



Recycling Best Practices Report
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Executive Summary

Due to the high level of campus interest in increasing recycling rates, the Office of Waste Reduction & Recycling sought to document the waste and recycling practices of U-M's top performing buildings. To determine these best practices, facility managers at these high performing locations were interviewed and building occupants and custodians were surveyed. While building practices vary among campus facilities, several common themes emerged:

- Building **culture** in regards to recycling
- Accessibility and **convenience** of recycling bins, trash receptacles, and dock/sorting space set-up
- **Communication** of recycling information and educational materials to building occupants, custodians, and student users
- **Custodial** habits, culture and training on recycling and the specific needs of the building.

This report aims to assist staff and faculty looking to improve recycling rates in their facilities, as well as for individuals who wish to improve their own personal recycling habits at the University of Michigan. Recycling and “going green” have become a focus for the University in recent years and, as part of the University’s focus on environmental stewardship, it is important to recognize recycling as a key to success in this area.

Introduction/Purpose

Across campus, recycling rates vary widely by building and by building category. This study evaluates recycling practices in campus facilities with consistently high recycling rates. These current practices are compiled and form a best practices report and guidelines that are largely applicable to any campus building. The goal of this report is to assist facilities with lower recycling rates by transferring best practices. This will not only help recycling rates in individual facilities, but for campus as a whole.

Methodology

The project began with identifying recycling rates, averaged over a three year period, fiscal years 2008-2010, for U-M buildings. Buildings were placed in six usage categories; administrative, athletic/recreational, classroom, residence, research and unions. This was to ensure that buildings with similar functions were being compared to one another. Facility use was taken into consideration in the research and interview process.

The buildings chosen for the study were:

- Administrative Buildings: Alumni Center & Fleming Administration Building
- Athletic/Recreation Buildings: Intramural Sports Building (IMSB) & Revelli Hall
- Classroom Buildings: Chemistry, Engineering Research Building I&II (ERB I&II), Gerstacker, Naval Architecture and Marine Engineering (NAME), & Weill Hall
- Research Buildings: Bonisteel Interdisciplinary Research Building (BIRB)
- Residence Hall: South Quadrangle
- Union Buildings: Pierpont Commons & Chrysler Center (while the Chrysler Center is not a Union, it shares trash and recycling dumpsters with Pierpont Commons and was therefore included in our study)

Facility managers in these buildings were interviewed in person and information gathered in these sessions was recorded, compiled and compared to high-performing buildings with similar functions, of similar sizes, and with similar student populations/traffic. In these interviews, facility managers were asked about their perception of why recycling is successful in their facility, the building culture, their perception of custodial involvement and knowledge of custodial training, special recycling/green groups and any environmental champions within the building (see Appendix I). These interviews were in conjunction with a facility tour to view bin quantities and placement. Interviews were used as the primary basis for this report, with supporting information drawn from survey data.

Surveys were created for both building occupants and custodians. The building occupant survey was distributed electronically, via Qualtrics, and contained questions about personal recycling habits, perception of recycling success and building culture and knowledge of U-M's recycling programs. The survey received 191 responses from twelve focus buildings. The custodial survey, distributed on paper, received 16 responses from Plant Building & Grounds Services (PBGS) custodians in the focus buildings. South Quadrangle was the residential focus building. However, since classes are not in session and academic year residents were not available to survey, no building occupant survey was distributed. A custodial survey was distributed to South Quadrangle custodians, and contained minor wording alterations to note the fact that custodians in this facility do not operate under the same leadership as PBGS custodians. The South Quadrangle report received 20 responses. Graphs contained in this report were created from the results of these three surveys.

Results:

Synthesis of Administrative, Athletic/Recreation, Classroom, Research, and Union Buildings:

Interviews showed that all included buildings took similar actions to make recycling a success at their facilities. While similar, these actions were also tailored to fit the needs of each individual facility. All of the twelve facility managers interviewed had a communication plan for discussing and distributing recycling information and materials. These plans ranged from emailing building listservs to discussing recycling at weekly staff meetings. These facilities also showed a good ratio, generally 1:1, of recycling to trash bins in locations that, on average, were conducive to convenient recycling practices. These locations include building and classroom entrances and exits, food vendors or vending machines, newspaper stands and computing and printing stations. Many kitchenettes and student common areas contained extra recycling bins to encourage recycling. A point stressed in all interviews was the necessity of a recycling-focused and supportive building culture. During the interviews, most facility managers highlighted the importance of having recycling-conscious building occupants, who, for the most part, recycle at work and at home. According to facility managers, the combination of building user responsibility and custodial action, and knowledge about recycling, lends itself to a successful recycling program.

The majority of the survey results show that occupants of high recycling rate facilities feel that recycling is very accessible in their building (83% of respondents), with only 2% of respondents saying that they felt recycling was not accessible in their building (see Table I). Many building occupants at high rate facilities are individually conscious of recycling, with 86% of respondents recycling on a daily basis. Only 1% of respondents reported never recycling (see Table II).

Table I: How accessible do you feel recycling is in your building?

Answer	%
Very Accessible	82%
Accessible	15%
Not Accessible	2%

Table II: How often (on average) do you recycle (paper, plastics, etc.) while at work?

Answer	%
Daily	86%
Weekly	12%
Monthly	2%
Never	1%

This recycling-conscious attitude is also reflected in 68% of respondents saying they are personally involved or invested in recycling, and its success, within their building (see Table III). The change to single stream recycling was a step forward in recycling for the U-M, and 74% of respondents were aware of the transition (see Table IV). The culture of a facility appears to lend greatly to recycling success, with 86% of respondents indicating the overall culture or atmosphere of the building is important (see Table V).

Table III: Are you personally involved/invested in recycling, and its success, at your facility?

Answer	%
Yes	68%
No	32%

Table IV: Are you aware of U-M's transition to single-stream recycling?

Answer	%
Yes	74%
No	26%

Table V: Do you feel that the overall culture/atmosphere of the building contributes to the success of recycling?

Answer	%
Yes	86%
No	14%

As many facilities switch from the Zone cleaning system to (OS1), it is important to take this transition into consideration when gauging recycling success. The majority of custodians surveyed have worked for PBGS for more than ten years (56% of respondents) (see Table VI), however only 25% of the respondents have worked for their current facility for more than ten years. Many respondents (44%) have worked in their current facility for less than one year (see Table VII). This suggests that recycling can maintain success as custodians move to various facilities. However, since the change in custodial methodologies is relatively new (a one year time period for many respondents), it should be noted that any affect this change may have on recycling rates might not have been reflected in the three years of rates considered for this study.

Table VI: How long have you been working for Plant Building Services?

Answer	%
Less Than 1 Year	6%
1-3 Years	19%
3-5 Years	6%
5-10 Years	13%
More Than 10 Years	56%

Table VII: How long have you been maintaining your facility?

Answer	%
Less Than 1 Year	44%
1-3 Years	25%
3-5 Years	0%
5-10 Years	6%
More Than 10 Years	25%

Although many custodians have transferred facilities, the majority (56%) said that they feel a sense of ownership or pride in maintaining their facility and that recycling is attached to this success (see Table VIII). Education of recycling practices for custodians, across the University, seems to be extremely important given that custodians at the high rate facilities said that they received recycling information at their initial training (75%) and that they receive continuing information on changes in recycling practices (69%) with 63% of respondents claiming that receiving recycling updates was helpful or necessary (see Tables IX, X, XI). Custodial supervisors also appear to be extremely important in this process, especially as custodians move between buildings. Custodial supervisor support of recycling can assist in making recycling a success at many facilities. Of custodians surveyed, 56% said that they thought their custodial supervisors were very supportive of recycling, while only 6% said they were not very supportive and 13% reported feeling that their supervisor was indifferent to recycling success (see Table XII).

Table VIII: Do you feel a sense of responsibility or pride attached to the success of recycling at this facility?

Answer	%
Strong Responsibility	56%
Moderate Responsibility	38%
Indifferent	6%
No Responsibility	0%

Table IX: When you received initial training was recycling information included?

Answer	%
Yes	75%
No	25%

Table X: Have you continued to receive information about recycling practices at UMich?

Answer	%
Yes	69%
No	31%

Table XI: Do you feel that receiving continuing information on recycling practices would be helpful or necessary?

Answer	%
Yes	63%
No	38%

Table XII: What is your perception of your supervisor's support of recycling?

Answer	%
Very Supportive	56%
Somewhat Supportive	25%
Indifferent	13%
Not Very Supportive	6%

It is important to note that interviews with facilities managers and building occupant and custodial surveys were only conducted at facilities with high rates of recycling. In order to further confirm these results and suggestions this same process could be performed at facilities with low recycling rates.

Administrative Buildings: Alumni Center & Fleming Administration Building

Unlike many campus buildings, administrative buildings experience a relatively low volume of student traffic and the Alumni Center and Fleming Administration Building are both primarily composed of full-time staff. While there may be students working in these facilities, the majority of the users and building occupants are U-M staff members. However, the Alumni Center does experience large fluxes in student traffic during events such as Welcome Wednesdays and graduation ticket pick-up. For these events, extra recycling and trash bins are supplied for student users to manage the increase waste volume. Both facilities ensure that staff have desk side recycling bins and access to a well-organized loading dock where waste is managed. They also provide numerous recycling and trash bins in hallways and kitchenettes. Both facilities communicate via email about recycling practices, however their staff is conscious of recycling both at home and at work, which aids in creating a recycling-friendly culture.

Athletic Buildings: Intramural Sports Building (IMSB) & Revelli Hall

Both the Intramural Sports Building (IMSB) and Revelli Hall handle student users, and both facility managers identified two key points that make recycling a success at their facilities. The first is that student users and staff members within their facilities like to recycle. The second is that bin

placement, availability, and single stream recycling have helped to foster recycling success. To facilitate recycling at events, both facilities supply extra bins to handle increases in building user numbers. Both facility managers also stressed the role community plays in recycling success. Although their populations and building sizes are very different, the feeling of community through both Recreational Sports and the Michigan Marching Band aid in creating a sense of responsibility for keeping the building in top condition, and therefore making recycling a priority.

Classroom Buildings: Chemistry, Engineering Research Building I&II (ERB I&II), Gerstacker, Naval Architecture and Marine Engineering (NAME), and Weill Hall

Classroom buildings deal with a flux in student population both throughout the day and academic year that other buildings do not experience. All classroom buildings have different needs and student populations so it is important to consider the needs of the particular students using the facility. In some classroom buildings, the same students access the building on a daily basis while in others, the students are passing through or spending limited amounts of time (i.e. one class) in the building. It is also important to consider the functions that the building serves. If the building contains a computer lab, library, or study space rather than classroom, lab, or research space, the needs of the building will differ. In all instances, however, it is important to recognize that students need to know about the availability of recycling in the facility. If trash bins are available in classrooms, commons, and hallways, recycling bins should also be readily available, and both bins should be properly labeled with the correct lids to ensure users place the correct type of waste in each bin. Forwarding information about recycling to building users is also important as faculty-student, student-student, and staff-student is critical in stressing the importance of recycling to student users and aids in creating a recycling-conscious campus culture.

Research Buildings: Bonisteel Interdisciplinary Research Building

Research buildings contain, perhaps, the greatest variety among buildings of all the categories presented in this report. Each serves a different research function, contains a variety of users, and generates a different type of waste. Bonisteel Interdisciplinary Research Building (BIRB) produces a high recycling rate due to a diligent and conscious staff who strive to maintain a high rate at their facility. The facility manager frequently sends emails containing recycling information to staff and student building users. BIRB also participates in the Recycling Champions competition on campus and associated weekly rankings are sent to the entire building. The facility manager also noted that the users of BIRB are frequently recycle both at home and on-campus, making recycling a part of their everyday lives. BIRB, however, does produce a lot of electronic waste, rather than medical or paper waste, which

might be large waste products at other research facilities. This highlights the importance of considering the specific function, waste production, and recycling needs for each research facility.

Union Buildings: Chrysler & Pierpont

The unions on the U-M campus see a massive volume of student traffic on a daily basis. At Pierpont Commons on North Campus, between 10,000 and 14,000 students travel through the facility daily. This large number of students traveling through a space in a relatively short amount of time makes controlling waste and recycling a concern. Pierpont Commons occupants are extremely proactive about recycling. Pierpont not only provides common and study areas for students, but they, along with a number of facilities on campus, provide food. This increases the amount of waste the building generates per capita, so they work extensively with vendors to make ensure napkins, cups, and carry-out containers, among other things, are compostable, recyclable, or made from recycled materials. Secondary recyclable receptacles for items like batteries and cell phones are also available to students and these receptacles are easily accessible at the front desk of Pierpont Commons. Not only is the staff at Pierpont Commons concerned about today's waste, but they are concerned about reducing future waste and moving toward paperless systems.

Chrysler Center is a good example of an administrative building or classroom building due to their functions and population. However, Pierpont Commons and Chrysler Center share dumpsters, so they have been combined for the purposes of this study. Like Pierpont, the staff and building occupants at Chrysler Center recognize that recycling is a part of the building culture. Chrysler Center is also extremely conscious about bin placement in common and classroom areas in order to ensure that students who are passing through, stopping for class or studying are able to recycle conveniently. However, Chrysler does not post recycling information or flyers on the wall in posting areas due to the massive number of student postings in these areas. It would take quite a bit of upkeep and reposting to ensure that these recycling messages are visible.

Residence Halls: South Quadrangle

In order to best consider Housing-specific practices, the South Quad results and practices have been kept separate as Housing custodians and certain programs function differently than PBGS. Not only is there a difference in programs, but the function of a residence hall is different from any other building group on campus given that they serve as home to students while on the U-M campus. Students have different needs and mindsets regarding the housing experience. A portion of the U-M student population occupies these buildings September through April each year, and South Quadrangle is home to several summer camp populations during the spring and summer months. The residence halls also provide numerous spaces for students including, but

not limited to, bedrooms, bathrooms, dining halls, study spaces, common spaces, performing arts spaces, classrooms, and computer labs. There are three separate entities to focus on when considering housing practices; dining hall recycling practices, residential space recycling practices, and custodial recycling practices.

The South Quadrangle dining hall recycling practices, which include a composting program, are unique to the residence hall system as composting is not common practice for most other buildings on campus. Year round, the dining halls on campus create large amounts of waste. Facilitating a healthy recycling and composting program for the dining halls can foster an environment of recycling in the building. In speaking with dining hall supervisors at South Quad, it was clear that location, availability, and convenience of bins were major factors in increasing both composting and recycling rates. Not only are the recycling, composting, and trash bins conveniently located, but the staff makes an effort to ensure that they are taken to the dock in a timely manner. The loading dock is also conveniently located and accessible for staff members. Recycling and composting are emphasized when new employees are hired, and South Quad Dining employed around 275 students last year alone. Another key to success in dining recycling and composting is worker accountability. Although recycling and composting bins fill up quickly, the dining hall staff makes a conscious effort to ensure that compostable and recyclable material are placed in the proper receptacles. This, combined with small turnover numbers in staff, aids in creating a sense of pride in the success of recycling at the South Quadrangle dining hall facility.

Resident recycling practices are evident through the convenience of recycling bins located in the trash closets in each hallway. The bins are labeled and, according to custodians, are mostly used correctly and frequently. Residence hall staff members and Residence Advisors also play a large role in educating student residents about the importance of recycling. At South Quad, the residence hall staff members are open to answering students' questions about programs, including recycling, and they encourage residence advisors to educate their residents about the availability of recycling information and recycling bin locations during Move-In. Residence advisors are also asked to re-use decorations and cut back on paper usage when advertising events and communicating with residents in an effort to reduce waste. In conjunction with this effort to reduce waste, the residence hall staff has been working towards going paperless and transferring paper files to electronic files in an effort to reduce future waste. Move-In and Move-Out efforts are large waste generators. During the Move-In process, residence halls are provided with extra bins for cardboard, Styrofoam, and packing peanuts, as these are the items that experience a large increase in volume during Move-In. Students are also provided with totes to store, transport, and dispose of their recyclables for their dorm rooms and each tote contains recycling information. During Move-Out,

donation bins are placed in the residence halls to encourage students to donate items which can be re-used in an effort to prevent unnecessary waste. South Quad’s hall council, which includes student representatives, occasionally discusses recycling/waste issues, however information regarding recycling is generally distributed from residence hall staff to residence advisors, and lastly to student residents.

The custodial staff at South Quad identified their strong sense of community, pride, and morale as reasons for custodial interests in recycling. In the past they have experienced recycling successes and successfully reaching a goal is a morale boost for the staff. While only 52% of custodians at South Quad feel a sense of ownership or pride in maintaining their facility, 76% of the staff has worked in South Quad for more than three years (see Tables XIII & XIV). As a part of this success, the custodial staff feels a sense of community and commitment not only to with other custodians, but with building residents. They view the months with student residents as successful for recycling, and 75% of the custodial staff pass along recycling information to students via the personal bonds they form during their time in the residence hall (see Table XV). Meetings are held with the custodial staff on a regular basis and recycling, as well as environmentally-friendly cleaning techniques, are often discussed. While 90% of the custodial staff received training regarding recycling when they were hired, 95% of the custodial staff say they receive continual information regarding recycling practices, and they feel that this continued education and information is necessary and beneficial (see Tables XVI, XVII, & XVIII).

Table XIII: Do you feel a sense of responsibility or pride attached to the success of recycling at this facility?

Answer	%
Strong Responsibility	48%
Moderate Responsibility	52%
Indifferent	0%
No Responsibility	0%

Table XIV: How long have you been maintaining your facility?

Answer	%
Less Than 1 Year	10%
1-3 Years	14%
3-5 Years	24%
5-10 Years	19%
More Than 10 Years	33%

Table XV: Do you pass this information along to other building participants?

Answer	%
Yes	75%
No	25%

Table XVI: When you received initial training was recycling information included?

Answer	%
Yes	90%
No	10%

Table XVII: Have you continued to receive information about recycling practices at U-M?

Answer	%
Yes	95%
No	5%

Table XVIII: Do you feel that receiving continuing information on recycling practices would be helpful or necessary?

Answer	%
Yes	95%
No	5%

The Best Practices

This study illustrated four factors key to recycling success:

- Building **Culture** in regards to recycling
- Accessibility and **Convenience** of recycling bins, trash receptacles, and dock/sorting space set-up
- **Communication** of recycling information and educational materials to building occupants, custodians, and student users
- **Custodial** habits, culture and training on recycling and the specific needs of the building.

Interviews with facility managers provided the basis for these four points. All facility managers who were interviewed had a procedure for communicating with building residents, including communications about recycling.

Convenience of recycling and trash bins, especially in high traffic areas such as entrances/exits and classrooms, was especially evident during the building walkthrough portion of the facility manager interviews. Both surveys to building occupants and custodians contained data that supported the need for communication and convenience. They also showed the need for a recycle conscious building culture and custodial involvement.

The 4 C's to Recycling Success

Communication

All facility managers interviewed had a communication strategy for distributing recycling information. In many cases it was found that the facility manager distributed information received from U-M's Recycling Program. Most often, the facility manager forwards information received from the program to the building's listserv, which serves as communication channel between the facility manager, building occupants, and frequent users. Weekly staff meetings, student outreach groups, and flyers/information posting are also convenient and effective ways to distribute information to building users. If there is an available place near a recycling bin or in a common area, such as a bulletin board or display case, placing recycling information on a board with recyclables and examples can be a quick way to educate students and frequent building users on what can be recycled and reminds them that recycling in that facility is important.

- Make recycling information accessible (via email or postings).
- Ensure that staff are aware of changes in recycling practices.
- Identify any environmental champions within the building and ask that their recycling expertise be available for questions or educational efforts.
- Communication should flow both ways. Building occupants should feel comfortable asking questions or requesting information on recycling, just as facility managers should feel comfortable distributing recycling information to the building occupants.

Convenience

In common areas, place trash bins and recycling bins together in convenient areas (e.g. near entrances/exits, bathrooms, newspaper stands) so that recycling and trash are placed in the proper containers. If containers are located conveniently and close to each other, both types of waste are more likely to end up in the proper container. It is also essential to locate bins at points where people most need recycling. Kitchenettes are also a great place to locate recycling bins, as many kitchen and lunch supplies can be easily recycled if a bin is available.

- Create a convenient space for recycling in common areas throughout the building.
- Foster a recycle-friendly atmosphere through recycling discussions and educational efforts.
- Make sure both trash and recycling are available to avoid contamination.
- Check bin placement, number, and ratio (ideally 1:1).
- Avoid hiding recycling and trash bins for aesthetic reasons, if possible.

Culture

While a recycling-friendly culture may seem difficult to cultivate, it appears to be extremely important to the success of recycling within an individual facility. Faculty, staff, and students should feel comfortable discussing recycling with co-workers, exchanging information, and pointing out recycling “mistakes” when an item lands in the wrong bin. The goal is to make placing recyclables in the recycling bin the norm. It is also important to let the building occupants know when their actions are leading to recycling success. Knowledge that actions are leading to successful results is a motivator, and many building occupants will feel encouraged to continue creating a building culture that has a positive recycling impact.

- Talk to your staff about recycling, and encourage them to talk to one another.
- Post recycling information in problem areas, where recycling frequently ends up in the trash.
- Encourage use individual desk-side recycling bins if they are not already available.
- Allow for a friendly sense of recycling accountability to one’s peers.

Custodians

In order for custodians to be fully dedicated to recycling and its success at the facilities they manage, recycling must be emphasized in training sessions and during staff updates. Recycling and environmentally-friendly services are a focus not only of PBGS but of U-M, and training for custodians has the potential to increase rates across all campus facilities.

- Provide recycling training/information when custodians are hired.
- Educate custodians on updated recycling practices.

- If information is available, encourage custodians to pass this information along to building occupants.
- Ensure custodians see recycling as a part of overall building cleanliness, upkeep, and job success.
- Encourage custodians to feel a sense of pride in and responsibility for their facility as buildings transfer from Zone to (OS1).

Conclusions

As recycling and sustainable actions become a focus of the University of Michigan, it is increasingly important to make recycling success a priority for individual facilities on campus. By combining aforementioned the points and suggestions (communication, convenience, culture, and custodians), facilities can work to increase recycling rates. It is also important to consider the function of your facility, the population utilizing your facility, and the types of waste your facility produces. By taking into account these specific needs, you can tailor the suggestions above to provide the maximum benefit for your facility's recycling success.

Appendix

Appendix I: Basic Interview Questionnaire

- Why do they think their building has a high recycling rate?
- How are secondary recyclables dealt with?
- Description of building recycling culture.
- Description of building occupants – community or independent departments?
- Population description and how it changes throughout the year.
- How does FM communicate with building occupants? Regarding recycling?
- What is their perception of custodial recycling involvement?
- Can they identify building champions for follow up interviews?
- Are there special environmental groups or committees in the building?
- Is there any unique recycling or waste programming?
- Description of material flow. Who picks up what?
- Are there building incentives for recycling?
- Would it be acceptable/useful to distribute an email survey to building occupants?

Table Questions

Table I: How accessible do you feel recycling is in your building?

Table II: How often (on average) do you recycle (paper, plastics, etc.) while at work?

Table III: Are you personally involved/invested in recycling, and its success, at your facility?

Table IV: Are you aware of U-M's transition to single-stream recycling?

Table V: Do you feel that the overall culture/atmosphere of the building contributes to the success of recycling?

Table VI: How long have you been working for Plant Building Services?

Table VII: How long have you been maintaining your facility?

Table VIII: Do you feel a sense of responsibility or pride attached to the success of recycling at this facility?

Table IX: When you received initial training was recycling information included?

Table X: Have you continued to receive information about recycling practices at UMich?

Table XI: Do you feel that receiving continuing information on recycling practices would be helpful or necessary?

Table XII: What is your perception of your supervisor's support of recycling?

Table XIII: Do you feel a sense of responsibility or pride attached to the success of recycling at this facility?

Table XIV: How long have you been maintaining your facility?

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