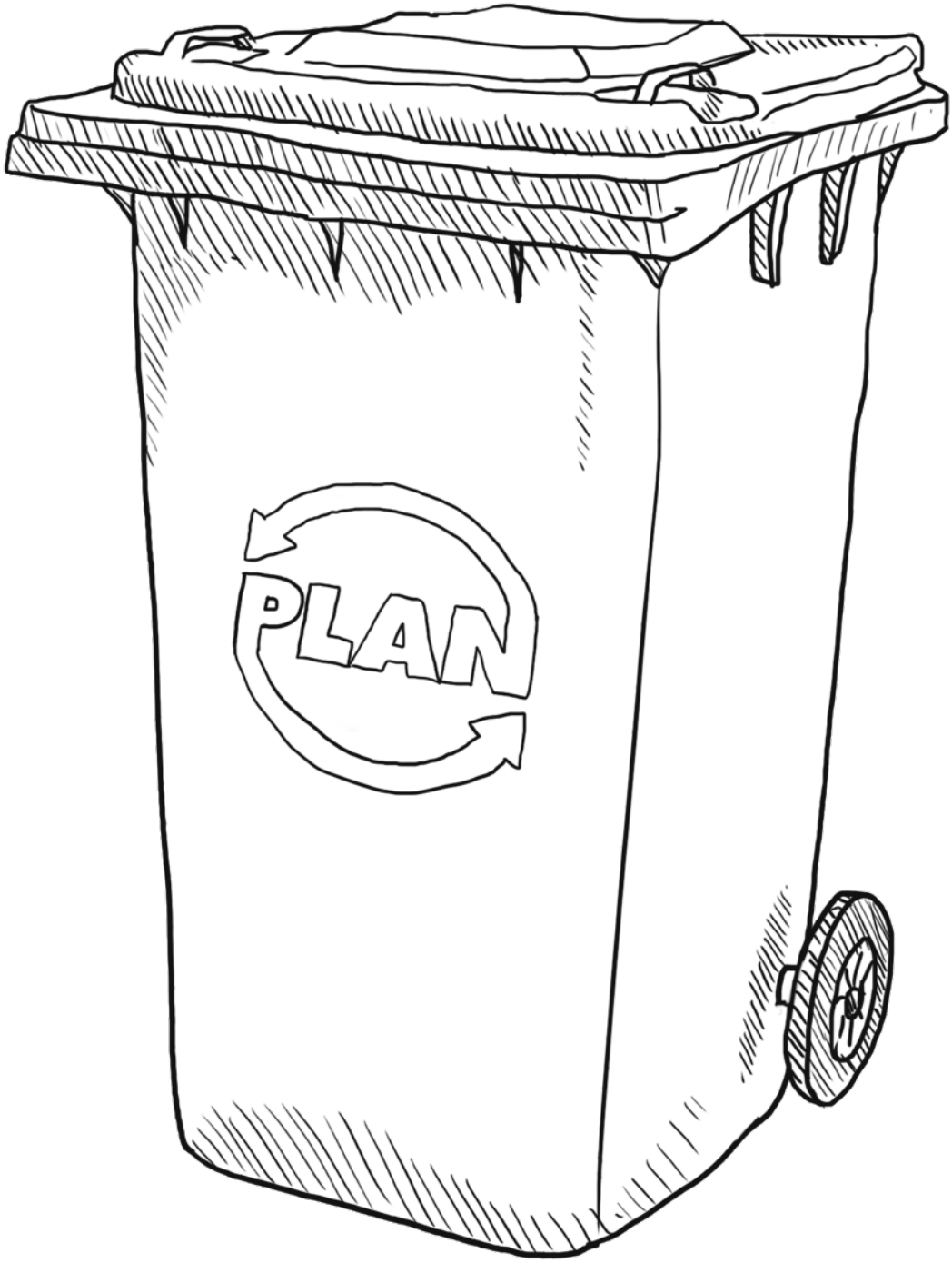

Waste Audit Manual

Table of Contents

Introduction

Welcome to the Post-Landfill Action Network Manual!

This document will help guide you through the process of conducting a waste audit on your campus. We've tried to keep this as short and sweet as possible while fitting in everything we think you'll need to spearhead a successful program. Throughout the year we will ask you to reference this manual numerous times during webinars, Skype sessions, and group workshops and trainings – so keep it handy! If you have any questions or would like more information about anything contained in this guide, be sure to reach out to us!

Get in Touch!

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ABOUT PLAN

The Post Landfill Action Network emerged from a 2011 pilot project at the University of New Hampshire known as Trash 2 Treasure (T2T), a program tackling the inefficiency and wastefulness of traditional end of the year dorm move out; students moving out at the end of the year discard useable items, the same sorts of items that students moving back to campus in fall would buy brand new at big box stores. To end this cycle of waste, students involved in T2T facilitated the collection, storage, and resale of discarded and donated items for continued student use. In its first year, T2T became the first student-led, self-sustaining program of its kind in the country, having reduced over 125 tons of waste and raised over $70,000 in revenue to date. Financial gains from T2T have been re-invested in other waste reduction programs on the UNH campus from composting to electronic waste recycling.

Today, PLAN serves as a resource for students all across the country launching waste reduction projects in their campus community. Through webinars, networking, and hands-on support, we provide student groups with advising, best practice guides, start-up funding, and other resources necessary to launch or expand waste reduction programs. Finally, we're working to elevate conversation about the global waste crisis, pushing out the culture of "throw away" and fostering that of reduction and reuse. Ultimately, our mission is to build a student-led movement for innovative solutions to the global waste crisis!

Some Advice for Every Project

1. Becoming the Leader of your Team

You have become a leader by deciding to partake in the fight towards a post-landfill society. Congratulations! This is a big responsibility but your hard work will help you and the students and staff you work with to achieve long lasting success.

It is important to form a team of people with the motivation, know-how, and position to ensure a successful program. This is a great opportunity for students and staff members to work together to reduce campus environmental impact and foster social change. Weekly meetings with your project team are important for planning and coordinating. The following are all potential stakeholders that will be involved in the success of your project:

Students: At PLAN we believe students are the driving force behind sustainable change. Any sort of waste management project can be a huge undertaking, so drum up support and interest from campus peers and staff alike. A project like this can serve as a community service opportunity for students involved in honor societies, Greek life, or other campus service groups. In addition, if your school has already established another PLAN program in the past, those students involved may be a great resource for you to utilize.

Sustainability Offices: Many schools have or are interested in developing departments of staff with the goal of sustainability in mind. Sustainability can encompass a variety of interests, backgrounds, and areas of study, and it is the job of these staff to initiate and support long lasting and collaborative work on campus. Staff in these departments will often have the resources and connections to guide your project to a successful outcome.

Administration: At the end of the day you need to talk to the people in charge of your waste contracts and resource management. Depending on your school anyone and everyone from facilities to purchasing departments can be involved in decision-making. This process can be a little intimidating and confusing but you will never know how to work through it until you start asking. Often administrators are willing to assist in giving you the information you will need to get your project done. Frequent meetings with all types of the stakeholders involved will keep your project transparent and increase the chances that your findings will be recognized and changes will be implemented.

ten tips for every leader

1. **Set a Timeline:** In order to keep things moving you must set deadlines and determine what you will need to reach them. Discuss to get the group consensus and allow everyone to feel that this project belongs to the them. Remember, it is your group and not you yourself who will complete the project!

2. **Share Information:** A common mistake made by new leaders is to hold on to all the information and responsibilities themselves. Sharing the lead can be tough, but is necessary if other groups members are to invest in the project and ultimately get more done. If you are unable to attend a meeting, your group should have enough information to be independent and continue as usual.

3. **Facilitate and Delegate:** Just like with information regarding your project, share the workload with your team in order to instill leadership in others and avoid exhausting yourself. Once the group comes up with big picture goals use weekly meetings to discuss next steps. Encourage others to take charge of various tasks and use this as a way to learn about each person's strengths and what they can bring to the decision-making table.

4. **Build Friendships:** When student activists click with one another they become much more effective. Group members should always feel comfortable working together and asking for help when needed. Team-building activities or check-in questions at the beginning of every meeting can set the tone for a safe space. Encourage the group to bond in settings outside of the project environment, such as hanging out on a Friday night or going for a hike on a Saturday afternoon.

5. **Find Your Passion:** Everyone has got something different they enjoy doing. Find out what it is and how you can incorporate it to increase the likelihood of your project's success. Often people can surprise you with their skills and the unique ways in which they can apply them.

6. **Make it Fun!:** As activists we are confronting the serious problems of the world. A sense of humor and making the most fun out of what we need to do is imperative. Make games out of dumpster diving, have silly contests involving trash bins, and make communication light-hearted. Being a goofball will make everything a little more fun and make you more approachable as a leader.

ten tips for every leader

7 **Avoid Burnout:** Student organizing is a lot of work. We can all feel a little overloaded or discouraged. We call this "burnout" and it happens to all of us in the activist cycle. Sometimes you need to just take a few steps back and remember:

- The world has many problems, you can't solve everything.
- Between school, work, activism, friends, and family, life can be stressful.
- Take one step at a time, play some music, write things down, or do whatever you need to do to calm yourself down.
- Take time for yourself. As an activist we can carry the world on our shoulders, but sometimes we need to prioritize sleep, exercise, and other outlets for our own well-being.
- Ask for help! This is arguably the biggest challenge of them all, but sometimes we need to lean on others; friends, family, mentors, coaches, advisors, etc. Find someone you're comfortable with and talk about what's bothering you, it's the best way to work through issues. The PLAN team is also here to help every step of the way.

8 **Value the Butterfly Effect:** The idea that a small difference can make significant impact later on is at the root of what we do. You never know just how far your actions will spread. Even if something is not successful despite our best efforts, that does not mean the very act of trying won't inspire others to join the fight.

9 **Don't Take "No" for an Answer:** It is very easy for administrators to dismiss a student's ideas. It takes time, consideration, and energy to say yes. Take the time to meet with administrators and get to know them – build a trusting relationship and discuss with them what their concerns are. Ask for help in making it work for both you and your campus and negotiate solutions.

10 **Create New Leaders:** Leadership isn't about creating followers – it's about creating leaders. Be an open book and share tips and skills with your peers. This will ensure that sustainable initiatives happen at your campus even after you have graduated and moved on to future endeavors!

2. Team Meetings

As the coordinator of your group, you are responsible for running and organizing regular meetings. You and your group will develop your own meeting structure and dynamics over time, but here are a few bits of advice to get you started:

Set an agenda for each meeting.

The agenda should be posted and available to your entire team before each meeting so that everyone is on the same page. If you have a limited meeting time, allocate time slots for each topic. As the semester progresses, find ways to include others in the agenda-making process. This could mean sending out a draft of the meeting agenda in a weekly reminder, posting it in the workspace, or reaching out to others for discussion topics they would like to add.

Have a note taker.

It's always important for someone in the group to take notes during the meeting to be sent out via email or social media after the meeting is over. This type of follow-up creates accountability within the organization, allows for members who missed the meeting to stay in the loop, and serves as an archival record to check that all tasks were addressed and action items accomplished.

Rotate facilitators.

The facilitator's main job is to ensure that the team sticks to the agenda. As a team leader, you don't always have to set the meeting agenda and you don't always have to be the meeting facilitator. Sharing this responsibility redistributes the workload and allows others in your group to step up and show leadership.

Hold your group accountable.

At some point during the meeting you should have all of your team members check in. They should update the group on the progress of the task they took on, and share any roadblocks they have encountered during the process. This creates a weekly incentive for team members to follow through, and keeps everyone accountable for the timeline they have committed to.

Include everyone.

Find ways to include all members in conversation and tasks. This might mean allowing another member to talk about a meeting you both attended. Or if you are having a group discussion and you notice someone hasn't weighed in yet you can ask them if there's anything they'd like to add. Some members feel less comfortable speaking up and it's important to make sure all voices are heard.

Start with an icebreaker.

This can be an easy way to set the tone of the meeting and break new members out of their shell. A "temperature check" by means of a check-in question can also create a safe space and bring your team members a little closer.

3. Dealing with Criticism

Despite your best intentions to make a positive change, you may receive criticism for your efforts from time to time. Presenting yourself professionally in the wake of criticism can go a long way. It can come from a number of sources and vary in nature, from constructive to hurtful. Maybe your members don't like your leadership style or how you run meetings. Perhaps someone in the administration is upset with how a particular aspect of your program was run. A customer might complain about an item at the yard sale. No matter the situation, approach it with rationality. Making the effort to understand what your critic is frustrated with can be much more effective than taking the criticism to heart. Perhaps you and your critic can reach a compromise. Be willing to admit if you are wrong – you're a student and this is a new program, and it's OK! You are here because you care and can only grow from any feedback you receive. Look at every critic as a chance to improve yourself and your program. Finally, do your best to document criticisms and share them with the group.

4. Recruiting and Retaining Team Members

As you are building your program, it's important to organize a team to help you. These "members" are more than just volunteers, they are fellow leaders and organizers. They are the people who help you fundraise, recruit and manage volunteers, establish program logistics, etc. The best way to retain members is to create incentives for them to keep coming back. There are two main ways to do so:

Build Leadership, Responsibility, & Accountability

Members will come back if they feel they have to. They want to participate, but unless they feel their involvement is necessary to the success of the project, they may not feel like they can fit it into their busy lives. Make sure that all of your members have a role within the project team. Similar to team meetings, regularly facilitate tasks and eventually divide up designated roles within the group. These positions may include "treasurer", "volunteer coordinator", "social media/ outreach coordinator", "secretary", etc.

Build Friendships and a Community of Support

In student organizing there's the reality of frequent turnover and constant recruitment. You can never have too much support, so why stop recruiting? Talk with your recruitment coordinator about creative ways to bring in new members throughout the year, or brainstorm ideas with your team. Build your social media presence and make it accessible to the public when and where your meetings will be. Use photos of your projects to show off all the cool stuff your group is doing. Post flyers around campus and advertise in the school newspaper.

If you are recruiting in person, make sure that you document contact information by creating a simple sign-up sheet asking for a name, email and cell number. Archive this information and follow up with an email describing the perks of being involved and encouraging everyone who provided their information to join your project and attend meetings.

Leadership Turnover

With any project on a university or college campus, it is a reality that super-star students playing a monumental role will graduate. Fortunately, there are incoming freshmen and transfer students who are often eager to get involved in their new campus home, especially in a project working for positive change!

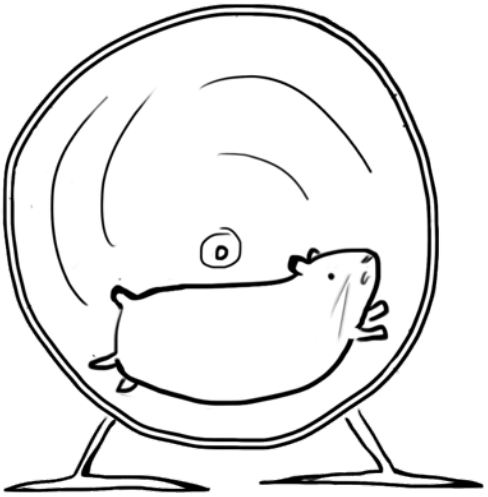
Whether you are the leader of your program, or a student who has been involved throughout your college career, always keep your eyes peeled for potential leaders among your ranks. It is useful to identify a younger student earlier on in the year that you can envision taking over your program once you have gone. This might be a student who shows diligence and a passion to be involved at the get-go, or a student who continues to step up their involvement throughout the year. That being said, it is certainly an undertaking to transfer over leadership roles and responsibilities. Identifying a potential leader earlier on can enable you to train the individual throughout the year, and give them increasingly weighted tasks to build them up for their new leadership role.

Leadership turnover is inevitable, and important for the longevity of any project or program. We are here to assist in this process, by providing you and your student-in-training with skill-building resources, as well as advice on how to gradually hand over major responsibilities.

A useful tool for handing over leadership is an end of year “Project Summary” document to provide your student-in-training with once you have gone. This document includes:

- a summary of your role as a leader
- annual projects and events involved in the position
- contact information for faculty, staff, community members, and other stakeholders that students will regularly be in touch with
- any other important tasks involved in the leadership role

Avoiding Administrative "Run-Arounds"



Starting any sort of change-making project or program involves meeting with representatives and administrators from different campus departments. This can become lengthy, as one administrator may send you onto another, culminating in what we refer to as "administrative run-arounds". To get the answers you need and establish important contacts ASAP, **find a "champion"** to assist in spearheading the setup of your project or program, and involve them in **collaborative meetings** with multiple campus stakeholders.

1) Find a Champion

This individual could be a faculty or staff member who is invested in the success of your project, a professor that you have established exceptional rapport with, or a recent graduate who has been involved in projects on your campus in the past, and has experience navigating the administrative hierarchy of your college or university.No matter how confident you are in your project, administrators are often more receptive to the voice and suggestions of other staff and faculty members.

2) Collaborative Meetings

Having a project champion can ensure that you get into the right meetings with the right people, ultimately to get the answers and permissions you need to get the ball rolling. Getting as many of these stakeholders in one room at the same time makes this process more time efficient. Be sure to keep your champion and all other important project stakeholders up to date and in communication to keep the progress of your project running smoothly.

The PLAN team is here to support you if you need help in identifying your project champion, to help you get the conversation started, and give you our backing that we are confident in the success of your project!

Collaboration & Intersectionality

Many hands make light work - aside from the people power of individual students from different campus groups, establishing a relationship with another student entity or organization can be an important “in” for securing materials, space, and advertising for a successful project. Likewise, having more students involved from a variety of disciplines, interests, and organizational backgrounds builds a program that better serves a larger, more inclusive audience of student users.

The Waste Audit

Every campus generates waste, but is your campus doing enough to make sure it is being handled properly?

The waste audit analyzes every part of the waste system including waste zones, bin types, collection process, diversion capacity, and general public knowledge. Waste audits can help identify issues within the system and changes that can be made to have a real impact on your campus's budget and environmental footprint. The main information you should be able to conclude from a waste audit is :

1 How much waste does your campus generate?

2 What materials make up your campus's waste?

3 Are all these materials being disposed of properly?

Other questions to consider throughout the process include:

What happens to the waste that leaves your campus? How much is recycled, landfilled, composted, or incinerated? (p. 27)

Is everything that can be diverted from the waste stream being handled properly? (p. 17)

What are the details of your campus's waste contracts? (p. 27 + 34)

How much are your campus's waste costs and how have they changed in recent years? (p. 21, 27, 34)

Are options such as recycling, composting, and e-waste collections being utilized? (p. 26)

Are all the best waste disposal options available on your campus? (p. 26)

How are your campus's waste costs calculated? By volume? By weight? (p. 27)

Is it clear for everyone who uses receptacles which type of waste goes where? (p. 28)

How does your campus compare to other institutions? (p. 29)

It is important to remember that every campus is different. You know your campus and the waste issues you want to address. You may not have the resources or campus infrastructure available to do every step that we suggest, and that's okay! Use what is available to you to accomplish what you feel is most important. This is *your* waste audit, although the campus coordinators at PLAN are available every step of the way to help you identify what will work best for your goals.

Methodologies

Your waste audit will have multiple stages and may include a combination of methodologies and approaches.

This chapter outlines the two major methodologies used for waste audits - weight-based and volume-based assessments - as well as categorization of typical waste streams found on a college campus. Chapter 5 of this manual covers four potential approaches in which to perform these methodologies. Further, the waste audit will involve some technical skills including statistical analysis and the scientific method. Since every piece of waste generated on your campus cannot be directly accounted for, your sample will never be perfect. Independent of the methodology and approaches you choose, take these steps to ensure you minimize errors in your data collection:

Choose dumpsters and waste bins that serve all types of spaces (i.e. academic buildings, residence halls, dining halls and cafés)

If you need to sample, choose a strategized random sample. For example if your campus has 50% residential dumpsters, 25% academic dumpsters, and 25% food dumpsters, make sure your sample has approximately the same ratio. Ratio consistency will apply at multiple levels, from dumpsters to office bins.

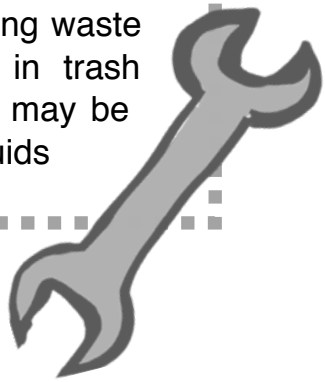
Take note of the time of year that you are conducting your audit so that external variables do not jeopardize the integrity of your sample. This could range from the time of week that the audit is conducted in relation to waste operation's pick-ups, or the time of year such as large campus events or holiday breaks.

Weight Based Assessments

The main component of this methodology is weighing the waste. It can be as simple as weighing all of the material in a particular waste receptacle, for example, by emptying out a dumpster bag by bag and weighing each bag to calculate a collective weight for the contents of the dumpster. There are cases where it is appropriate or necessary to calculate waste weight by a visual "guesstimate", though this approach has a higher potential for error. This involves finding out the weight of the dumpster contents, visually estimating the proportions of each material type, and extrapolating those proportions to find the individual material category weights. Visual weight guesstimates should only be used when the individual material types of a trash receptacle are at the point where they cannot realistically be weighed - i.e. contents are wet, resulting in a "stew" of materials, or your access to an industrial scale is limited.

A weight-based assessment is an opportunity to assess all of the different material types that enter your campus's waste stream, and their concomitant proportions. This involves deciding on waste stream categories to accommodate for all of the materials that you expect to find during your audit. You will use these categories when you physically separate out the contents of the dumpster.

A luggage weight can be a useful tool for weighing waste materials in trash bags that may be leaking fluids



Case Study

The specificity of your categories will depend on what type of information you want to get out of your waste audit. For example, in an assessment conducted in 2014 at the University of California Santa Cruz, sustainability staff were interested in how much of the waste stream consisted specifically of compostable paper towels from campus restrooms. This was following a removal of paper towels from all dorms during the prior academic year. For this reason, potentially compostable materials were denoted into three separate categories: “paper towels”, “food scraps”, and “other organics”. Likewise, when sorted, each category of material was weighed and recorded separately, rather than collectively into one “compostables” category.

Categories can be as general or as detailed as you like - as we have stressed before, it all depends on your capacity in regards to time, labor, budget, etc. For example, categories as broad as “recyclables” can include all of the different types of material that can be recycled, from plastic containers numbered 1 - 7, to paper, bottles, cans, and plastic film. Likewise, a “compostables” category would include all materials that have the potential to biodegrade in a compost pile, from food scraps and yard clippings to napkins and paper plates.

No matter how detailed you make your audit, knowing the quantity of the waste your institution produces by weight is valuable information. A weight-based assessment can produce reliable data used to lower material dumping costs and reduce your institution’s quantity of waste produced.

Compost

- Food scraps
- Pizza boxes
- Paper napkins, plates, sugar packets and towels
- Teabags and tea
- Plants, flowers and other garden trimmings
- Certified compostable packaging and utensils

Landfill Waste

- Non-recyclable plastics
- Contaminated recyclables
- Plastic-lined paper products (i.e. Dixie cup
- Packaging made up of multiple material types
- Plastic wrap
- Plastic bags (check with your local municipality)

Hazardous Waste

Take extra care in handling and disposal of these items. They are illegal to throw into the general waste stream and should be reported to the Environmental Health and Safety authority at your institution or in your local municipality.

- mercury containing items (i.e. light bulbs, thermometers)
- weapons
- batteries
- medical waste (i.e. syringes)
- household cleaning supplies
- industrial chemicals
- medications and pharmaceuticals

Mixed Recycling

If your campus has single stream recycling you can opt to do this as one category or separate into:

- Plastic containers numbered 1-7
- Glass
- Aluminum
- Clean/Unsoiled Paper
- Cardboard

Electronic Waste

- Electronics (cell phones, computers, etc.)
- Wiring
- Fans

Reusable Items

- Clothes
- Shoes
- Furniture

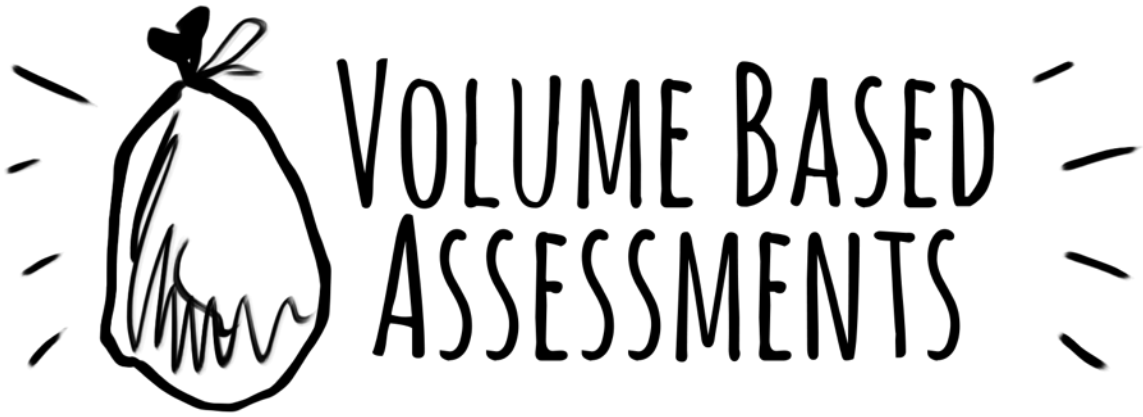
Styrofoam

- to-go food containers
- packing peanuts
- other non-food packaging

Construction Debris

- wood
- carpet
- metal scrap

You can find a category data sheet on the Member Resources Hub!



Volume Based Assessments

If you do not have access to a scale, or are unable to physically separate out the contents of a waste receptacle, a volume-based assessment is another appropriate methodology to conduct a waste audit. Assess the volume of waste by estimating the amount of physical space that is filled by materials in the trash receptacle you are auditing. This can be done by taking small samples of the materials in a particular receptacle, and extrapolating your guesstimated material percentages to apply to the rest of the receptacle contents.

For example, you may open up a dumpster and only have a view of the top third of its contents. In your field of vision, you may see that ⅓ of that material is recyclable paper, ⅓ is food scraps, and ⅓ trash. By multiplying these proportions with the dimensions of the dumpster, you can calculate an informed estimate of the volumes of material types filling the receptacle. As in weight-based assessments, categorization of materials can be done as extensively as is appropriate for your project needs.

It is important to note how the nature of the data that you collect is different for a volume-based assessment versus a weight-based one.

For example, a relatively light-weight material such as Styrofoam takes up a large amount of space relative to its weight. Keeping this type of information in mind is important in assessing the efficiency of your institution's waste management operations - lightweight items that take up more space in a waste receptacle requires more frequent services and more trips to the landfill. Depending on the waste infrastructure of your local municipality, this may result in higher costs to dump your trash, as some operations charge by volume dumped, while others charge by weight.

<< Considering Costs >>

It is important to plan ahead for the cost of your waste audit. Depending on your situation you will want to account for all costs that will be changing hands throughout the project. Be sure to consider :

- Labor costs for you, your students, or hired help
- Things to keep your workers happy and healthy (i.e. food, water, safety equipment)
- Compensation from your school, grants, or fundraising
- Equipment and supply costs

You can find a sample budget drafted up by PLAN on the Member Resources Hub.

The Campus Waste Timeline

Move-in and Move-out Periods

Move-in is a time of increased waste generated on campus, especially with the disposal of newly purchased dorm furniture and decor wrapped in a plethora of packaging. Some campuses may bring in extra waste receptacles or plan more frequent pickup times in order to account for this added waste. It is important to note whether extra dumpsters interfere with access to other receptacles, which could result in stream contamination. For example, if a recycling dumpster full, students may throw recycling into the municipal waste stream. Conducting a waste assessment during move-in period may not deliver results representative of your campus's usual waste production. Auditing during this time will likely be more labor-intensive, but can serve as a great opportunity to gather information for suggestions to minimizing waste generated during the move-in process.

Move-out generates a huge amount of waste on college campuses, as students dispose of everything from furniture to unfinished toiletries. Similar to move-in time, it is important to ensure that extra dumpsters brought in by haulers do not block other receptacles. Daily records should be kept documenting the levels to which dumpsters are filled – take note of overflowing dumpsters or cross contamination. As with move-in period, hauler records are worth consulting. If your school has a yard sale program keep an eye out for the types of items that bypass collection areas and wind up in dumpsters. Don't be afraid to jump into the dumpster to grab anything usable and prevent it from reaching the landfill. If your school has a yard sale program then you can integrate these items into the program for resale.

Breaks & Holidays

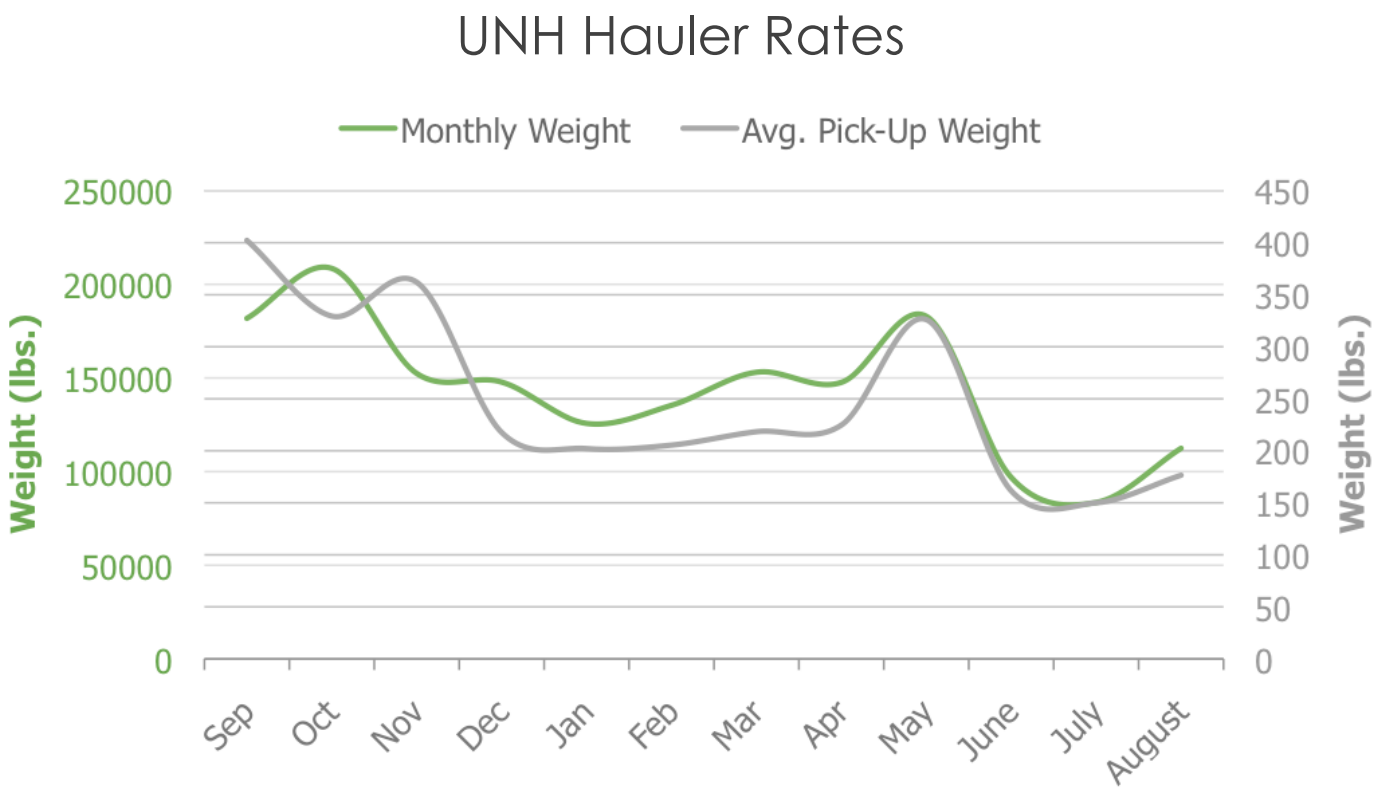
Over the summer months there are typically less students on campus, so less waste is being generated. If possible, keep a lookout for instances of receptacles being picked up when less than full. This can be a time in which to better gauge the overall efficiency of the waste management operations on your campus, and make suggestions that will save the university time and money. Take note of your college's waste hauler records for this time period. Note if any significantly small (less than 50 pounds is a good benchmark) waste pickups were recorded by the hauler.

School Year

The majority of waste audits will be most useful when conducted during regular school year operations. Likewise, hauler data for this time period should be relatively consistent. It is often beneficial to track unusual pickup-weight fluctuations with events on campus, campus tours, or visits from non-campus residents.

Examples of unusual things that can affect waste generation during the school year include:

- Weather: snow and rainwater add weight to dumpsters
- Winter sand tracked indoors and swept up by housekeeping
- Renovation Projects
- Campus-wide events



Tracking reported pick-up weights over time allowed UNH to identify periods when the most waste was generated vs. when haulers were collecting more often than was necessary.

Approaches

There are many different approaches in which to carry out both weight-based and volume-based assessments. A couple of approaches that we suggest include:

1) Trash Pick
2) Receptacle Audit (offices, dorms, dumpsters, etc.)
3) Analysis of your campus waste hauler's records
4) In-person survey of staff and students

All steps require extensive planning, so depending on your resources you may opt to do one or a combination of these approaches. Tailor your waste audit to reflect your campus's size and most important issues.

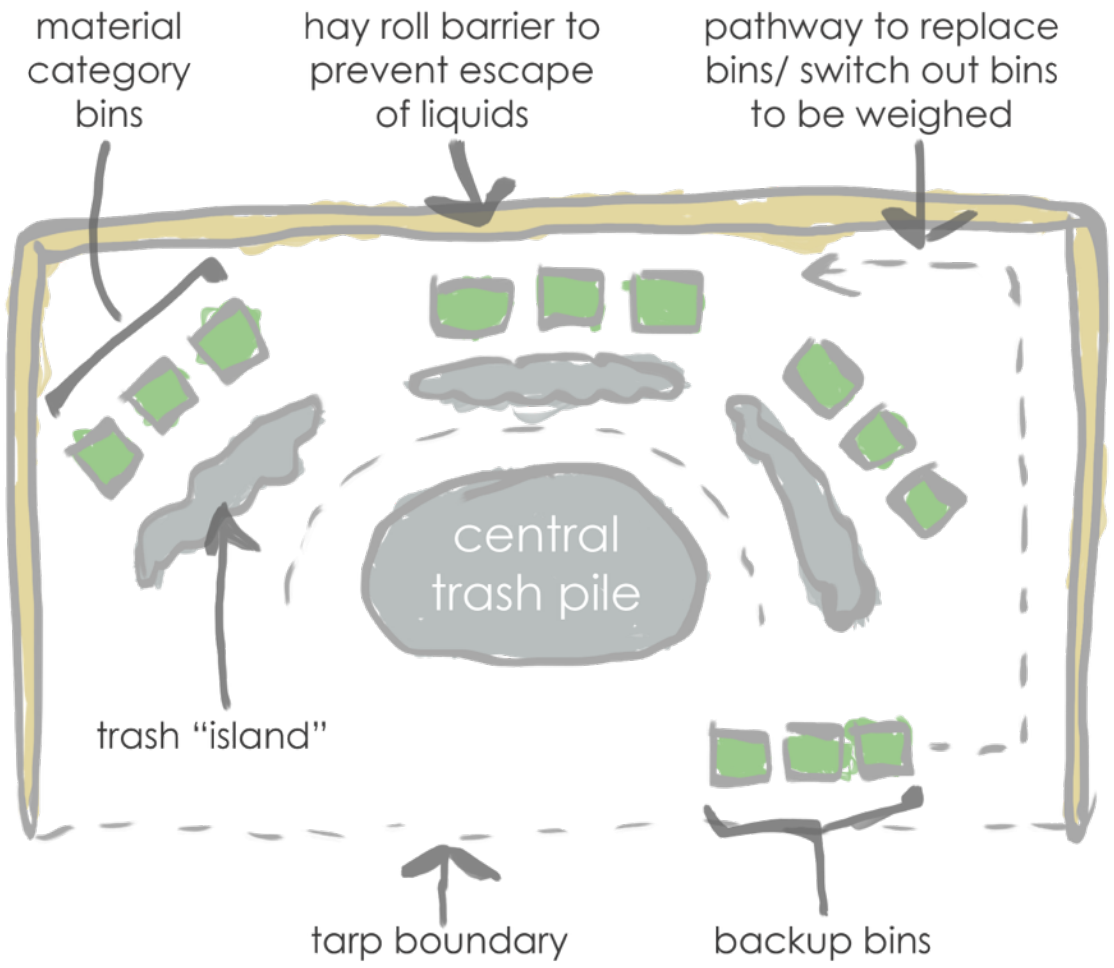
Grounds Services staff, Sustainability Office students, and temporarily hired workers work alongside one another to separate out materials into designated categories at UCSC's 2014 Waste Assessment. Photo Credit Elida Erickson.

1) Trash Pick

A trash pick is one of the dirtiest approaches to a waste audit, so it is important to find willing participants long in advance and keep morale high. It's name is very much indicative of what it entails, in that you will be physically removing the contents of a waste receptacle to be separated out into material categories that will be weighed or visually assessed. Although it is a dirty job, you can make a trash pick into a fun and interactive event that students want to attend. Some campuses have planned celebrations for after their trash pick, involving music, food, and interactive activities around the waste assessed. The trash pick is also a great opportunity to educate student populations about waste and the impact of their decisions as consumers.

A trash pick is typically done from a sampling of dumpsters or other receptacles serving a variety of spaces. You may opt to separate waste by the types of locations it came from to gauge the different disposal habits throughout campus. Be sure to get a good representation of locations for your trash pick including academic buildings, residence halls, and dining facilities. It may also be helpful to consult a waste operations employee for advice on how to separate questionable items. You may not want to designate a container for every category listed in the material categories that we have suggested in a prior section of this manual (p. 17), but the more diligently items are separated, the more detailed your information you can collect.

Waste Assessment Site Layout



For an outside trash pick, it is wise to lay down a large tarp to put waste materials on, and lining this tarp with hay rolls to prevent the escape of liquids. Material can be dumped into a pile at the center of the tarp; create smaller trash "islands" that will be easier to sort through. Category bins can be lined around the perimeter of these smaller piles, with a clear path for changing out full bins with empty ones.

Sample List of Supplies

- Tarp for separating out waste
- Sandbags, to weigh down tarp
- Grabbers for separating materials
- Industrial-style gloves
- Safety glasses
- Shovels, for stew of material left after sorting of materials into categories
- Dust masks

Safety First, ya know?

Keep in mind that the sorting process can expose people to harmful waste including sharp objects, toxins, and medical waste. While these are usually minimal in college campus waste streams, it is important to take precautionary measures. Safety garments such as puncture-resistant gloves, sturdy boots, pants, and long-sleeved shirts should be used during the trash pick. Participants should have the option of wearing additional outerwear (coveralls or Tyvek suits) and masks as well. You may be able to borrow some of these items from your waste management operations on campus or otherwise find it worthwhile to invest in these types of supplies if you anticipate conducting more audits in the future.

When and Where

Picking an appropriate location and time for your trash pick will involve some pre-planning. For example, if your trash pick is in an open location with a lot of traffic, it can serve as a good educational opportunity for passers-by. However, you may have to take more steps to ensure that materials do not scatter to impede on the regular functioning of the space. Also consider weather events such as wind and rain when choosing a time and location, so as to avoid materials blowing around, prevent the travel of odors, and ensure the ability of workers and volunteers to sort materials in a bearable environment. More often than not, dumpster contents will conglomerate into a "stew" of material, so that liquids are released from damp or wet waste products. Take into account the escape of liquids when selecting a location for your trash pick.

Location	Benefits	Disadvantages
Off-campus location, such as a local Waste Management facility	- won't be interrupted by or disrupt on-campus activities - ability to reserve space for as much time as you need	- may have costs associated with use of space - extra planning required: safely transporting waste material, workers, & supplies
Open space on-campus (i.e. parking lot, field)	- visibility for passers-by serves as educational opportunity - no cost to use space	- materials that escape sorting space may impede on campus activity - time constrictions may come with shared public space
Enclosed space on-campus (i.e. sports stadium)	- likely no cost for space use - won't interrupt or be interrupted by regular campus activities	- requires more navigation through admin to reserve space - liability for any damages to the space during use

2) Receptacle Audits

The concept behind receptacle audits is to go beyond tracking the actual material that is disposed of on your campus to assessing the usability and efficiency of the system of containers in which that material is discarded in. These audits can be done at multiple scales, depending on the type of receptacle you are auditing.

Bins

Many campuses have inconsistencies among their waste receptacles. It is important that all waste receptacles are appropriately sized, colored, and labeled, and that all available waste options appear in every location. If your campus is too large or you do not have the resources to document every trash bin, collect a strategized random sample. Bins can be audited through visual assessment, assessment by weight both, or with a mixture of both, as discussed in the "Methodologies" section. It is best to track this information with a spreadsheet, such as the template document listed in the resources appendix of this guide. The following information should be included when analyzing bins and their effectiveness as a component of your waste management operations:

- Bin color, size, and labeling
- Bin location
- Type of space served
- Accessibility
- Lack/excess of bins
- Collection of empty bins or overflowing receptacles
- Unusual observations such as mislabeling or bin displacement

Recording these types of details can enable you to identify gaps in the waste collection on your campus. Furthermore, this data can be used to make recommendations ensuring that bins on campus are easy for students and staff to use. When collections sites and receptacles are streamlined so that users don't have to think too hard about the disposal of their waste, it is more likely that material will be disposed of properly. Less contaminations in material streams will extend to the efficiency of waste management operations for the greater campus.

For a Receptacle Tracking Datasheet template, check out the Member Resources Hub.

Dumpsters

For waste management operations to run smoothly, it is important to ensure that dumpsters are properly sized and being served at the correct intervals. Be mindful of the time period of the school year as the waste stream varies widely between holiday breaks, the academic year, and during big campus events. Talk with your campus waste management operations about the times and days that dumpsters are serviced, taking into account these timelines in comparison to when you conduct your audits. Checking back in with operations officials after your audit will also serve to help you approximate weights to the levels you saw, and identify any inconsistencies in your data.

3) Hauler Records

Waste operations are required to keep records of your campus trash pickup, and can be useful in verifying your data from other audit approaches. Some records may be better than others. Do your best to find all information available and use it to your advantage to track dumpster weights and frequencies throughout the year. Keep an eye out for inconsistencies or time periods of low pickup weights or other unusual patterns. By comparing these records with your own assessment data/results, you can recognize areas where recommendations will be most effective.

For a Hauler Records Datasheet template, check out the Member Resources Hub.

4) In-Person Surveys

Surveys are a qualitative assessment approach, used to gauge the attitudes of the general public regarding the way they dispose of waste. Surveys can also identify gaps in the public's knowledge of recycling and composting. Surveying a wide variety and large number of individuals will improve your results. Students, housekeeping staff, administrators, and other faculty will all offer different insights into waste practices and attitudes on your campus.

You can use many different methods of surveying including electronic surveys or in-person interviews. Electronic surveys are easily set up through Google and will compile information into a spreadsheet for you. Online surveys have the potential to be biased in regards to participation, but do your best to reach a wide variety of people by posting your survey on social media platforms. If you have resources available, simple incentives such as entering participants into a gift card drawing can bring in more people. Some sample questions you can include, but are certainly not limited to, are:

How often do you recycle or compost on campus?

How often do you recycle or compost at home?

What would make you recycle or compost more on campus?

What steps do you take to reduce your overall waste impact?

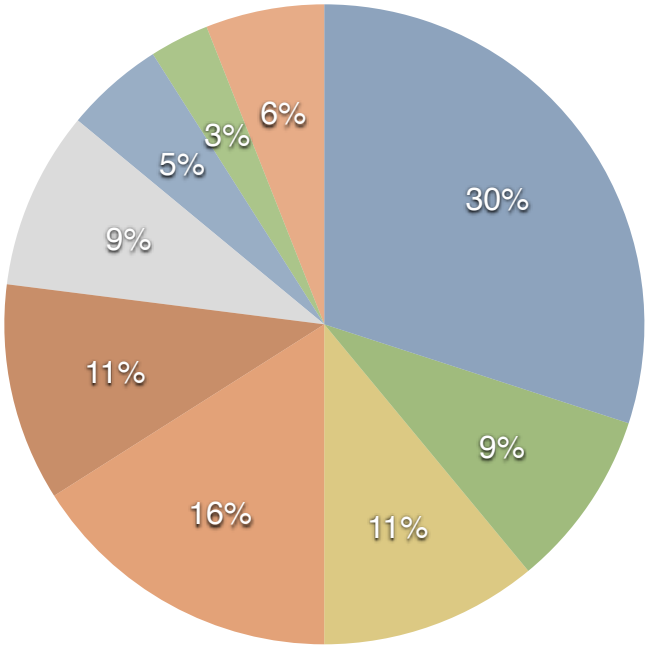
How do you think the campus could reduce its waste impact?

You can find a sample in-person survey on the Member Resources Hub.

Data Analysis & Presentation

There are many approaches you can take to analyze and present the data that you compile from your waste audit.

For more quantitative approaches such as weight and/or volume-based trash picks, graphs and pie charts can be useful tools to present the different proportions of materials in your waste stream. Depending on your data needs, your analysis may simply include material proportions and weights, or could extend to calculating confidence intervals and margins of error to validate your data.



Campus-Wide (Overall)
Waste Resource Distribution

- Trash
- Recycle Paper
- Recycle Container
- Organics Food
- Organics Paper Towels
- Organics Other
- Plastic Film
- Cardboard
- Styro
- E Waste, Other

Data from 2014 Waste Assessment conducted at University of California Santa Cruz; courtesy of Roger Edberg, UCSC Grounds Services.

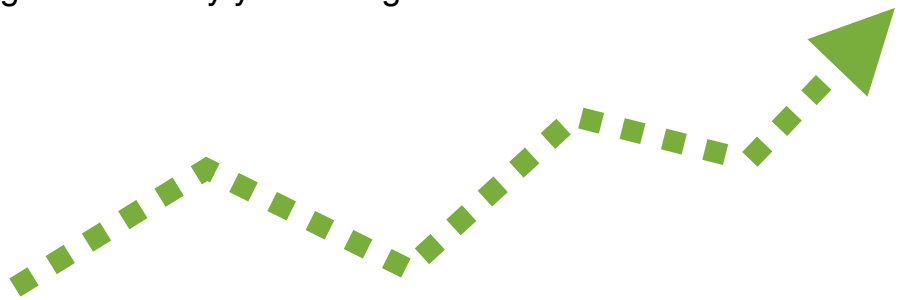
More qualitative audits such as in-person surveys can be a bit trickier to present in a visual way, but don't be afraid to get creative! Infographics that incorporate both qualitative and quantitative information can be useful for analyzing and presenting your data. You may want to consult the statistical analysis center or statistics department at your institution to assist you in identifying the best approaches to analyzing and presenting your audit data.

Waste Audit Follow-Up

Recommendations for Your Campus

A well conducted waste audit will identify areas where your campus can improve its waste system. Improvements can often be made from management, environmental, educational and fiscal perspectives. Do your best to bring forward your results to all of the stakeholders we mentioned on page 3 of the “Introduction” chapter, including administrators and students involved in the process, or anyone with a general interest. The more you publicize the results from your audit, the more likely it is that your recommendations will be considered and put into action.

Make sure your arguments make it clear for your institution why it is in their best interest to implement changes. While many of your suggestions may be well-founded, not all institutions are quick to adopt changes. Although the snail pace of institutional progress can be frustrating, it is important to maintain a professional attitude to ensure that your suggestions are taken seriously. By talking to the right people and gaining sufficient support, your team can bring real changes to the way your college handles waste.



Improving Waste Management on Campus

CONGRATULATIONS! You have successfully conducted a waste audit, and let's face it, it can certainly be a messy undertaking! So now what?

Take a look at the next-steps we've outlined below for using your audit findings to improve waste management on your campus. Remember to involve all of the campus stakeholders we have stressed before, including the Sustainability Office, Waste Management department, and other aspects of administration that influence the way waste is handled on campus.

1. Familiarize yourself with existing waste management operations of your campus and the municipality in which your campus is located.

2. Know the financial incentives involved in your campus's waste management operations.

3. Make the waste disposal process educational, interactive, and user-friendly.

4. Identify that your campus has a variety of waste streams, and that they will all need to be deal with differently!

Existing Waste Management Operations

Identify any existing recycling and/or composting programs that your campus partners in with the local community. If campus and community operations are separate, there may be an opportunity for a partnership to exist. Municipal partnerships are an opportunity fr material aggregation to streamline diversion efforts. Part of knowing existing waste management operations on campus is familiarizing yourself with the **sizing and location of bins** as well as **pickup logistics.**

Sizing & Location

If you are able to identify any receptacles or dumpsters that are consistently under-filled or overflowing, this is an opportunity for you to make recommendations. Furthermore, different streams may require different sized bins, especially in regards to your campus's procurement. For example, if all of the food services on your campus package their to-go food in compostable containers, your bin for compostables may need to be bigger and more obvious than the trash bin.

Pickup Logistics

If dumpsters are owned and operated by the waste contractor the administration in charge of waste contracts will need to be involved in the process of dumpster relocation. This varies widely between schools but typically falls under the responsibility of facilities, grounds, or the purchasing department. These types of changes are important to your school, as they are typically those that will make the most fiscal impact on your institution.

Case Study

In a Zero Waste Pilot of UCSC's McHenry Library, the need to reevaluate bin size surfaced early on in the project. Zero Waste stations consisting of equally sized bins for paper, container recycling, compost, and trash were placed throughout the building. Sustainability Office student employees conducted weekly visual audits of the stations and found that the compost bin was continually overflowing, mostly with compostable service-ware from the library's cafe. Students deduced that compost was the largest waste stream in McHenry Library, and that this stream's bin should have been double the size of other standard bins.

Financial Incentives

Your institution may already receive **monetary rebates** for certain recyclables; latch onto this to advocate expanded recycling operations to your administration. Furthermore, you can focus on how establishing a recycling program at your school could decrease dumping fees for landfill waste and even provide revenue through selling valuable materials such as cardboard to local businesses. If your campus already has a rigorous recycling program in place, perhaps do some research into a cost benefit analysis of recycling rebates versus the procurement of more durable products that aren't single use. That way, your campus can work towards producing less material that needs to be recycled in the first place!

You may find from your audit that waste management operations are financially inefficient. Perhaps dumpsters are picked up when they aren't full, and your campus is being charged more than it should be. In this case, your campus waste contracts may need to be renegotiated. Consultants can be hired by the university to re-evaluate and negotiate your waste contracts. The advantage of doing this is that it will still save the university a significant amount of money without putting more responsibility on students and staff.

For campuses interested in optimizing their waste systems and cost savings, PLAN works in collaboration with a organization called Waste Focus. Waste Focus emphasizes waste reduction and an average of 25% cost savings through recycling programs and hauler optimization. If your campus might be interested in such a program, talk to our Campus Coordinators for more information.

WasteFocus
Focused on environmental solutions

Some things to look for when comparing waste contractors:

- Overall cost for service (one contractor may be cheaper based on your specific needs)
- More recycling options
- Composting services
- Satisfactory quality of service

A User-Friendly Process

The disposable culture that we are so accustomed to makes it easy to be oblivious to what we throw away. It's no surprise that people can get confused when asked to take the extra time to sort their waste. Shaming students and staff when they don't discard of materials in the proper place will only result in push back or frustration by all parties involved.

Campus residents may be more likely to participate in material recovery efforts if they don't have to work to decipher which material belongs where. All waste receptacles should be placed in convenient locations across campus with **consistent color schemes**, **lid size**, and **clear labeling**.

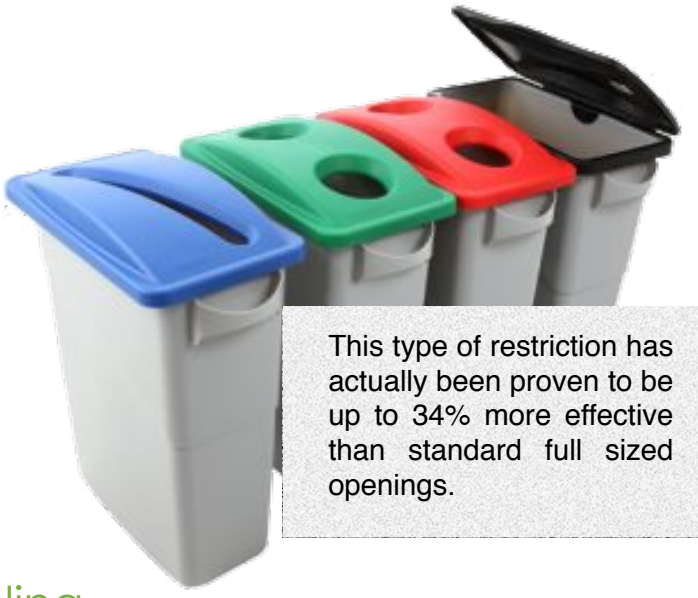
When choosing colors for your disposal streams, make sure that they are consistent across campus, easily distinguishable from one another, and ideally not in conflict with existing color systems for waste.

Labeling should also be consistent, and should include the type of waste, an appropriate symbol for that type of waste (for example, the recycling symbol), as well as a list of typical items for that waste stream. Place permanent labels either directly on the receptacle or at eye level behind the bin.

Compost bins should have a lid on them to minimize smell and pest issues. Lids should be relatively airtight but easy to open with hands or a foot petal.

Work with your institution to ensure that labelling on these receptacles remains consistent with the locality in which campus is located. For example, if your district uses blue for trash bins and green for recycling, it might be a disadvantage for your campus to use green for trash and blue for recycling.

Recycling bins can come with openings on top that demonstrate the types of waste they are intended for. In locations where a more formal appearance is needed, permanent waste cabinets may be used.



This type of restriction has actually been proven to be up to 34% more effective than standard full sized openings.

Beyond Trash and Recycling

Food waste and hard to recycle materials like Styrofoam and e-waste will require their own special attention. For more information on dealing with other waste streams, take a look at our “Expanded Recycling” and “Food Recovery” manuals.

Simple Steps to Reduce Waste generation

We have discussed many different ways for your campus to implement for sustainable waste management operations. There are also ways to reduce the waste produced at all. Minimizing waste of any kind is always better than trash, recycling, or even composting. Ways that your campus can systematically impact the waste stream:

- Offering reusable to-go containers
- Offering reusable beverage cups
- Buying recycled products including paper (creates more demand for recycled products which incentivizes the industry)
- Charging extra for trash generating to-go items
- Providing easy access to reusable water bottles and water refill stations for students
- Installing hand dryers instead of paper towels in restrooms

Conclusion

This waste audit is for your specific campus.

No two campuses are exactly the same and so no two waste audits will work the same. This guide provides you with the general tools to start designing a waste audit on your campus. Focus on how you can best use your own resources and where your campus needs the most improvement. Customizing your plan and creating goals for your team will maximize your success. Not every school can improve on everything, but every school can improve on something. Your job is to identify what those gaps in the system are and how to best implement long term, sustainable solutions.

When the only option is a dumpster,
everything looks like trash.