



HOW TO CONDUCT A WASTE SORT

A Step-By-Step Guide



**NEBRASKA
RECYCLING
COUNCIL**

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Created by Nebraska Recycling Council with permission to use content from the following resources:

How-to Guide for Conducting a Waste Sort www.hennepin.us/organics

RUBICONMethod™ Waste Audit Guide www.rubiconglobal.com/tools-guides

WHY CONDUCT A WASTE SORT?

A waste sort is an essential tool for maximizing the effectiveness of waste management programs and improving operational efficiency. It can expose wasteful practices, reveal opportunities for cost-saving improvements, or confirm the success of diversion programs. The data collected can pinpoint specific areas where actions can be taken.

HOW A WASTE SORT DIFFERS FROM A WASTE ASSESSMENT

Waste assessments and waste sorts are useful tools for analyzing solid waste and recycling programs. A waste assessment is a process used to evaluate a facility's waste processes, where and how much waste material is generated and managed. On the other hand, a waste sort is a type of audit in which materials are collected from trash and recycling containers, sorted by material, and quantified for a specific period of time. A waste assessment is generally more qualitative, while a waste audit provides hard data on the amount and categories of materials being discarded.

DETERMINING THE GOALS OF A WASTE SORT

Given the logistics and labor involved in a waste sort, it is important to be able to articulate why it is needed to obtain required approvals and cooperation from staff. Here are a few reasons for conducting a sort:

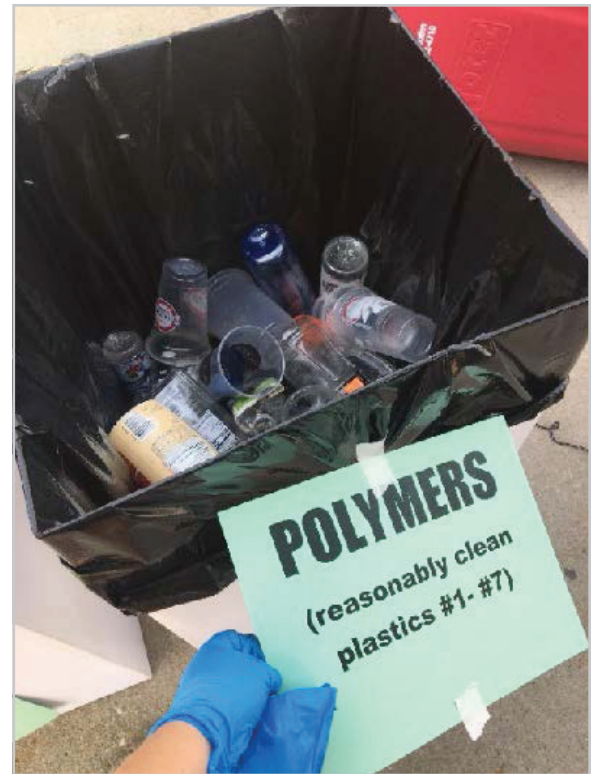
- To establish realistic waste diversion goals for the facility.
- To measure the current recycling and/or composting rates as compared to the landfill rate.
- To determine the feasibility of adding organics recycling.
- To determine how well occupants are following the current recycling program.
- To determine waste composition in the cafeteria for low-waste lunch initiatives or composting.
- To determine the feasibility and relative costs of separating recyclables in multiple streams instead of single-stream recycling. A facility may also decide to have at least three streams of collection, one for cardboard, one for other paper fiber, and one for cans and bottles. This would impact both container design and how the materials are collected.
- To identify specific waste streams that could be reduced or eliminated through the application of different processes. For example, the facility may generate a large amount of high-quality office paper that could either generate revenue or be reduced by digitizing office functions.
- To identify gaps in recycling communications and education programs.
- To qualify for a certification, like LEED or to become a certified Zero Waste Facility.
- To find operational savings through waste reduction opportunities.

Certain waste streams are not included in a waste sort, like fluorescent lamps, auto and rechargeable batteries, used cooking or motor oil, tires, scrap metal, electronics, and hazardous wastes, etc., but in order to calculate an annual waste diversion rate for the facility, all discarded materials should be quantified to create an accurate picture.

SCHEDULING AND APPROVAL

The first step is to get approval and notify key people about the proposed waste sort and the rationale for conducting it.

- Obtain approval from upper management. They may be interested in the results of the study, particularly if potential savings can be quantified.
- Facility management will need to assist with logistics, date(s), location, personal protective equipment (PPE), and other supplies that will be needed.
- Inform the custodial department or service to discuss the process and their roles.
- Inform department heads to ask for volunteer sorters.
- Inform waste and recycling haulers so they can adjust collection schedules, if necessary.



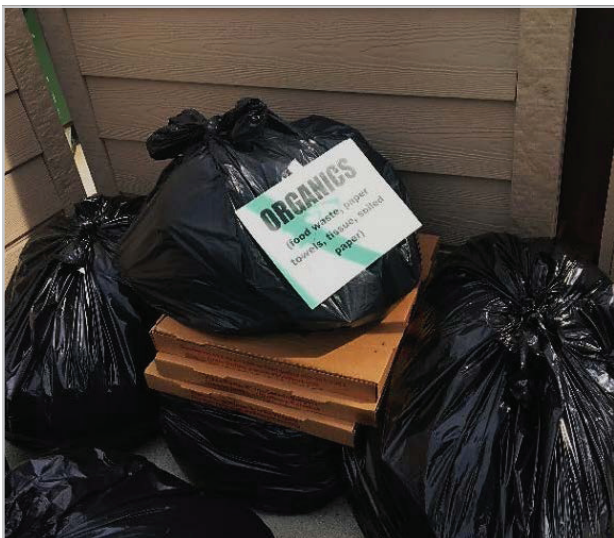
WHAT TO COLLECT AND FOR HOW LONG

The scope of a waste sort should be determined by the goals. Unless there is a desire to establish an overall recycling/composting rate, a limited sort can be appropriate. If the goal is to measure how much organic waste is being generated in the cafeteria and restrooms, for example, the sort would be limited to bins in those areas.

Once the scope is determined, select a timeframe that will provide the most accurate representative data. Several days, a week, or multiple weeks of data can be collected as long as there are no unusual events or seasonal variations that could skew the data. The sort can take place in one day after a week's worth of waste has been collected, or conducted on a daily basis during the specified timeframe.

SORTING CATEGORIES

The number of materials categories will be based on the details needed for waste management planning. Waste can be sorted into as few as two categories (trash and recycling) or 20 or more categories. Increasing the number of categories will increase the workload — more containers for sorting, more figures to record and report, and more intricate sorting of waste.



Trash subcategories might include Styrofoam products, plastic film, plastic containers and textiles. Recycling may consist of plastic bottles, glass bottles, mixed paper, office paper, metal cans, and cardboard. Organic waste usually consists of food and food-contaminated paper products. Liquid can be a category by itself or included with trash or with organics.

Zero waste tracking takes a more granular approach. This is because every material in the waste stream is examined under the lens of eliminating all trash, organics, and recycling bins.



WASTE SORT PERSONNEL

Sorting can be carried out by internal staff or volunteers, by hiring waste sort contractors, or a combination of these. It is valuable to include employees from various departments in the sort, even if they only participate in a brief shift.

Participation helps employees experience the extent and types of waste generated in the facility, and this can be a powerful motivator for improvement.

There is no specific guideline for the number of waste sorters required other than to obtain plenty of helpers! A general rule of thumb is that it takes 2 people 2 hours to sort 2 cubic yards of material.

Recycling bins can be sorted faster than trash containers because there is less “ick” to sort through.

The role of custodial staff is crucial. Provide instructions leading up to the collection day(s) and a checklist, as well as daily reminders to ensure waste is being properly collected during the waste sort timeframe.

One person should be the designated data recorder during the sort. To minimize errors, the data recorder should have no other job than to record data. Another best practice is to appoint one person to transport waste from the storage area to the sorting area and from the sorting area to the outdoor central collection bins after data is recorded.

EQUIPMENT AND TRAINING

Safety Training

Sorters should be trained to be on the alert for potential hazards while sorting through discarded material, following these and other precautionary procedures:

- Be aware of sharp objects.
- Be aware of hazardous chemicals.
- Use available tools to take apart clumps of waste.
- Look before grabbing items from the waste stream.

Personal Protective Equipment

- Wear sturdy, closed-toe shoes and dress appropriately for sorting through waste.
- Tyvek® suits and/or aprons.
- Safety goggles.
- Protective masks.
- Nitrile gloves. This is a thinner glove that can be worn beneath a tougher work glove as a secondary layer of protection from leaks.
- Work gloves. Look for ones that have a thick rubbery material on the palm side with a cloth upper side for

Tip:

Sorters should wear clothing and shoes that they don't mind getting dirty and bring a clean set to change into after the sort.

better fit and flexibility.

- Hand sanitizer.

Sorting equipment and data recording supplies

- Toters, also known as carts, can be used to store waste before sorting.
- Uniformly-sized sorting containers are helpful, but a mix of various containers is not a problem.
- Signs or labels for each waste stream for sorting containers.
- Data sheets or laptop for recording data electronically.
- Masking tape for marking material category, place of origin, date on bags of sorted materials.
- Permanent markers.
- Sorting surfaces, such as 6-8' portable tables or a piece of half-inch-thick plywood balanced on posts, toters, or other base.
- Tarps for floor or sorting tables, if needed.
- Squeegees, mops, brooms, dust pans for cleanup.
- Hand rakes and trowels for taking apart clumps of waste.
- Scale – either platform or hanging.
- First aid kit.
- Nearby access to a drain or sink, soap and hot water.
- Beverages and snacks for sorters.



COLLECTION AND STORAGE OF MATERIALS

As much as possible, only reveal the date of the sort to those who need to know. People will sometimes change their behavior if they know a waste sort is taking place. Place signs in central collection areas to remind custodians not to place waste in the dumpsters during the sort timeframe.

Each bag collected should be labeled with information on which type of container it came from (trash, recycling or organics), its place of origin (e.g., office, classroom, kitchen, room number, building, etc.), the day or date it was collected, and any other information needed.



SORTING AREA LAYOUT

The sorting area is designed to streamline the inflow and outflow of waste being sorted. A staging area for bags waiting to be sorted should be designated, as well as an area for materials that have been sorted, weighed, and recorded, (unless they will be taken to central collection containers immediately).

Each bag will be sorted on a table. The number of tables depends on the number of sorters. Surrounding each table are containers into which waste is separated by category. Label each of these containers with the type of waste it will contain (e.g., food, mixed paper, glass bottles, metal, etc.).

RECORDING DATA

Waste can be weighed in bags or containers. A digital hanging scale is quick and handy for weighing bags of waste. When materials are placed in containers, a platform scale is needed and the tare weight will need to be subtracted from the total weight. Tare weight is the weight of the container. Lone items, bulky materials such as cardboard boxes may be placed directly on the floor scale.

Volumes, if recorded, are estimated in gallons. Garbage bags and containers are usually sized by gallons, making it easier to estimate.



DISPOSING OF SORTED WASTE

After sorted waste is weighed and recorded, it should be moved from the main sorting area to avoid being mixed with samples that have not been sorted. Make sure all containers are empty and the sorting table is clear before beginning to sort subsequent samples.

ANALYZING DATA

The following are useful metrics that can be gained from the waste sort:

- Total waste generation in a specific time period (e.g., day, week) or in a specific area (e.g., cafeteria, kitchen, bathroom, etc.)
- Waste generation per employee, revenue, unit of production, etc.
- Waste composition
- Current Diversion Rate
- Potential Diversion Rate
- Recycling Contamination Rate
- Compost Contamination Rate

POST-SORT QUESTIONS TO CONSIDER

- Are existing services, service providers, and equipment still appropriate?
- Should any services be revised, optimized, or removed entirely?
- What new services and equipment are needed?
- Are there materials in the waste stream that can be reduced or eliminated?
- Is the training and education program adequate (i.e., proper signage and "what goes where" training)?

APPENDIX A: WASTE SORT CHECKLIST

Pre-sort Decisions and Approvals

- ☐ Determine goals and scope of the waste sort.
- ☐ Obtain approval from upper management.
- ☐ Schedule dates for collection and sort, location, and supplies needed with facilities management.
- ☐ Inform custodial department or service and develop protocol for collection.
- ☐ Inform waste hauler(s) of schedule and needs.
- ☐ Inform department heads of the need for volunteers.
- ☐ Inform participants not to broadcast the waste sort date so as not to change behaviors.

Pre-sort Preparations

- ☐ Determine sorting categories.
- ☐ Develop labeling protocol for bags, containers, carts.
- ☐ All bags or carts of waste collected must be labeled. Have markers and masking tape on hand.
- ☐ Make signs for waste sort containers.
- ☐ Determine number of sorters needed, number of shifts based on current volume of waste/recycling using 2-2-2 rule of thumb. Add one person for data recorder.
- ☐ Assemble PPEs and other supplies needed for sort crew.
- ☐ Develop safety training.
- ☐ Develop plan and processes for weighing bags, containers.
- ☐ Create reminder signs in central collection area for custodians. Post signs at waste disposal areas to remind collection personnel to divert waste for the sort.
- ☐ Determine layout of sorting area.
- ☐ Contact all internal stakeholders to provide important information on dates, roles, etc.
- ☐ Remind custodial service about waste sort the day before collection day.
- ☐ Contact haulers to remind them about the sort and change in collection schedule.
- ☐ Schedule sort crew shifts.

Day of Sort Activities

- ☐ Set up sort area with tables, supplies, tarps, first aid kit, beverages/snacks for sorters, etc.
- ☐ Conduct safety training for sorters.
- ☐ Conduct process training for sort; assign jobs/roles.
- ☐ Set up sort containers with signs.
- ☐ Record weights and volumes for all material categories.
- ☐ Contact haulers, if needed, to reaffirm post-sort collection.

Post-sort Activities

- ☐ Aggregate and analyze data.
- ☐ Determine diversion rates.
- ☐ Identify areas and materials for improving materials management practices.
- ☐ Create report with data, recommendations, potential cost-savings, etc. Present to management.

For more information, contact Nebraska Recycling Council staff at 402-436-2384.

FORMULAS & EXAMPLE TABLE

Gross Weight Calculation (for each bin)

$$\text{Landfill Material Weight} + \text{Recycling Material Weight} + \text{Compost Material Weight}$$

Contamination Weight Calculation (for each bin "X")

$$\text{Gross Weight} - \text{"X" Material Weight}$$

Recycling Contamination Rate Calculation

$$\frac{\text{Recycling Bin Contamination Weight}}{\text{Recycling Bin Gross Weight}}$$

$$\text{Recycling Bin Gross Weight}$$

Compost Contamination Rate Calculation

$$\frac{\text{Compost Bin Contamination Weight}}{\text{Compost Bin Gross Weight}}$$

$$\text{Compost Bin Gross Weight}$$

Current Diversion Rate Calculation: Percentage of all materials that are currently diverted from landfill

$$\frac{(\text{Recycling Bin Gross Weight} + \text{Compost Bin Gross Weight}) - (\text{Recycling Bin Contamination Weight} + \text{Compost Bin Contamination Weight})}{\text{Total Weight of All Material}}$$

$$\text{Total Weight of All Material}$$

Potential Diversion Rate Calculation: Percentage of all materials that COULD be diverted from landfill

$$\frac{(\text{Total Recycling Material Weight} + \text{Total Compost Material Weight})}{\text{Total Weight of All Material}}$$

$$\text{Total Weight of All Material}$$

Date: 5/20	Location of Bin or Station: Break Room			
	Bin Type			
Material Type	Landfill Bin	Recycling Bin	Compost Bin	Totals
Gross Weight	15	8	10	33
Landfill	2	2.5	1	5.5
Recycling	8	4.5	3	15.5
Compost	5	1	6	12
Contamination Weight	13	3.5	4	20.5
Recycling Contamination Rate	3.5 / 8 =			44%
Compost Contamination Rate	4 / 10 =			40%
Current Diversion Rate	(8 + 10) - (3.5 + 4) / 33 =			32%
Potential Diversion Rate	(15.5 + 12) / 33 =			83%

SAMPLE DATA TRACKING WORKSHEET #1

These tracking tables are for measuring weights from the general categories of Landfill, Recycling, and Compost from individual bins and multi-bin stations. Formulas and examples for calculating contamination rates, current diversion rate, and potential diversion rate are on page 10.

Date:	Location of Bin or Station:			
	Bin Type			
Material Type	Landfill Bin	Recycling Bin	Compost Bin	Totals
Gross Weight				
Landfill				
Recycling				
Compost				
Contamination Weight				
Recycling Contamination Rate				
Compost Contamination Rate				
Current Diversion Rate				
Potential Diversion Rate				

Date:	Location of Bin or Station:			
	Bin Type			
Material Type	Landfill Bin	Recycling Bin	Compost Bin	Totals
Gross Weight				
Landfill				
Recycling				
Compost				
Contamination Weight				
Recycling Contamination Rate				
Compost Contamination Rate				
Current Diversion Rate				
Potential Diversion Rate				

SAMPLE DATA TRACKING WORKSHEET #2

This data sheet is designed to accommodate a wider range of material categories. Fill out the date and location of the Bin/Station. Circle the Bin Type: Landfill, Recycling, or Compost. List material that belongs in the Bin Type under Appropriate Materials. List unwanted material under Contaminant Materials. Find the Net Material Weight by subtracting the Tare Weight (weight of the container) from the Weight for each material.

Date:	Location of Bin/Station:		
Circle Bin Type: Landfill Recycling Compost			
Appropriate Materials	Weight	Minus Tare Weight	Net Material Weight
EXAMPLE: Plastic Bottles #1 & 2			
Total Appropriate Materials Weight			

Contaminant Materials	Weight	Minus Tare Weight	Net Material Weight
EXAMPLE: Food Waste			
Total Contamination Weight			

Current Diversion Rate	
Potential Diversion Rate	

(see page 9 for formulas)

EXAMPLE COLLECTION CONTAINER/BAG LABELS

Break Room Landfill Bin #2 Monday	3rd Floor Landfill Bin #1 Monday
Break Room Recycling Bin #2 Wednesday	3rd Floor Recycling Bin #1 Monday
Break Room Compost Bin #2 Friday	3rd Floor Compost Bin #1 Monday