



CASE STUDY:

Increasing Recycling Rates and Efficacy in Higher Education



PREPARED BY:

Ben Walker
Consultant, ManageMen Inc.



I. The Opportunity

Facility managers at colleges and universities have historically faced significant challenges when implementing recycling systems that encourage students, faculty, and janitorial staff to recycle more effectively. These challenges often lead to higher costs of labor as well as hauling costs associated with managing large amounts of landfill waste. They also can hinder facilities' overarching sustainability goals.

Michigan State University (MSU) hosts a robust recycling program at which its Material Recovery Facility (MRF) is at the heart. Constructed in 2009, MRF services the campus and surrounding East Lansing community, processing recyclable materials such as paper, plastic and metals. Recyclable materials are brought to MRF where they are collected, weighed and sorted into bales. They are then shipped for sale.

However, benchmarking efforts revealed that MSU had lots of room for improvement in regards to its waste diversion rates. When it competed in a diversion competition with 171 other universities in 2016, MSU took 91st place, with a recycling rate of only 31.7 percent compared to the winning rate of 94.9 percent.¹

To improve efficiencies and maximize diversion rates, MSU needed a simplified, standardized approach to their recycling program. MSU turned to Rubbermaid Commercial Products (RCP) to assist in the development of a standardized recycling system. With RCP's Slim Jim® Recycling Station, an adaptable recycling solution that features visually instructive containers, consistent labels and color-coded system, MSU hoped to further develop its recycling program to drive occupant compliance, improve sorting performance and ultimately increase recycling rates.



Material Recovery Facility
photo courtesy of sustainability.msu.edu

II. The Methodology

a. Facility Selection

To identify how RCP's new Slim Jim® Recycling Station could help improve waste diversion efforts, ManageMen teamed up with the custodial management team at MSU to select a location for a 30-day pilot study. Located near the heart of campus, Bessey Hall was recently renovated and is a core instructional building with the potential to serve more

¹2016 RecycleMania recycling competition for US colleges and universities. RecycleMania is a benchmarking and competition tool and managed by the National Wildlife Foundation.

than 10,000 students every day. It was selected because the symmetrical building includes a mix of classrooms, offices, break rooms, copy rooms, restrooms, hallways and common areas.

Bessey Hall would serve as a controlled environment for the new collection system from RCP during the pilot and also as a scalable model for adoption throughout other campus locations.



Bessey Hall

b. Observed Processes

At the start of pilot, ManageMen observed the custodial team collect trash within Bessey Hall to gain a better understanding of their processes and gather data to benchmark the new system against the existing program. This included reviewing process steps, custodial workload, logistics (bin placement and signage) and understanding training procedures for individual custodians performing the work.

Within the custodial program at MSU, waste collection duties are assigned to the utility specialist position. The utility specialist route is designed as a single waste collection route where the custodian begins in the third floor hallway and descending throughout the building, collecting all four waste streams—office paper, mixed paper, landfill, bottles and cans—in one pass. However, observations revealed that the custodian had to make multiple trips to each floor—up to three—because of space limitations with the current waste collection systems.

c. Site Assessment

Logistically, there were three main elements in MSU's existing recycling program (see photos to the right):

1. Material Collection Stations: Mismatched containers serving as collection points in the offices, common areas and main hallways of each floor. This consisted of the following:

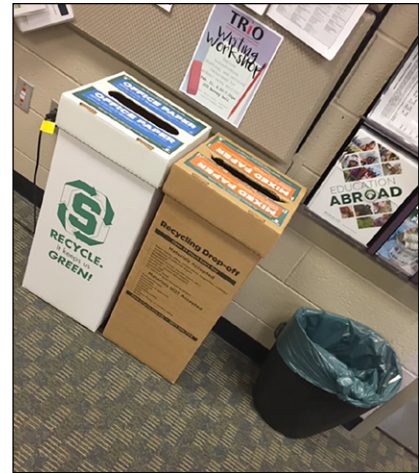
- Old-fashioned metal containers (three collection stations per floor)
- Mismatched signage, lids and containers
- Cardboard containers

2. In-Building Material Transport: Stainless steel cart with two BRUTE® containers used by custodians to gather and consolidate from collection points.

3. Central Sorting Collection: Large, basic gray, roll-out containers without color coordination and nondescript signage.

During the initial meeting, key stakeholders from MSU and ManageMen met and walked through Bessey Hall to determine existing collection points and materials, including wastebaskets and station locations. This included one station centrally located in each of the three hallways on each floor.

From that assessment, ManageMen created a building profile of Bessey Hall's 82,000 square foot of space. ManageMen worked with RCP to develop new receptacle counts and strategic location placements for the new Slim Jim® Recycling Station.



Cardboard containers.



In-Building material transport.



Previous trash collection methods and materials.

BESSEY HALL: TYPES OF SPACES

INVENTORY TYPE	FLOOR 1	FLOOR 2	FLOOR 3
Offices	84	93	6
Breakrooms	2	1	3
Restrooms	6	6	4
Copy rooms	—	2	—
Office hallways	4	3	2
Common Area <small>(large hallways)</small>	2	1	1

Recommended Diversion Improvement Solution:

To help capture the maximum number of recyclable materials from the building, the following components of RCP’s recycling systems were recommended:

- 1. Material Collection Stations:** For collection of recyclable materials and waste in common areas and office hallways, Slim Jim® Recycling Stations were recommended. These customizable stations feature visual signage and color-coded lids for each waste stream. Available in seven colors and four lid openings, the units have easily identifiable visual cues for patrons and staff when sorting recyclables. Waste streams are also labeled using three visual cues, including a recycling symbol, a waste stream icon and verbiage to increase recycling effectiveness. In offices, smaller color-coded 28-quart wastebaskets would serve to collect office paper. These receptacles were equipped with a 13-quart side bin for the collection of landfill waste.

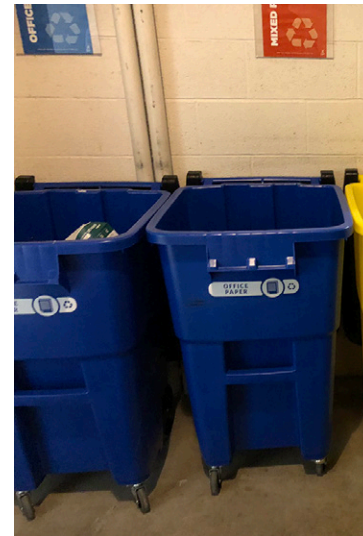


Slim Jim® Recycling Station.

2. In-Building Material Transport: To help custodial workers gather recyclable materials and waste from the collection points, RCP recommended using a dolly that can accommodate the BRUTE® container. Each BRUTE® container on the dolly is color-coded to each waste stream with large, visually instructive labels to ensure waste items are stored properly.

3. Central Sorting

Collection: At the central sorting collection station, located on the loading dock at the base of Bessey Hall, color-coded rollout containers were in-stalled to provide custodial workers with easy visual cues of the appropriate receptacle for each waste stream. Updated signage was implemented for further reinforcement of visual cues.



Central sorting collection station.

e. Initial Waste Audit

To better understand how much recyclable material was being thrown away and sent to the landfill, RCP and ManageMen conducted an audit to establish two key metrics—the existing diversion rate (40 percent) and contamination rate (37 percent) for Bessey Hall. The diversion rate is the total amount of waste diverted from the landfill stream and the contamination rate is the number of incorrect items or non-recyclables that are placed in the recycling stream.

To conduct the audit, project coordinators followed recommendations included in RCP's unique waste audit kit. The kit contains everything needed to perform an individual waste audit so facility managers can establish their existing recycling baseline data and potential rates.



Implementation team member conducts waste audit.

f. Baseline Data

The results of the initial audit findings are detailed below:

WASTE AUDIT TYPE	CONTAMINATION RATE	DIVERSION RATE
Baseline	40%	37%

Based on all data collected before the system implementation, the team predicted that diversion and contamination rates could potentially improve by 10% after implementing a new streamlined recycling collection program.

In addition to driving compliance and improving diversion rates, another goal for the study was to reduce the number of tasks in the utility specialist workload, allowing custodians to collect all four waste streams more efficiently, in one pass.

g. Education Plan

To ensure a successful transition to the new collection system, educational materials were developed by RCP and targeted to the building occupants (e.g. students, faculty and administrators) and the custodial workers. The curriculum encompassed the following:

- National recycling statistics based upon waste generation per person
- Baseline waste audit results for Bessey Hall, including waste types, weights and potential savings
- The new standardized color-coding scheme with simplified icons (image right)
- Identifying the new Slim Jim® Recycling Station containers and the areas in which they would be located (image right)
- Presentations for MSU students and staff within Bessey Hall
- Pre-implementation product training for custodial workers

h. System Implementation

At the kick-off of the program, the previous containers were removed and a total of six (6) Slim Jim® Recycling Stations and the associated tools were implemented throughout Bessey Hall. This included:

- Strategically locating two Slim Jim® Recycling Stations on each floor in main corridors. A total of six collection stations were used.
- Adding collection stations close to building entry points
- Locating Slim Jim® containers in office hall-ways and break rooms
- Placing new wastebaskets with side bins for landfill items in office areas

i. Staff Training

The custodial crew received instruction on how to use the new collection system and its associated tools. This included instruction on how to:

- Assemble collection stations in common areas and office hallway
- Install liners in each type of container
- Fasten BRUTE® containers on their dollies
- Collect and sort waste streams according to the new color-coded system
- Collect trash according to the updated Utility Specialist route (no change to the existing assignment)

Additionally, key features were introduced, including a unique snap-in connector that prevented users from removing a trash can from the Slim Jim® Recycling Station. Custodial workers also learned how to change liners using easy-to-use bag cinching features, which allow for quick, knot-free liner changes.

Finally, MSU implemented a new tracking document to help custodial personnel record how they used the new system. Each employee was assigned a “Self-Tracking Record” to complete, marking each trip they made to collect waste from its corresponding bin.



Implementation team member assembling collection station.



Easy-to-use bag cinching feature.

j. Ongoing Tracking

Each week, key stakeholders from ManageMen, RCP and MSU conducted an update call to gather feedback on challenges and successes with the new recycling system. During this call, MSU offered feedback gathered from staff, professors and students. MSU also reviewed weekly workflow charts recorded by custodial workers to identify whether further changes needed to be made to routes or collection locations. All reports provided during these update calls showed favorable feedback from building occupants and users of the system.



New wastebaskets with side bins, placed outside of offices.

k. Final Waste Audit

Upon the conclusion of the 60-day trial, RCP visited MSU to conduct a final waste audit in order to establish the overall impact of the new RCP recycling system on waste diversion efforts. The results were staggering—the waste stream at Bessey Hall experienced a 38.9 percent improvement in diversion and 30.5 percent reduction in contamination.

WASTE AUDIT TYPE	CONTAMINATION RATE	DIVERSION RATE
Baseline (2/13/18)	40%	37%
Progress (5/3/18)	27%	51.4%
Improvement	32.5%	38.9%

III. The Results

- a. **Increased Diversion** – The waste diversion rate at Bessey Hall went from 37% at the start of the pilot study to 51.4%. This increased diversion of recyclable materials has a direct impact on the amount of waste going into the landfill, improving MSU’s environmental footprint. Additional recyclable material leads to increased revenue for MRF.
- b. **Reduced Contamination** – The visually instructive containers helped reduce contamination rates from 40% at the start of the program to 27% at the conclusion of the pilot. The visual cues on collection and sorting containers made it easier for building occupants and custodial staff alike to identify the appropriate container for each waste type. Reduced contamination helps lower the overall landfill waste, as contaminated loads are often rejected and sent to the landfill—even if the majority of items are recyclable.
- c. **Reduction in Trips for Janitorial Staff**

TRIPS PER STREAM ON ASSIGNED ROUTE	OFFICE PAPER	MIXED PAPER	PLASTIC/METAL	LANDFILL	TOTAL COLLECTION TRIPS PER WEEK
Before (estimated from custodian reports)	10	10	5	5	30
Week 1	5	5	5	5	20
Week 2	5	5	5	5	20
Week 3	5	5	5	5	20
Week 4	5	5	5	5	20

- d. **Operational Efficiencies** – MSU’s custodial team uses (OS1), a standardized process for cleaning and maintaining its campus facilities. Much of the emphasis of their custodial program is continuously searching for ways to improve their processes. Waste, particularly wasted motion, is common in custodial operations. Back-and-forth trips to receptacles, collection points and dumpsters can sometimes double the working speed of a cleaning crew. The Slim Jim Recycling Station provides a practical solution for eliminat-



Rubbermaid Commercial Products

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ing wasted motion by cleaning personnel. This is largely due to the color-coded collection system. Color-coded visual cues provide a simplified approach driving recycling compliance from a building's occupants. Furthermore, the color-coded containers help cleaning and waste management staff easily identify how to properly separate recyclables.

