

# The Big Picture:

## Waste Generation & Prevention (WGP)

### Prerequisite: Measuring and Calculating

# Waste Generation, Recovery and Disposal

## (Required, Reciprocal)

### Credit Summary

The WGP Prerequisite: Measuring and Calculating Waste Generation, Recovery, and Disposal intends to develop an understanding of and implement programs for waste generation and waste characteristics. The Local Government or Industry must estimate, calculate or measure the generation of [Waste](#), including, as appropriate, [construction and demolition \(C&D\) waste](#) within the boundaries and report this in total aggregated annual tonnage of all generated and collected materials.

### Impact Summary

Measuring and calculating waste generation has many benefits, as it justifies waste reduction programs, provides positive publicity opportunities, reveals the economic value of waste reduction, uncovers opportunities for process efficiency, and motivates employees.

### Submittal Summary

Private companies and local governments should submit documentation showing estimated/calculated/measured generation of municipal solid waste. Calculations should include generation of tons of MSW and C&D waste for both residential and non-residential sectors. Certifying entities should report the aggregated annual tonnage for Mixed Waste, Recycling (contamination included), Green Waste, and C&D. Report total waste imports using SWEEP's [Waste Import Calculator](#).

The local government and company must collect data on how their waste is ultimately disposed of. This includes noting the type of facility where the waste is disposed of, naming the specific facilities in use, and categorizing how much of the recycling stream is being diverted or sent to disposal.

### Case Study and Benefits

With the waste generation, recovery, and disposal calculations performed in Austin, TX, the city was able to analyze the rate of trash collected and address areas of potential improvement. It was found that 26.25 pounds of trash per consumer were collected, which was higher than their established goal of 24.41 pounds, and 0.29 pounds greater than the previous year. With the collection of this data, the city

of Austin was able to analyze the rate of trash collected and address areas of potential improvement. They are planning on continuing to focus on increasing the diversion rates by decreasing materials sent to landfill, as well as adding a waste composition study to their existing waste measurements.

## Other Resources

[Definitions](#)

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## Intent and Requirements

### Intent:

Develop an understanding of waste generation and characteristics as a good foundation for public policy making or business strategy and program implementation for measuring macro and micro progress towards achieving [Sustainable Materials Management](#) objectives.

### Local Government & Industry Requirements

Based on the SMMP Performance Path (SMMP Credit 1) or Prescriptive Path (other applicable SMMP credits pursued), the Local Government or Company should estimate, calculate or measure the generation of [Municipal Solid Waste](#), including, as appropriate, [construction and demolition \(C&D\) waste](#) within the boundaries of the [Local Government's Jurisdiction](#) or the [Company's Service Area](#) by the Residential and Nonresidential (i.e. multifamily, commercial and non-hazardous industrial premises) sectors.

The Local Government or the Company servicing the community should report total aggregated annual tonnage of all generated and collected materials within the boundaries of the jurisdiction including [Mixed Waste](#), [Recycling](#) (including contamination), [Green Waste](#), and C&D as weighed on certified scales, or the equivalent, at the final destination of the material. [Total Waste Imports](#) should be measured/quantified separately but should not be included in the calculation of waste generation within the Local Government jurisdiction or [Company's Service Area](#).

The Local Government and Company must collect data on how their waste is ultimately disposed of. This includes noting the type of facility the waste is disposed of at, naming the specific facilities in use, and categorizing how much of the [Recycling](#) stream is being diverted or sent to disposal.

## Why We Care

Measuring waste is a critical aspect of waste reduction. By generating quantitative proof of waste reduction, one is able to see where they are performing well, and the areas of their waste management that can be improved upon. The benefits include:

- Justifying waste reduction programs to management
- Providing positive publicity opportunities
- Revealing the economic value of waste reduction

- Uncovering opportunities for process efficiency
- Motivating employees

These benefits provide a way for a local government or industry to understand the extent of their waste generation, and work to remedy it, which can ultimately lead to substantial economic and environmental benefits. <sup>1</sup>

## How to Meet the Requirements

### Potential Strategies:

- Companies are only responsible for measuring or calculating materials that they handle through collection, processing or disposal. Companies can focus their analysis only on their services within the jurisdiction seeking certification or within the [Geographical Service Area](#), which could be applied to multiple jurisdictions.
- Local Governments should conduct, or private Companies should utilize or support the development of, a recent baseline study of waste generation and characterization in the Local Government jurisdiction or [Company's Service Area](#) including total quantity and composition, by residential and nonresidential sector. Update this information on a 5 to 10-year basis.
- Encourage or require solid waste haulers (i.e., service providers of waste collection) to conduct studies of collected materials by sector on a regular basis.
- Conduct or support the development of regular (as defined in SMMP Credit 4) studies or surveys of major waste generators and/or haulers to estimate the total amount of waste by type generated in the Local Government jurisdiction or [Company's Service Area](#). Typically, the top 30% of individual sources generate upwards of 70% of all waste in that sector.
- Encourage or require [Transfer Stations](#) and [Material Recovery Facilities](#) to conduct studies of received materials, any recovery, and [Residual Disposition](#).
- For C&D associated with permitted projects, generation may be calculated based on lbs. per sq. ft.
- If field data are not available, use default waste generation and characterization values in the SWEEP+ Certification Manual to estimate waste generation and characterization.

## Required Documentation

<b>UPLOAD</b>	<ol style="list-style-type: none"> <li>1) Data on how waste is ultimately disposed of, including type of facility, naming specific facility and categorizing how much of <a href="#">Recycling</a> stream is diverted or sent to disposal.</li> </ol> <hr/> <ol style="list-style-type: none"> <li>2) Total aggregated tonnage of all generated and collected materials within the boundary of the jurisdiction.</li> </ol>
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<b><u>CALCULATE</u></b>	<b>1)</b> Internal imports: Data on how waste is ultimately disposed of, including type of facility, naming specific facility and categorizing how much of <a href="#">Recycling</a> stream is diverted or sent to disposal.
	<b>2)</b> Measure or Calculate total aggregated annual tonnage of MSW, recycled materials, organics, and C&D. (Residential & Non-Residential)
	<b>3)</b> Measure or Calculate total aggregated annual tonnage of all generated and collected recycled materials, organics, and C&D diverted from landfills or Waste-to-Energy facilities. (Residential & Non-Residential)
	<b>4)</b> Measure or Calculate total waste imports.

**Clarification:** Companies are only responsible for measuring or calculating materials that they handle through collection, processing or disposal. Companies can focus their analysis only on their services within the jurisdiction seeking certification or within the geographical service area, which could be applied to multiple jurisdictions.

**Clarification:** Local Governments should conduct, or private Companies should utilize or support the development of, a recent baseline study of waste generation and characterization in the Local Government jurisdiction or Company’s service area including total quantity and composition, by residential and nonresidential sector. Update this information on a 5 to 10-year basis.

**Clarification:** For C&D associated with permitted projects, generation may be calculated based on lbs. per sq. ft.

## Case Studies & In-Depth Information

### Local Government

The City of Austin Performance Report (2015-15) details the average pounds of trash per customer account per week. These results were found by calculating the total pounds of curbside trash and dividing this by the curbside customers and number of weeks of the reporting period. It was found that 26.25 pounds of trash per consumer were collected, which was higher than their established goal of 24.41 pounds, and 0.29 pounds greater than the previous year. This data helped determine the increasing rate of average pounds of trash per residential customer, enabling Austin to better analyze their waste production.

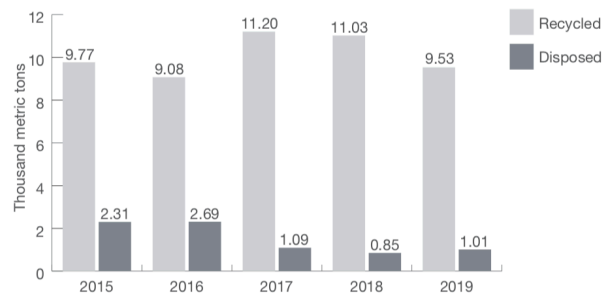
With the collection of this data, the city of Austin was able to analyze the rate of trash collected and address areas of potential improvement. They are planning on continuing to focus on increasing the diversion rates by decreasing materials sent to landfill, as well as adding a waste composition study to

their existing waste measurements. Using the quantitative results of this study, Austin aims to lower the average pounds of trash per customer account per week goal through [Recycling](#) and a series of targeted education and outreach programs.<sup>2</sup>

### Industry

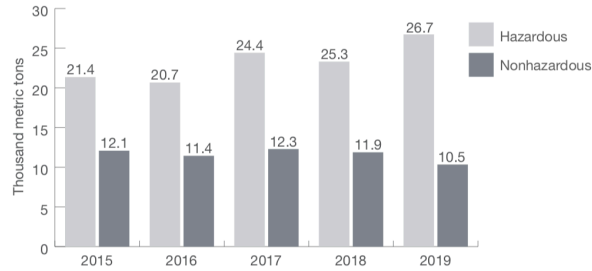
Texas Instruments (TI), an American technology company, implements many impressive sustainability commitments. Waste generation, recovery, and disposal are tracked thoroughly in the annual Texas Instruments sustainability report. TI's changes in material use, both amount and type, were highlighted in the report. Nonhazardous and hazardous waste was tracked, with note on if the waste was recycled or disposed of. Recycled waste was much more common than waste disposed of regularly: in 2019, 9.55 thousand metric tons of nonhazardous waste was recycled and 1.01 thousand metric tons was disposed of. Regarding 2019's hazardous waste, 23.87 thousand metric tons were recycled, with 2.87 disposed of. Additionally, the waste is tracked by type, with almost half the amount of nonhazardous waste used per year, when compared to hazardous. Total waste generated and normalized waste use per chip was tracked as well. This data shows trends in waste use and disposal, such as a sharp drop off in normalized waste use per chip in 2018.

Nonhazardous waste

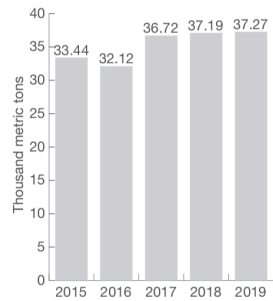




Waste by type



Waste generated



Normalized waste use per chip



<https://www.ti.com/lit/ml/szso005/szso005.pdf?ts=1627189605026>

## Referenced Standards

N/a

## Definitions

### Baseline Study

[UN Women Definition](#): The purpose of a baseline study is to provide an information base against which to monitor and assess an activity's progress and effectiveness during implementation and after the activity is completed

### Company's Service Area

- Multifamily
- Commercial
- Non-hazardous industrial

## **Construction and Demolition (C&D) Waste**

*Relevant ReTrac definitions:*

**Construction, Renovation and Demolition (CR&D) Waste** - Construction, renovation and demolition (CR&D) waste, also referred to as demolition, land-clearing and construction waste (DLC), refers to waste generated by construction, renovation and demolition activities. It generally includes materials such as brick, painted wood, drywall, metal, cardboard, doors, windows, wiring, etc. It excludes materials from land clearing on areas not previously developed. It excludes materials from land clearing on areas not previously developed. CR&D waste can come from residential sources such as house renovations or from non-residential sources for example the construction or demolition of office buildings.

[EPA Definition](#)- debris generated during the construction, renovation and demolition of buildings, roads, and bridges. Construction and demolition (C&D) materials are generated when new building and civil-engineering structures are built and when existing buildings and civil-engineering structures are renovated or demolished (including deconstruction activities). C&D materials often contain bulky, heavy materials such as: Concrete, Wood (from buildings), Asphalt (from roads and roofing shingles), Gypsum (the main component of drywall), Metals, Bricks, Glass, Plastics, Salvaged building components (doors, windows, and plumbing fixtures), Trees, stumps, earth, and rock from clearing sites

[CORR Definition of C&D materials](#) - Building materials from the construction, renovation or demolition of building structures (excluding land clearing, grubbing, and excavation materials).

## **Geographical Service Area**

Sample SWEEP Definition: A specific area in which solid waste companies provide services

## **Green Waste**

[SWANA Definition](#): Solid waste comprising grass clippings, shrub and tree cuttings and other organic wastes resulting from lawn care and gardening.

[CalRecycle Definition](#): A term used to refer to urban landscape waste generally consisting of leaves, grass clippings, weeds, yard trimmings, wood waste, branches and stumps, home garden residues, and other miscellaneous organic materials.

[WM Definition](#): All meat, bones, dairy & egg shells; bread, rice, beans & pasta; coffee grounds, filters, tea leaves & bags; food-soiled paper containers; fruits, vegetables & leftovers; paper towels, plates, napkins & cups; shredded paper contained in paper bags; waxed paper cartons (milk, ice cream, juice, etc.) Plus, Yard Trimmings, such as: branches & twigs; flowers, weeds & roots; leaves, grass & plant clippings; uncoated wood & chips

## **Local Government's Jurisdiction**

[Cambridge Dictionary Definition](#): the authority of a court or official organization to make decisions and judgments

Sample SWEEP Definition based on above definition: the Local Government's authority to make decisions and judgements

### **Material Recovery Facilities (MRF)**

[EPA Definition](#): Refers to a facility where recyclables are sorted into specific categories and processed, or transported to processors, for remanufacturing

### **Mixed Waste**

[EPA Definition](#): A waste that has a hazardous component and a radioactive component

### **Municipal Solid Waste (MSW)**

[EPA definition](#): Municipal solid waste (MSW) (also called trash) consists of everyday items such as product packaging, yard trimmings, furniture, clothing, bottles and cans, food, newspapers, appliances, electronics and batteries. Sources of MSW include residential waste (including waste from multi-family housing) and waste from commercial and institutional locations, such as businesses, schools and hospitals. The Environmental Protection Agency's (EPA) definition of MSW does not include industrial, hazardous or construction and demolition (C&D) waste.

### **Recycling**

[EPA Definition](#): Recycling is the process of collecting and processing materials that would otherwise be thrown away as trash and turning them into new products.

### **Residual Disposition**

[DEP Definition](#): Residual waste is nonhazardous industrial waste. It includes waste material (solid, liquid or gas) produced by industrial, mining and agricultural operations.

### **Sustainable Materials Management**

[EPA Definition](#): A systemic approach to using and reusing materials more productively over their entire life cycles. It represents a change in how our society thinks about the use of natural resources and environmental protection. By looking at a product's entire life cycle, we can find new opportunities to reduce environmental impacts, conserve resources and reduce costs.

### **SWEEP+ Certification Manual**

An all-encompassing instruction manual that acts as a guide for SWEEP certifying waste management entities. The Certification Manual expands on each of the Standard's performance credits and provides in-depth case studies and definitions to keywords used throughout the standard.

### **Total Waste Imports**

Sample SWEEP Definition: All waste that is not generated within the Local Government's jurisdiction or Company's service area.

**Transfer Stations**

[EPA Definition](#): Waste transfer stations are facilities where municipal solid waste is unloaded from collection vehicles and briefly held while it is reloaded onto larger long-distance transport vehicles for shipment to landfills or other treatment or disposal facilities.