action Plan 3.0 (CSAP 3.0). Since 2019, Penn's overall diversion rate has been on the decline, marking a shift from the progress that the university had made in increasing its diversion rate over the past decade. As of 2021, the diversion rate stands at approximately 22%. The general goal is to create a steady increase in the diversion rate rather than achieving a specific number by a certain date. Having data available with clear uses would help to drive the decisions necessary to increase the diversion rate, another key reason to improve existing practices.

Project Overview

The driving goal behind this project was to analyze the performance of Penn's current waste-management infrastructure, especially in regards to reducing the amount of waste being sent to waste-to-energy and landfills in accordance with the university's sustainability goals. If possible, incorporating new tactics from other organizations and institutions would be ideal for combatting shortfalls in Penn's waste collection.

Eco-Reps worked with the Solid Waste Working Group in the Housekeeping and Urban Park divisions of Facilities & Real Estate Services to identify challenges that exist in Penn's waste-management practices and conducted research on strategies that peer institutions have utilized to improve their own waste-management practices. Through Penn Sustainability's Eco-Reps program, a student group dedicated to environmental work on Penn's campus, this

project commenced in an effort to understand and improve upon the existing waste infrastructure.

Key points of contact among these groups were Joe Gaither, Wendy Sparks, James Allen, and Steve Jenet with Penn Housekeeping and Craig Roncace with Urban Park, all of whom were fundamental in providing tours of Penn and opportunities for tours of other large-scale institutions in the city of Philadelphia and beyond. Tours were set up with J. P. Mascaro, a private recycling company, with local colleges and universities that deal with a similar waste stream, and with Lincoln Financial Field and Citizens Bank Park with the help of Michael Hughes of Aramark, a company responsible for coordinating recycling services for large venues among other duties.

The team performed a broad assessment of challenges that exist in waste management on Penn's campus by engaging in a series of on-campus back-of-house tours. The first of these consisted of a general compactor tour highlighting Penn's current waste infrastructure capacities and challenges that space constraints and other landscape factors pose to Penn's waste efficiency. The team also evaluated indoor waste-management infrastructure at Penn, especially in regards to receptacles and signage that has been posted around them regarding sorting. The team also observed large-event waste-management practices at Penn, especially athletic games, in order to evaluate challenges that Penn faces in communicating around waste at such events.

This project relied heavily on tours of other large institutions to gather information on what types of practices related to waste and recycling work in different environments. The tours to the campuses of Drexel and Temple were key, for they offered insights into what works for other universities of similar size to Penn in regards to what they were doing with recycling and waste collection. Drexel's location in particular in University City right next to Penn also showed a university in a remarkably similar urban environment. Visits to sports venues like Lincoln Financial Field and Citizens Bank Park allowed for a view into how recycling and waste are managed when a large number of people interact with a location for a limited amount of time. These locations' signage demonstrated how to successfully grab attention of people who are potentially disinterested in recycling.

Research Findings

The team identified several key challenges that have existed in Penn's waste-management practices through conversations about infrastructure and auditing practices.

Staff at Facilities & Real Estate Services identified landscape challenges, especially space constraints due to the urban nature of Penn's campus, as a key issue. Limited space means that there is less room for the introduction of new initiatives like composting and confines the ability to create new infrastructure to support the university's existing recycling program. Even in interior settings, space is at a premium, meaning that it is difficult to place recycling receptacles in a manner that meets demand in some locations, like locker rooms in athletic facilities.

Another challenge that was identified was that the university has not been able to utilize data from waste audits to the extent that it would like to in order to inform decisions about waste-management practices. While the university does conduct waste audits at a number of key

locations on campus, Facilities & Real Estate Services has not been able to use the information in a meaningful way in order to drive improvements in the contamination rate and eventual diversion rate.

An additional aspect of waste management that was identified as potentially needing improvement is the way that the university communicates around waste, both in day-to-day waste management and during the waste processes that occur during large events. While signage is posted at nearly all receptacles on campus, the efficacy of such signage has not been evaluated and the university may benefit from additional means of communication around waste in order to increase compliance with sorting and increase the overall diversion rate.

Upon identifying these key challenges, the team conducted research in partnership with peer institutions in order to identify strategies to address them. For the purposes of this project, two separate waste-management situations were identified on Penn's campus—the management of waste produced on a day-to-day basis by the university's schools, centers, offices, residences, and facilities, and the management of waste produced during large-scale events like athletic competitions and campus-wide events like Commencement. Accordingly, the peer institutions that were identified included large-sized institutions of higher education in the Philadelphia region that are located in urban settings, in addition to venues and contractors that handle large events in the Philadelphia region.

Site visits at peer universities in the Philadelphia region yielded important information about strategies for improving communications around waste among students, faculty, and staff.

Drexel University has implemented a variety of strategies for doing so. For one thing, they have paid particular attention to signage as a way of motivating students to take a greater interest in sorting their waste appropriately. The signage at Drexel can be seen as more artistic and student-friendly than the signage that Penn currently uses to sort waste. Penn may benefit from hosting some sort of student competition to design new signage to communicate around waste sorting. Drexel also includes signage about the actual process of recycling around key locations in order to make pedestrians more aware of the greater impact of their decisions about waste, a strategy that may appeal to socially conscious Penn students.





recycling

where does it all go?

WHAT?

Lined bins
General trash includes plastic wrapping or bags, styrofoam containers, food scraps, and other items not currently recycled.

Recycling bins
Bins with the recycle logo or odd shaped openings are typically for recycling.

Cardboard
Give us your boxes! Cardboard can be placed nearby trash bins. Other forms of cardboard are small package boxes.

WHEN?

Should I recycle styrofoam or plastic bags? What about paper food containers? **Answer:** No. Drexel's bulk collection is only for common plastic bottles, aluminum beverage cans, beverage glass bottles, cardboard, and office paper products. Other items like electronic waste, for example, are collected on special recycling dates.

Every day, University Facilities collects trash and recyclables from offices, buildings and outdoor spaces, placing waste, paper and commingled containers in separate bags for collection by trash and recycling contractors.

HOW?

Landfill trash is compacted until pickup.

Cardboard is compressed into transportable bails where it is picked up to be recycled many times over and over.

Paper, glass, plastics and aluminum are separated, ground, and re-processed for post-consumer products like new glass bottles, polar fleece, toilet paper, composite decking, or even aluminum in aircraft. Glass and metal can be recycled indefinitely.

Cardboard can be recycled to make new cardboard, tissue, or other paper products.

WHERE?

Landfills are the final chain of custody for non-incinerated waste where methane may be recaptured for energy production. Eventually they may be covered and made into nature reserves, solar farms or golf courses.

WHY?

You only get one of these. Don't trash it.

Every year, Drexel diverts approximately 30% of its waste from landfill through recycling. We need your help to push those numbers even higher!

Drexel also conducts waste-centered events on a regular basis in order to increase consciousness about waste in general among community members. A key event on Drexel's campus is the Campus Race to Zero Waste, an eight-week long competition in which different schools and centers compete to see who has the highest diversion rate. The event rallies community members around the university's recycling program and increases awareness about certain waste-management issues, such as the disposal of electronic waste. Penn can benefit from implementing campus-wide waste-management events in a similar fashion to increase consciousness among the campus community.

Furthermore, Drexel has generated interesting strategies for utilizing the data obtained from periodic waste audits conducted around its campus. According to facilities staff on Drexel's campus, when a high contamination rate is found at a particular campus location, Drexel's Real Estate and Facilities department send out email blasts, with photos of the contamination in an effort to raise awareness of the contamination and encourage greater consciousness among community members about sorting waste. In these emails, information is also provided about how waste should be sorted in order to provide a refresher in regards to decision making about sorting. Penn could benefit from generating some sort of campus-wide listserv or other communications channel dedicated to waste-management practices.

Temple University has similarly adopted a number of tactics in order to increase its overall diversion rate over the years. For one thing, the signage at Temple is evaluated constantly in order to ensure user-friendliness, especially in terms of simplicity. Members of the housekeeping team raised concerns about the complexity of Penn's signage in comparison to the more simple signage used at Temple during the team's site visit to Temple. Penn could benefit from reducing the number of different categories delineated on its signage, so that community members don't get overwhelmed or confused when deciding how to sort a particular waste item.





Temple's use of location-specific receptacles is also something Penn could improve on. For instance, at Temple, recycling bins in certain dining areas are restricted so that the openings are only able to accept plastic and glass bottles, small plastic containers, and small paper items, since there is minimal consumption of large paper products like cardboard boxes in the area, according to waste audits. Inside Penn's Palestra, items like cardboard food boxes are not able to fit inside the smaller opening of the recycling bins installed there, despite consistent production of cardboard waste at the facility. Tailoring the types of receptacles to location would improve waste and recycling separation at Penn.



Site visits to large event venues in the Philadelphia region also provided key insights into how Penn can better handle waste during large-scale events, in which there is a high rate of rapid pedestrian traffic.

During visits to Lincoln Financial Center, the home of the Philadelphia Eagles, and Citizens Bank Park, the home of the Phillies, the team spoke at length with officials from Aramark, the contractor that does most of the facilities work for these venues. One key difference between the waste-management strategies employed by Aramark and those employed by Penn relates to how waste sorting is done following large events. While Penn tends to group all waste left in stands as trash, Aramark employs a team to sort the waste left in stands, improving the diversion rate for

large games dramatically. Penn's diversion rate would be improved greatly if sorting were to be implemented on a wider basis following events.

Additionally, the receptacles that have been placed in facilities where large events occur at Penn are often not ideal to promote sustainable waste-management practices. Recycling receptacles often have small holes in their lids that discourage pedestrians from placing cardboard waste or larger bottles into recycling receptacles, while trash bins have open tops, making it the "easier" option for waste disposal. Aramark representatives pointed out the importance of ease in improving diversion rate. Penn could potentially benefit from exploring other receptacle types in settings where large events occur.

Results and Evaluation

Penn's unique position as a residential facility along with possessing large recreational facilities creates a need for a plethora of recycling programs. As far as residential needs, Drexel University's more obvious signage and waste outreach would be of great benefit to the University of Pennsylvania. Updating the signage to better reflect Penn's own recycling goals would further expand our waste abilities. For recreational needs, stadiums like Lincoln Financial Field proudly remind patrons everywhere of its commitment to recycling and greener practices, and while Penn holds the same commitment, wearing it on its sleeve and having more attention diverted to waste management would prove immensely beneficial to increasing interaction with recycling infrastructure.

Finding effective uses for waste-audit data would also establish new methods for tackling recycling. This could be done by using the data to create infographics for signage, incorporating the data into new CSAP goals, or keeping track of trends found in the data to monitor practices that work more efficiently than others. Once waste audits find a role in Penn's waste infrastructure, the mounds of data generated by them can be utilized towards communicating better recycling strategies with Penn staff, students, and faculty. In general, communication should be focused around successes when it comes to waste management, and relaying these successes to Penn's campus would be beneficial in improving engagement with better waste practices.

Nine key recommendations follow about improving Penn's recycling and waste programs:

- ❖ Rethinking the signage on Penn's campus to increase simplicity and user-friendliness could better guide user decisions about sorting. Perhaps a signage competition that uses the artistic skills of students would simultaneously create interest and excitement in Penn's recycling initiatives and would spread information about recycling practices.
- ❖ Regular audits of signage and bin pairing during student absences, i.e., during Winter and Spring Breaks, would help to evaluate how well signage is performing throughout the year.
- ❖ Creating signage that pertains to the actual process of Penn's recycling program would engage with students and show them the tangible effects of their efforts towards recycling on campus, and it would enlighten them about the impacts and benefits of proper recycling.
- ❖ Sorting on a wider scale after events would greatly improve Penn's diversion rate.

- ❖ The creation of a network among peer institutions like Drexel and Temple pertaining to waste practices would inform all institutions of new and effective waste-management tactics.
- ❖ Campus-wide events involving waste management—a helpful strategy in other universities—would increase knowledge of recycling at Penn and make students more aware of the role of waste management in their daily lives. This could take the form of competitions involving who can have the least amount of waste or commemorative days in which recycling is advertised heavily across campus.
- ❖ A dashboard, potentially at the sustainability office, that shows simple waste data would help to educate students and broadcast good waste practices.
- ❖ A dedicated communication channel surrounding Penn’s waste management would be a dynamic, practical means of informing students, staff, and faculty about recycling and waste information.
- ❖ New receptacle types could be utilized on campus. Tailoring these receptacles to location based on audit data could be beneficial for increasing the diversion rate.

Conclusion

While Penn’s waste management has made great strides, and while it is doing its part in meeting CSAP 3.0 goals and expectations, much can be done to improve the current state of recycling and waste. A desultory use of waste-audit data has left what could be plentiful opportunities for waste education unutilized. Partnerships with companies like J. P. Mascaro ensure that Penn can stay on top of recycling, but findings from other institutions and venues have elucidated further tactics yet to be employed, many of which have definitively positive results, e.g., Aramark’s immediate sorting of waste after large events or Drexel’s more-convincing signage. Penn’s continued commitment to a better future is a staple piece of the university, but a more hands-on approach to recycling with revitalized and obvious signage should be the next step in ensuring that the university stays on track.

Appendices

Key Stakeholders Appendix

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