



4/13/2023

Barrier Mapping Case Study: The Ohio State University
Wexner Medical Center

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“There will always be challenges with waste that you can never cross off your list and declare them done. You must constantly educate yourself, be ready to get creative about finding space and identifying transportation solutions, and engage employees in the process.”

– Lauren Koch, Sustainability Program Manager, The Ohio State University Wexner Medical Center

OVERVIEW

The Ohio State University Wexner Medical Center is striving to become a zero-waste campus by 2025 (i.e., 90% diversion of non-hazardous waste away from landfills) through an economically sustainable waste diversion program. To make progress towards this ambitious goal within a three-year deadline, the institution must rapidly ramp up its waste diversion and waste prevention practices. The institution has identified three key barriers it must overcome to achieve its zero-waste goal: inadequate staffing and training resources; lack of real-time waste data; and space limitations.

BACKGROUND

One of the nation’s leading academic health centers, the Ohio State Wexner Medical Center, is committed to being a responsible steward of natural resources through efficient operations, innovative research and ideas, and upholding the oath to “first, do no harm.”

The medical center seeks to meet its ambitious goal of becoming a zero-waste campus by 2025 by diverting 90% of non-hazardous waste from landfills. This involves reducing waste generation upstream and then managing it responsibly through landfill diversion, recycling, composting, and sorting of waste streams.

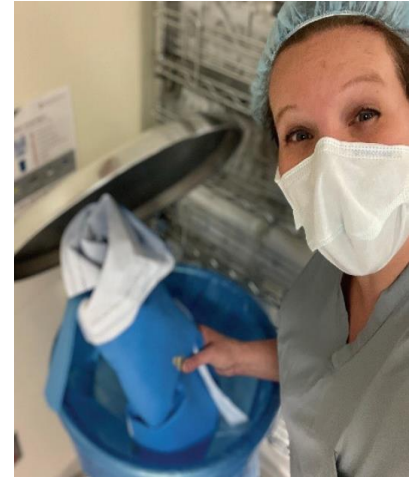
Healthcare Industry Plastic Waste Footprint

According to [Practice Greenhealth](#), operating rooms drive up to 60% of a hospital’s revenue while:

- producing more than 30% of a facility’s general waste and over 65% of its regulated medical waste; and
- consuming three to six times more energy per square foot than other parts of the facility.

In FY 2022, the Ohio State Wexner Medical Center estimated that it increased its landfill diversion rate to 37.4% – a 2.4% increase over the previous fiscal year’s rate – through efforts including doubling blue wrap collection, implementing a reusable sharps container program, and increasing food waste diversion using a biodigester.

In FY 2022, the medical center received a grant from the state EPA to support its effort to capture more commingled recycling. The reusable sharps container program has diverted more than 60 tons of plastic from landfill during FY 2022, and the blue sterilization wrap recycling program has diverted more than five tons of waste from landfill to date. Separating blue sterilization wrap from red bags used for hazardous waste has reduced waste disposal costs; red bags are around ten times more expensive to dispose of than standard landfill waste.



Blue sterilization wrap recycling in an operating room.

CHALLENGES AND BARRIERS

The Ohio State Wexner Medical Center believes it is important to set an ambitious goal to drive rapid improvement of its waste diversion practices. To move towards its goal of zero waste, the medical center is focusing on three key challenges:

- 1.) Staffing and training resource constraints
- 2.) Lack of accurate and real-time data
- 3.) Space limitations in its facilities.

Challenge 1: Staffing and Training

The most difficult barrier in the zero-waste journey relates to staffing and training. While most staff members are supportive of the medical center’s recycling efforts and zero-waste goal, some have resisted, seeing waste collection as disruptive to their primary roles, including providing patient care. Throughout the healthcare industry, staff shortages, high turnover rates, and training gaps have been ongoing barriers to sustainability initiatives, especially during the COVID-19 pandemic. At the medical center, recycling has historically been one of the first programs impacted when staffing resources are constrained. Compounding the problem, training gaps due to high turnover have led to greater contamination of recyclable materials.



Nurse collecting healthcare plastics in purple bag for advanced recycling.

Challenge 2: Lack of Accurate and Real-Time Data

As the Ohio State Wexner Medical Center works toward its zero-waste goal, a significant barrier is that the data surrounding its current waste levels is based on estimates rather than specific measurements and, at best, comes in monthly intervals. In order to gauge progress, the medical center needs to have access to more accurate and real-time metrics around its waste diversion practices. When waste is collected by waste transporters, it is not always weighed, with standard dumpster volume-to-weight conversion used instead of exact weights. Further, the sheer volume of vendors that provide waste services or diversion data adds another layer of complexity to accurately tracking progress in real-time.

There is currently no formal standard operating procedure to guide the medical center's recycling program, drive consistent practices, or collect specific waste measurements. Because the program lacks an accountability structure, its success often depends on participants' goodwill. As a result of these challenges, it is difficult for the medical center to definitively quantify and communicate its current waste diversion rate and any progress toward its zero-waste goal.

Challenge 3: Limited Space

The medical center's existing facilities were not designed with waste diversion in mind. Many locations only have space for one or two non-hazardous waste streams. There is minimal space available at the medical center's shipping docks, with no space currently available to add new equipment, such as a baler to consolidate recyclable materials.

Healthcare plastics are collected in purple plastic bags, color-coded to help Environmental Services identify proper back-house disposal. The purple bags are placed in roll-off containers, located outside due to space constraints in the facilities. Because these containers are placed in easily accessible public locations near other collection containers, there have been instances when other material, such as building materials or landfill waste, has been incorrectly disposed of in these dedicated purple bag roll-off containers. One roll-off container is completely covered and closed, requiring individuals to open a door to dispose of materials, but has higher contamination rates due to its location in the middle of a publicly accessible parking lot.



Roll-off container located in a facility parking lot.

The medical center's current waste collection point is not a viable long-term solution as it has resulted in higher contamination, is not visually appealing to the public, and has reduced available parking spots. Inadequate space to accommodate waste sorting and collection is a common issue in many hospitals.

SOLUTIONS AND APPROACHES

Staffing and Training

The Ohio State Wexner Medical Center is working to overcome staffing and training challenges by focusing on employee engagement and training, and by educating employees on zero-waste initiatives. More than 40 department leaders participate in a sustainability council, lead sustainability initiatives within their respective departments, and participate in monthly education and information-sharing calls. The sustainability council's waste working group supports the council's waste diversion initiatives.

Overall, the staff are highly engaged with waste diversion programs. For example, the Green Team, launched in 2018 as an employee volunteer group to drive sustainability throughout the organization, now has more than 800 members. However, pockets of low engagement are an ongoing concern. The medical center is pursuing a variety of employee engagement strategies and education initiatives to increase sustainability knowledge and involvement. These include computer-based learning programs, articles and stories on the academic health center's intranet, digital signage, webinars, and developing Green Team members as program champions.

As part of improved training efforts, the organization's "Greening the OR" task force, formed in 2018, worked to promote best practices and drive new sustainability procedures for improved efficiency and reduced operating room waste. For example, this group was the original driver of the medical center's current blue sterilization wrap recycling program. The institution is working with its marketing and communications department to develop new training materials and signage targeting operating room doctors and staff to boost the volume of recycled materials.

The Ohio State Wexner Medical Center works with student groups and interns to assist with sustainability initiatives, including waste. Lastly, to improve consistency, the institution plans to design and implement formal standard operating procedures for its recycling program.

Addressing Data Challenges

To measure progress toward its zero-waste goal, the Ohio State Wexner Medical Center needs concrete, real-time data related to its waste diversion practices. One solution is using a waste dashboard in Tableau to compile monthly vendor data by location. The organization's analytics department is building out this tool and anticipates a working version to be ready for monthly reporting in the spring of 2023.

Thanks to a state EPA grant received in fiscal year 2022, the institution was able to complete a waste characterization study to identify the three top recycling opportunities (i.e., cardboard, clinical plastics, and commingled plastics) as well as the highest-generating areas for those respective recycling opportunities. This data is critical in driving the priority areas for waste diversion efforts, and points in a surprising direction: clean healthcare plastics.

Around the same time as the waste characterization study, the Ohio State Wexner Medical Center launched an advanced recycling pilot program with Freepoint Eco-Systems, as proof of concept for its

Best Practices for Staffing and Training

- Start with an easily distinguishable, clean stream of clinical plastics, such as blue wrap.
- Employ high-tech engagement tools like e-learning platforms and digital signage.
- Conduct a pilot program for healthcare plastics recycling to determine best practices for collection and training.

Waste Characterization

"This data is critical in driving the priority areas for waste diversion efforts, and points in a surprising direction: **clean healthcare plastics.**"

full network of facilities. Two outpatient care locations were chosen for the pilot because they are segregated from the rest of the medical campus, allowing for an isolated pilot program. This will allow the organization to train and monitor staff recycling practices in small group settings and evaluate practices, before expanding the pilot to the main medical campus.

For the pilot program, the medical center is collecting clean medical plastic packaging waste from clinical areas in designated purple bags to divert to a recycling partner. This waste stream is primarily composed of plastics numbered 2, 4, 5, 6, and 7, which commonly include flexible films, Tyvek, irrigation bottles, wipes containers, blister packaging, and other rigid bottles. When these materials are collected, they are weighed to gather specific measurements to inform the baseline collection practices.

Lastly, blue sterilization wrap is collected and measured separately from the pilot program and turned into bedpans. The amount of blue sterilization wrap recycled will be combined with the pilot program to create baseline data on total hard-to-recycle healthcare plastics recycled. The blue sterilization wrap recycling program diverted more than five tons of waste from landfill since the program started in August 2019.

Limited Space

In 2021, the Ohio State Wexner Medical Center implemented a new green building policy that requires the provision of a materials management plan for projects meeting specific dollar thresholds. By implementing this new policy, the institution is demonstrating its commitment to meeting its zero-waste diversion goal and incorporating recycling into all projects.

In early 2022, a medical supply distributor began transporting healthcare plastic waste collected by the medical center to a warehouse that consolidates material for Freepoint Eco-Systems. The distributor makes daily drop-offs to the hospital and picks up healthcare plastic waste for return to Freepoint Eco-Systems' warehouse. This solution solves the logistics issue of recycling plastics, requires a smaller physical footprint, and optimizes transportation emissions since the vendor would otherwise leave the institution with an empty truck.

To further address space constraints and make waste pickups more efficient and cost-effective, the institution is considering investment in vertical compactors for cardboard and clinical plastics recycling. Investing in compactors would decrease the number of pickups required from a waste hauling partner but would take up valuable space. This is currently in the proposed dock renovation, slated for

Best Practices for Data Challenges:

- Target high-volume waste generation areas like operating rooms for additional training and signage.
- Partner with an advanced recycler to collect healthcare plastics.
- Develop formal standard operating procedures for recycling programs.
- Leverage interns as a cost-effective, short-term resource to assist with measuring the impact of recycling program improvements.

Best Practices for Limited Space

- Implement a facility design policy that requires inclusion of designated space for recycling operations.
- Invest in equipment to condense waste for more efficient use of space and reduced waste collection frequency.

June 2024. New sustainable design standards will help ensure that future spaces are designed with waste diversion built in.

CONCLUSION

The Ohio State Wexner Medical Center has made significant investments in, and progress toward, becoming a zero-waste campus and diverting healthcare plastics from landfill. The institution recognizes that despite recent successes, it will need to continually focus on new approaches to waste management and it anticipates ongoing engagement and training around waste diversion due to continual changes in staffing and waste management practices.

By undertaking the healthcare plastics recycling pilot program, the institution is establishing a baseline waste diversion rate in support of its zero-waste goal. The pilot program needs to expand practices across all facilities to accurately determine baseline data. The institution plans to develop and implement standard operating procedures to hold staff accountable to waste diversion practices.

Because, like most hospitals, the medical center was not designed with waste diversion as a priority, it must continue to find creative solutions to limited space for waste sorting and collection in the hospital and loading docks. The institution plans to design future spaces with waste management in mind by determining a longer-term solution for where to collect healthcare plastics while balancing competition for unrenovated spaces.

Based on current solutions and approaches, the Ohio State Wexner Medical Center anticipates positive outcomes including:

- driving consistency in recycling practices and decreasing contamination levels in recycling collections through continued focus on training nursing and custodial staff on waste diversion;
- making significant progress on its zero-waste goals while simultaneously decreasing costs associated with waste disposal by more efficiently managing the collection and pickup of recyclable materials;
- scaling its healthcare plastics recycling collection to additional locations using key learnings from the pilot program;
- continuing to implement new approaches and solutions to increase waste diversion across the campus aligned with the university's strategic plan and leadership support; and
- empowering staff to make a direct social and environmental impact through their jobs.

Key Success Metrics

- As of FY 2022, the institution has diverted 37.4% of non-hazardous waste from landfill.
- Through the advanced recycling pilot project, approximately 550 pounds of healthcare plastics are collected weekly from the two ambulatory locations.
- As of FY 2022, the institution has diverted 5 tons of blue sterilization wrap from landfill.
- From August 2021 to January 2023, the institution diverted 23,558 pounds of healthcare plastics to Freepoint Eco-Systems for recycling.

About the Healthcare Plastics Recycling Council

The [Healthcare Plastics Recycling Council](#) (HPRC) is a private technical coalition of industry peers across the healthcare, recycling, and waste management industries seeking to improve the recyclability of plastic products and packaging in healthcare. HPRC recognizes that reduction and reuse initiatives have a higher priority in the waste hierarchy and efforts in these areas must continue. HPRC seeks to influence plastics recycling from healthcare product design and manufacturing through product use, disposal, and recycling.

[Freepoint Eco-Systems](#) has been a member of HPRC since 2021.