



Agenda Report

TO: CCCSWA BOARD OF DIRECTORS
FROM: DAVID KRUEGER, EXECUTIVE DIRECTOR
DATE: DECEMBER 14, 2023
SUBJECT: DIVERSION GOALS AND METRICS

SUMMARY

The Central Contra Costa Solid Waste Authority (Authority) has implemented state-of-the-art waste reduction, recycling and composting programs and has established a goal of 75% landfill diversion. Using different metrics, the Authority's diversion rates have fluctuated between 60% and 65% for the past several years.

This report describes alternative approaches for measuring program performance, including:

- Percent of waste diverted from landfills
- CalRecycle diversion calculation method
- Disposal reduction
- Generation reduction
- Waste characterization studies
- Capture rate analysis
- Using multiple metrics (C40 cities)

RECOMMENDED ACTION

1. Review the report and provide direction to staff.

DISCUSSION

The Central Contra Costa Solid Waste Authority (Authority) has implemented state-of-the-art waste reduction, recycling and composting programs and has established a goal of 75% landfill diversion. Using different metrics, the Authority's diversion rates have fluctuated between 60% and 65% for the past several years. This report alternative approaches for measuring program performance.

Percent of Waste Diverted from Landfills

Traditionally, diversion rates are measured based on weight-based landfill diversion, using the following formula:

$$\text{Diversion Tons} + \text{Disposal Tons} = \text{Total Tons Generated}$$

$$\text{Diversion Rate (\%)} = \text{Diversion Tons} / \text{Total Tons Generated}$$

Based on the franchised tons collected by Republic and MDRR, and the tons of Construction and Demolition debris (C&D) generated from covered projects as reported through the Green Halo tracking website, the landfill diversion rate for the Authority is 60%.

2022 Diversion and Disposal Tonnage by Sector

	Single-Family*	Multifamily	Commercial**	C&D	Total
Disposed	43,337	10,226	27,364	2,663	83,590
Diverted	89,368	4,831	17,212	11,407	122,818
Generated	132,705	15,057	44,576	14,070	206,408
% Diversion	67%	32%	39%	81%	60%

* Includes Reuse Program

**Includes schools

Source: Republic, MDR, and Green Halo tonnage reports

There are clear advantages to using landfill diversion as a measure of performance. It is easy to measure and easy to understand and communicate. However, by treating all materials equally, the relative environmental benefit of recovering different materials (aluminum vs. glass vs. food) are minimized. In addition, the results do not reflect the fact that some materials are easier to recover than others. For example, the high rate of diversion for the single-family sector is driven by the high recovery of yard trimmings. The high diversion rate for C&D results from recovery of inert materials, including concrete, asphalt and dirt.

CalRecycle Diversion Calculation Method

California statutes require that all jurisdictions reach and maintain a 50% landfill diversion goal. Originally, this goal was measured based on landfill diversion tonnages. To reduce the level of effort of diversion-counting, subsequent legislation allowed a jurisdiction to demonstrate compliance based on measuring landfill reduction and using growth factors to estimate generation. These growth factors include changes in population, taxable sales, and the Consumer Price Index.

Additional legislation (SB 1016) further simplified goal measurement. Generation was calculated using the average of 2003-2006 per capita generation for each jurisdiction and compliance is measured based on meeting each jurisdiction’s 50% equivalent per capita disposal target.

The Authority’s per capita disposal (3.5 pounds in 2022) is well-below its disposal target (4.7 pounds). By back-calculating from the disposal target, the Authority’s estimated diversion rate is 63%.

2018-2022 Disposal Target

Year	Authority Pounds Per Capita Per Day Disposal Limit	Pounds Per Capita Per Day Disposal	Total Disposal (tons)	CalRecycle Equivalent Diversion Rate	Under Limit
2018	4.7	3.7	119,403	60%	Yes
2019	4.7	3.5	109,156	64%	Yes
2020	4.7	3.5	112,211	63%	Yes
2021	4.7	3.3	106,595	65%	Yes
2022	4.7	3.5	111,537	63%	Yes

Source: CalRecycle Disposal Reporting System and Recycling and Disposal Reporting System, updated 11-8-23

There are significant downsides to using this method to measure program performance:

- The generation rate used to identify the disposal target is from the average of 2003-2006 generation, nearly 20 years ago
- It assumes that generation stays static and does not change over time
- It does not factor in changes to economic activity
- It’s somewhat confusing to translate disposal tons into pounds per capita (since disposal tons from all generator types – residential, commercial, industrial, C&D – are included)
- It includes disposal tons outside of the Authority’s direct control

Disposal Reduction

In addition to establishing goals for landfill diversion (percentage diverted), some communities have established goals for absolute landfill reduction (tons disposed).

Reducing landfill disposal is more of an absolute measure and does not consider changes in population or economic activity. The Authority’s landfill disposal has fluctuated over time.

Disposal Tons (2018-2022)

Year	2018	2019	2020	2021	2022
Disposal	119,403	109,156	112,211	106,595	111,537

Source: CalRecycle Disposal Reporting System and Recycling and Disposal Reporting System, updated 11-8-23

Note that the total disposal tons reported by CalRecycle include material flows outside the Authority’s franchise system and Green Halo reporting C&D program. These include self-haul materials outside the Authority’s direct control. This is a disadvantage in tracking performance using an absolute measure of landfill reduction.

Generation Reduction

Reducing total generation (diversion + disposal) goes beyond reducing the amount of waste disposed of in landfills but also works to decouple economic activity from the consumption of finite resources. Reducing generation means potentially reducing overall consumption and thereby reducing recycling and composting in addition to reducing landfilling, essentially shrinking the overall pie.

The Authority’s generation tons have decreased steadily over the past several years. This chart uses franchised materials collected and the Green Halo C&D reports to estimate generation.

Generation Tons

Year	2018	2019	2020	2021	2022
Generation	244,616	247,515	221,892	237,032	204,597

Waste Characterization Studies

Composition studies or characterization studies can provide useful information for measuring program performance. Typically, a statistically-significant number of samples are taken from landfill-bound materials at a transfer station and sorted into 80 to 100 different categories of materials to determine the type and amount of recoverable materials that are being disposed.

Capture Rate Analysis

An alternative to traditional waste characterization studies is to obtain samples from all three collection streams (recycling, compost, landfill) to conduct a capture rate analysis. A capture rate indicates what proportion of a material type is being placed in the correct container.

A recent capture rate study conducted for the City of Berkeley determined that while landfill diversion rates were higher for single-family generators compared to multifamily and commercial generators (66% for single-family compared to 34% for multifamily and commercial), the capture rates were comparable. All three sectors were capturing high percentages of readily recoverable materials, such as yard trimmings and cardboard. And all three sectors were recovering lower percentages of harder to recover materials, such as food and food-soiled paper. Similar to the Authority, single-family generators in Berkeley have more readily recoverable yard trimmings compared to multifamily and commercial generators.

Using Multiple Metrics (C40 Cities)

The C40 Cities, which include the City of San Francisco, is a global network of nearly 100 mayors of the world’s leading cities that are united in action to confront the climate crisis and have pledged to advance towards zero waste by:

- 1) Reducing the municipal solid waste generation per capita by at least 15% by 2030 compared to 2015; and

- 2) Reducing the amount of municipal solid waste disposed to landfill and incineration by at least 50% by 2030 compared to 2015, and increase the diversion rate away from landfill and incineration to at least 70% by 2030.

The Authority's franchised materials and reported C&D disposal and generation tons have decreased steadily over the past several years. Diversion tons have fluctuated, but also decreased. This has resulted in landfill diversion rates between 60% to 63% over the past several years.

Franchised Collected Material Tons and Green Halo C&D Reporting Program

Year	2018	2019	2020	2021	2022
Disposal	92,910	91,675	86,915	90,329	82,658
Diversion	151,706	155,840	134,977	146,703	121,939
Generation	244,616	247,515	221,892	237,032	204,597
Diversion Rate	62%	63%	61%	62%	60%