



2024 City of Cupertino Waste Characterization Study

FINAL REPORT

APRIL 2025





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Executive Summary

Overview

In 2024, the City of Cupertino (City) commissioned Cascadia Consulting Group (Cascadia) to conduct a study of all three waste streams (garbage, recycle, and organics) for the City's single-family, multifamily, commercial, and municipal sectors. The objective of this study is to provide statistically reliable estimates for the composition and quantity of the City's waste. Conducting a citywide waste characterization study every 4 to 5 years is a key supporting action of Zero Waste Measure W-1, as established in the City's Climate Action Plan 2.0.¹

The City can use findings from this study to identify potential diversion opportunities, assess compliance with California Senate Bill 1383 (SB 1383), and plan and evaluate waste reduction programs in support of the City's Zero Waste goals.

Methodology

In August 2024, Cascadia collected 211 representative samples of material from each sector and stream. This study evaluated four distinct sectors that generate waste throughout the City:

- **Single-family:** residential properties with a single dwelling unit or fewer than five dwelling units. Each dwelling unit typically has its own set of garbage, recycle, and organics containers.
- **Multifamily:** residential properties with four or more dwelling units. Many dwelling units typically share garbage, recycle, and organics containers.
- **Commercial:** non-residential properties including businesses, industries (e.g., factories), and institutions (e.g., hospitals, churches, schools).
- **Municipal:** municipal properties including City government buildings and facilities (e.g., City Hall, parks).

Cascadia hand-sorted each sample into 63 unique material types to generate composition and quantity estimates for the material present in each stream. The streams are defined as follows:

- **Garbage:** material placed in gray or black containers that are hauled to landfill with no processing.

¹ City of Cupertino, Climate Action Plan 2.0, <https://www.cupertino.gov/files/assets/city/v/1/our-community/documents/cupertino-climate-action-p.pdf>

- **Recycle:** material placed in blue containers that are collected by a certified or franchised hauler on a regular, contracted schedule.
- **Organics:** material placed in green containers that are collected by a certified or franchised hauler on a regular, contracted schedule.

Material types are assigned to one of five recoverability groups that align with the methods of recovery available through the City and the best recovery pathway for a given material type. The recoverability groups are defined as follows:

- **Recyclable:** material currently accepted in the City's curbside recycle program.
- **Contaminated Recyclable:** material that is currently accepted in the City's curbside recycle program but that is soiled, contaminated, or otherwise improperly prepared before being discarded.
- **Compostable:** material currently accepted in the City's curbside organics program.
- **Potentially Recoverable:** material that can be diverted from landfill through safe disposal, specialty take-back or drop-off recycling programs, or other recovery programs for material that cannot be recycled or composted curbside.
- **Non-recoverable:** material that is not readily recyclable or compostable or that faces other market, technology, or programmatic barriers to recovery.

Key Findings

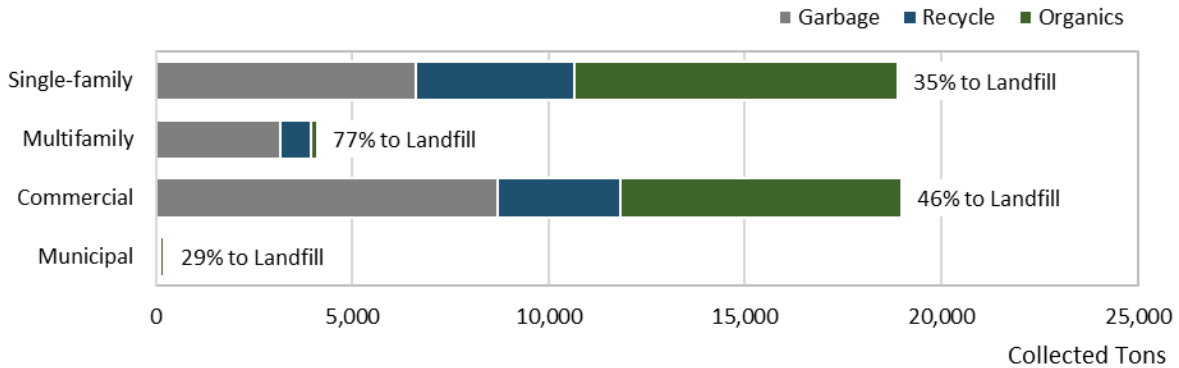
In 2024, the City collected 42,204 tons of material in its garbage, recycle, and organics streams across all four sectors, as reported by Recology, the City's waste hauler.

- The garbage stream represents the largest proportion of each sector's overall generation (Figure 1).
- The multifamily sector sent the greatest proportion (77% or 3,182 tons) of its overall generation to landfill.
- The commercial sector sent the greatest absolute amount (8,721 tons or 46%) of its overall generation to landfill.
- Over half (53% to 68%) of the material in each sector's garbage stream was curbside recoverable and could have been diverted from landfill if prepared and sorted properly.
 - Compostable material in particular accounted for 39% to 52% of the garbage stream in each sector.
 - The large proportion of curbside recoverable material going to landfill indicates opportunities for improvement throughout the City.
- Contaminant material accounted for 25% to 31% of the recycle stream in each sector.

SB 1383, which went into effect in 2022, requires that jurisdictions reduce the amount of "organic waste" sent to landfill. Since previous studies conducted in 2018 and 2019, the capture rate for

Compostable material in the organics stream has increased by 2 percentage points for the multifamily sector, 6 percentage points for single-family, and 22 percentage points for municipal. The capture rate has decreased by 6 percentage points for the commercial sector.

Figure 1. Tons by Sector and Waste Stream

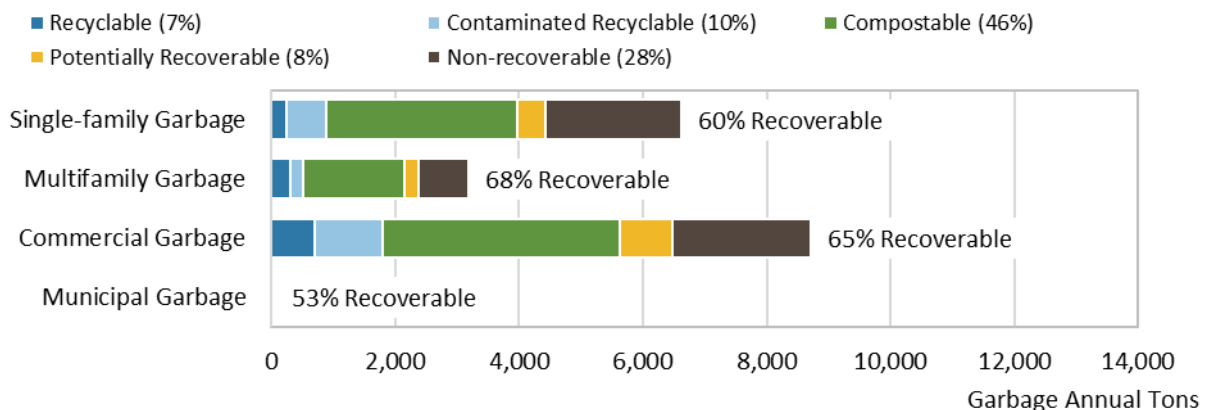


Garbage Key Findings

Across all sectors, the City disposed of 18,583 tons of material in the garbage stream, all of which was sent to landfill (Figure 2).

- Curbside recoverable material accounted for 53% to 69% of the garbage stream in each sector.
- The multifamily garbage stream contained the greatest proportion (68% or 2,183 tons) of recoverable material.
- The municipal garbage stream contained the smallest proportion (53% or 34 tons) of recoverable material.
- Compostable material represents the largest recovery opportunity, accounting for 46% (8,583 tons) of the garbage stream overall.

Figure 2. Garbage Tons by Sector and Recoverability Group



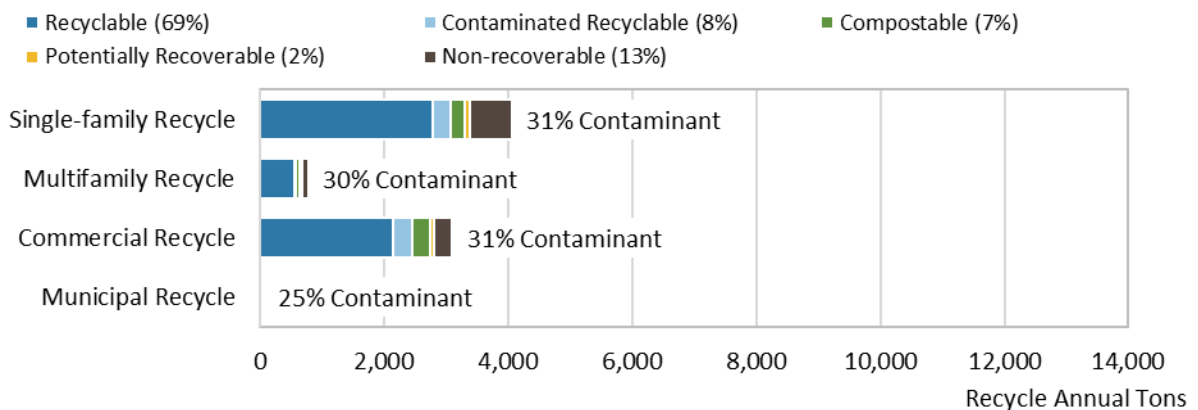
Compostable material made up the top three missorted material types for all sectors. These were Edible Food: Non-donatable and Non-edible Food in each sector and Paper Tissue & Towels in three of the four sectors. The most prevalent Recyclable material types missorted into the garbage stream in all sectors were Clean Recyclable Paper and Contaminated Recyclable Paper.

Recycle Key Findings

Across all sectors, the City diverted 7,974 tons of material into the recycle stream (Figure 3).

- Contaminant material accounted for 25% to 31% of the recycle stream in each sector.
- The single-family and commercial recycle streams contained the greatest proportions (31% each or 1,274 tons of single-family recycle and 967 tons of commercial recycle) of contaminant material.
- The municipal recycle stream contained the smallest proportion (25% or 10 tons) of contaminant material.
- Non-recoverable material represents the largest source of contamination, accounting for 13% (1,071 tons) of the recycle stream overall.

Figure 3. Recycle Tons by Sector and Recoverability Group



Top missorted material or contaminants observed for multiple sectors included Edible Food: Non-donatable, Non-edible Food, Other Composite Plastic, and Contaminated Recyclable Paper.

Table 1 compares Recyclable material capture rates measured for each sector in 2018 and 2019 and those measured in the current study. In each study, the single-family sector successfully captured the greatest proportion of Recyclable material in its recycle stream, while the multifamily sector captured the smallest proportion.

- The commercial sector saw the greatest increase (25 percentage points) between studies.
- The single-family sector saw the smallest change in capture rate (1 percentage point) between studies.

Table 1. Recyclable Material Capture Rates 2018-2024 by Sector

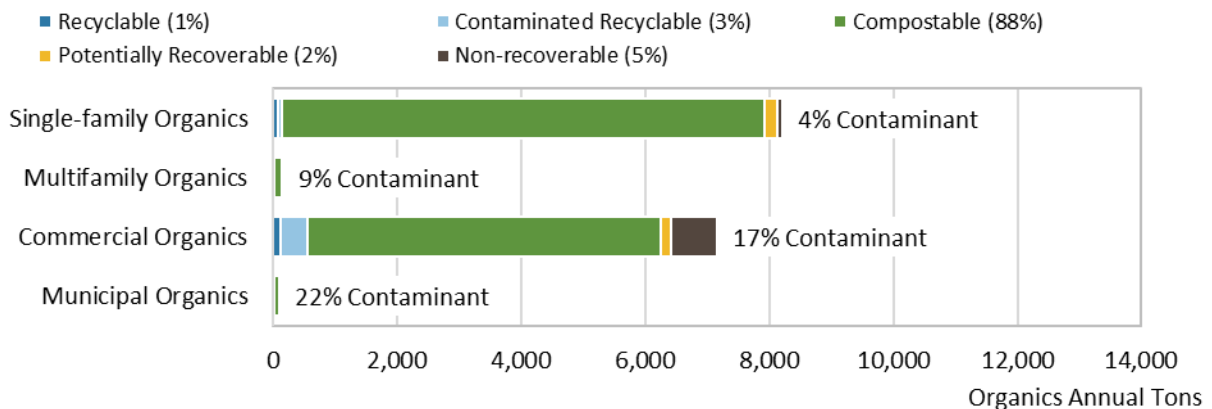
	Recyclable Material Capture Rates			
	2018-2019		2024	Difference
Single-family	 90%	 89%	▼	-1%
Multifamily	 45%	 64%	▲	18%
Commercial	 47%	 72%	▲	25%
Municipal	 59%	 66%	▲	7%

Organics Key Findings

Across all sectors, the City diverted 15,647 tons of material into the organics stream (Figure 4).

- Contaminant material accounted for 4% to 22% of the organics stream in each sector.
- The municipal organics stream contained the greatest proportion (22% or 34 tons) of contaminant material.
- The single-family organics stream contained the smallest proportion (4% or 413 tons).
- Non-recoverable material represents the largest source of contamination, accounting for 5% (858 tons) of the organics stream overall.

Figure 4. Organics Tons by Sector and Recoverability Group



Top missorted material or contaminants observed for multiple sectors included Other Composite Plastic, Other Composite Film Plastics, and Compostable Plastic.

SB 1383 mandates a 75% statewide reduction in organic waste sent to landfill by 2025, relative to 2014 baseline values. Measuring the proportion of organic waste that is successfully captured in the organics stream versus the proportion that is missorted into the garbage stream can help cities track progress toward the SB 1383 target.

Table 2 compares Compostable material capture rates measured for each sector in 2018 and 2019 and those measured in the current study.² In each study, the single-family sector successfully captured the greatest proportion of Compostable material in its organics stream, while the multifamily sector captured the smallest proportion.

- The municipal sector saw the greatest increase (22 percentage points) in capture rates between studies but generates the smallest tonnage of Compostable material.
- The commercial sector capture rate decreased by 6 percentage points between studies and generates the second largest tonnage of Compostable material.
- The tons of Compostable material composted increased for all sectors in 2024 compared to the 2018 and 2019 studies.
- The tons of Compostable material going to disposal decreased for only two sectors (single-family and municipal) and increased overall by 709 tons.

Table 2. Compostable Material Capture Rates and Tons 2018-2024 by Sector

	Compostable Material Capture Rates		
	2018-2019	2024	Difference
Single-family	 65%	 70%	▲ 6%
Composted Tons	7,211	7,799	▲ 588
Disposed Tons	3,763	3,079	▼ (685)
Multifamily	 6%	 7%	▲ 2%
Composted Tons	97	137	▲ 40
Disposed Tons	1,422	1,641	▲ 219
Commercial	 64%	 58%	▼ -6%
Composted Tons	4,890	5,704	▲ 814
Disposed Tons	2,641	3,839	▲ 1,198
Municipal	 51%	 74%	▲ 22%
Composted Tons	52	79	▲ 27
Disposed Tons	48	25	▼ (23)

² Compostable material includes all materials classified as “organic waste” under SB 1383, except for uncoated recyclable paper material types. These materials are best diverted through the recycle stream and are not represented in these capture rates.

Introduction and Background

In 2022, the City of Cupertino (City) adopted its Climate Action Plan 2.0, which established a series of Zero Waste measures and supporting actions designed to increase diversion and reduce contamination in the City's waste streams.³ A key supporting action under Measure W-1, which set targets to reduce the amount of organic and inorganic landfilled waste, is to conduct a Citywide waste characterization study every 4 to 5 years. The objective of this recurring study is to provide statistically reliable estimates for the composition and quantity of the City's waste, which the City can use to track progress toward its Zero Waste goals.

In 2024, the City commissioned Cascadia Consulting Group (Cascadia) to conduct a study of all three waste streams (garbage, recycle, and organics) for the City's single-family, multifamily, commercial, and municipal sectors. This study builds on results from the most recent waste characterization studies conducted for the City in 2018 (single-family) and 2019 (multifamily, commercial, and municipal).

The composition and quantity findings from the 2024 study will enable the City to:

- Identify potential diversion opportunities presented by missorted material.
- Assess compliance with California Senate Bill 1383 (SB 1383).
- Provide a baseline for evaluating the success of existing diversion programs.
- Provide data useful in planning future programs to support the City's Zero Waste goals.

This report contains the following sections:

- A summary of the study methodology
- Study results for the composition of waste from each of the four sectors
- Appendices with additional results and more detailed methodology, as follows:
 - Detailed composition results for each sector and stream (Appendix A)
 - Material categories and definitions (Appendix B)
 - A detailed study design (Appendix C)
 - Waste composition calculations (Appendix D)

³ City of Cupertino, Climate Action Plan 2.0, <https://www.cupertino.gov/files/assets/city/v/1/our-community/documents/cupertino-climate-action-p.pdf>

Summary of Methodology

This section describes the waste-generating sectors and waste streams included in this study. It also describes how Cascadia sampled, sorted, and analyzed material from each sector. Appendix C provides more detail on the study methodology and Appendix D provides an explanation of the calculations used in data analysis.

Study Parameters

This study characterized waste material from four sectors and three streams for a total of twelve sector-stream combinations, as defined in the following sections. Not included in this study were construction and demolition debris and household hazardous waste streams.

Waste Sectors

This study evaluated four distinct sectors that generate waste throughout the City.

- **Single-family:** residential properties with a single dwelling unit or fewer than five dwelling units. Each dwelling unit typically has its own set of garbage, recycle, and organics containers.
- **Multifamily:** residential properties with four or more dwelling units. Many dwelling units typically share garbage, recycle, and organics containers.
- **Commercial:** non-residential properties including businesses, industries (e.g., factories), and institutions (e.g., hospitals, churches, schools).
- **Municipal:** municipal properties including City government buildings and facilities (e.g., City Hall, parks).

Waste Streams

The three waste streams evaluated in this study are distinguished by their collection method and whether material is sent for further processing or directly to a landfill. This study assessed all material within each stream, regardless of sorting behavior.

- **Garbage:** material placed in gray or black containers that are hauled to a landfill with no processing. If generators correctly sorted waste material based on container signage and outreach materials, the material in garbage containers would not include any curbside-recyclable or curbside-compostable material.
- **Recycle:** material placed in blue containers that are collected by a certified or franchised hauler on a regular, contracted schedule. Material is hauled to a facility that specializes in removing the recyclable fraction. If generators correctly sorted material based on container

signage and outreach materials, the material in recycle containers would only include curbside-recyclable material (e.g., paper and recyclable containers).

- **Organics:** material placed in green containers that are collected by a certified or franchised hauler on a regular, contracted schedule. Material is hauled to a facility that specializes in recovering the compostable fraction. If generators correctly sorted material based on signage and outreach materials, the material in organics containers would only include curbside-compostable material (e.g., food waste, food-soiled paper, and yard waste).

Sampling Plan

Cascadia collected and sorted samples from each stream for 10 days from August 19 to 31, 2024. The field crew planned to characterize up to 220 total samples and ultimately characterized 211, due to limited material available for sampling from municipal properties and from the multifamily organics stream (Table 3).

Table 3. 2024 Study Sample Counts by Sector and Stream

	Garbage		Recycle		Organics		Total	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
Overall	80	78	70	68	70	65	220	211
Single-family	20	20	20	20	20	20	60	60
Multifamily	20	20	20	20	20	17	60	57
Commercial	30	30	20	20	20	20	70	70
Municipal	10	8	10	8	10	8	30	24

Sample Collection

The following sections describe how Cascadia selected waste samples from each sector.

Single-family and Commercial Sectors

Cascadia randomly selected single-family and commercial routes from a complete list provided by the City's hauler, Recology. The hauler ensured that the trucks from selected routes were redirected to the Recology Rogers Avenue Transfer Station (for garbage and organics) or GreenWaste Material Recovery Facility (for recycle) for sample collection.

If a selected route contained material from a mixture of sectors (for example, commercial and multifamily mixed together), Recology updated the sequencing for those routes to ensure that material from only a single sector was present in the truck when it arrived at a facility to tip its waste. Trucks tipped their material in a designated area of each facility, and the Cascadia field team worked with facility personnel to select a random sample from the tipped load. Table 4 reports the sample target weights for each stream.

Table 4. Sample Target Weights for Single-family and Commercial Sectors

Sector	Garbage Sample Target Weight (lbs.)	Recycle Sample Target Weight (lbs.)	Organics Sample Target Weight (lbs.)
Single-family	175	125	175
Commercial	175	125	175

Multifamily and Municipal Sectors

Cascadia staff collected multifamily and municipal samples directly from waste containers at selected properties rather than asking Recology to create unmixed loads. Cascadia randomly selected properties from a City-provided list and worked with the City to determine an appropriate sampling schedule, based on service-level information provided by Recology. The City reviewed the final list of properties to ensure that collection was feasible.

The Cascadia field team visited each selected property to collect samples either the day before or the morning of their scheduled collection day, to ensure that containers were as full as possible. The team secured the collected material in a tarp, labeled it with identifying information on a sample placard, and transported it to the appropriate facility for sorting.

If the material available for sampling was less than the target weight, the field team collected all available material and returned for a second visit to achieve the target weight. If the total weight after the second visit was above 50 pounds, the team kept the sample. If the total weight was below 50 pounds, the team discarded the sample and removed the property from the study list. Samples less than 50 pounds may not be representative of the waste stream.

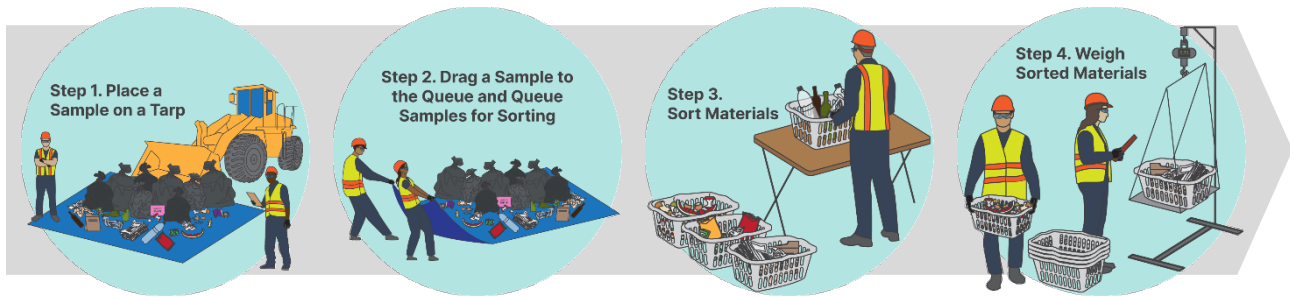
Table 5. Sample Target Weights for Multifamily and Municipal Sectors

Sector	Garbage Sample Target Weight (lbs.)	Recycle Sample Target Weight (lbs.)	Organics Sample Target Weight (lbs.)
Multifamily	125	125	125
Municipal	125	125	125

Sample Sorting

The Cascadia field team sorted garbage and organics samples at the Recology Rogers Avenue Transfer Station and sorted recycle samples at the GreenWaste Material Recovery Facility (Figure 5). The team hand-sorted each sample into 63 unique material types (defined in Appendix B). The 63 material types include detailed material types in seven material classes: Paper, Plastic, Glass, Metal, Organic Waste, Hazardous Waste, and Other Materials. The team recorded the weight of each sorted material type into Cascadia's customized cloud database and reviewed the data for errors before exporting it to Excel for analysis.

Figure 5. Hand-sort Procedure



Data Analysis

Cascadia calculated material composition estimates for each stream by aggregating individual sample data using a weighted average procedure. Appendix D describes the composition calculations in greater detail.

Cascadia then applied the composition percentages to the 2024 annual collected tons for each sector and stream, as reported to the City of Cupertino, to obtain tonnage estimates for each material type. Recology reports tonnages for the commercial and municipal sector combined. Cascadia separated the sector tons by using service levels for the City's 10 municipal properties to estimate municipal tons and subtracting the estimate from the combined tonnage.

Study Results

Interpreting Results

This section presents the overall structure and format of the composition results, along with detailed information about how numbers are reported in the study.

How Study Results are Presented

Composition results are grouped by sector and are presented in the following formats:

1. An overview of **tons by waste stream** as a bar chart.
2. An overview of **tons by recoverability group** as a bar chart for each stream.
3. **Most prevalent** curbside recoverable or contaminant material types in a table for each stream.

For each sector, **Recyclable and Compostable material capture rate** findings are presented with the additional following sections:

4. A table of **capture rates** by recoverable material.
5. A comparison of **tons by waste stream** as a bar chart.
6. A table of capture rates **comparing the previous and current study years**.

For the current study and for each sector and stream, Appendix A contains the following:

7. An overview of **tons by material class** as a bar chart.
8. **Detailed composition and tonnage estimates** for all 63 material types.

RECOVERABILITY GROUPS

To identify additional diversion opportunities, material types are classified into five recoverability groups that align with the availability and potential methods of recovery based on how the material was received. These assignments reflect recovery programs available in Cupertino in 2024 and the best recovery pathway for a given material type. For example, while Flattened Corrugated Cardboard is accepted in the City's curbside organics program, it is best recovered in the curbside recycle stream and is classified as Recyclable. See Appendix B for all material type assignments.

- **Recyclable:** material currently accepted in the City's curbside recycle program. These material types are highlighted in blue throughout the tables and figures.
- **Contaminated Recyclable:** material that is currently accepted in the City's curbside recycle program but that is soiled, contaminated, or otherwise improperly prepared before being discarded. This includes Recyclable material that is contaminated before being discarded into any stream. It also includes Clean & Loose Recyclable Film that is not bagged appropriately



when placed in the recycle stream or in any stream. These material types are highlighted in light blue throughout the tables and figures.

- **Compostable:** material currently accepted in the City's curbside organics program. These material types are highlighted in green throughout the tables and figures.
- **Potentially Recoverable:** material that can be diverted from landfill through safe disposal, specialty take-back or drop-off recycling programs, or other recovery programs for material that cannot be recycled or composted curbside. These material types are highlighted in yellow throughout the tables and figures.
- **Non-recoverable:** material that is not readily recyclable or compostable or that faces other market, technology, or programmatic barriers to recovery. These material types are highlighted in brown throughout the tables and figures.

Reported Numbers and Rounding

Each detailed composition table presents the overall estimated percent composition of each recoverability group, material class, and material type by weight, including the 90% confidence interval for each. Cascadia calculated the composition and confidence intervals according to the study's composition calculations and statistical procedures.

Composition tables also present estimated tons of each material type. This was calculated by applying estimated composition percentages to the estimated total tons of material in each stream, based on City-provided tons. All weight estimates report units in tons per year unless otherwise noted.

To keep the composition tables and figures readable, estimated tonnages are rounded to the nearest ton, and estimated percentages are rounded to the nearest percent or tenth of a percent. Percentages less than 0.05% are shown as 0.0%. Tonnages less than 0.5 tons are shown as 0. True zeros in tables are displayed as a dash ("–"). Each number in the text uses the same rounding as the number in the figure or table being referenced. Due to this rounding, the tonnages presented in the report, when added together, may not exactly match the totals shown. Similarly, the percentages, when added together, may not exactly match the totals shown. Each number reported in the text is accurate and has been rounded at the end of data analysis, after performing all calculations with more precise values. As such, using the rounded percentages to calculate tonnages or sums may yield results that are inaccurate and differ from the correct numbers shown in the report.

Performance Metrics

The following metrics are used to quantify the performance of each sector in the diversion of recoverable material.

CURBSIDE RECOVERABILITY RATE

The recoverability rate is defined as the sum of Recyclable, Contaminated Recyclable, and Compostable material in the garbage stream. This is material that could have been recovered through curbside recovery programs in Cupertino, if it had been placed in the correct stream and properly prepared.

CONTAMINATION RATE

Material that is either not accepted by the City’s curbside recycle or organics program or discarded in the wrong stream is considered contaminant or missorted.

For the recycle stream, the contamination rate is defined as the sum of all non-recyclable material present in the recycle stream divided by the total recycle tons. Non-recyclable material types are those classified as:

- Contaminated Recyclable
- Compostable
- Potentially Recoverable
- Non-recoverable

Similarly, for the organics streams, the contamination rate is calculated as the sum of all non-compostable material present in the organics stream divided by the total organics tons. Non-compostable material types are those classified as:

- Recyclable – except for Flattened Corrugated Cardboard, Unflattened Corrugated Cardboard, and Clean Recyclable Paper, which are also accepted in the organics stream
- Contaminated Recyclable – except for Contaminated Recyclable Paper, which is also accepted in the organics stream
- Potentially Recoverable
- Non-recoverable

Uncoated paper material types are not considered contaminants in the organics stream and are treated as “compostable” when calculating the organics contamination rate. This material is considered “organic waste” under SB 1383 and should be diverted from the garbage stream, either through the recycle stream (the best recovery option) or the organics stream.⁴

CAPTURE RATE

The capture rate for Recyclable material is defined as the tons of Recyclable material in the recycle stream divided by the sum of the tons of Recyclable material in the garbage, recycle, and organics streams. Similarly, the Compostable material capture rate is defined as the tons of Compostable

⁴ CalRecycle, New Statewide Mandatory Organic Waste Collection,
<https://calrecycle.ca.gov/organics/slcp/collection>

material in the organics stream divided by the sum of the tons of Compostable material in the garbage, recycle, and organics stream.

2024 Tons by Sector

In 2024, the City generated 42,204 tons of material in its garbage, recycle, and organics streams across all four sectors, as reported by Recology (Table 6). The single-family sector accounted for 45% (18,882 tons) of overall generation while the multifamily sector accounted for 10% (4,111 tons), the commercial sector accounted for 45% (18,991 tons), and the municipal sector accounted for 1% (219 tons).

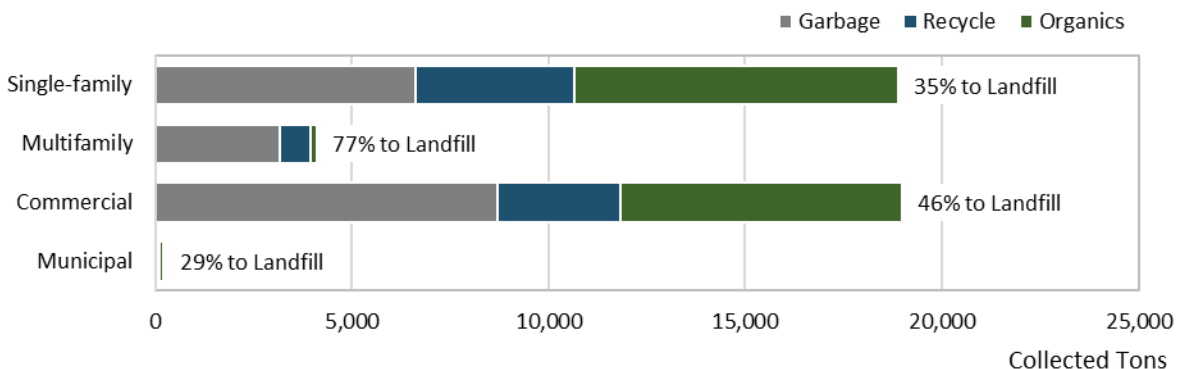
Table 6. 2024 Total Collected Tons

	2024 Collected Tons					
	Garbage	Recycle	Organics	Generation		
Overall	18,583	7,974	15,647	42,204	100%	
Single-family	6,616	4,054	8,212	18,882	45%	
Multifamily	3,182	776	154	4,111	10%	
Commercial	8,721	3,102	7,169	18,991	45%	
Municipal	64	42	113	219	1%	

Percentages may not total 100% due to rounding.

Figure 6 summarizes each sector's generation across the garbage, recycle, and organics streams and the proportion of waste that was sent to landfill. The commercial sector reported the most garbage (8,721 tons), and the municipal sector reported the least garbage (64 tons). The multifamily sector sent the greatest proportion of waste to landfill (77%, or 3,182 out of 4,111 tons).

Figure 6. Total Tons by Sector and Waste Stream

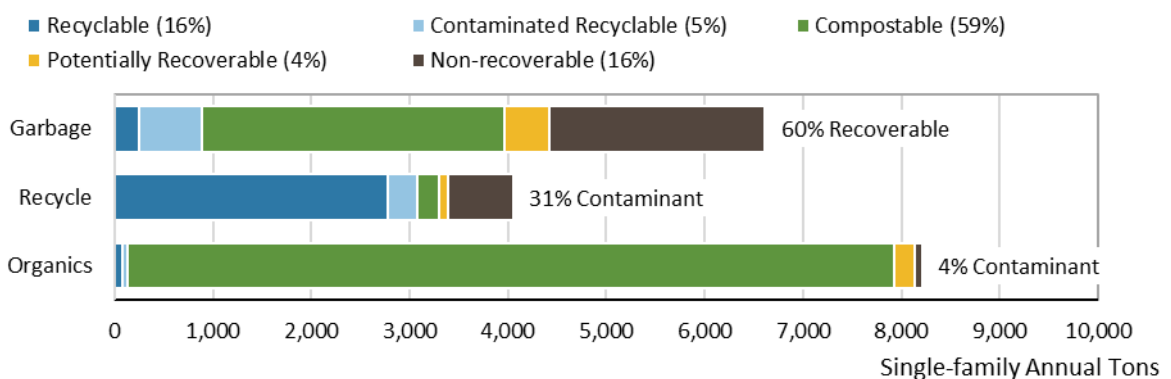


Single-family Study Results

Composition Findings

In 2024, the single-family sector generated 18,882 tons of material across all waste streams. This represents 45% of the City's overall generation. Curbside recoverable material accounted for 60% (3,980 tons) of the garbage stream (Figure 7). Contaminant material accounted for 31% (1,274 tons) of the recycle stream and 4% (299 tons) of the organics stream.

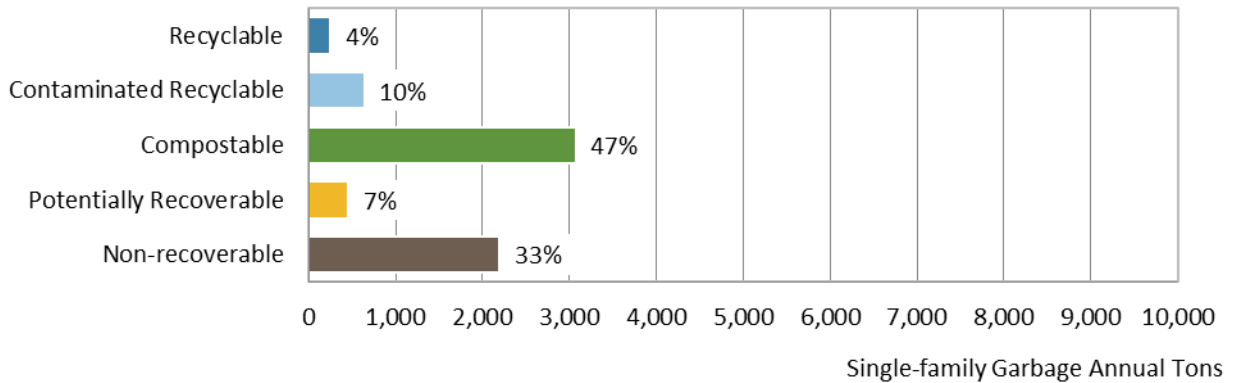
Figure 7. Total Tons by Waste Stream: Single-family



GARBAGE

The single-family sector disposed of 6,616 tons of material in the garbage stream. Overall, 51% (3,331 tons) of the single-family garbage was clean material that could have been recovered through curbside collection programs (4% Recyclable or 252 tons and 47% Compostable or 3,079 tons; Figure 8). An additional 10% (640 tons) of the garbage stream was Contaminated Recyclable material that could have been recovered with appropriate cleaning and sorting. Potentially Recoverable material accounted for 7% (448 tons) and Non-recoverable material accounted for 33% (2,198 tons) of the stream.

Figure 8. Tons by Recoverability Group: Single-family Garbage



Within the garbage stream, the three most prevalent curbside recoverable material types were Non-edible Food (16.6% or 1,096 tons), Edible Food: Non-donatable (12.5% or 830 tons), and Paper Tissue & Towels (9.4% or 619 tons; Table 7).

Table 7. Most Prevalent Curbside Recoverable Material Types: Single-family Garbage

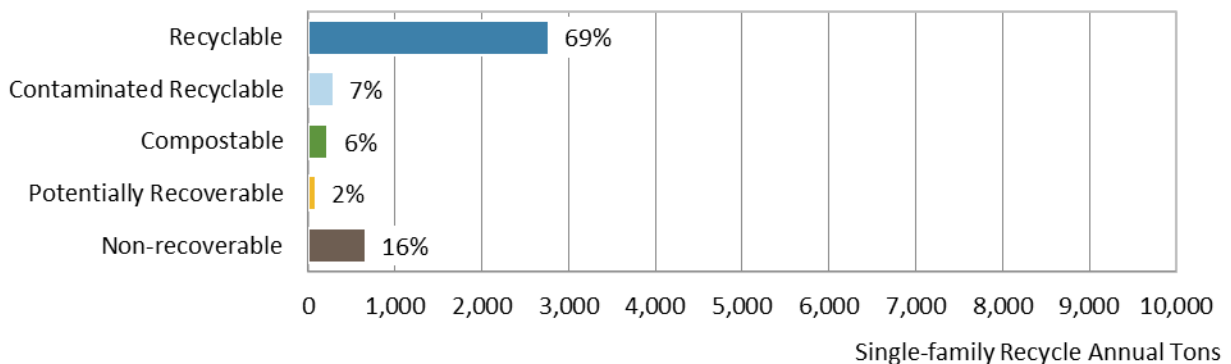
Material	Est. %	+ / -	Est. Tons
Non-edible Food	16.6%	1.6%	1,096
Edible Food: Non-donatable	12.5%	1.6%	830
Paper Tissue & Towels	9.4%	1.3%	619
Edible Food: Potentially Donatable	4.7%	1.2%	311
Contaminated Recyclable Paper	4.3%	0.5%	284
Contaminated Recyclable Plastic: Non-CRV	1.8%	0.2%	121
Contaminated Recyclable Metal	1.6%	0.8%	105
Clean Recyclable Paper	1.4%	0.5%	93
Plastic Takeout Containers	1.1%	0.2%	70
Other Compostable Paper	1.0%	0.2%	68
Total for Top Recoverable Material	54.3%		3,596
Total for Other Recoverable Material	5.8%		385
All Other Material	39.8%		2,636
Total Annual Garbage Tons	100.0%		6,616

Percentages for material types may not total 100% due to rounding.

RECYCLE

The single-family sector diverted 4,054 tons of material into the recycle stream. The majority (69% or 2,780 tons) of the single-family recycle stream was Recyclable material (Figure 9). Missorted, contaminant material accounted for 31% of the material in blue recycle containers. Contaminated Recyclable material accounted for 7% (296 tons) of the stream, Compostable material accounted for 6% (227 tons), Potentially Recoverable material accounted for 2% (86 tons), and Non-recoverable material accounted for 16% (665 tons) of the single-family recycle stream.

Figure 9. Tons by Recoverability Group: Single-family Recycle



Contaminant material accounted for 31.4% (1,274 tons) of the single-family recycle stream (Table 8). The three most prevalent contaminant material types were Other Composite Materials & Fines (3.2% or 129 tons), Contaminated Recyclable Paper (3.1% or 127 tons), and Other Composite Plastic (2.4% or 99 tons). Refer to Appendix B for definitions of these capitalized material types.

Table 8. Most Prevalent Contaminant Material Types: Single-family Recycle

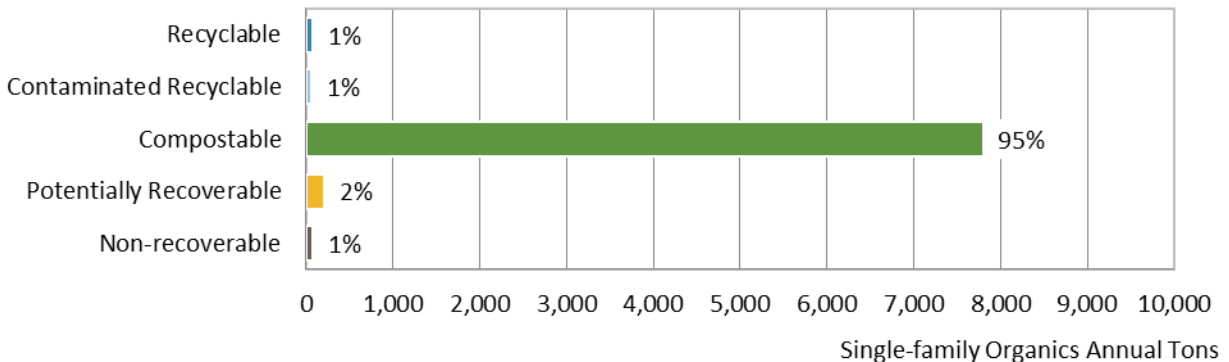
Material	Est. %	+ / -	Est. Tons
Other Composite Materials & Fines	3.2%	1.3%	129
Contaminated Recyclable Paper	3.1%	1.2%	127
Other Composite Plastic	2.4%	0.4%	99
Clean & Loose Recyclable Film	2.4%	0.7%	97
Other Composite Metal	2.1%	1.2%	86
Total for Top Contaminant Material	13.3%		538
Total for Other Contaminant Material	18.1%		736
All Other Material	68.6%		2,780
Total Annual Recycle Tons	100.0%		4,054

Percentages for material types may not total 100% due to rounding.

ORGANICS

The single-family sector diverted 8,212 tons of material into the organics stream. The majority (95% or 7,799 tons) of the single-family organics stream was Compostable material (Figure 10). Potentially Recoverable material accounted for 2% (205 tons) of the stream and Recyclable (79 tons), Contaminated Recyclable (54 tons), and Non-recoverable (76 tons) material each accounted for 1% of the stream.

Figure 10. Tons by Recoverability Group: Single-family Organics



Contaminant material accounted for 3.7% (299 tons) of the single-family organics stream (Table 9). The three most prevalent contaminant material types were Construction & Demolition Debris (2.0% or 166 tons), Untreated Wood (0.4% or 31 tons), and Other Composite Plastic (0.3% or 24 tons).

Material types that are accepted in the organics stream but are best recovered through the recycle stream (e.g., Flattened Corrugated Cardboard) are categorized as Recyclable for the recoverability analysis above (Figure 10). However, they are not considered contaminated for the contaminant analysis (Table 9).

Table 9. Most Prevalent Contaminant Material Types: Single-family Organics

Material	Est. %	+ / -	Est. Tons
Construction & Demolition Debris	2.0%	1.6%	166
Untreated Wood	0.4%	0.2%	31
Other Composite Plastic	0.3%	0.2%	24
Compostable Plastic	0.2%	0.1%	18
Other Composite Paper	0.2%	0.2%	15
Total for Top Contaminant Material	3.1%		253
Total for Other Contaminant Material	0.6%		46
All Other Material	96.4%		7,912
Total Annual Organics Tons	100.0%		8,212

Percentages for material types may not total 100% due to rounding.

Recyclable Material Capture Rates

The capture rate for Recyclable material in the recycle stream for the single-family sector was 89% (Table 10). This means that of all the Recyclable material placed in the single-family garbage, recycle, and organics streams, 89% (2,780 out of 3,110 tons) was correctly captured in the recycle stream.

Clean Recyclable Paper was the most prevalent Recyclable material in single-family generation (all three streams combined) and had a recycle capture rate of 87% (936 out of 1,079 tons). Flattened

Corrugated Cardboard was the second-most prevalent Recyclable material and had a capture rate of 97% (641 out of 663 tons).

Capture rates were highest for Clean & Bagged Recyclable Film (100% of 7 tons) and Clean Tin Cans: CRV (100% of 12 tons) and lowest for Plastic Takeout Containers (32% or 35 out of 109 tons), although these material types accounted for small proportions of all three streams.

Table 10. Recyclable Material Capture Rates: Single-family

Material	Garbage		Recycle		Organics		Generation		Capture Rate
	Est. %	Est. Tons	Est. %	Est. Tons	Est. %	Est. Tons	Est. %	Est. Tons	
Total Annual Tons	100.0%	6,616	100.0%	4,054	100.0%	8,212	100.0%	18,882	
Recyclable	3.8%	252	68.6%	2,780	0.9%	78	16.5%	3,110	89%
Flattened Corrugated Cardboard	0.1%	4	15.8%	641	0.2%	18	3.5%	663	97%
Unflattened Corrugated Cardboard	0.1%	6	9.6%	388	0.0%	3	2.1%	397	98%
Clean Recyclable Paper	1.4%	93	23.1%	936	0.6%	50	5.7%	1,079	87%
Clean #1 PET Containers: CRV	0.1%	5	1.9%	75	0.0%	0	0.4%	81	93%
Clean #1 PET Packaging: Non-CRV	0.1%	6	2.7%	110	0.0%	0	0.6%	117	94%
Clean #2 HDPE Containers: CRV	0.0%	0	0.2%	6	-	-	0.0%	7	99%
Clean #2 HDPE Packaging: Non-CRV	0.0%	2	2.3%	92	-	-	0.5%	94	97%
Clean Other #3-7 Container: CRV	0.0%	1	0.0%	2	-	-	0.0%	3	70%
Clean Other #3-7 Packaging: Non-CRV	0.1%	4	1.4%	56	0.0%	1	0.3%	61	92%
Plastic Takeout Containers	1.1%	70	0.9%	35	0.0%	4	0.6%	109	32%
Durable Plastic Products	0.4%	28	2.1%	84	0.0%	1	0.6%	112	74%
Clean & Bagged Recyclable Film	-	-	0.2%	7	-	-	0.0%	7	100%
Clean Glass Bottles: CRV	0.1%	6	3.0%	122	-	-	0.7%	128	95%
Clean Glass Containers: Non-CRV	0.1%	4	2.3%	94	-	-	0.5%	98	96%
Clean Aluminum Cans: CRV	0.0%	2	0.9%	37	0.0%	0	0.2%	40	95%
Clean Aluminum Cans & Foil: Non-CRV	0.0%	3	0.3%	14	0.0%	0	0.1%	17	80%
Clean Tin Cans: CRV	-	-	0.3%	12	-	-	0.1%	12	100%
Clean Tin Cans: Non-CRV	0.0%	1	0.8%	31	-	-	0.2%	32	96%
Clean Other Recyclable Metal	0.2%	16	0.9%	37	0.0%	1	0.3%	53	69%
Sample Count		20		20		20			

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

In 2024, the single-family sector generated 3,110 tons of Recyclable material and missorted 252 tons into the garbage stream and 28 tons into the organics stream (Figure 11). This compares to 3,560 tons of Recyclable material generated in 2018, of which 360 tons were missorted into the garbage stream and 31 tons into the organics stream.

Figure 11. Recyclable Material Tons by Stream 2018-2024: Single-family

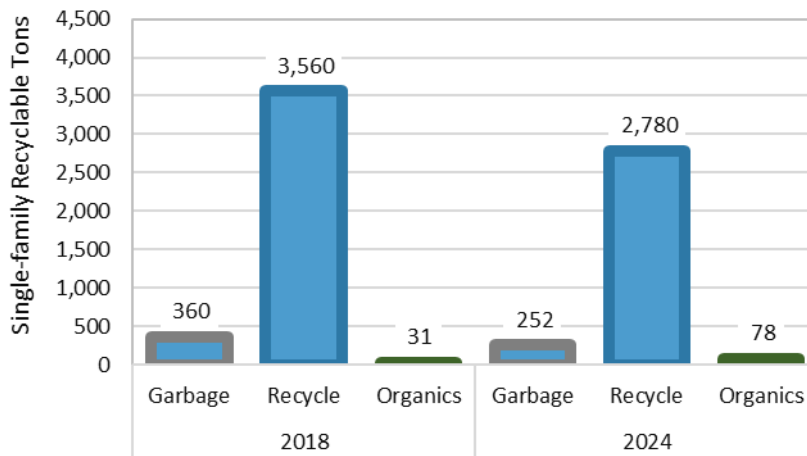


Table 11 compares Recyclable material capture rates for the single-family sector between the 2018 and 2024 studies. Between the two study periods, Recyclable material decreased in both the amount generated (840 fewer tons) and successfully captured (780 fewer tons). Since 2018, the single-family sector decreased their capture of Recyclable material in the recycle stream by 1 percentage point.⁵

Table 11. Recyclable Material Capture Rates 2018-2024: Single-family

Single-family	Recyclable Materials		
	2018	2024	Difference
Generated Tons	3,950	3,110	▼ -840
Recycled Tons	3,560	2,780	▼ -780
Capture Rate	90%	89%	▼ -1%

Compostable Material Capture Rates

The capture rate for Compostable material in the organics stream for the single-family sector was 70% (Table 12). This means that of all the Compostable material placed in the single-family garbage, recycle, and organics streams, 70% (7,799 out of 11,105 tons) was correctly captured in the organics stream.

Plant Trimmings was the most prevalent Compostable material in single-family generation (all three streams combined) and had an organics capture rate of 99% (7,147 out of 7,217 tons). Non-

⁵ These differences between study years were not tested to evaluate whether the changes in capture rates are statistically significant.

edible Food was the second-most prevalent Compostable material and had a capture rate of 21% (304 out of 1,422 tons).

Plant Trimmings had the highest capture rate. Pizza Boxes had the next highest capture rate at 51% (25 out of 49 tons), although this material type accounted for a small proportion of all three streams. Relatedly, Coated Corrugated Cardboard had the lowest capture rate of 0% (0 out of 8 tons) but was also the least prevalent material.

Table 12. Compostable Material Capture Rates: Single-family

Material	Garbage		Recycle		Organics		Generation		Capture Rate
	Est. %	Est. Tons	Est. %	Est. Tons	Est. %	Est. Tons	Est. %	Est. Tons	
Total Annual Tons	100.0%	6,616	100.0%	4,054	100.0%	8,212	100.0%	18,882	
Compostable	46.5%	3,079	5.6%	227	95.0%	7,799	58.8%	11,105	70%
Pizza Boxes	0.1%	10	0.4%	15	0.3%	25	0.3%	49	51%
Coated Corrugated Cardboard	-	-	0.2%	8	-	-	0.0%	8	0%
Paper Takeout Containers	0.9%	57	0.5%	21	0.1%	4	0.4%	81	5%
Coated Paper Cups	0.3%	17	0.2%	9	0.0%	4	0.2%	30	13%
Paper Tissue & Towels	9.4%	619	0.9%	35	0.5%	41	3.7%	695	6%
Other Compostable Paper	1.0%	68	1.2%	49	0.2%	17	0.7%	135	13%
Plant Trimmings	1.0%	65	0.1%	5	87.0%	7,147	38.2%	7,217	99%
Edible Food: Potentially Donatable	4.7%	311	0.3%	10	1.3%	110	2.3%	431	26%
Edible Food: Non-donatable	12.5%	830	1.2%	50	1.7%	143	5.4%	1,022	14%
Non-edible Food	16.6%	1,096	0.6%	23	3.7%	304	7.5%	1,422	21%
Other Compostable Organics	0.1%	7	0.1%	3	0.0%	4	0.1%	14	28%
Sample Count		20		20		20			

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

In 2024, the single-family sector generated 11,105 tons of Compostable material and missorted 3,079 tons into the garbage stream and 227 tons into the recycle stream (Figure 12). This compares to 11,152 tons of Compostable material generated in 2018, of which 3,763 tons were missorted into the garbage stream, and 178 tons into the recycle stream.

Figure 12. Compostable Material Tons by Stream 2018-2024: Single-family

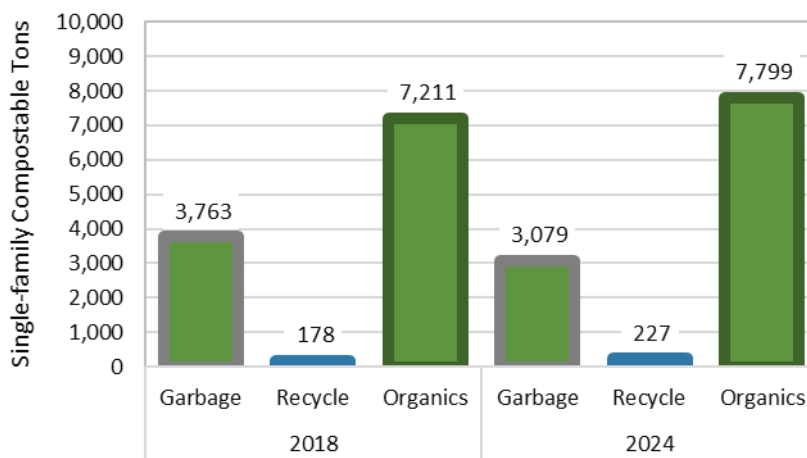


Table 11 compares Compostable material capture rates for the single-family sector between the 2018 and 2024 studies. Between the two study periods, Compostable material decreased in the amount generated (48 fewer tons) and increased in the amount successfully captured (588 more tons). Since 2018, the single-family sector increased their capture of Compostable material in the organics stream by 6 percentage points.⁶

Table 13. Compostable Material Capture Rates 2018-2024: Single-family

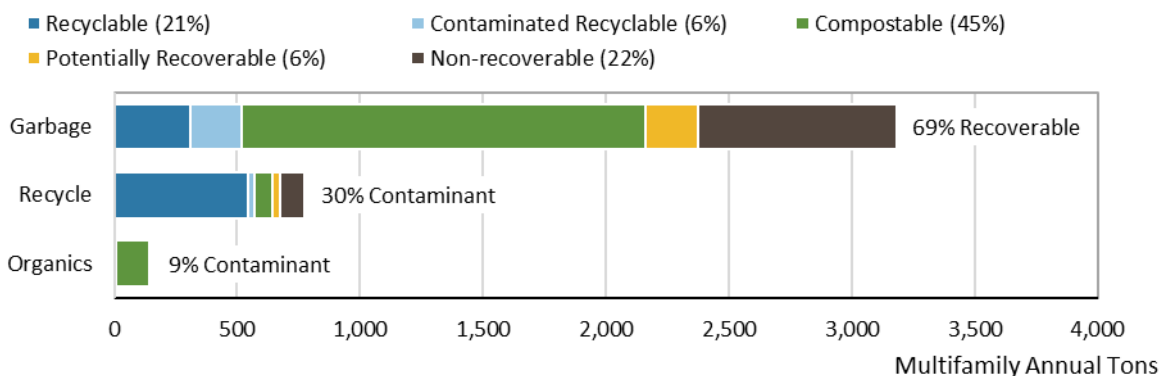
	Compostable Materials		
Single-family	2018	2024	Difference
Generated Tons	11,152	11,105	▼ -48
Composted Tons	7,211	7,799	▲ 588
Capture Rate	65%	70%	▲ 6%

Multifamily Study Results

Composition Findings

In 2024, the multifamily sector generated 4,111 tons of material across all waste streams. This represents 10% of the City's overall generation. Curbside recoverable material accounted for 69% (2,183 tons) of the garbage stream (Figure 13). Contaminant material accounted for 30% (232 tons) of the recycle stream and 9% (13 tons) of the organics stream.

Figure 13. Total Tons by Waste Stream: Multifamily



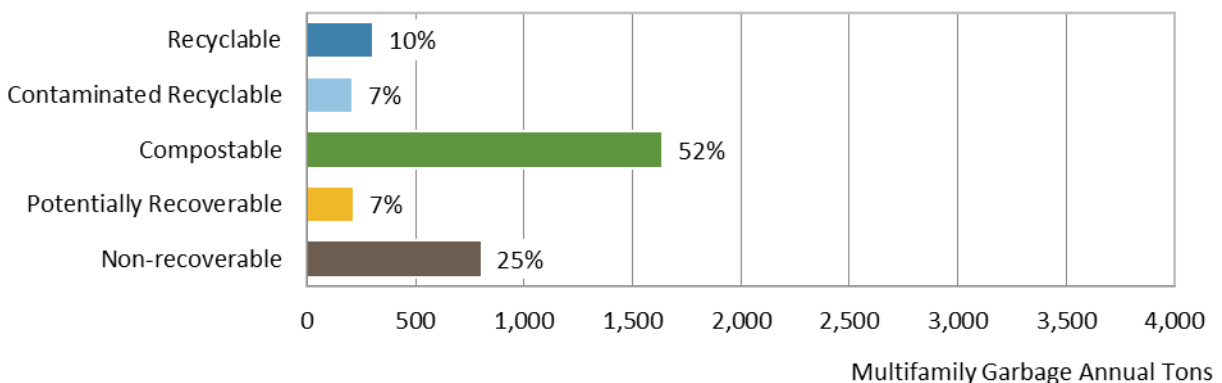
GARBAGE

The multifamily sector disposed of 3,182 tons of material in the garbage stream. Overall, 62% (1,949 tons) of multifamily garbage was clean material that is recoverable through curbside

⁶ These differences between study years were not tested to evaluate whether the changes in capture rates are statistically significant.

collection programs (10% Recyclable or 308 tons and 52% Compostable or 1,641 tons; Figure 14). An additional 7% (212 tons) of the stream was Contaminated Recyclable material that could have been recovered with appropriate cleaning and sorting. Potentially Recoverable material accounted for 7% (216 tons) and Non-recoverable material accounted for 25% (805 tons) of the stream.

Figure 14. Tons by Recoverability Group: Multifamily Garbage



Within the garbage stream, the three most prevalent curbside recoverable material types were Non-edible Food (17.2% or 546 tons), Edible Food: Non-donatable (15.2% or 484 tons), and Edible Food: Potentially Donatable (8.3% or 265 tons; Table 14).

Table 14. Most Prevalent Curbside Recoverable Material Types: Multifamily Garbage

Material	Est. %	+ / -	Est. Tons
Non-edible Food	17.2%	2.9%	546
Edible Food: Non-donatable	15.2%	2.1%	484
Edible Food: Potentially Donatable	8.3%	2.2%	265
Paper Tissue & Towels	7.0%	0.9%	224
Clean Recyclable Paper	3.0%	0.6%	96
Contaminated Recyclable Paper	2.5%	0.5%	79
Plant Trimmings	1.9%	1.3%	61
Contaminated Recyclable Plastic: Non-CRV	1.7%	0.4%	55
Clean Other Recyclable Metal	1.2%	1.0%	40
Plastic Takeout Containers	0.9%	0.2%	30
Total for Top Recoverable Material	59.1%		1,879
Total for Other Recoverable Material	9.6%		304
All Other Material	31.4%		998
Total Annual Garbage Tons	100.0%		3,182

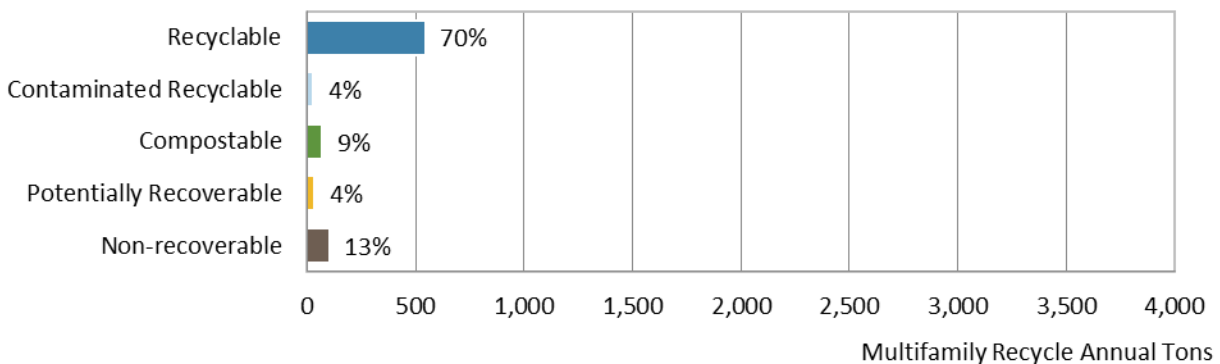
Percentages for material types may not total 100% due to rounding.

RECYCLE

The multifamily sector diverted 776 tons of material into the recycle stream. The majority (70% or 544 tons) of the multifamily recycle stream was Recyclable material (Figure 15). Missorted, contaminant material accounted for 30% of the material in blue recycle containers. Contaminated

Recyclable material accounted for 4% (28 tons), Compostable material accounted for 9% (70 tons), Potentially Recoverable material accounted for 4% (31 tons), and Non-recoverable material accounted for 13% (103 tons) of the multifamily recycle stream. Refer to Appendix B for definitions of these capitalized material types.

Figure 15. Tons by Recoverability Group: Multifamily Recycle



Contaminant material accounted for 29.8% (232 tons) of the multifamily recycle stream (Table 15). The three most prevalent contaminant material types were Non-edible Food (3.7% or 28 tons), Other Composite Metal (3.2% or 25 tons), and Other Composite Materials & Fines (2.0% or 15 tons).

Table 15. Most Prevalent Contaminant Material Types: Multifamily Recycle

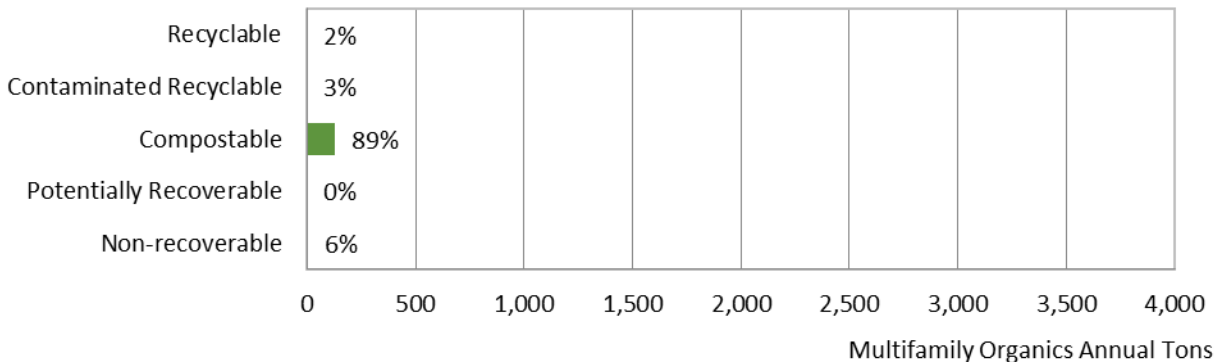
Material	Est. %	+ / -	Est. Tons
Non-edible Food	3.7%	2.7%	28
Other Composite Metal	3.2%	3.6%	25
Other Composite Materials & Fines	2.0%	1.8%	15
Other Compostable Organics	1.7%	2.7%	13
Other Composite Plastic	1.6%	0.5%	12
Total for Top Contaminant Material	12.1%		94
Total for Other Contaminant Material	17.7%		138
All Other Material	70.1%		544
Total Annual Recycle Tons	100.0%		776

Percentages for material types may not total 100% due to rounding.

ORGANICS

The multifamily sector diverted 154 tons of material into the organics stream. The majority (89% or 137 tons) of the multifamily organics stream was Compostable material (Figure 16). Recyclable material accounted for 2% (3 tons) of the multifamily organics stream, while Contaminated Recyclable material accounted for 3% (4 tons), Potentially Recoverable material accounted for 0% (less than 0.5 tons), and Non-recoverable material accounted for 6% (9 tons) of the stream.

Figure 16. Tons by Recoverability Group: Multifamily Organics



Contaminant material accounted for 8.6% (13 tons) of the multifamily organics stream (Table 16). The three most prevalent contaminant material types were Other Composite Plastic (2.5% or 4 tons), Other Composite Film Plastics (1.4% or 2 tons), and Compostable Plastic (1.0% or 1 ton).

Material types that are accepted in the organics stream but are best recovered through the recycle stream (e.g., Flattened Corrugated Cardboard) are categorized as Recyclable for the recoverability analysis above (Figure 16). However, they are not considered contaminated for the contaminant analysis (Table 16).

Table 16. Most Prevalent Contaminant Material Types: Multifamily Organics

Material	Est. %	+ / -	Est. Tons
Other Composite Plastic	2.5%	1.1%	4
Other Composite Film Plastics	1.4%	0.8%	2
Compostable Plastic	1.0%	0.3%	1
Contaminated Recyclable Film	0.6%	0.4%	1
Contaminated Recyclable Plastic: Non-CRV	0.4%	0.2%	1
Total for Top Contaminant Material	5.8%		9
Total for Other Contaminant Material	2.8%		4
All Other Material	91.5%		141
Total Annual Organics Tons	100.0%		154

Percentages for material types may not total 100% due to rounding.

Recyclable Material Capture Rates

The capture rate for Recyclable material in the recycle stream for the multifamily sector was 64% (Table 17). This means that of all the Recyclable material placed in the multifamily garbage, recycle, and organics streams, 64% (544 out of 855 tons) was correctly captured in the recycle stream.

Clean Recyclable Paper was the most prevalent Recyclable material in multifamily generation (all three streams combined) and had a recycle capture rate of 57% (129 out of 277 tons). Flattened Corrugated Cardboard was the second-most prevalent Recyclable material and had a capture rate

of 95% (163 out of 171 tons). Unflattened Corrugated Cardboard was the third-most prevalent Recyclable material and had a capture rate of 82% (119 out of 146 tons).

Capture rates were highest for Clean & Bagged Recyclable Film (100% of less than 0.5 tons) and Clean Tin Cans: CRV (100% of less than 0.5 tons), although the two material types accounted for a small proportion of all three streams. Capture rates were lowest for Plastic Takeout Containers (6% or 2 out of 32 tons).

Table 17. Recyclable Material Capture Rates: Multifamily

Material	Garbage		Recycle		Organics		Generation		Capture Rate
	Est. %	Est. Tons	Est. %	Est. Tons	Est. %	Est. Tons	Est. %	Est. Tons	
Total Annual Tons	100.0%	3,182	100.0%	776	100.0%	154	100.0%	4,111	
Recyclable	9.7%	308	70.1%	544	1.9%	3	20.8%	855	 64%
Flattened Corrugated Cardboard	0.3%	8	21.0%	163	0.0%	0	4.2%	171	 95%
Unflattened Corrugated Cardboard	0.8%	26	15.4%	119	0.1%	0	3.5%	146	 82%
Clean Recyclable Paper	3.0%	96	16.7%	129	0.7%	1	5.5%	227	 57%
Clean #1 PET Containers: CRV	0.4%	14	1.0%	8	0.1%	0	0.5%	22	 36%
Clean #1 PET Packaging: Non-CRV	0.3%	8	1.5%	12	0.0%	0	0.5%	20	 58%
Clean #2 HDPE Containers: CRV	0.0%	1	0.1%	1	-	-	0.0%	1	 46%
Clean #2 HDPE Packaging: Non-CRV	0.2%	7	1.5%	12	0.0%	0	0.5%	19	 62%
Clean Other #3-7 Container: CRV	0.0%	0	0.1%	1	0.0%	0	0.0%	1	 71%
Clean Other #3-7 Packaging: Non-CRV	0.2%	7	0.7%	6	0.1%	0	0.3%	12	 45%
Plastic Takeout Containers	0.9%	30	0.3%	2	0.4%	1	0.8%	32	 6%
Durable Plastic Products	0.4%	14	1.7%	13	0.1%	0	0.7%	27	 49%
Clean & Bagged Recyclable Film	-	-	0.0%	0	-	-	0.0%	0	 100%
Clean Glass Bottles: CRV	0.5%	17	7.3%	57	-	-	1.8%	74	 77%
Clean Glass Containers: Non-CRV	0.8%	25	1.0%	8	-	-	0.8%	33	 25%
Clean Aluminum Cans: CRV	0.3%	10	0.4%	3	0.0%	0	0.3%	13	 26%
Clean Aluminum Cans & Foil: Non-CRV	0.1%	3	0.1%	1	0.0%	0	0.1%	4	 24%
Clean Tin Cans: CRV	-	-	0.0%	0	-	-	0.0%	0	 100%
Clean Tin Cans: Non-CRV	0.1%	2	0.5%	4	0.0%	0	0.1%	6	 62%
Clean Other Recyclable Metal	1.2%	40	0.7%	6	0.2%	0	1.1%	46	 12%
Sample Count		20		20		17			

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

In 2024, the multifamily sector generated 855 tons of Recyclable material and missorted 308 tons into the garbage stream and 3 tons into the organics stream (Figure 17). This compares to 983 tons of Recyclable material generated in 2019, of which 531 tons were missorted into the garbage stream and 5 tons into the organics stream.

Figure 17. Recyclable Material Tons by Stream 2018-2024: Multifamily

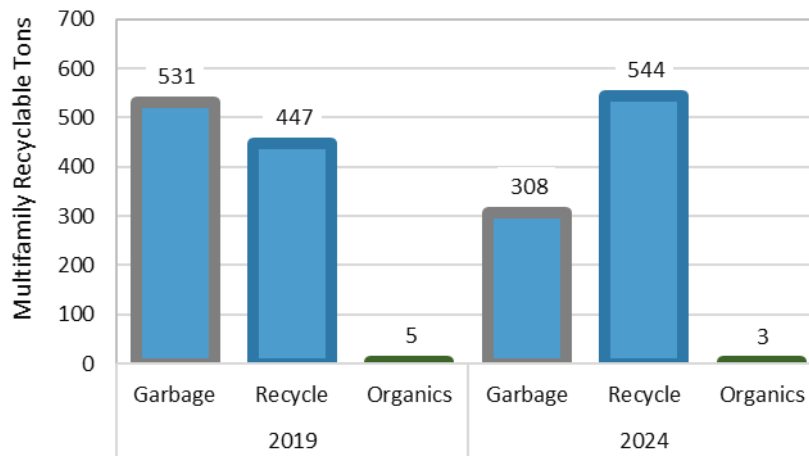


Table 18 compares Recyclable material capture rates for the multifamily sector between the 2019 and 2024 studies. Between the two study periods, Recyclable material decreased in the amount generated (127 fewer tons) and increased in the amount successfully captured (97 more tons). Since 2019, the multifamily sector increased their capture of Recyclable material in the recycle stream by 18 percentage points.⁷

Table 18. Recyclable Material Capture Rates 2018-2024: Multifamily

Multifamily	Recyclable Materials		
	2019	2024	Difference
Generated Tons	983	855	▼ -127
Recycled Tons	447	544	▲ 97
Capture Rate	45%	64%	▲ 18%

Compostable Material Capture Rates

The capture rate for Compostable material in the organics stream for the multifamily sector was 7% (Table 19). This means that of all the Compostable material placed in the multifamily garbage, recycle, and organics streams, 7% (137 out of 1,848 tons) was correctly captured in the organics stream.

Non-edible Food was the most prevalent Compostable material in multifamily generation (all three streams combined) and had an organics capture rate of 11% (73 out of 648). Edible Food: Non-

⁷ These differences between study years were not tested to evaluate whether the changes in capture rates are statistically significant.

donatable was the second-most prevalent Compostable material and had a capture rate of 6% (32 out of 527 tons).

Plant Trimmings had the highest capture rate at 16% (12 out of 73 tons), followed by Pizza Boxes at 11% (1 out of 7 tons), although these material types accounted for small proportions of all three streams. Relatedly, Coated Corrugated Cardboard had the lowest capture rate of 0% (0 of 1 tons) with the smallest proportion of the overall generation

Table 19. Compostable Material Capture Rates: Multifamily

Material	Garbage		Recycle		Organics		Generation		Capture Rate
	Est. %	Est. Tons	Est. %	Est. Tons	Est. %	Est. Tons	Est. %	Est. Tons	
Total Annual Tons	100.0%	3,182	100.0%	776	100.0%	154	100.0%	4,111	
Compostable	51.6%	1,641	9.0%	70	89.2%	137	45.0%	1,848	7%
Pizza Boxes	0.1%	4	0.3%	2	0.5%	1	0.2%	7	11%
Coated Corrugated Cardboard	-	-	0.1%	1	-	-	0.0%	1	0%
Paper Takeout Containers	0.7%	23	0.2%	2	0.5%	1	0.6%	26	3%
Coated Paper Cups	0.2%	7	0.1%	1	0.0%	0	0.2%	8	1%
Paper Tissue & Towels	7.0%	224	0.8%	6	7.4%	11	5.9%	242	5%
Other Compostable Paper	0.8%	26	0.1%	0	1.6%	2	0.7%	28	8%
Plant Trimmings	1.9%	61	0.0%	0	7.5%	12	1.8%	73	16%
Edible Food: Potentially Donatable	8.3%	265	0.5%	4	3.0%	5	6.7%	273	2%
Edible Food: Non-donatable	15.2%	484	1.5%	11	21.0%	32	12.8%	527	6%
Non-edible Food	17.2%	546	3.7%	28	47.6%	73	15.8%	648	11%
Other Compostable Organics	0.0%	1	1.7%	13	0.0%	0	0.4%	15	0%
Sample Count		20		20		17			

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

In 2024, the multifamily sector generated 1,848 tons of Compostable material and missorted 1,641 tons into the garbage stream and 70 tons into the recycle stream (Figure 18). This compares to 1,660 tons of Compostable material generated in 2019, of which 1,422 tons were missorted into the garbage stream and 140 tons into the recycle stream.

Figure 18. Compostable Material Tons by Stream 2018-2024: Multifamily

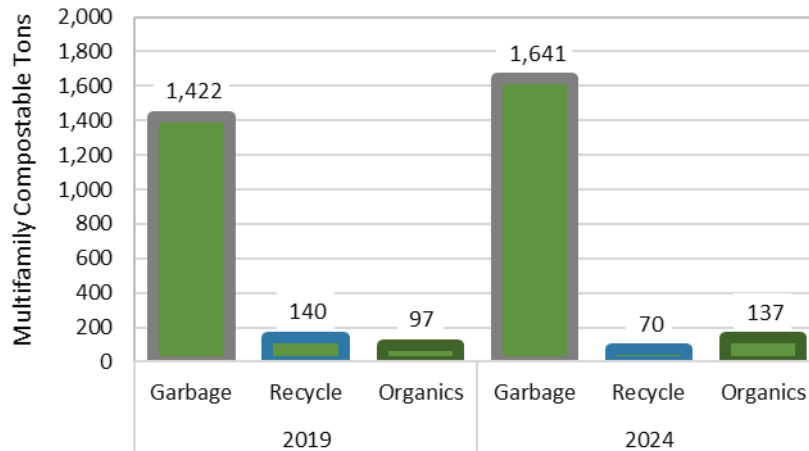


Table 20 compares Compostable material capture rates for the multifamily sector between the 2019 and 2024 studies. Between the two study periods, Compostable material increased in the amount generated (188 more tons) and successfully captured (40 more tons). Since 2019, the multifamily sector increased their capture of Compostable material in the organics stream by 2 percentage points.⁸

Table 20. Compostable Material Capture Rates 2019-2024: Multifamily

Multifamily	Compostable Materials		
	2019	2024	Difference
Generated Tons	1,660	1,848	▲ 188
Composted Tons	97	137	▲ 40
Capture Rate	6%	7%	▲ 2%

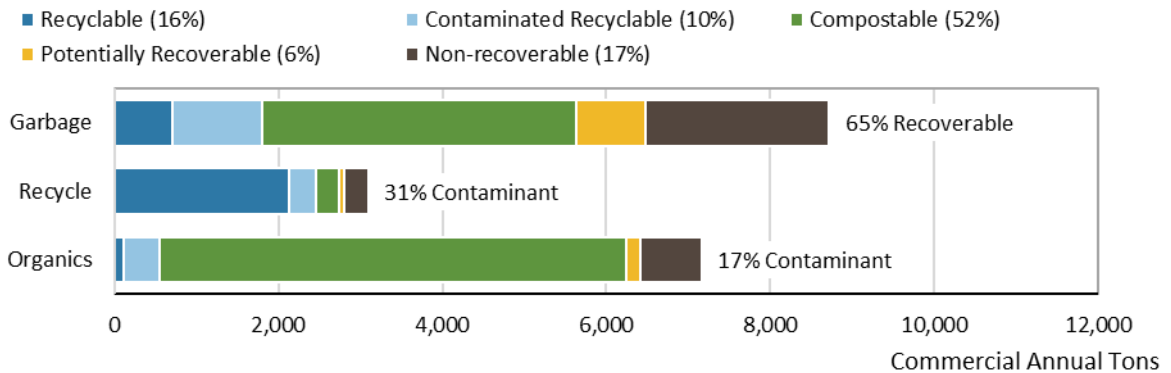
Commercial Study Results

Composition Findings

In 2024, the commercial sector generated 18,991 tons of material across all waste streams. This represents 45% of the City's overall generation. Curbside recoverable material accounted for 65% (8,721 tons) of the garbage stream (Figure 19). Contaminant material accounted for 31% (3,102 tons) of the recycle stream and 17% (7,169 tons) of the organics stream.

⁸ These differences between study years were not tested to evaluate whether the changes in capture rates are statistically significant.

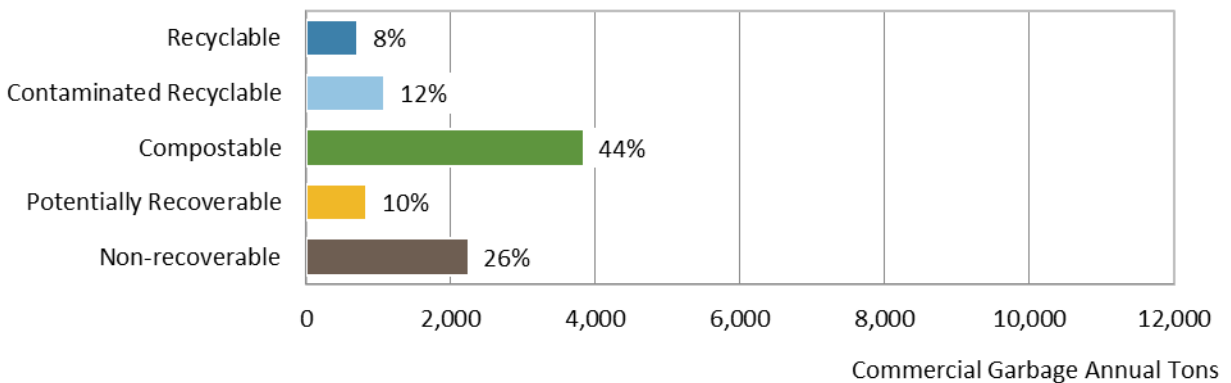
Figure 19. Total Tons by Waste Stream: Commercial



GARBAGE

The commercial sector disposed of 8,721 tons of material in the garbage stream. Overall, 52% (4,549 tons) of commercial garbage was clean material that is recoverable through curbside collection programs (8% Recyclable or 710 tons and 44% Compostable or 3,839 tons; Figure 20). An additional 12% (1,086 tons) of the stream was Contaminated Recyclable material that could have been recovered with appropriate cleaning and sorting. Potentially Recoverable material accounted for 10% (837 tons) and Non-recoverable material accounted for 26% (2,248 tons) of the stream.

Figure 20. Tons by Recoverability Group: Commercial Garbage



Within the garbage stream, the three most prevalent curbside recoverable material types were Edible Food: Non-donatable (15.2% or 1,321 tons), Non-edible Food (9.4% or 820 tons), and Paper Tissue & Towels (8.8% or 766 tons; Table 21).

Table 21. Most Prevalent Curbside Recoverable Material Types: Commercial Garbage

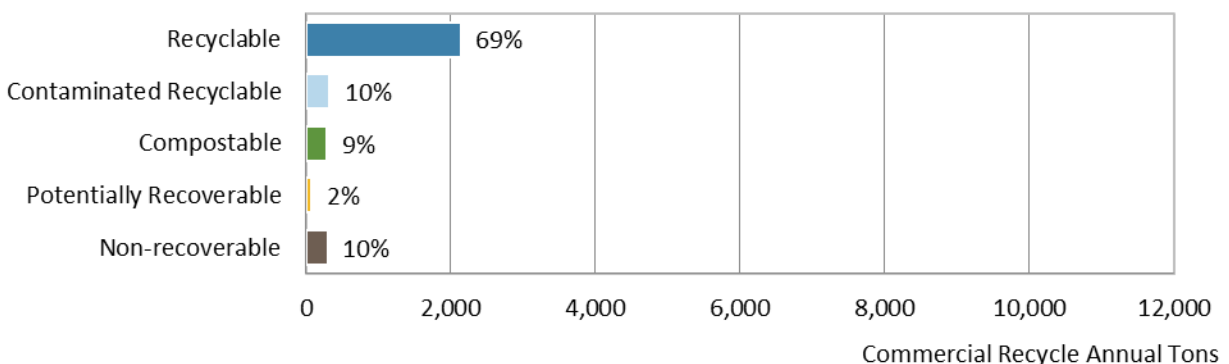
Material	Est. %	+ / -	Est. Tons
Edible Food: Non-donatable	15.2%	3.1%	1,321
Non-edible Food	9.4%	1.9%	820
Paper Tissue & Towels	8.8%	1.9%	766
Contaminated Recyclable Paper	5.7%	1.0%	498
Contaminated Recyclable Metal	3.0%	2.1%	264
Edible Food: Potentially Donatable	2.8%	0.7%	247
Clean Recyclable Paper	2.7%	1.0%	232
Plant Trimmings	2.0%	1.0%	174
Other Compostable Paper	2.0%	0.5%	171
Contaminated Recyclable Plastic: Non-CRV	1.8%	0.2%	153
Total for Top Recoverable Material	53.3%		4,646
Total for Other Recoverable Material	11.9%		1,041
All Other Material	34.8%		3,034
Total Annual Garbage Tons	100.0%		8,721

Percentages for material types may not total 100% due to rounding.

RECYCLE

The commercial sector diverted 8,721 tons of material into the recycle stream. The majority (69% or 2,135 tons) of the commercial recycle stream was Recyclable material (Figure 21). Missorted, contaminant material accounted for 31% of the material in blue recycle containers. Contaminated Recyclable material accounted for 10% (325 tons) of the stream, Compostable material accounted for 9% (276 tons), Potentially Recoverable material accounted for 2% (68 tons), and Non-recoverable material accounted for 10% (299 tons) of the commercial recycle stream.

Figure 21. Tons by Recoverability Group: Commercial Recycle



Contaminant material accounted for 31.1% (967 tons) of the commercial recycle stream (Table 22). The three most prevalent contaminant material types were Contaminated Recyclable Paper (6.9% or 215 tons), Edible Food: Non-donatable (2.6% or 80 tons), and Non-edible Food (1.9% or 60 tons). Refer to Appendix B for definitions of these capitalized material types.

Table 22. Most Prevalent Contaminant Material Types: Commercial Recycle

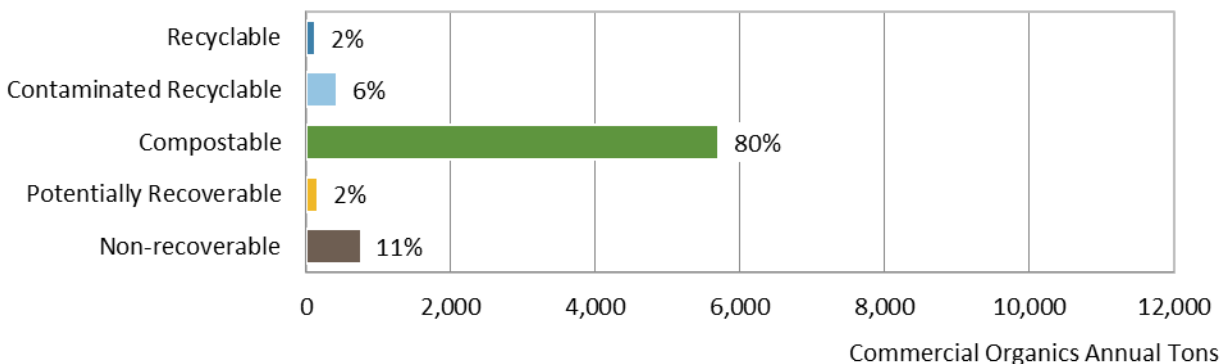
Material	Est. %	+ / -	Est. Tons
Contaminated Recyclable Paper	6.9%	4.0%	215
Edible Food: Non-donatable	2.6%	0.9%	80
Non-edible Food	1.9%	1.7%	60
Other Textiles	1.5%	1.1%	48
Other Composite Plastic	1.4%	0.4%	44
Total for Top Contaminant Material	14.4%		448
Total for Other Contaminant Material	16.7%		519
All Other Material	68.8%		2,135
Total Annual Recycle Tons	100.0%		3,102

Percentages for material types may not total 100% due to rounding.

ORGANICS

The commercial sector diverted 7,169 tons of material into the organics stream. The majority (80% or 5,704 tons) of the commercial organics stream was Compostable material (Figure 22). Recyclable material accounted for 2% (118 tons) of the commercial organics stream, while Contaminated Recyclable material accounted for 6% (428 tons), Potentially Recoverable material accounted for 2% (159 tons) and Non-recoverable material accounted for 11% (760 tons) of the stream.

Figure 22. Tons by Recoverability Group: Commercial Organics



Contaminant material accounted for 16.4% (1,204 tons) of the commercial organics stream (Table 23). The three most prevalent contaminant material types were Other Composite Plastic (4.6% or 328 tons), Other Composite Film Plastics (2.1% or 151 tons), and Compostable Plastic (1.5% or 104 tons).

Material types that are accepted in the organics stream but are best recovered through the recycle stream (e.g., Flattened Corrugated Cardboard) are categorized as Recyclable for the recoverability analysis above (Figure 22). However, they are not considered contaminated for the contaminant analysis (Table 23).

Table 23. Most Prevalent Contaminant Material Types: Commercial Organics

Material	Est. %	+ / -	Est. Tons
Other Composite Plastic	4.6%	1.2%	328
Other Composite Film Plastics	2.1%	1.1%	151
Compostable Plastic	1.5%	0.7%	104
Construction & Demolition Debris	1.4%	1.5%	104
Contaminated Recyclable Plastic: Non-CRV	1.3%	0.4%	94
Total for Top Contaminant Material	10.9%		781
Total for Other Contaminant Material	5.9%		423
All Other Material	83.2%		5,965
Total Annual Organics Tons	100.0%		7,169

Percentages for material types may not total 100% due to rounding.

Recyclable Material Capture Rates

The capture rate for Recyclable material in the recycle stream for the commercial sector was 72% (Table 24). This means that of all the Recyclable material placed in the commercial garbage, recycle, and organics streams, 72% (2,135 out of 2,963 tons) was correctly captured in the recycle stream.

Flattened Corrugated Cardboard was the most prevalent Recyclable material in commercial generation (all three streams combined) and had a recycle capture rate of 92% (688 out of 748 tons). Clean Recyclable Paper was the second-most prevalent Recyclable material and had a capture rate of 67% (492 out of 740 tons).

Capture rates were highest for Clean & Bagged Recyclable Film (100% of 2 tons) and Clean Tin Cans: CRV (100% of 5 tons) and lowest for Plastic Takeout Containers (8% or 15 out of 177 tons), although these material types accounted for small proportions of the overall generation.

Table 24. Recyclable Material Capture Rates: Commercial

Material	Garbage		Recycle		Organics		Generation		Capture Rate
	Est. %	Est. Tons	Est. %	Est. Tons	Est. %	Est. Tons	Est. %	Est. Tons	
Total Annual Tons	100.0%	8,721	100.0%	3,102	100.0%	7,169	100.0%	18,991	
Recyclable	8.1%	710	68.8%	2,135	1.6%	118	15.6%	2,963	72%
Flattened Corrugated Cardboard	0.6%	54	22.2%	688	0.1%	6	3.9%	748	92%
Unflattened Corrugated Cardboard	0.6%	53	13.7%	424	0.3%	25	2.6%	501	85%
Clean Recyclable Paper	2.7%	232	15.9%	492	0.2%	16	3.9%	740	67%
Clean #1 PET Containers: CRV	0.2%	18	1.4%	42	0.0%	1	0.3%	62	68%
Clean #1 PET Packaging: Non-CRV	0.1%	8	1.7%	54	0.0%	1	0.3%	63	86%
Clean #2 HDPE Containers: CRV	0.0%	0	0.1%	2	-	-	0.0%	2	90%
Clean #2 HDPE Packaging: Non-CRV	0.2%	14	1.3%	40	0.0%	1	0.3%	55	73%
Clean Other #3-7 Container: CRV	0.0%	0	0.1%	2	-	-	0.0%	2	97%
Clean Other #3-7 Packaging: Non-CRV	0.2%	20	0.7%	23	0.1%	4	0.2%	46	49%
Plastic Takeout Containers	1.4%	121	0.5%	15	0.6%	41	0.9%	177	8%
Durable Plastic Products	1.3%	111	2.2%	67	0.0%	2	0.9%	179	37%
Clean & Bagged Recyclable Film	-	-	0.1%	2	-	-	0.0%	2	100%
Clean Glass Bottles: CRV	0.3%	22	4.8%	149	0.0%	2	0.9%	173	86%
Clean Glass Containers: Non-CRV	0.1%	12	2.4%	76	0.0%	2	0.5%	91	84%
Clean Aluminum Cans: CRV	0.1%	9	0.7%	23	0.0%	2	0.2%	34	68%
Clean Aluminum Cans & Foil: Non-CRV	0.1%	5	0.2%	5	0.0%	0	0.1%	10	49%
Clean Tin Cans: CRV	-	-	0.2%	5	-	-	0.0%	5	100%
Clean Tin Cans: Non-CRV	0.0%	2	0.5%	16	-	-	0.1%	17	91%
Clean Other Recyclable Metal	0.3%	30	0.4%	11	0.2%	14	0.3%	56	20%
Sample Count		30		20		20			

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

In 2024, the commercial sector generated 2,963 tons of Recyclable material and missorted 710 tons into the garbage stream and 118 tons into the organics stream (Figure 23). This compares to 3,532 tons of Recyclable material generated in 2019, of which 1,129 tons were missorted into the garbage stream and 742 tons into the organics stream.

Figure 23. Recyclable Material Tons by Stream 2019-2024: Commercial

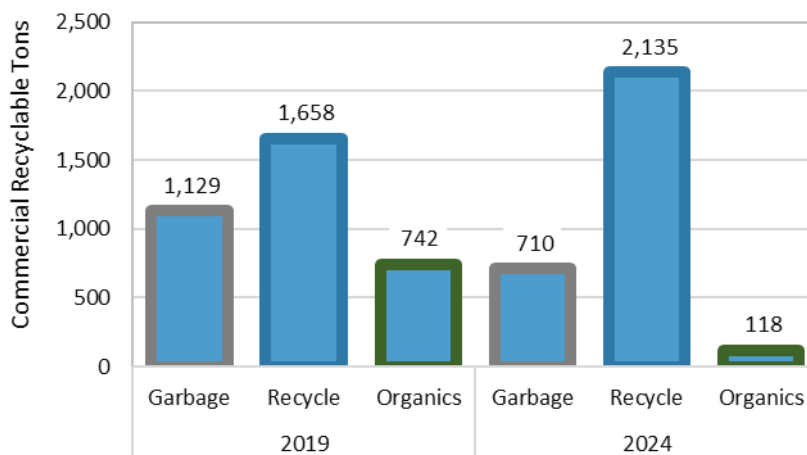


Table 25 compares Recyclable material capture rates for the commercial sector between the 2019 and 2024 studies. Between the two study periods, Recyclable material decreased in the amount

generated (567 fewer tons) and increased in the amount successfully captured (477 more tons). Since 2019, the commercial sector increased their capture of Recyclable material in the recycle stream by 25 percentage points.⁹

Table 25. Recyclable Material Capture Rates 2019-2024: Commercial

Commercial	Recyclable Materials		
	2019	2024	Difference
Generated Tons	3,530	2,963	▼ -567
Recycled Tons	1,658	2,135	▲ 477
Capture Rate	47%	72%	▲ 25%

Compostable Material Capture Rates

The capture rate for Compostable material in the organics stream for the commercial sector was 58% (Table 26). This means that of all the Compostable material placed in the commercial garbage, recycle, and organics streams, 58% (5,704 out of 9,818 tons) was correctly captured in the organics stream.

Edible Food: Non-donatable was the most prevalent Compostable material in commercial generation (all three streams combined) and had an organics capture rate of 58% (1,898 out of 3,299 tons). Non-edible Food was the second-most prevalent Compostable material and had a capture rate of 59% (1,289 out of 2,169 tons).

Plant Trimmings had the highest capture rate at 85% (985 out of 1,161 tons), followed by Edible Food: Potentially Donatable at 69% (572 out of 825 tons). These materials also accounted for large proportions of the overall generation.

⁹ These differences between study years were not tested to evaluate whether the changes in capture rates are statistically significant.

Table 26. Compostable Material Capture Rates: Commercial

Material	Garbage		Recycle		Organics		Generation		Capture Rate
	Est. %	Est. Tons	Est. %	Est. Tons	Est. %	Est. Tons	Est. %	Est. Tons	
Total Annual Tons	100.0%	8,721	100.0%	3,102	100.0%	7,169	100.0%	18,991	
Compostable	44.0%	3,839	8.9%	276	79.6%	5,704	51.7%	9,818	58%
Pizza Boxes	0.2%	21	0.9%	27	0.1%	5	0.3%	53	9%
Coated Corrugated Cardboard	0.8%	70	0.4%	13	0.9%	67	0.8%	150	45%
Paper Takeout Containers	1.4%	123	0.8%	26	0.6%	41	1.0%	190	22%
Coated Paper Cups	1.3%	113	0.2%	6	1.3%	93	1.1%	212	44%
Paper Tissue & Towels	8.8%	766	0.8%	23	6.3%	454	6.5%	1,243	36%
Other Compostable Paper	2.0%	171	1.0%	30	4.2%	301	2.6%	502	60%
Plant Trimmings	2.0%	174	0.1%	2	13.7%	985	6.1%	1,161	85%
Edible Food: Potentially Donatable	2.8%	247	0.2%	6	8.0%	572	4.3%	825	69%
Edible Food: Non-donatable	15.2%	1,321	2.6%	80	26.5%	1,898	17.4%	3,299	58%
Non-edible Food	9.4%	820	1.9%	60	18.0%	1,289	11.4%	2,169	59%
Other Compostable Organics	0.1%	13	0.0%	1	0.0%	0	0.1%	14	1%
Sample Count		30		20		20			

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

In 2024, the multifamily sector generated 8,818 tons of Compostable material and missorted 3,839 tons into the garbage stream and 276 tons into the recycle stream (Figure 24). This compares to 7,613 tons of Compostable material generated in 2019, of which 2,641 tons were missorted into the garbage stream and 82 tons into the recycle stream.

Figure 24. Compostable Material Tons by Stream 2019-2024: Commercial

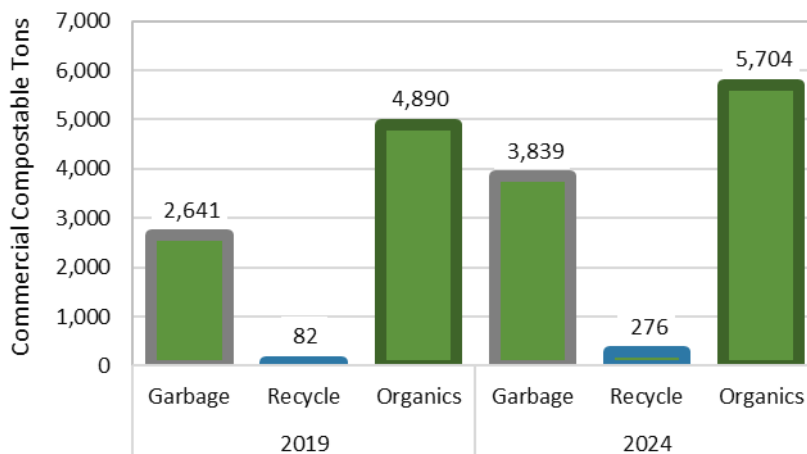


Table 27 compares Compostable material capture rates for the commercial sector between the 2019 and 2024 studies. Between the two study periods, Compostable material increased in both the amount generated (2,206 more tons) and successfully captured (814 more tons). Since 2019,

the commercial sector decreased their capture of Compostable material in the organics stream by 6 percentage points.¹⁰

Table 27. Compostable Material Capture Rates 2019-2024: Commercial

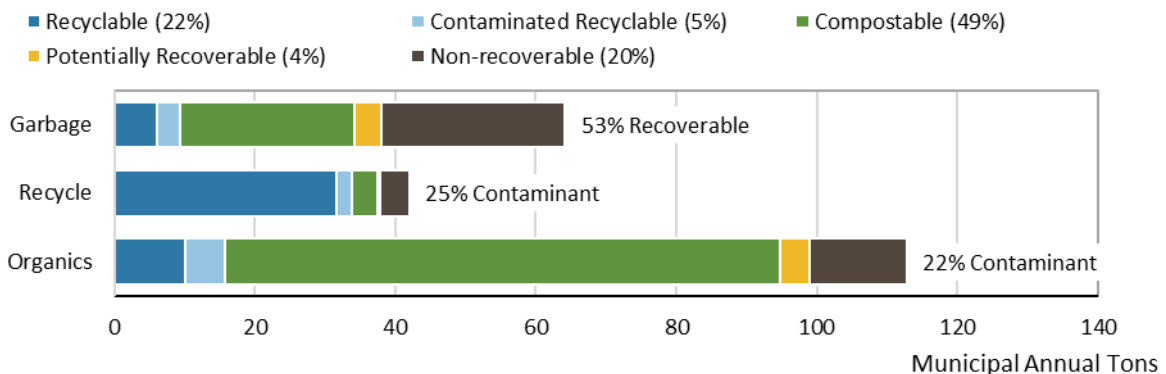
Commercial	Compostable Materials		
	2019	2024	Difference
Generated Tons	7,613	9,818	▲ 2206
Composted Tons	4,890	5,704	▲ 814
Capture Rate	64%	58%	▼ -6%

Municipal Study Results

Composition Findings

In 2024, the municipal sector generated 219 tons of material across all three streams. This represents 1% of the City's overall generation. Curbside recoverable material accounted for 53% (34 tons) of the garbage stream (Figure 25). Contaminant material accounted for 25% (10 tons) of the recycle stream and 22% (25 tons) of the organics stream.

Figure 25. Total Tons by Waste Stream: Municipal



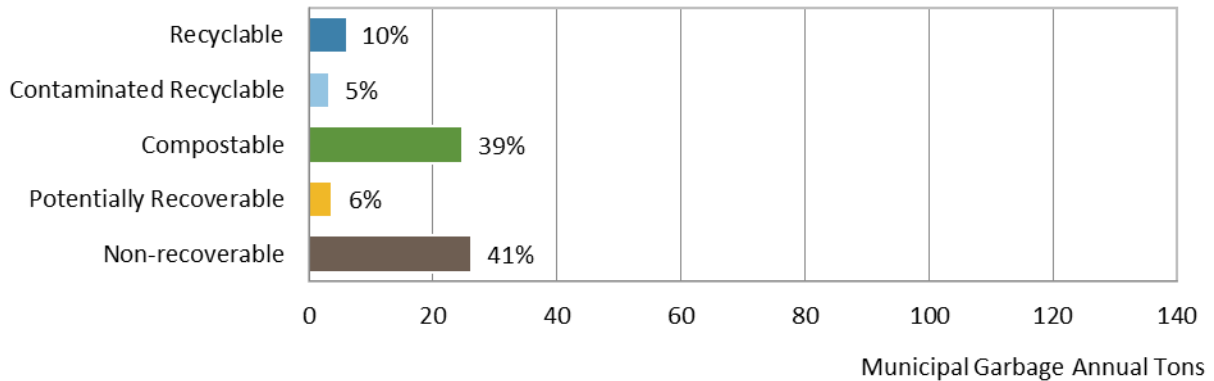
GARBAGE

Municipal properties disposed of 64 tons of material in the garbage stream. Overall, 49% (31 tons) of municipal garbage was clean material that is recoverable through curbside collection programs (10% Recyclable or 6 tons and 39% Compostable or 25 tons; Figure 26). An additional 5% (3 tons) of the stream was Contaminated Recyclable material that could have been recovered with

¹⁰ These differences between study years were not tested to evaluate whether the changes in capture rates are statistically significant.

appropriate cleaning and sorting. Potentially Recoverable material accounted for 6% (4 tons) and Non-recoverable material accounted for 41% (26 tons) of the stream.

Figure 26. Tons by Recoverability Group: Municipal Garbage



Within the garbage stream, the three most prevalent curbside recoverable material types were Paper Tissue & Towels (13.5% or 9 tons), Non-edible Food (9.1% or 6 tons), and Edible Food: Non-donatable (7.6% or 5 tons; Table 28).

Table 28. Most Prevalent Curbside Recoverable Material Types: Municipal Garbage

Material	Est. %	+ / -	Est. Tons
Paper Tissue & Towels	13.5%	7.0%	9
Non-edible Food	9.1%	4.3%	6
Edible Food: Non-donatable	7.6%	3.0%	5
Clean Recyclable Paper	2.2%	0.8%	1
Contaminated Recyclable Paper	1.9%	1.0%	1
Edible Food: Potentially Donatable	1.6%	1.1%	1
Plant Trimmings	1.5%	1.7%	1
Plastic Takeout Containers	1.5%	0.8%	1
Other Compostable Paper	1.4%	0.4%	1
Paper Takeout Containers	1.2%	1.3%	1
Total for Top Recoverable Material	41.6%		27
Total for Other Recoverable Material	11.8%		8
All Other Material	46.5%		30
Total Annual Garbage Tons	100.0%		64

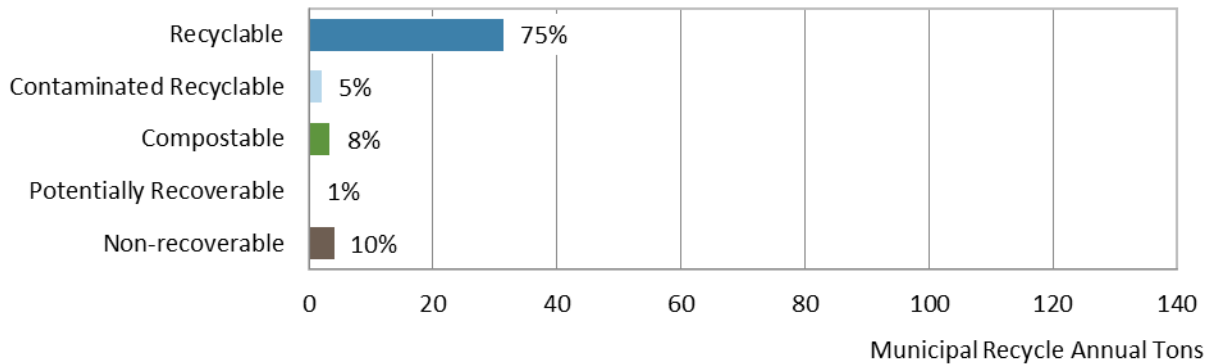
Percentages for material types may not total 100% due to rounding.

RECYCLE

The municipal sector diverted 42 tons of material into the recycle stream. The majority (75% or 32 tons) of the municipal recycle stream was Recyclable material (Figure 27). Missorted, contaminant material accounted for 25% of the material in blue recycle containers. Contaminated Recyclable material accounted for 5% (2 tons) of the stream, Compostable material accounted for 8% (4 tons),

Potentially Recoverable material accounted for 1% (less than 0.5 tons), and Non-recoverable material accounted for 10% (4 tons) of the municipal recycle stream.

Figure 27. Tons by Recoverability Group: Municipal Recycle



Contaminant material accounted for 24.8% (11 tons) of the municipal recycle stream (Table 29). The three most prevalent contaminant material types were Other Composite Paper (3.2% or 1 ton), Edible Food: Non-donatable (2.9% or 1 ton), and Non-edible Food (2.7% or 1 ton). Refer to Appendix B for definitions of these capitalized material types.

Table 29. Most Prevalent Contaminant Material Types: Municipal Recycle

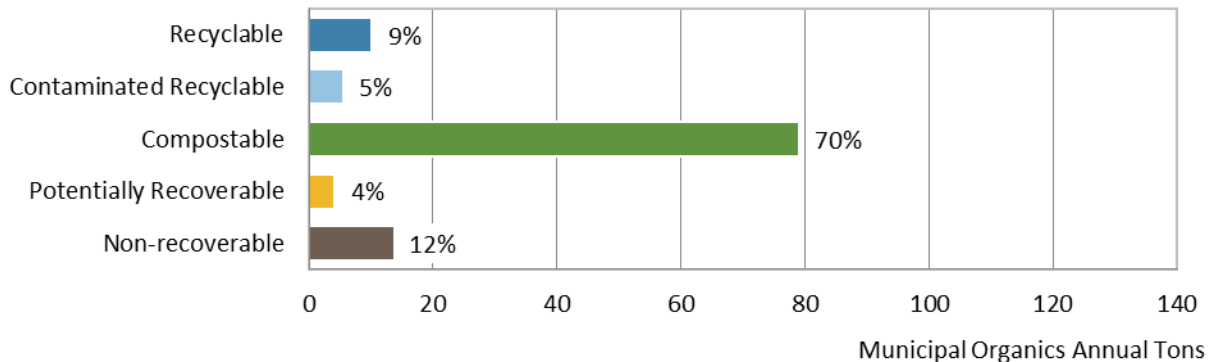
Material	Est. %	+ / -	Est. Tons
Other Composite Paper	3.2%	1.5%	1
Edible Food: Non-donatable	2.9%	3.1%	1
Non-edible Food	2.7%	3.8%	1
Other Composite Plastic	2.6%	1.5%	1
Contaminated Recyclable Plastic: CRV	2.0%	3.2%	1
Total for Top Contaminant Material	13.4%		6
Total for Other Contaminant Material	11.4%		5
All Other Material	75.2%		32
Total Annual Recycle Tons	100.0%		42

Percentages for material types may not total 100% due to rounding.

ORGANICS

The municipal sector diverted 113 tons of material into the organics stream. The majority (70% or 79 tons) of the municipal organics stream was Compostable material (Figure 28). Recyclable material accounted for 9% (10 tons) of the municipal organics stream, while Contaminated Recyclable material accounted for 5% (6 tons) of the municipal organics stream while Potentially Recoverable material accounted for 4% (4 tons) and Non-recoverable material accounted for 12% (14 tons) of the stream.

Figure 28. Tons by Recoverability Group: Municipal Organics



Contaminant material accounted for 21.8% (25 tons) of the municipal organics stream (Table 30). The two most prevalent contaminant material types were Other Composite Plastic (5.3% or 6 tons) and Natural Textiles (3.4% or 4 tons).

Material types that are accepted in the organics stream but are best recovered through the recycle stream (e.g., Flattened Corrugated Cardboard) are categorized as Recyclable for the recoverability analysis above (Figure 28). However, they are not considered contaminated for the contaminant analysis (Table 30).

Table 30. Most Prevalent Contaminant Material Types: Municipal Organics

Material	Est. %	+ / -	Est. Tons
Other Composite Plastic	5.3%	2.8%	6
Natural Textiles	3.4%	4.5%	4
Diapers	1.5%	0.9%	2
Other Textiles	1.4%	1.5%	2
Plastic Takeout Containers	1.3%	0.8%	1
Total for Top Contaminant Material	12.9%		15
Total for Other Contaminant Material	8.9%		10
All Other Material	78.3%		88
Total Annual Organics Tons	100.0%		113

Percentages for material types may not total 100% due to rounding.

Recyclable Material Capture Rates

The capture rate for Recyclable material in the recycle stream for the municipal sector was 66% (Table 31). This means that of all the Recyclable material placed in the municipal garbage, recycle, and organics streams, 66% (32 out of 48 tons) was correctly captured in the recycle stream.

Clean Recyclable Paper was the most prevalent Recyclable material in municipal generation (all three streams combined) and had a recycle capture rate of 69% (13 out of 19 tons). Flattened Corrugated Cardboard was the second-most prevalent Recyclable material and had a capture rate of 88% (8 out of 9 tons).

Three materials had a capture rate of 100% and each accounted for less than 0.5 tons of the overall generation: Clean Other #3-7 Container: CRV, Clean & Bagged Recyclable Film, and Clean Tin Cans: CRV. Clean Tin Cans: Non-CRV had the lowest capture rate (0% of less than 0.5 tons) and also accounted for a very small proportion of the overall generation.

Table 31. Recyclable Material Capture Rates: Municipal

Material	Garbage		Recycle		Organics		Generation		Capture Rate
	Est. %	Est. Tons	Est. %	Est. Tons	Est. %	Est. Tons	Est. %	Est. Tons	
Total Annual Tons	100.0%	64	100.0%	42	100.0%	113	100.0%	219	
Recyclable	9.6%	6	75.2%	32	9.0%	10	21.9%	48	66%
Flattened Corrugated Cardboard	0.4%	0	19.7%	8	0.7%	1	4.3%	9	88%
Unflattened Corrugated Cardboard	0.3%	0	9.3%	4	0.3%	0	2.0%	4	89%
Clean Recyclable Paper	2.2%	1	30.8%	13	4.0%	5	8.6%	19	69%
Clean #1 PET Containers: CRV	0.4%	0	1.2%	1	0.6%	1	0.7%	1	36%
Clean #1 PET Packaging: Non-CRV	0.8%	0	1.3%	1	0.1%	0	0.5%	1	49%
Clean #2 HDPE Containers: CRV	-	-	0.0%	0	0.0%	0	0.0%	0	14%
Clean #2 HDPE Packaging: Non-CRV	0.1%	0	0.3%	0	0.4%	0	0.3%	1	22%
Clean Other #3-7 Container: CRV	-	-	0.9%	0	-	-	0.2%	0	100%
Clean Other #3-7 Packaging: Non-CRV	0.2%	0	0.5%	0	0.1%	0	0.2%	0	45%
Plastic Takeout Containers	1.5%	1	0.4%	0	1.3%	1	1.2%	3	6%
Durable Plastic Products	0.7%	0	3.5%	1	0.0%	0	0.9%	2	77%
Clean & Bagged Recyclable Film	-	-	0.0%	0	-	-	0.0%	0	100%
Clean Glass Bottles: CRV	0.8%	1	3.6%	2	0.6%	1	1.2%	3	57%
Clean Glass Containers: Non-CRV	0.4%	0	0.6%	0	0.4%	0	0.4%	1	28%
Clean Aluminum Cans: CRV	0.4%	0	1.8%	1	0.4%	0	0.7%	1	53%
Clean Aluminum Cans & Foil: Non-CRV	0.3%	0	0.3%	0	0.1%	0	0.2%	0	32%
Clean Tin Cans: CRV	-	-	0.5%	0	-	-	0.1%	0	100%
Clean Tin Cans: Non-CRV	-	-	-	-	0.1%	0	0.0%	0	0%
Clean Other Recyclable Metal	1.2%	1	0.4%	0	0.1%	0	0.4%	1	17%
Sample Count		8		8		8			

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

In 2024, the commercial sector generated 48 tons of Recyclable material and missorted 6 tons into the garbage stream and 10 tons into the organics stream (Figure 29). This compares to 53 tons of Recyclable material generated in 2019, of which 20 tons were missorted into the garbage stream and 2 tons into the organics stream.

Figure 29. Recyclable Material Tons by Stream 2019-2024: Municipal

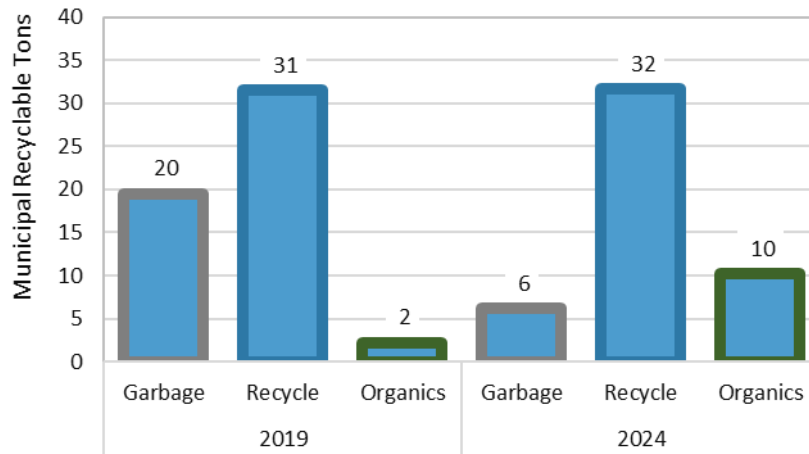


Table 32 compares Recyclable material capture rates for the commercial sector between the 2019 and 2024 studies. Between the two study periods, Recyclable material decreased in the amount generated (5 fewer tons) and increased in the amount successfully captured (less than 1 more ton). Since 2019, the municipal sector increased their capture of Recyclable material in the recycle stream by 7 percentage points.¹¹

Table 32. Recyclable Material Capture Rates 2019-2024: Municipal

Municipal	Recyclable Materials		
	2019	2024	Difference
Generated Tons	53	48	▼ -5
Recycled Tons	31	32	▲ 0
Capture Rate	59%	66%	▲ 7%

Compostable Material Capture Rates

The capture rate for Compostable material in the organics stream for the municipal sector was 74% (Table 33). This means that of all the Compostable material placed in the municipal garbage, recycle, and organics streams, 74% (79 out of 107 tons) was correctly captured in the organics stream.

Paper Tissue & Towels was the most prevalent Compostable material in municipal generation (all three streams combined) and had an organics capture rate of 74% (25 out of 34 tons). Plant

¹¹ These differences between study years were not tested to evaluate whether the changes in capture rates are statistically significant.

Trimmings was the second-most prevalent Compostable material and also had the highest capture rate of 97% (29 out of 30 tons).

Table 33. Compostable Material Capture Rates: Municipal

Material	Garbage		Recycle		Organics		Generation		Capture Rate
	Est. %	Est. Tons	Est. %	Est. Tons	Est. %	Est. Tons	Est. %	Est. Tons	
Total Annual Tons	100.0%	64	100.0%	42	100.0%	113	100.0%	219	
Compostable	38.6%	25	8.5%	4	70.1%	79	49.0%	107	74%
Pizza Boxes	0.5%	0	0.2%	0	0.0%	0	0.2%	0	9%
Coated Corrugated Cardboard	-	-	-	-	-	-	-	-	
Paper Takeout Containers	1.2%	1	0.4%	0	0.5%	1	0.7%	2	37%
Coated Paper Cups	1.1%	1	0.4%	0	0.6%	1	0.7%	2	45%
Paper Tissue & Towels	13.5%	9	1.0%	0	22.4%	25	15.7%	34	74%
Other Compostable Paper	1.4%	1	0.6%	0	0.6%	1	0.9%	2	38%
Plant Trimmings	1.5%	1	0.0%	0	26.1%	29	13.9%	30	97%
Edible Food: Potentially Donatable	1.6%	1	0.2%	0	0.8%	1	0.9%	2	44%
Edible Food: Non-donatable	7.6%	5	2.9%	1	8.2%	9	7.0%	15	60%
Non-edible Food	9.1%	6	2.7%	1	9.5%	11	8.1%	18	61%
Other Compostable Organics	1.0%	1	0.0%	0	1.2%	1	0.9%	2	69%
Sample Count	8		8		8				

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

In 2024, the municipal sector generated 107 tons of Compostable material and missorted 25 tons into the garbage stream and 4 tons into the recycle stream (Figure 30). This compares to 101 tons of Compostable material generated in 2019, of which 48 tons were missorted into the garbage stream and 1 ton into the recycle stream.

Figure 30. Compostable Material Tons by Stream 2019-2024: Municipal

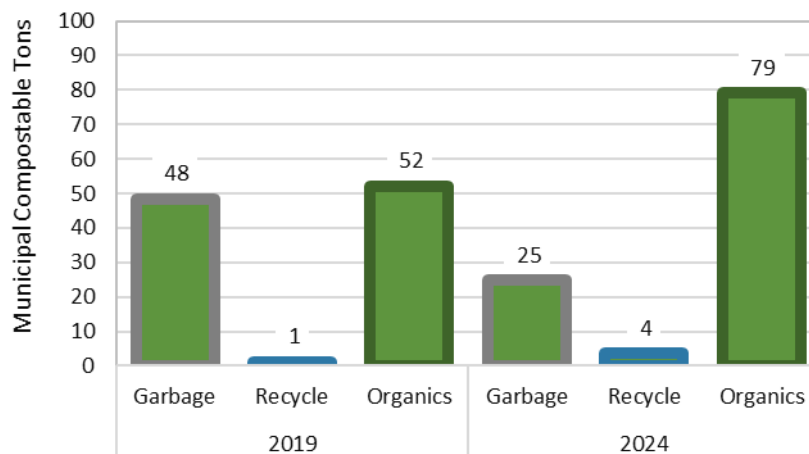


Table 34 compares Compostable material capture rates for the municipal sector between the 2019 and 2024 studies. Between the two study periods, Compostable material increased in both the amount generated (6 more tons) and successfully captured (27 more tons). Since 2019, the



municipal sector increased their capture of Compostable material in the organics stream by 22 percentage points.¹²

Table 34. Compostable Material Capture Rates 2019-2024: Municipal

	Compostable Materials		
Municipal	2019	2024	Difference
Generated Tons	101	107	▲ 6
Composted Tons	52	79	▲ 27
Capture Rate	51%	74%	▲ 22%

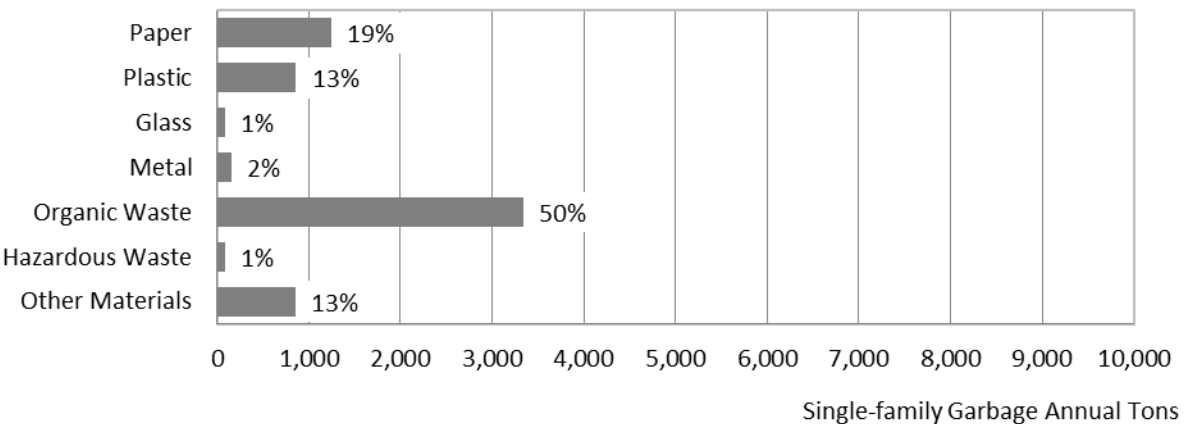
¹² These differences between study years were not tested to evaluate whether the changes in capture rates are statistically significant.

Appendix A. Detailed Composition Results

Single-family Garbage

Organic Waste was the most prevalent material class, accounting for 50% (3,339 tons) of the overall annual tons (Figure 31). The next most prevalent material classes were Paper (19% or 1,243 tons) and Plastic (13% or 859 tons).

Figure 31. Tons by Material Class: Single-family Garbage



2024 City of Cupertino Waste Characterization Study

Table 35. Detailed Composition Table: Single-family Garbage

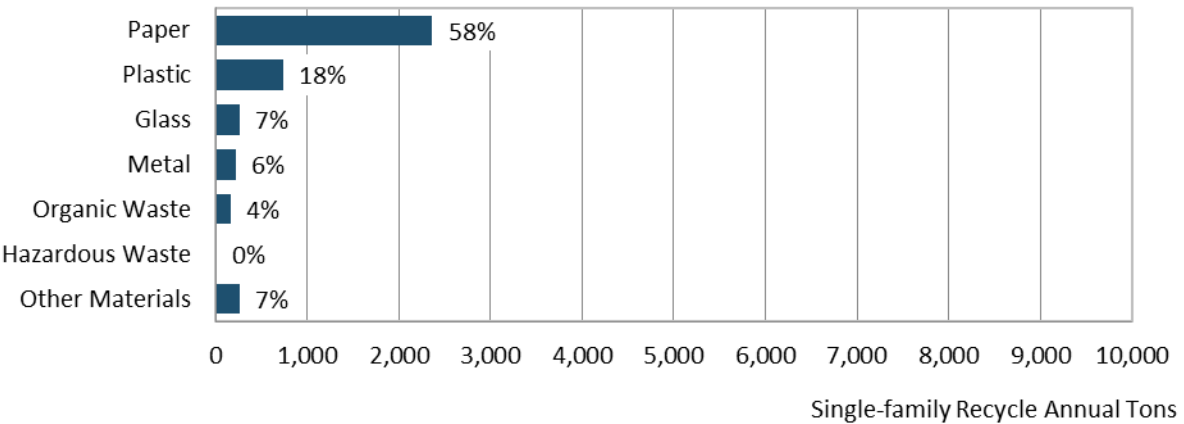
Material	Est. %	+ / -	Est. Tons	Material	Est. %	+ / -	Est. Tons
Recyclable	3.8%	0.8%	252	Glass	1.2%	0.4%	81
Contaminated Recyclable	9.7%	0.9%	640	Clean Glass Bottles: CRV	0.1%	0.0%	6
Compostable	46.5%	3.5%	3,079	Clean Glass Containers: Non-CRV	0.1%	0.1%	4
Potentially Recoverable	6.8%	2.3%	448	Contaminated Glass Bottles: CRV	0.1%	0.1%	5
Non-recoverable	33.2%	2.5%	2,198	Contaminated Glass Containers: Non-CRV	0.7%	0.2%	48
Paper	18.8%	1.6%	1,243	Other Composite Glass	0.3%	0.2%	18
Flattened Corrugated Cardboard	0.1%	0.0%	4	Metal	2.3%	0.8%	155
Unflattened Corrugated Cardboard	0.1%	0.1%	6	Clean Aluminum Cans: CRV	0.0%	0.0%	2
Clean Recyclable Paper	1.4%	0.5%	93	Clean Aluminum Cans & Foil: Non-CRV	0.0%	0.0%	3
Contaminated Recyclable Paper	4.3%	0.5%	284	Clean Tin Cans: CRV	-	-	-
Pizza Boxes	0.1%	0.1%	10	Clean Tin Cans: Non-CRV	0.0%	0.0%	1
Coated Corrugated Cardboard	-	-	-	Clean Other Recyclable Metal	0.2%	0.1%	16
Paper Takeout Containers	0.9%	0.3%	57	Contaminated Recyclable Metal	1.6%	0.8%	105
Coated Paper Cups	0.3%	0.1%	17	Other Composite Metal	0.4%	0.2%	27
Paper Tissue & Towels	9.4%	1.3%	619	Organic Waste	50.5%	2.6%	3,339
Other Compostable Paper	1.0%	0.2%	68	Plant Trimmings	1.0%	0.6%	65
Gable Top Cartons & Aseptics	0.3%	0.1%	21	Edible Food: Potentially Donatable	4.7%	1.2%	311
Other Coated Paper	0.1%	0.1%	6	Edible Food: Non-donatable	12.5%	1.6%	830
Other Composite Paper	0.9%	0.2%	59	Non-edible Food	16.6%	1.6%	1,096
Plastic	13.0%	1.3%	859	Other Compostable Organics	0.1%	0.1%	7
Clean #1 PET Containers: CRV	0.1%	0.0%	5	Untreated Wood	0.2%	0.2%	13
Clean #1 PET Packaging: Non-CRV	0.1%	0.0%	6	Natural Textiles	2.1%	1.1%	138
Clean #2 HDPE Containers: CRV	0.0%	0.0%	0	Diapers	7.7%	1.0%	507
Clean #2 HDPE Packaging: Non-CRV	0.0%	0.0%	2	Animal Feces & Litter	5.5%	1.7%	365
Clean Other #3-7 Container: CRV	0.0%	0.0%	1	Other Composite Organics	0.1%	0.2%	7
Clean Other #3-7 Packaging: Non-CRV	0.1%	0.0%	4	Hazardous Waste	1.3%	0.4%	83
Plastic Takeout Containers	1.1%	0.2%	70	Electronics	0.3%	0.2%	23
Durable Plastic Products	0.4%	0.2%	28	Batteries	0.0%	0.0%	2
Contaminated Recyclable Plastic: CRV	0.1%	0.1%	8	Medicine	0.2%	0.1%	12
Contaminated Recyclable Plastic: Non-CRV	1.8%	0.2%	121	Other Hazardous Waste	0.7%	0.3%	46
Expanded #6 Products & Packaging	0.3%	0.1%	22	Other Materials	13.0%	2.4%	857
Compostable Plastic	0.1%	0.0%	5	Carpet	0.0%	0.0%	0
Other Composite Plastic	5.4%	1.1%	354	Construction & Demolition Debris	3.2%	1.8%	214
Clean & Bagged Recyclable Film	-	-	-	Other Textiles	2.7%	0.8%	180
Clean & Loose Recyclable Film	0.4%	0.1%	24	Small Appliances	0.1%	0.1%	5
Contaminated Recyclable Film	0.7%	0.2%	45	Other Composite Materials & Fines	6.9%	1.4%	459
Flexible Plastic Pouches: CRV	-	-	-				
Flexible Plastic Pouches: Non-CRV	0.1%	0.0%	4				
Other Composite Film Plastics	2.4%	0.8%	159				
Sample Count	20			Garbage Total	100%		6,616

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Single-family Recycle

Paper was the most prevalent material class, accounting for 58% (2,366 tons) of the overall annual tons (Figure 32). The next most prevalent material classes were Plastic (18% or 742 tons) and Glass (7% or 268 tons).

Figure 32. Tons by Material Class: Single-family Recycle



2024 City of Cupertino Waste Characterization Study

Table 36. Detailed Composition Table: Single-family Recycle

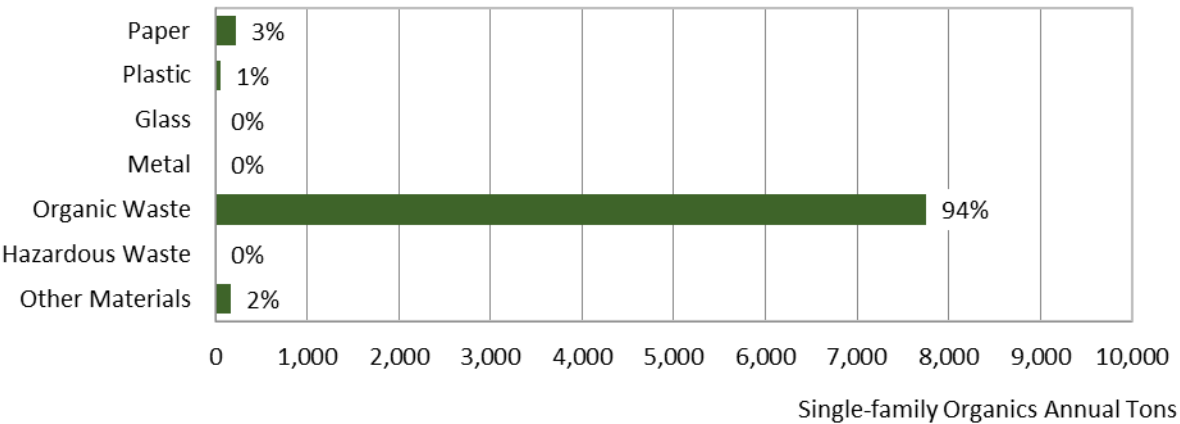
Material	Est. %	+ / -	Est. Tons	Material	Est. %	+ / -	Est. Tons
Recyclable	68.6%	3.3%	2,780	Glass	6.6%	1.7%	268
Contaminated Recyclable	7.3%	1.4%	296	Clean Glass Bottles: CRV	3.0%	1.1%	122
Compostable	5.6%	1.8%	227	Clean Glass Containers: Non-CRV	2.3%	0.9%	94
Potentially Recoverable	2.1%	0.9%	86	Contaminated Glass Bottles: CRV	0.1%	0.1%	2
Non-recoverable	16.4%	2.2%	665	Contaminated Glass Containers: Non-CRV	0.1%	0.1%	6
Paper	58.4%	2.7%	2,366	Other Composite Glass	1.1%	0.7%	44
Flattened Corrugated Cardboard	15.8%	2.6%	641	Metal	5.6%	1.6%	226
Unflattened Corrugated Cardboard	9.6%	2.2%	388	Clean Aluminum Cans: CRV	0.9%	0.1%	37
Clean Recyclable Paper	23.1%	2.2%	936	Clean Aluminum Cans & Foil: Non-CRV	0.3%	0.2%	14
Contaminated Recyclable Paper	3.1%	1.2%	127	Clean Tin Cans: CRV	0.3%	0.2%	12
Pizza Boxes	0.4%	0.1%	15	Clean Tin Cans: Non-CRV	0.8%	0.2%	31
Coated Corrugated Cardboard	0.2%	0.3%	8	Clean Other Recyclable Metal	0.9%	0.7%	37
Paper Takeout Containers	0.5%	0.2%	21	Contaminated Recyclable Metal	0.2%	0.2%	8
Coated Paper Cups	0.2%	0.0%	9	Other Composite Metal	2.1%	1.2%	86
Paper Tissue & Towels	0.9%	0.2%	35	Organic Waste	4.1%	0.8%	164
Other Compostable Paper	1.2%	1.6%	49	Plant Trimmings	0.1%	0.2%	5
Gable Top Cartons & Aseptics	1.3%	0.2%	51	Edible Food: Potentially Donatable	0.3%	0.1%	10
Other Coated Paper	0.6%	0.2%	25	Edible Food: Non-donatable	1.2%	0.5%	50
Other Composite Paper	1.5%	0.3%	61	Non-edible Food	0.6%	0.3%	23
Plastic	18.3%	1.5%	742	Other Compostable Organics	0.1%	0.1%	3
Clean #1 PET Containers: CRV	1.9%	0.3%	75	Untreated Wood	0.1%	0.1%	5
Clean #1 PET Packaging: Non-CRV	2.7%	0.3%	110	Natural Textiles	0.6%	0.3%	24
Clean #2 HDPE Containers: CRV	0.2%	0.1%	6	Diapers	0.5%	0.4%	18
Clean #2 HDPE Packaging: Non-CRV	2.3%	0.4%	92	Animal Feces & Litter	0.0%	0.0%	0
Clean Other #3-7 Container: CRV	0.0%	0.1%	2	Other Composite Organics	0.6%	0.4%	26
Clean Other #3-7 Packaging: Non-CRV	1.4%	0.2%	56	Hazardous Waste	0.4%	0.2%	17
Plastic Takeout Containers	0.9%	0.2%	35	Electronics	0.1%	0.1%	5
Durable Plastic Products	2.1%	0.5%	84	Batteries	0.0%	0.0%	0
Contaminated Recyclable Plastic: CRV	0.1%	0.1%	5	Medicine	0.0%	0.0%	2
Contaminated Recyclable Plastic: Non-CRV	1.1%	0.4%	43	Other Hazardous Waste	0.2%	0.2%	10
Expanded #6 Products & Packaging	0.3%	0.1%	12	Other Materials	6.7%	2.0%	270
Compostable Plastic	0.0%	0.0%	2	Carpet	-	-	-
Other Composite Plastic	2.4%	0.4%	99	Construction & Demolition Debris	1.0%	0.8%	39
Clean & Bagged Recyclable Film	0.2%	0.1%	7	Other Textiles	1.9%	1.2%	75
Clean & Loose Recyclable Film	2.4%	0.7%	97	Small Appliances	0.7%	0.5%	27
Contaminated Recyclable Film	0.2%	0.1%	8	Other Composite Materials & Fines	3.2%	1.3%	129
Flexible Plastic Pouches: CRV	-	-	-				
Flexible Plastic Pouches: Non-CRV	0.0%	0.0%	2				
Other Composite Film Plastics	0.2%	0.1%	8				
Sample Count	20			Recycle Total	100%		4,054

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Single-family Organics

Organic Waste was the most prevalent material class, accounting for 94% (7,747 tons) of the overall annual tons (Figure 33). The next most prevalent material classes were Paper (3% or 225 tons) and Other Materials (2% or 169 tons).

Figure 33. Tons by Material Class: Single-family Organics



2024 City of Cupertino Waste Characterization Study

Table 37. Detailed Composition Table: Single-family Organics

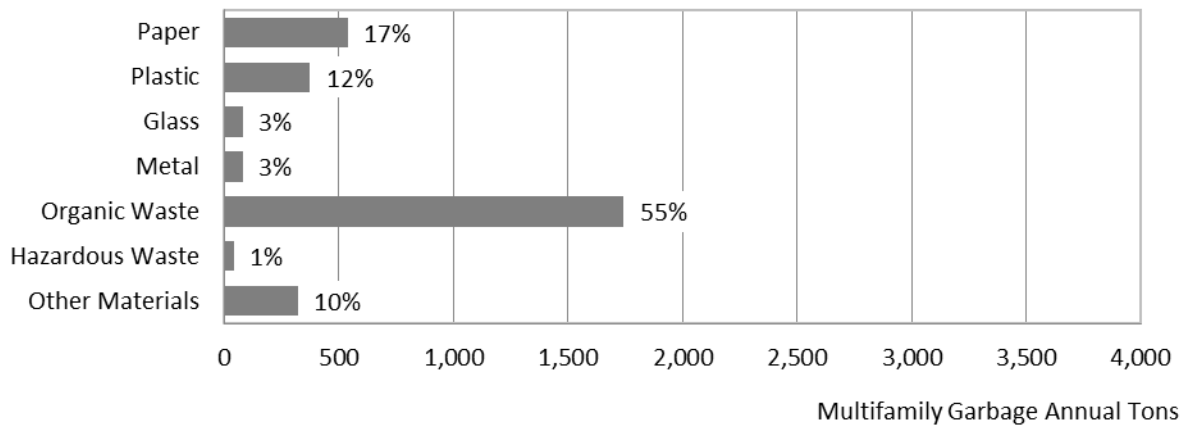
Material	Est. %	+ / -	Est. Tons	Material	Est. %	+ / -	Est. Tons
Recyclable	0.9%	0.6%	78	Glass	0.0%	0.0%	0
Contaminated Recyclable	0.7%	0.3%	54	Clean Glass Bottles: CRV	-	-	-
Compostable	95.0%	2.1%	7,799	Clean Glass Containers: Non-CRV	-	-	-
Potentially Recoverable	2.5%	1.6%	205	Contaminated Glass Bottles: CRV	0.0%	0.0%	0
Non-recoverable	0.9%	0.3%	76	Contaminated Glass Containers: Non-CRV	-	-	-
Paper	2.7%	0.9%	225	Other Composite Glass	-	-	-
Flattened Corrugated Cardboard	0.2%	0.2%	18	Metal	0.1%	0.1%	5
Unflattened Corrugated Cardboard	0.0%	0.1%	3	Clean Aluminum Cans: CRV	0.0%	0.0%	0
Clean Recyclable Paper	0.6%	0.6%	50	Clean Aluminum Cans & Foil: Non-CRV	0.0%	0.0%	0
Contaminated Recyclable Paper	0.5%	0.2%	42	Clean Tin Cans: CRV	-	-	-
Pizza Boxes	0.3%	0.1%	25	Clean Tin Cans: Non-CRV	-	-	-
Coated Corrugated Cardboard	-	-	-	Clean Other Recyclable Metal	0.0%	0.0%	1
Paper Takeout Containers	0.1%	0.0%	4	Contaminated Recyclable Metal	0.0%	0.0%	3
Coated Paper Cups	0.0%	0.1%	4	Other Composite Metal	0.0%	0.0%	1
Paper Tissue & Towels	0.5%	0.2%	41	Organic Waste	94.3%	2.2%	7,747
Other Compostable Paper	0.2%	0.1%	17	Plant Trimmings	87.0%	3.2%	7,147
Gable Top Cartons & Aseptics	0.1%	0.1%	6	Edible Food: Potentially Donatable	1.3%	0.5%	110
Other Coated Paper	0.0%	0.0%	1	Edible Food: Non-donatable	1.7%	1.0%	143
Other Composite Paper	0.2%	0.2%	15	Non-edible Food	3.7%	0.9%	304
Plastic	0.7%	0.2%	58	Other Compostable Organics	0.0%	0.1%	4
Clean #1 PET Containers: CRV	0.0%	0.0%	0	Untreated Wood	0.4%	0.2%	31
Clean #1 PET Packaging: Non-CRV	0.0%	0.0%	0	Natural Textiles	0.0%	0.0%	2
Clean #2 HDPE Containers: CRV	-	-	-	Diapers	0.1%	0.1%	5
Clean #2 HDPE Packaging: Non-CRV	-	-	-	Animal Feces & Litter	0.0%	0.0%	1
Clean Other #3-7 Container: CRV	-	-	-	Other Composite Organics	-	-	-
Clean Other #3-7 Packaging: Non-CRV	0.0%	0.0%	1	Hazardous Waste	0.1%	0.1%	6
Plastic Takeout Containers	0.0%	0.0%	4	Electronics	-	-	-
Durable Plastic Products	0.0%	0.0%	1	Batteries	-	-	-
Contaminated Recyclable Plastic: CRV	-	-	-	Medicine	-	-	-
Contaminated Recyclable Plastic: Non-CRV	0.1%	0.0%	4	Other Hazardous Waste	0.1%	0.1%	6
Expanded #6 Products & Packaging	0.0%	0.0%	0	Other Materials	2.1%	1.6%	169
Compostable Plastic	0.2%	0.1%	18	Carpet	-	-	-
Other Composite Plastic	0.3%	0.2%	24	Construction & Demolition Debris	2.0%	1.6%	166
Clean & Bagged Recyclable Film	-	-	-	Other Textiles	0.0%	0.0%	0
Clean & Loose Recyclable Film	0.0%	0.0%	1	Small Appliances	-	-	-
Contaminated Recyclable Film	0.0%	0.0%	3	Other Composite Materials & Fines	0.0%	0.0%	3
Flexible Plastic Pouches: CRV	-	-	-				
Flexible Plastic Pouches: Non-CRV	-	-	-				
Other Composite Film Plastics	0.0%	0.0%	3				
Sample Count	20			Organics Total	100%		8,212

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Multifamily Garbage

Organic Waste was the most prevalent material class, accounting for 55% (1,743 tons) of the overall annual tons (Figure 34). The next most prevalent missorted material classes were Paper (17% or 538 tons) and Plastic (12% or 374 tons).

Figure 34. Tons by Material Class: Multifamily Garbage



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Table 38. Detailed Composition Table: Multifamily Garbage

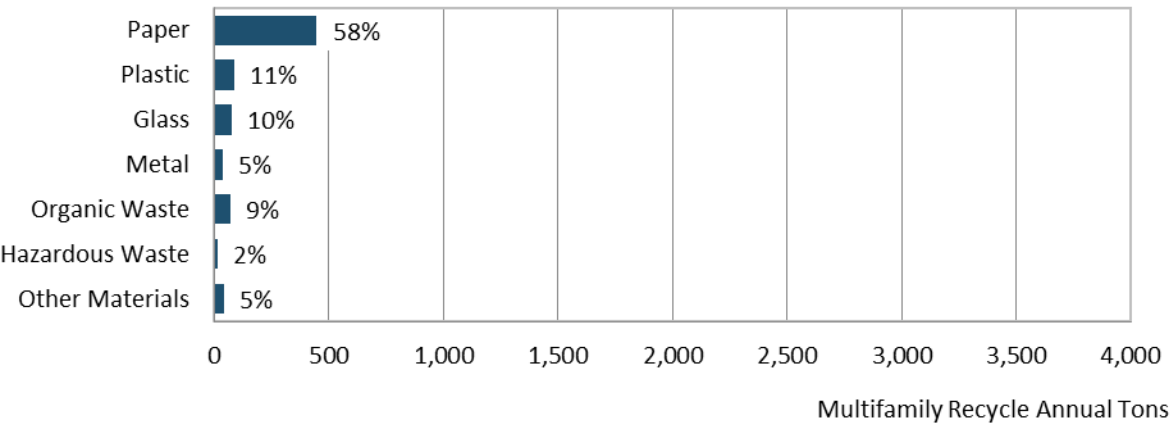
Material	Est. %	+ / -	Est. Tons	Material	Est. %	+ / -	Est. Tons
Recyclable	9.7%	1.7%	308	Glass	2.6%	0.7%	83
Contaminated Recyclable	6.7%	1.2%	212	Clean Glass Bottles: CRV	0.5%	0.3%	17
Compostable	51.6%	4.1%	1,641	Clean Glass Containers: Non-CRV	0.8%	0.5%	25
Potentially Recoverable	6.8%	3.2%	216	Contaminated Glass Bottles: CRV	0.1%	0.1%	4
Non-recoverable	25.3%	3.3%	805	Contaminated Glass Containers: Non-CRV	0.9%	0.4%	28
Paper	16.9%	1.6%	538	Other Composite Glass	0.3%	0.2%	10
Flattened Corrugated Cardboard	0.3%	0.2%	8	Metal	2.5%	1.1%	80
Unflattened Corrugated Cardboard	0.8%	0.4%	26	Clean Aluminum Cans: CRV	0.3%	0.1%	10
Clean Recyclable Paper	3.0%	0.6%	96	Clean Aluminum Cans & Foil: Non-CRV	0.1%	0.0%	3
Contaminated Recyclable Paper	2.5%	0.5%	79	Clean Tin Cans: CRV	-	-	-
Pizza Boxes	0.1%	0.1%	4	Clean Tin Cans: Non-CRV	0.1%	0.1%	2
Coated Corrugated Cardboard	-	-	-	Clean Other Recyclable Metal	1.2%	1.0%	40
Paper Takeout Containers	0.7%	0.2%	23	Contaminated Recyclable Metal	0.4%	0.1%	13
Coated Paper Cups	0.2%	0.1%	7	Other Composite Metal	0.4%	0.3%	12
Paper Tissue & Towels	7.0%	0.9%	224	Organic Waste	54.8%	3.7%	1,743
Other Compostable Paper	0.8%	0.2%	26	Plant Trimmings	1.9%	1.3%	61
Gable Top Cartons & Aseptics	0.4%	0.1%	13	Edible Food: Potentially Donatable	8.3%	2.2%	265
Other Coated Paper	0.1%	0.0%	3	Edible Food: Non-donatable	15.2%	2.1%	484
Other Composite Paper	0.9%	0.2%	29	Non-edible Food	17.2%	2.9%	546
Plastic	11.8%	1.4%	374	Other Compostable Organics	0.0%	0.0%	1
Clean #1 PET Containers: CRV	0.4%	0.1%	14	Untreated Wood	2.1%	2.5%	67
Clean #1 PET Packaging: Non-CRV	0.3%	0.1%	8	Natural Textiles	1.4%	0.7%	45
Clean #2 HDPE Containers: CRV	0.0%	0.0%	1	Diapers	5.3%	1.8%	169
Clean #2 HDPE Packaging: Non-CRV	0.2%	0.1%	7	Animal Feces & Litter	3.3%	2.0%	105
Clean Other #3-7 Container: CRV	0.0%	0.0%	0	Other Composite Organics	0.0%	0.0%	0
Clean Other #3-7 Packaging: Non-CRV	0.2%	0.1%	7	Hazardous Waste	1.3%	0.9%	41
Plastic Takeout Containers	0.9%	0.2%	30	Electronics	0.4%	0.3%	13
Durable Plastic Products	0.4%	0.3%	14	Batteries	0.1%	0.1%	2
Contaminated Recyclable Plastic: CRV	0.2%	0.1%	6	Medicine	0.1%	0.0%	2
Contaminated Recyclable Plastic: Non-CRV	1.7%	0.4%	55	Other Hazardous Waste	0.8%	0.7%	24
Expanded #6 Products & Packaging	0.2%	0.1%	5	Other Materials	10.1%	2.6%	322
Compostable Plastic	0.1%	0.0%	2	Carpet	-	-	-
Other Composite Plastic	4.0%	1.0%	128	Construction & Demolition Debris	2.0%	1.6%	62
Clean & Bagged Recyclable Film	-	-	-	Other Textiles	2.5%	1.2%	78
Clean & Loose Recyclable Film	0.5%	0.0%	15	Small Appliances	0.6%	0.6%	21
Contaminated Recyclable Film	0.4%	0.1%	12	Other Composite Materials & Fines	5.0%	1.7%	160
Flexible Plastic Pouches: CRV	0.0%	0.0%	0				
Flexible Plastic Pouches: Non-CRV	0.1%	0.0%	2				
Other Composite Film Plastics	2.2%	0.9%	69				
Sample Count	20			Garbage Total	100%		3,182

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Multifamily Recycle

Paper was the most prevalent material class, accounting for 58% (448 tons) of the overall annual tons (Figure 35). The next most prevalent material classes were Plastic (11% or 88 tons) and Glass (10% or 75 tons).

Figure 35. Tons by Material Class: Multifamily Recycle



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Table 39. Detailed Composition Table: Multifamily Recycle

Material	Est. %	+ / -	Est. Tons	Material	Est. %	+ / -	Est. Tons
Recyclable	70.1%	5.6%	544	Glass	9.6%	5.5%	75
Contaminated Recyclable	3.6%	0.9%	28	Clean Glass Bottles: CRV	7.3%	5.2%	57
Compostable	9.0%	3.7%	70	Clean Glass Containers: Non-CRV	1.0%	0.4%	8
Potentially Recoverable	4.0%	2.8%	31	Contaminated Glass Bottles: CRV	0.2%	0.2%	1
Non-recoverable	13.2%	3.6%	103	Contaminated Glass Containers: Non-CRV	0.4%	0.2%	3
Paper	57.7%	7.0%	448	Other Composite Glass	0.7%	0.5%	6
Flattened Corrugated Cardboard	21.0%	6.7%	163	Metal	5.1%	3.7%	40
Unflattened Corrugated Cardboard	15.4%	4.6%	119	Clean Aluminum Cans: CRV	0.4%	0.2%	3
Clean Recyclable Paper	16.7%	4.1%	129	Clean Aluminum Cans & Foil: Non-CRV	0.1%	0.1%	1
Contaminated Recyclable Paper	0.7%	0.3%	6	Clean Tin Cans: CRV	0.0%	0.1%	0
Pizza Boxes	0.3%	0.2%	2	Clean Tin Cans: Non-CRV	0.5%	0.5%	4
Coated Corrugated Cardboard	0.1%	0.1%	1	Clean Other Recyclable Metal	0.7%	0.4%	6
Paper Takeout Containers	0.2%	0.1%	2	Contaminated Recyclable Metal	0.1%	0.1%	1
Coated Paper Cups	0.1%	0.0%	1	Other Composite Metal	3.2%	3.6%	25
Paper Tissue & Towels	0.8%	0.4%	6	Organic Waste	8.9%	3.7%	69
Other Compostable Paper	0.1%	0.0%	0	Plant Trimmings	0.0%	0.0%	0
Gable Top Cartons & Aseptics	0.6%	0.2%	4	Edible Food: Potentially Donatable	0.5%	0.6%	4
Other Coated Paper	0.3%	0.1%	2	Edible Food: Non-donatable	1.5%	0.7%	11
Other Composite Paper	1.5%	0.8%	12	Non-edible Food	3.7%	2.7%	28
Plastic	11.4%	2.3%	88	Other Compostable Organics	1.7%	2.7%	13
Clean #1 PET Containers: CRV	1.0%	0.4%	8	Untreated Wood	0.2%	0.3%	2
Clean #1 PET Packaging: Non-CRV	1.5%	0.3%	12	Natural Textiles	0.1%	0.1%	1
Clean #2 HDPE Containers: CRV	0.1%	0.1%	1	Diapers	0.3%	0.4%	2
Clean #2 HDPE Packaging: Non-CRV	1.5%	0.3%	12	Animal Feces & Litter	-	-	-
Clean Other #3-7 Container: CRV	0.1%	0.1%	1	Other Composite Organics	0.9%	0.7%	7
Clean Other #3-7 Packaging: Non-CRV	0.7%	0.2%	6	Hazardous Waste	1.9%	1.2%	14
Plastic Takeout Containers	0.3%	0.1%	2	Electronics	0.6%	0.8%	5
Durable Plastic Products	1.7%	1.0%	13	Batteries	0.0%	0.0%	0
Contaminated Recyclable Plastic: CRV	0.2%	0.2%	1	Medicine	0.0%	0.0%	0
Contaminated Recyclable Plastic: Non-CRV	0.5%	0.2%	4	Other Hazardous Waste	1.2%	0.9%	9
Expanded #6 Products & Packaging	0.4%	0.2%	3	Other Materials	5.4%	3.1%	42
Compostable Plastic	0.0%	0.0%	0	Carpet	0.3%	0.5%	3
Other Composite Plastic	1.6%	0.5%	12	Construction & Demolition Debris	1.5%	1.6%	12
Clean & Bagged Recyclable Film	0.0%	0.0%	0	Other Textiles	1.2%	0.5%	9
Clean & Loose Recyclable Film	1.4%	0.4%	11	Small Appliances	0.4%	0.3%	3
Contaminated Recyclable Film	0.1%	0.1%	1	Other Composite Materials & Fines	2.0%	1.8%	15
Flexible Plastic Pouches: CRV	-	-	-				
Flexible Plastic Pouches: Non-CRV	0.1%	0.0%	0				
Other Composite Film Plastics	0.1%	0.0%	1				
Sample Count	20			Recycle Total	100%		776

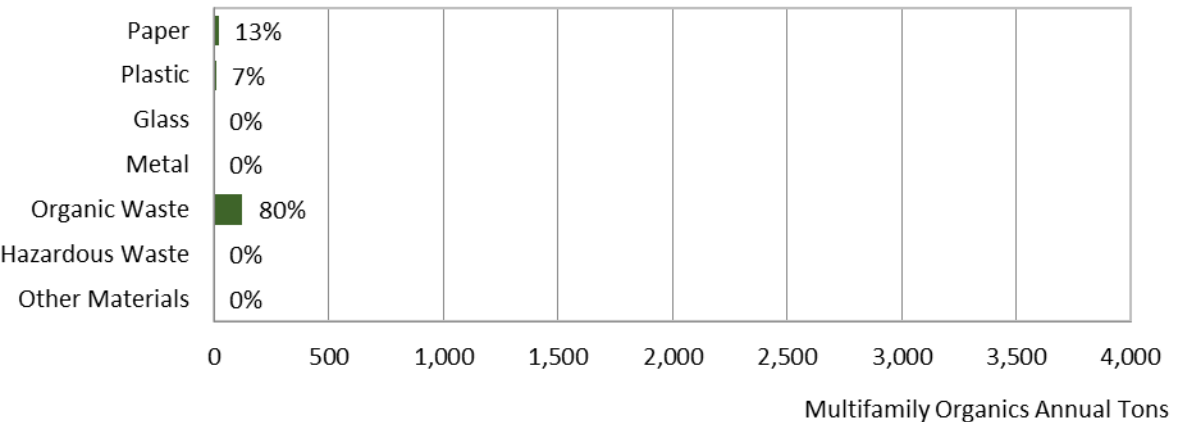
Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.



Multifamily Organics

Organic Waste was the most prevalent material class, accounting for 80% (122 tons) of the overall annual tons (Figure 36). The next most prevalent material classes were Paper (13% or 19 tons) and Plastic (7% or 10 tons).

Figure 36. Tons by Material Class: Multifamily Organics



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Table 40. Detailed Composition Table: Multifamily Organics

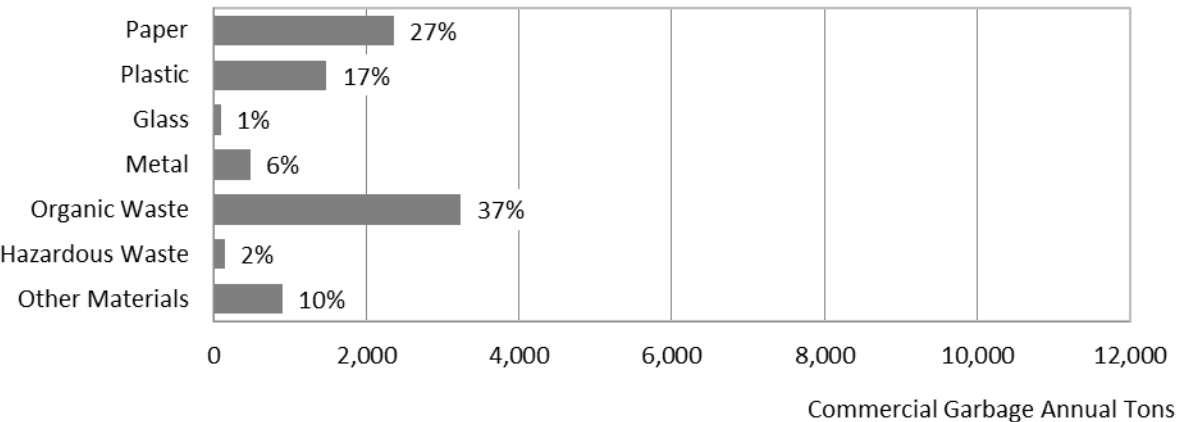
Material	Est. %	+ / -	Est. Tons	Material	Est. %	+ / -	Est. Tons
Recyclable	1.9%	1.6%	3	Glass	0.2%	0.2%	0
Contaminated Recyclable	2.8%	0.7%	4	Clean Glass Bottles: CRV	-	-	-
Compostable	89.2%	3.2%	137	Clean Glass Containers: Non-CRV	-	-	-
Potentially Recoverable	0.3%	0.2%	0	Contaminated Glass Bottles: CRV	-	-	-
Non-recoverable	5.8%	1.6%	9	Contaminated Glass Containers: Non-CRV	0.2%	0.2%	0
Paper	12.6%	6.8%	19	Other Composite Glass	0.0%	0.0%	0
Flattened Corrugated Cardboard	0.0%	0.0%	0	Metal	0.5%	0.4%	1
Unflattened Corrugated Cardboard	0.1%	0.2%	0	Clean Aluminum Cans: CRV	0.0%	0.0%	0
Clean Recyclable Paper	0.7%	0.8%	1	Clean Aluminum Cans & Foil: Non-CRV	0.0%	0.0%	0
Contaminated Recyclable Paper	1.4%	0.4%	2	Clean Tin Cans: CRV	-	-	-
Pizza Boxes	0.5%	0.7%	1	Clean Tin Cans: Non-CRV	0.0%	0.0%	0
Coated Corrugated Cardboard	-	-	-	Clean Other Recyclable Metal	0.2%	0.3%	0
Paper Takeout Containers	0.5%	0.4%	1	Contaminated Recyclable Metal	0.1%	0.2%	0
Coated Paper Cups	0.0%	0.0%	0	Other Composite Metal	0.0%	0.0%	0
Paper Tissue & Towels	7.4%	5.5%	11	Organic Waste	79.7%	8.2%	122
Other Compostable Paper	1.6%	0.7%	2	Plant Trimmings	7.5%	4.4%	12
Gable Top Cartons & Aseptics	0.1%	0.1%	0	Edible Food: Potentially Donatable	3.0%	1.2%	5
Other Coated Paper	-	-	-	Edible Food: Non-donatable	21.0%	6.4%	32
Other Composite Paper	0.2%	0.1%	0	Non-edible Food	47.6%	10.1%	73
Plastic	6.6%	1.5%	10	Other Compostable Organics	0.0%	0.0%	0
Clean #1 PET Containers: CRV	0.1%	0.1%	0	Untreated Wood	0.0%	0.0%	0
Clean #1 PET Packaging: Non-CRV	0.0%	0.0%	0	Natural Textiles	0.1%	0.2%	0
Clean #2 HDPE Containers: CRV	-	-	-	Diapers	0.3%	0.4%	1
Clean #2 HDPE Packaging: Non-CRV	0.0%	0.0%	0	Animal Feces & Litter	0.0%	0.1%	0
Clean Other #3-7 Container: CRV	0.0%	0.0%	0	Other Composite Organics	-	-	-
Clean Other #3-7 Packaging: Non-CRV	0.1%	0.1%	0	Hazardous Waste	0.0%	0.0%	0
Plastic Takeout Containers	0.4%	0.2%	1	Electronics	-	-	-
Durable Plastic Products	0.1%	0.2%	0	Batteries	-	-	-
Contaminated Recyclable Plastic: CRV	0.0%	0.0%	0	Medicine	0.0%	0.0%	0
Contaminated Recyclable Plastic: Non-CRV	0.4%	0.2%	1	Other Hazardous Waste	-	-	-
Expanded #6 Products & Packaging	0.0%	0.0%	0	Other Materials	0.4%	0.3%	1
Compostable Plastic	1.0%	0.3%	1	Carpet	-	-	-
Other Composite Plastic	2.5%	1.1%	4	Construction & Demolition Debris	0.1%	0.1%	0
Clean & Bagged Recyclable Film	-	-	-	Other Textiles	0.0%	0.0%	0
Clean & Loose Recyclable Film	0.1%	0.0%	0	Small Appliances	-	-	-
Contaminated Recyclable Film	0.6%	0.4%	1	Other Composite Materials & Fines	0.3%	0.2%	0
Flexible Plastic Pouches: CRV	-	-	-				
Flexible Plastic Pouches: Non-CRV	0.0%	0.0%	0				
Other Composite Film Plastics	1.4%	0.8%	2				
Sample Count	17			Organics Total	100%		154

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Commercial Garbage

Organic Waste was the most prevalent missorted material class, accounting for 37% (3,241 tons) of the overall annual tons (Figure 37). The next most prevalent missorted material classes were Paper (27% or 2,359 tons) and Plastic (17% or 1,481 tons).

Figure 37. Tons by Material Class: Commercial Garbage



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Table 41. Detailed Composition Table: Commercial Garbage

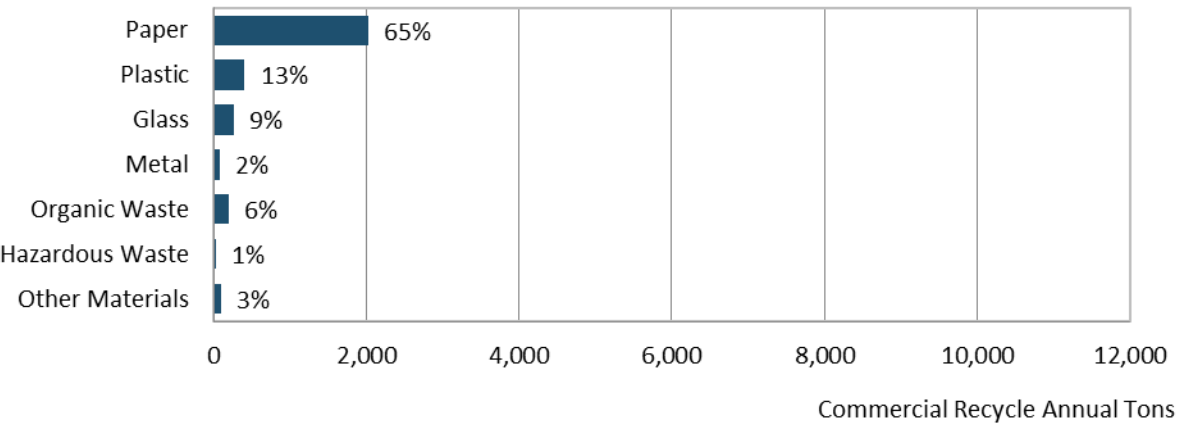
Material	Est. %	+ / -	Est. Tons	Material	Est. %	+ / -	Est. Tons
Recyclable	8.1%	1.6%	710	Glass	1.2%	0.3%	101
Contaminated Recyclable	12.5%	2.0%	1,086	Clean Glass Bottles: CRV	0.3%	0.1%	22
Compostable	44.0%	4.2%	3,839	Clean Glass Containers: Non-CRV	0.1%	0.1%	12
Potentially Recoverable	9.6%	4.0%	837	Contaminated Glass Bottles: CRV	0.2%	0.1%	18
Non-recoverable	25.8%	3.4%	2,248	Contaminated Glass Containers: Non-CRV	0.5%	0.2%	43
Paper	27.1%	3.5%	2,359	Other Composite Glass	0.1%	0.0%	6
Flattened Corrugated Cardboard	0.6%	0.3%	54	Metal	5.6%	2.4%	486
Unflattened Corrugated Cardboard	0.6%	0.2%	53	Clean Aluminum Cans: CRV	0.1%	0.0%	9
Clean Recyclable Paper	2.7%	1.0%	232	Clean Aluminum Cans & Foil: Non-CRV	0.1%	0.0%	5
Contaminated Recyclable Paper	5.7%	1.0%	498	Clean Tin Cans: CRV	-	-	-
Pizza Boxes	0.2%	0.2%	21	Clean Tin Cans: Non-CRV	0.0%	0.0%	2
Coated Corrugated Cardboard	0.8%	0.6%	70	Clean Other Recyclable Metal	0.3%	0.3%	30
Paper Takeout Containers	1.4%	0.5%	123	Contaminated Recyclable Metal	3.0%	2.1%	264
Coated Paper Cups	1.3%	0.6%	113	Other Composite Metal	2.0%	1.5%	177
Paper Tissue & Towels	8.8%	1.9%	766	Organic Waste	37.2%	4.4%	3,241
Other Compostable Paper	2.0%	0.5%	171	Plant Trimmings	2.0%	1.0%	174
Gable Top Cartons & Aseptics	0.6%	0.2%	53	Edible Food: Potentially Donatable	2.8%	0.7%	247
Other Coated Paper	0.1%	0.1%	5	Edible Food: Non-donatable	15.2%	3.1%	1,321
Other Composite Paper	2.3%	1.8%	201	Non-edible Food	9.4%	1.9%	820
Plastic	17.0%	1.9%	1,481	Other Compostable Organics	0.1%	0.1%	13
Clean #1 PET Containers: CRV	0.2%	0.1%	18	Untreated Wood	1.4%	0.9%	120
Clean #1 PET Packaging: Non-CRV	0.1%	0.0%	8	Natural Textiles	1.4%	0.5%	123
Clean #2 HDPE Containers: CRV	0.0%	0.0%	0	Diapers	4.3%	2.1%	371
Clean #2 HDPE Packaging: Non-CRV	0.2%	0.1%	14	Animal Feces & Litter	0.6%	0.3%	51
Clean Other #3-7 Container: CRV	0.0%	0.0%	0	Other Composite Organics	0.0%	0.0%	0
Clean Other #3-7 Packaging: Non-CRV	0.2%	0.1%	20	Hazardous Waste	1.7%	0.9%	149
Plastic Takeout Containers	1.4%	0.3%	121	Electronics	0.3%	0.2%	22
Durable Plastic Products	1.3%	0.5%	111	Batteries	0.0%	0.0%	2
Contaminated Recyclable Plastic: CRV	0.3%	0.1%	22	Medicine	0.0%	0.0%	3
Contaminated Recyclable Plastic: Non-CRV	1.8%	0.2%	153	Other Hazardous Waste	1.4%	0.9%	122
Expanded #6 Products & Packaging	0.4%	0.1%	31	Other Materials	10.4%	3.9%	903
Compostable Plastic	0.4%	0.2%	35	Carpet	0.0%	0.0%	2
Other Composite Plastic	7.8%	1.4%	683	Construction & Demolition Debris	5.1%	3.8%	442
Clean & Bagged Recyclable Film	-	-	-	Other Textiles	1.4%	0.6%	123
Clean & Loose Recyclable Film	0.5%	0.3%	44	Small Appliances	0.2%	0.3%	16
Contaminated Recyclable Film	0.5%	0.2%	43	Other Composite Materials & Fines	3.7%	1.1%	319
Flexible Plastic Pouches: CRV	-	-	-				
Flexible Plastic Pouches: Non-CRV	0.0%	0.0%	3				
Other Composite Film Plastics	2.0%	0.6%	173				
Sample Count	30			Garbage Total	100%		8,721

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Commercial Recycle

Paper was the most prevalent material class, accounting for 65% (2,025 tons) of the overall annual tons (Figure 38). The next most prevalent material classes were Plastic (13% or 409 tons) and Glass (9% or 271 tons).

Figure 38. Tons by Material Class: Commercial Recycle



2024 City of Cupertino Waste Characterization Study

Table 42. Detailed Composition Table: Commercial Recycle

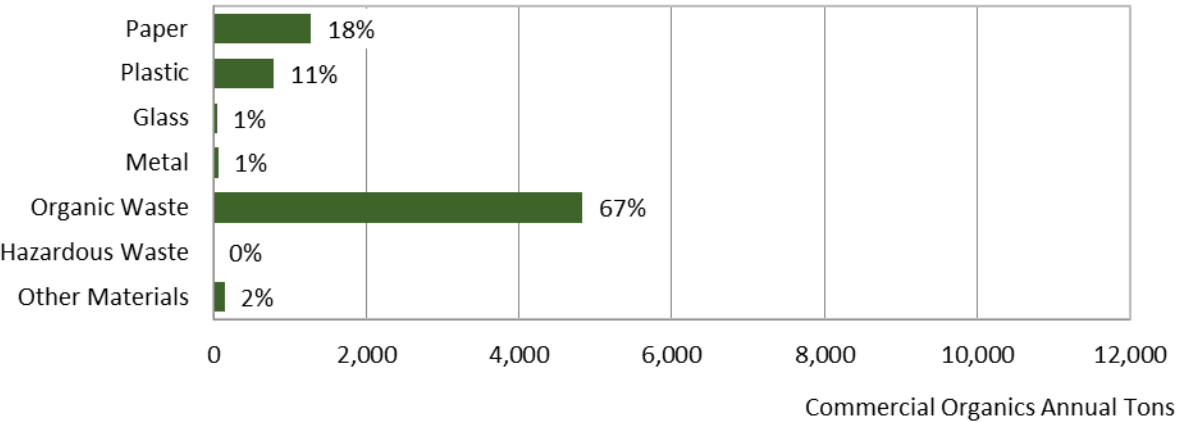
Material	Est. %	+ / -	Est. Tons	Material	Est. %	+ / -	Est. Tons
Recyclable	68.8%	6.0%	2,135	Glass	8.7%	3.5%	271
Contaminated Recyclable	10.5%	4.1%	325	Clean Glass Bottles: CRV	4.8%	2.7%	149
Compostable	8.9%	3.7%	276	Clean Glass Containers: Non-CRV	2.4%	1.0%	76
Potentially Recoverable	2.2%	1.0%	68	Contaminated Glass Bottles: CRV	0.1%	0.2%	4
Non-recoverable	9.6%	2.1%	299	Contaminated Glass Containers: Non-CRV	0.2%	0.1%	6
Paper	65.3%	6.1%	2,025	Other Composite Glass	1.2%	0.5%	36
Flattened Corrugated Cardboard	22.2%	6.0%	688	Metal	2.4%	0.6%	75
Unflattened Corrugated Cardboard	13.7%	3.6%	424	Clean Aluminum Cans: CRV	0.7%	0.2%	23
Clean Recyclable Paper	15.9%	3.4%	492	Clean Aluminum Cans & Foil: Non-CRV	0.2%	0.1%	5
Contaminated Recyclable Paper	6.9%	4.0%	215	Clean Tin Cans: CRV	0.2%	0.2%	5
Pizza Boxes	0.9%	0.4%	27	Clean Tin Cans: Non-CRV	0.5%	0.4%	16
Coated Corrugated Cardboard	0.4%	0.4%	13	Clean Other Recyclable Metal	0.4%	0.3%	11
Paper Takeout Containers	0.8%	0.6%	26	Contaminated Recyclable Metal	0.1%	0.1%	2
Coated Paper Cups	0.2%	0.1%	6	Other Composite Metal	0.4%	0.2%	13
Paper Tissue & Towels	0.8%	0.3%	23	Organic Waste	6.5%	2.9%	201
Other Compostable Paper	1.0%	1.5%	30	Plant Trimmings	0.1%	0.1%	2
Gable Top Cartons & Aseptics	0.8%	0.2%	25	Edible Food: Potentially Donatable	0.2%	0.1%	6
Other Coated Paper	0.4%	0.2%	12	Edible Food: Non-donatable	2.6%	0.9%	80
Other Composite Paper	1.4%	0.4%	44	Non-edible Food	1.9%	1.7%	60
Plastic	13.2%	2.5%	409	Other Compostable Organics	0.0%	0.0%	1
Clean #1 PET Containers: CRV	1.4%	0.4%	42	Untreated Wood	0.4%	0.6%	13
Clean #1 PET Packaging: Non-CRV	1.7%	0.5%	54	Natural Textiles	0.4%	0.4%	12
Clean #2 HDPE Containers: CRV	0.1%	0.1%	2	Diapers	0.5%	0.3%	15
Clean #2 HDPE Packaging: Non-CRV	1.3%	0.4%	40	Animal Feces & Litter	0.0%	0.0%	0
Clean Other #3-7 Container: CRV	0.1%	0.1%	2	Other Composite Organics	0.4%	0.3%	11
Clean Other #3-7 Packaging: Non-CRV	0.7%	0.2%	23	Hazardous Waste	0.9%	0.7%	28
Plastic Takeout Containers	0.5%	0.2%	15	Electronics	0.1%	0.1%	5
Durable Plastic Products	2.2%	0.9%	67	Batteries	0.4%	0.6%	12
Contaminated Recyclable Plastic: CRV	0.6%	0.4%	17	Medicine	0.0%	0.0%	0
Contaminated Recyclable Plastic: Non-CRV	0.9%	0.4%	29	Other Hazardous Waste	0.4%	0.2%	11
Expanded #6 Products & Packaging	0.2%	0.1%	7	Other Materials	3.0%	1.4%	93
Compostable Plastic	0.0%	0.0%	1	Carpet	0.2%	0.3%	7
Other Composite Plastic	1.4%	0.4%	44	Construction & Demolition Debris	0.2%	0.3%	7
Clean & Bagged Recyclable Film	0.1%	0.1%	2	Other Textiles	1.5%	1.1%	48
Clean & Loose Recyclable Film	1.4%	0.2%	42	Small Appliances	0.0%	0.0%	0
Contaminated Recyclable Film	0.3%	0.2%	9	Other Composite Materials & Fines	1.0%	0.4%	31
Flexible Plastic Pouches: CRV	0.0%	0.0%	0				
Flexible Plastic Pouches: Non-CRV	0.1%	0.1%	4				
Other Composite Film Plastics	0.3%	0.2%	9				
Sample Count	20			Recycle Total	100%		3,102

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Commercial Organics

Organic Waste was the most prevalent material class, accounting for 67% (4,831 tons) of the overall annual tons (Figure 39). The next most prevalent material classes were Plastic (18% or 1,278 tons) and Glass (11% or 791 tons).

Figure 39. Tons by Material Class: Commercial Organics



2024 City of Cupertino Waste Characterization Study

Table 43. Detailed Composition Table: Commercial Organics

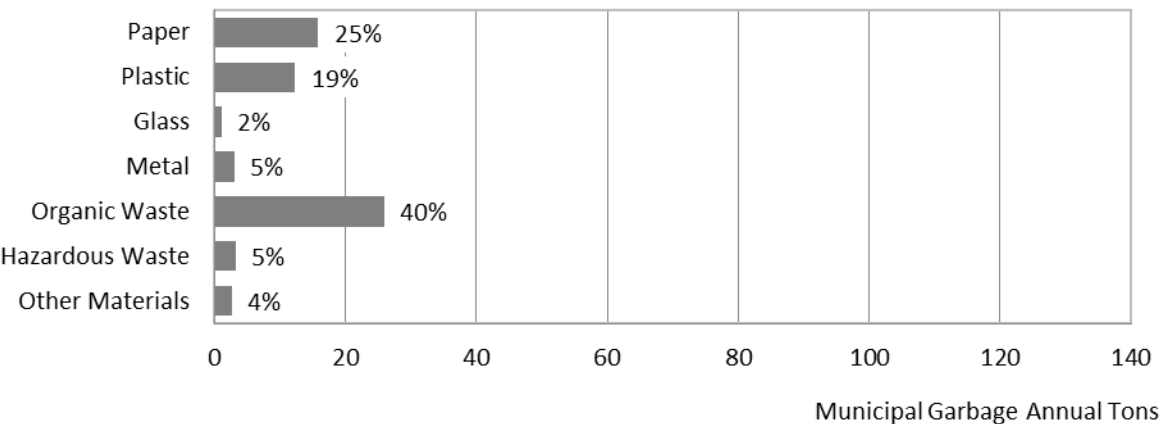
Material	Est. %	+ / -	Est. Tons	Material	Est. %	+ / -	Est. Tons
Recyclable	1.6%	0.7%	118	Glass	0.8%	0.3%	54
Contaminated Recyclable	6.0%	1.1%	428	Clean Glass Bottles: CRV	0.0%	0.0%	2
Compostable	79.6%	2.7%	5,704	Clean Glass Containers: Non-CRV	0.0%	0.0%	2
Potentially Recoverable	2.2%	1.6%	159	Contaminated Glass Bottles: CRV	0.1%	0.1%	11
Non-recoverable	10.6%	1.7%	760	Contaminated Glass Containers: Non-CRV	0.4%	0.2%	27
Paper	17.8%	4.5%	1,278	Other Composite Glass	0.2%	0.2%	12
Flattened Corrugated Cardboard	0.1%	0.1%	6	Metal	0.8%	0.3%	60
Unflattened Corrugated Cardboard	0.3%	0.3%	25	Clean Aluminum Cans: CRV	0.0%	0.0%	2
Clean Recyclable Paper	0.2%	0.1%	16	Clean Aluminum Cans & Foil: Non-CRV	0.0%	0.0%	0
Contaminated Recyclable Paper	3.0%	0.7%	214	Clean Tin Cans: CRV	-	-	-
Pizza Boxes	0.1%	0.1%	5	Clean Tin Cans: Non-CRV	-	-	-
Coated Corrugated Cardboard	0.9%	0.5%	67	Clean Other Recyclable Metal	0.2%	0.2%	14
Paper Takeout Containers	0.6%	0.4%	41	Contaminated Recyclable Metal	0.5%	0.2%	35
Coated Paper Cups	1.3%	0.6%	93	Other Composite Metal	0.1%	0.1%	8
Paper Tissue & Towels	6.3%	2.0%	454	Organic Waste	67.4%	5.9%	4,831
Other Compostable Paper	4.2%	2.3%	301	Plant Trimmings	13.7%	7.2%	985
Gable Top Cartons & Aseptics	0.4%	0.3%	31	Edible Food: Potentially Donatable	8.0%	2.6%	572
Other Coated Paper	0.1%	0.2%	8	Edible Food: Non-donatable	26.5%	6.2%	1,898
Other Composite Paper	0.2%	0.1%	18	Non-edible Food	18.0%	3.8%	1,289
Plastic	11.0%	1.8%	791	Other Compostable Organics	0.0%	0.0%	0
Clean #1 PET Containers: CRV	0.0%	0.0%	1	Untreated Wood	0.2%	0.2%	18
Clean #1 PET Packaging: Non-CRV	0.0%	0.0%	1	Natural Textiles	0.5%	0.3%	35
Clean #2 HDPE Containers: CRV	-	-	-	Diapers	0.1%	0.1%	11
Clean #2 HDPE Packaging: Non-CRV	0.0%	0.0%	1	Animal Feces & Litter	0.3%	0.5%	24
Clean Other #3-7 Container: CRV	-	-	-	Other Composite Organics	0.0%	0.0%	0
Clean Other #3-7 Packaging: Non-CRV	0.1%	0.0%	4	Hazardous Waste	0.0%	0.0%	3
Plastic Takeout Containers	0.6%	0.2%	41	Electronics	-	-	-
Durable Plastic Products	0.0%	0.0%	2	Batteries	0.0%	0.0%	0
Contaminated Recyclable Plastic: CRV	0.1%	0.0%	5	Medicine	-	-	-
Contaminated Recyclable Plastic: Non-CRV	1.3%	0.4%	94	Other Hazardous Waste	0.0%	0.0%	2
Expanded #6 Products & Packaging	0.2%	0.1%	16	Other Materials	2.1%	1.6%	152
Compostable Plastic	1.5%	0.7%	104	Carpet	-	-	-
Other Composite Plastic	4.6%	1.2%	328	Construction & Demolition Debris	1.4%	1.5%	104
Clean & Bagged Recyclable Film	-	-	-	Other Textiles	0.2%	0.3%	17
Clean & Loose Recyclable Film	0.1%	0.1%	5	Small Appliances	-	-	-
Contaminated Recyclable Film	0.5%	0.3%	37	Other Composite Materials & Fines	0.4%	0.3%	31
Flexible Plastic Pouches: CRV	-	-	-				
Flexible Plastic Pouches: Non-CRV	0.0%	0.0%	1				
Other Composite Film Plastics	2.1%	1.1%	151				
Sample Count	20			Organics Total	100%		7,169

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Municipal Garbage

Organic Waste was the most prevalent missorted material class, accounting for 40% (26 tons) of the overall annual tons (Figure 40). The next most prevalent missorted material classes were Paper (25% or 16 tons) and Plastic (19% or 12 tons).

Figure 40. Tons by Material Class: Municipal Garbage



2024 City of Cupertino Waste Characterization Study

Table 44. Detailed Composition Table: Municipal Garbage

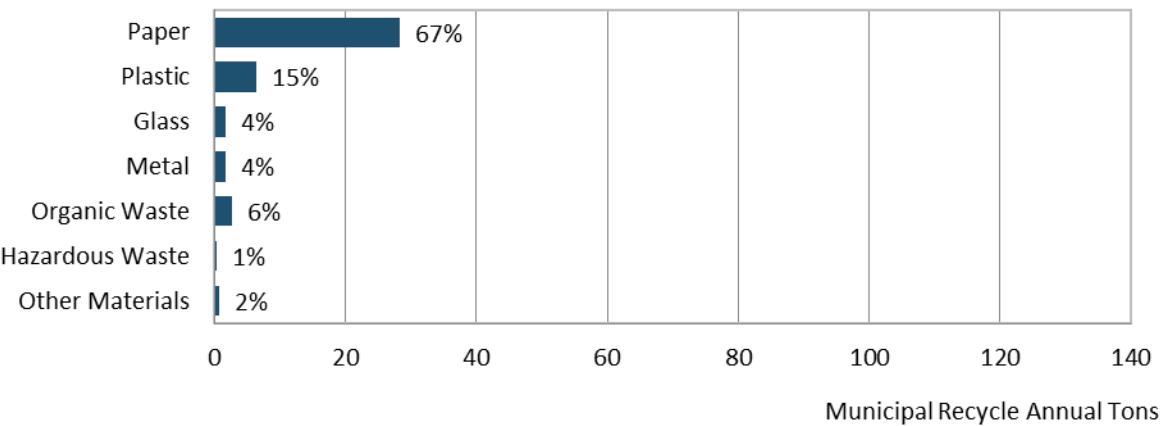
Material	Est. %	+ / -	Est. Tons	Material	Est. %	+ / -	Est. Tons
Recyclable	9.6%	3.9%	6	Glass	1.8%	1.2%	1
Contaminated Recyclable	5.1%	1.8%	3	Clean Glass Bottles: CRV	0.8%	0.6%	1
Compostable	38.6%	12.7%	25	Clean Glass Containers: Non-CRV	0.4%	0.5%	0
Potentially Recoverable	5.9%	8.7%	4	Contaminated Glass Bottles: CRV	0.5%	0.5%	0
Non-recoverable	40.8%	14.0%	26	Contaminated Glass Containers: Non-CRV	0.1%	0.1%	0
Paper	24.7%	9.0%	16	Other Composite Glass	-	-	-
Flattened Corrugated Cardboard	0.4%	0.6%	0	Metal	4.8%	4.6%	3
Unflattened Corrugated Cardboard	0.3%	0.2%	0	Clean Aluminum Cans: CRV	0.4%	0.2%	0
Clean Recyclable Paper	2.2%	0.8%	1	Clean Aluminum Cans & Foil: Non-CRV	0.3%	0.3%	0
Contaminated Recyclable Paper	1.9%	1.0%	1	Clean Tin Cans: CRV	-	-	-
Pizza Boxes	0.5%	0.7%	0	Clean Tin Cans: Non-CRV	-	-	-
Coated Corrugated Cardboard	-	-	-	Clean Other Recyclable Metal	1.2%	1.5%	1
Paper Takeout Containers	1.2%	1.3%	1	Contaminated Recyclable Metal	0.6%	0.3%	0
Coated Paper Cups	1.1%	0.6%	1	Other Composite Metal	2.4%	2.7%	2
Paper Tissue & Towels	13.5%	7.0%	9	Organic Waste	40.4%	19.9%	26
Other Compostable Paper	1.4%	0.4%	1	Plant Trimmings	1.5%	1.7%	1
Gable Top Cartons & Aseptics	0.2%	0.2%	0	Edible Food: Potentially Donatable	1.6%	1.1%	1
Other Coated Paper	0.1%	0.1%	0	Edible Food: Non-donatable	7.6%	3.0%	5
Other Composite Paper	1.8%	1.6%	1	Non-edible Food	9.1%	4.3%	6
Plastic	19.3%	7.9%	12	Other Compostable Organics	1.0%	1.6%	1
Clean #1 PET Containers: CRV	0.4%	0.2%	0	Untreated Wood	0.2%	0.3%	0
Clean #1 PET Packaging: Non-CRV	0.8%	0.9%	0	Natural Textiles	0.3%	0.2%	0
Clean #2 HDPE Containers: CRV	-	-	-	Diapers	2.7%	1.8%	2
Clean #2 HDPE Packaging: Non-CRV	0.1%	0.1%	0	Animal Feces & Litter	16.3%	16.8%	10
Clean Other #3-7 Container: CRV	-	-	-	Other Composite Organics	-	-	-
Clean Other #3-7 Packaging: Non-CRV	0.2%	0.2%	0	Hazardous Waste	5.0%	8.0%	3
Plastic Takeout Containers	1.5%	0.8%	1	Electronics	-	-	-
Durable Plastic Products	0.7%	0.5%	0	Batteries	-	-	-
Contaminated Recyclable Plastic: CRV	0.2%	0.1%	0	Medicine	0.0%	0.0%	0
Contaminated Recyclable Plastic: Non-CRV	0.9%	0.5%	1	Other Hazardous Waste	5.0%	8.0%	3
Expanded #6 Products & Packaging	0.3%	0.3%	0	Other Materials	4.1%	2.6%	3
Compostable Plastic	0.2%	0.2%	0	Carpet	-	-	-
Other Composite Plastic	10.7%	6.1%	7	Construction & Demolition Debris	0.4%	0.3%	0
Clean & Bagged Recyclable Film	-	-	-	Other Textiles	0.9%	0.9%	1
Clean & Loose Recyclable Film	0.7%	0.5%	0	Small Appliances	-	-	-
Contaminated Recyclable Film	0.1%	0.1%	0	Other Composite Materials & Fines	2.9%	1.6%	2
Flexible Plastic Pouches: CRV	-	-	-				
Flexible Plastic Pouches: Non-CRV	0.2%	0.2%	0				
Other Composite Film Plastics	2.3%	1.8%	1				
Sample Count	8			Garbage Total	100%		64

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Municipal Recycle

Paper was the most prevalent material class, accounting for 67% (28 tons) of the overall annual tons (Figure 41). The next most prevalent material classes were Plastic (15% or 6 tons) and Organic Waste (6% or 3 tons).

Figure 41. Tons by Material Class: Municipal Recycle



2024 City of Cupertino Waste Characterization Study

Table 45. Detailed Composition Table: Municipal Recycle

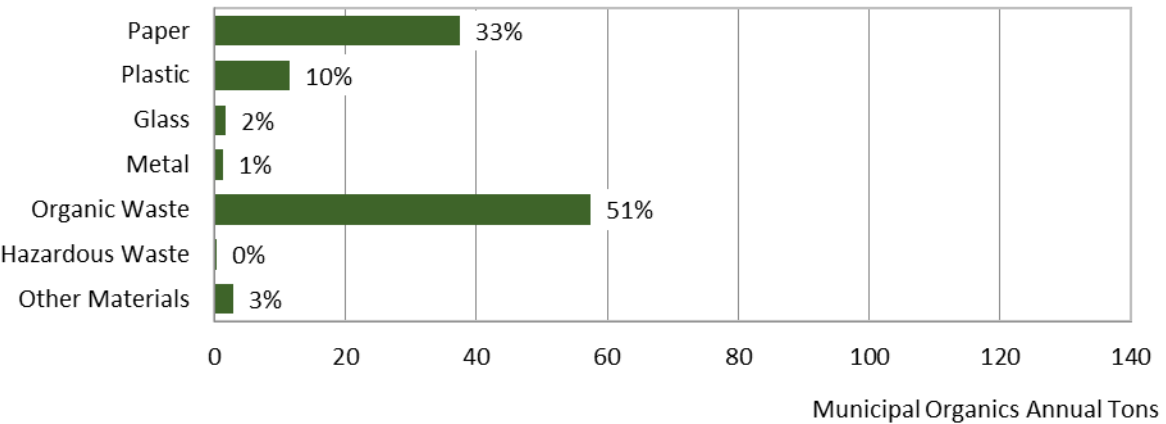
Material	Est. %	+ / -	Est. Tons	Material	Est. %	+ / -	Est. Tons
Recyclable	75.2%	13.0%	32	Glass	4.2%	4.6%	2
Contaminated Recyclable	5.4%	4.2%	2	Clean Glass Bottles: CRV	3.6%	4.5%	2
Compostable	8.5%	6.4%	4	Clean Glass Containers: Non-CRV	0.6%	0.7%	0
Potentially Recoverable	0.9%	1.0%	0	Contaminated Glass Bottles: CRV	-	-	-
Non-recoverable	10.1%	3.9%	4	Contaminated Glass Containers: Non-CRV	-	-	-
Paper	67.4%	17.0%	28	Other Composite Glass	-	-	-
Flattened Corrugated Cardboard	19.7%	9.5%	8	Metal	4.0%	2.8%	2
Unflattened Corrugated Cardboard	9.3%	4.6%	4	Clean Aluminum Cans: CRV	1.8%	2.2%	1
Clean Recyclable Paper	30.8%	18.2%	13	Clean Aluminum Cans & Foil: Non-CRV	0.3%	0.3%	0
Contaminated Recyclable Paper	1.3%	1.7%	1	Clean Tin Cans: CRV	0.5%	0.6%	0
Pizza Boxes	0.2%	0.2%	0	Clean Tin Cans: Non-CRV	-	-	-
Coated Corrugated Cardboard	-	-	-	Clean Other Recyclable Metal	0.4%	0.5%	0
Paper Takeout Containers	0.4%	0.1%	0	Contaminated Recyclable Metal	0.4%	0.4%	0
Coated Paper Cups	0.4%	0.3%	0	Other Composite Metal	0.7%	0.6%	0
Paper Tissue & Towels	1.0%	0.9%	0	Organic Waste	6.5%	5.1%	3
Other Compostable Paper	0.6%	0.8%	0	Plant Trimmings	0.0%	0.1%	0
Gable Top Cartons & Aseptics	0.2%	0.1%	0	Edible Food: Potentially Donatable	0.2%	0.2%	0
Other Coated Paper	0.3%	0.2%	0	Edible Food: Non-donatable	2.9%	3.1%	1
Other Composite Paper	3.2%	1.5%	1	Non-edible Food	2.7%	3.8%	1
Plastic	15.1%	6.8%	6	Other Compostable Organics	0.0%	0.0%	0
Clean #1 PET Containers: CRV	1.2%	1.3%	1	Untreated Wood	0.0%	0.1%	0
Clean #1 PET Packaging: Non-CRV	1.3%	0.9%	1	Natural Textiles	-	-	-
Clean #2 HDPE Containers: CRV	0.0%	0.0%	0	Diapers	0.1%	0.1%	0
Clean #2 HDPE Packaging: Non-CRV	0.3%	0.2%	0	Animal Feces & Litter	0.2%	0.2%	0
Clean Other #3-7 Container: CRV	0.9%	1.2%	0	Other Composite Organics	0.1%	0.1%	0
Clean Other #3-7 Packaging: Non-CRV	0.5%	0.3%	0	Hazardous Waste	0.8%	1.0%	0
Plastic Takeout Containers	0.4%	0.2%	0	Electronics	0.6%	1.0%	0
Durable Plastic Products	3.5%	2.9%	1	Batteries	0.0%	0.0%	0
Contaminated Recyclable Plastic: CRV	2.0%	3.2%	1	Medicine	-	-	-
Contaminated Recyclable Plastic: Non-CRV	0.3%	0.1%	0	Other Hazardous Waste	0.2%	0.3%	0
Expanded #6 Products & Packaging	0.4%	0.3%	0	Other Materials	2.0%	1.4%	1
Compostable Plastic	0.0%	0.0%	0	Carpet	-	-	-
Other Composite Plastic	2.6%	1.5%	1	Construction & Demolition Debris	-	-	-
Clean & Bagged Recyclable Film	0.0%	0.1%	0	Other Textiles	0.8%	0.6%	0
Clean & Loose Recyclable Film	1.1%	0.3%	0	Small Appliances	0.1%	0.2%	0
Contaminated Recyclable Film	0.3%	0.1%	0	Other Composite Materials & Fines	1.1%	1.0%	0
Flexible Plastic Pouches: CRV	-	-	-				
Flexible Plastic Pouches: Non-CRV	0.1%	0.1%	0				
Other Composite Film Plastics	0.2%	0.1%	0				
Sample Count	8			Recycle Total	100%		42

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Municipal Organics

Organic Waste was the most prevalent material class, accounting for 51% (57 tons) of the overall annual tons (Figure 42). The next most prevalent material classes were Paper (33% or 38 tons) and Plastic (10% or 11 tons).

Figure 42. Tons by Material Class: Municipal Organics



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Table 46. Detailed Composition Table: Municipal Organics

Material	Est. %	+ / -	Est. Tons	Material	Est. %	+ / -	Est. Tons
Recyclable	9.0%	5.6%	10	Glass	1.6%	1.1%	2
Contaminated Recyclable	4.9%	2.6%	6	Clean Glass Bottles: CRV	0.6%	0.4%	1
Compostable	70.1%	17.1%	79	Clean Glass Containers: Non-CRV	0.4%	0.4%	0
Potentially Recoverable	3.7%	4.9%	4	Contaminated Glass Bottles: CRV	0.6%	0.9%	1
Non-recoverable	12.2%	5.6%	14	Contaminated Glass Containers: Non-CRV	0.0%	0.1%	0
Paper	33.2%	17.7%	38	Other Composite Glass	0.0%	0.0%	0
Flattened Corrugated Cardboard	0.7%	0.7%	1	Metal	1.2%	0.6%	1
Unflattened Corrugated Cardboard	0.3%	0.2%	0	Clean Aluminum Cans: CRV	0.4%	0.2%	0
Clean Recyclable Paper	4.0%	2.5%	5	Clean Aluminum Cans & Foil: Non-CRV	0.1%	0.0%	0
Contaminated Recyclable Paper	3.2%	1.8%	4	Clean Tin Cans: CRV	-	-	-
Pizza Boxes	0.0%	0.1%	0	Clean Tin Cans: Non-CRV	0.1%	0.1%	0
Coated Corrugated Cardboard	-	-	-	Clean Other Recyclable Metal	0.1%	0.1%	0
Paper Takeout Containers	0.5%	0.3%	1	Contaminated Recyclable Metal	0.3%	0.2%	0
Coated Paper Cups	0.6%	0.4%	1	Other Composite Metal	0.3%	0.2%	0
Paper Tissue & Towels	22.4%	10.6%	25	Organic Waste	50.9%	24.8%	57
Other Compostable Paper	0.6%	0.4%	1	Plant Trimmings	26.1%	26.5%	29
Gable Top Cartons & Aseptics	0.2%	0.1%	0	Edible Food: Potentially Donatable	0.8%	0.3%	1
Other Coated Paper	0.0%	0.0%	0	Edible Food: Non-donatable	8.2%	6.2%	9
Other Composite Paper	0.7%	0.4%	1	Non-edible Food	9.5%	11.5%	11
Plastic	10.2%	5.0%	11	Other Compostable Organics	1.2%	1.9%	1
Clean #1 PET Containers: CRV	0.6%	0.3%	1	Untreated Wood	0.0%	0.0%	0
Clean #1 PET Packaging: Non-CRV	0.1%	0.0%	0	Natural Textiles	3.4%	4.5%	4
Clean #2 HDPE Containers: CRV	0.0%	0.0%	0	Diapers	1.5%	0.9%	2
Clean #2 HDPE Packaging: Non-CRV	0.4%	0.3%	0	Animal Feces & Litter	0.1%	0.2%	0
Clean Other #3-7 Container: CRV	-	-	-	Other Composite Organics	-	-	-
Clean Other #3-7 Packaging: Non-CRV	0.1%	0.0%	0	Hazardous Waste	0.3%	0.4%	0
Plastic Takeout Containers	1.3%	0.8%	1	Electronics	0.0%	0.0%	0
Durable Plastic Products	0.0%	0.0%	0	Batteries	0.0%	0.0%	0
Contaminated Recyclable Plastic: CRV	0.2%	0.2%	0	Medicine	0.0%	0.0%	0
Contaminated Recyclable Plastic: Non-CRV	0.4%	0.2%	0	Other Hazardous Waste	0.3%	0.4%	0
Expanded #6 Products & Packaging	0.0%	0.0%	0	Other Materials	2.6%	1.7%	3
Compostable Plastic	0.3%	0.1%	0	Carpet	-	-	-
Other Composite Plastic	5.3%	2.8%	6	Construction & Demolition Debris	-	-	-
Clean & Bagged Recyclable Film	-	-	-	Other Textiles	1.4%	1.5%	2
Clean & Loose Recyclable Film	0.2%	0.1%	0	Small Appliances	-	-	-
Contaminated Recyclable Film	0.1%	0.1%	0	Other Composite Materials & Fines	1.2%	0.5%	1
Flexible Plastic Pouches: CRV	-	-	-				
Flexible Plastic Pouches: Non-CRV	0.1%	0.1%	0				
Other Composite Film Plastics	1.2%	1.2%	1				
Sample Count	8			Organics Total	100%		113

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Appendix B. Material Categories and Definitions

Material Type Definitions Organized by Material Class

Paper

1. **Flattened Corrugated Cardboard:** Uncoated boxes, packaging, sheets, and other pieces with a corrugated layer sandwiched between two outer layers that has been flattened to reduce the volume. Examples include shipping boxes and some shoe boxes.
2. **Unflattened Corrugated Cardboard:** Uncoated boxes, packaging, sheets, and other pieces with a corrugated layer sandwiched between two outer layers that has NOT been flattened to reduce the volume. Examples include shipping boxes and some shoe boxes.
3. **Clean Recyclable Paper:** Paper and paper products that can be recycled curbside, except corrugated cardboard. Includes newspaper; high-grade white or colored ledger; paper bags; bond, rag, stationary, office, copy, or printing paper; low-grade mixed junk mail; envelopes (plastic windows are okay); magazines; clay-coated glossy catalogs; brochures and pamphlets; hardback and paperback books; spiral notebooks; manila folders; index cards; self-adhesive notes; phonebooks; bagged shredded paper; construction paper; kraft or bleached sheets; toilet paper tubes; non-corrugated box/liner/chip/paper board (e.g., cereal and tissue boxes, six-pack holders); egg cartons; tissue wrapping paper; blueprints; and carbonless forms. Minor amounts of glue or other binding are okay.
4. **Contaminated Recyclable Paper:** Paper items normally accepted in the curbside recycle program that are too contaminated to be marketed. Examples include ledger paper soaked in coffee, cardboard covered in paint, and excessively wet boxboard packaging. Includes loose shredded paper.
5. **Pizza Boxes:** Boxes used for the take-out or delivery of prepared pizza. Includes both clean and soiled boxes.
6. **Coated Corrugated Cardboard:** Cardboard boxes coated in wax or plastic. Does not include fully plastic corrugated boxes.
7. **Paper Takeout Containers:** Rigid paper containers used for serving or transporting single-use, ready-to-eat, prepared foods from a food service point-of-sale. This material type includes containers that could have been avoided had a customer brought a reusable food container to the point-of-sale. Examples include boxes and clamshells for items from the “hot food” bar or salad bar at a grocery store or deli and take-out cartons. This does not include paper cups or paper wraps (e.g., for a hamburger, deli sandwich, or burrito). This does not include items in paper retail packaging like frozen foods or cereals.
8. **Coated Paper Cups:** Paper cups that are poly-coated, compostable plastic-coated, or wax-coated inside and/or outside such as for coffee and other hot drinks or soda and other cold drinks.

9. **Paper Tissue & Towels:** Paper towels, napkins, tissues, toilet paper, and other short-fiber or potentially soiled paper that is not recyclable, but is compostable. Includes cotton balls, pads, and non-plastic swabs and wipes.
10. **Other Compostable Paper:** Uncoated paper not generally accepted in the recycle program that is not tissue and towels and that can be composted. This includes some paper products with a compostable plastic liner, except for cups. Examples include some food-soiled paper plates, French fry containers, and coffee filters. Recyclable paper that was likely soiled in the collection container should be sorted as Contaminated Recyclable Paper. Paper cups with a compostable plastic liner should be sorted as Coated Paper Cups.
11. **Gable Top Cartons & Aseptics:** Containers that are poly-coated or wax-coated (not clay-coated) inside and/or outside with a gable top such as milk and juice cartons (including those with plastic spouts) and multilayer composite cartons of bleached paper, poly-film, and foil that contain shelf-stable products such as juice, milk, and soup and tofu boxes.
12. **Other Coated Paper:** Paper and paper products that are coated with polyethylene or other non-compostable layers inside and/or outside. Includes fast food wrappers, pizza box liners, butcher paper, and ice cream and other frozen or refrigerated food packaging. This does not include coated corrugated cardboard, items with a gable top, prepared food takeout containers, or paper cups.
13. **Other Composite Paper:** Items predominantly made of paper that are not defined elsewhere, but that contain one or more other material rendering them hard to recycle or compost, such as orange juice concentrate cans, carbon copy paper, foil-laminated paper boxes and gum wrappers, packaging with large plastic windows (blister packs) or integrated foam, cylindrical coffee containers made of paperboard and metal with a plastic lid, and heavily plastic-laminated or painted paper.

Plastic

14. **Clean #1 PET Containers: CRV:** Polyethylene terephthalate (PET) bottles of all sizes eligible for a California Redemption Value (CRV). This includes carbonated soft drinks (e.g., Coke), non-carbonated soft drinks (e.g., Califia almond milk), sports drinks (e.g., Gatorade), noncarbonated water (e.g., Dasani), fruit juice, vegetable juice, and coffee or tea beverages. Items must bear the CRV mark.
15. **Clean #1 PET Packaging: Non-CRV:** PET jars, frozen food trays, retail packaging, and other rigid items such as food and beverage containers. This includes clamshells that are not otherwise included in the Plastic Takeout Containers material type, like berry clamshells and four-pack muffin clamshells. Items do not bear the CRV mark
16. **Clean #2 HDPE Containers: CRV:** High-density polyethylene (HDPE) bottles, jars, tubs, lids, and other rigid items such as containers for distilled water, non-carbonated soft drinks (e.g., aloe vera drink), and juice. Items must bear the CRV mark.
17. **Clean #2 HDPE Packaging: Non-CRV:** HDPE bottles, jars, tubs, lids, and other rigid items such as containers for vinegar, milk, yogurt, and detergent. Items do not bear the CRV mark.
18. **Clean Other #3-7 Container: CRV:** Polyvinyl chloride (PVC), low-density polyethylene (LDPE), polypropylene (PP), non-expanded styrene (PS), other (#7, various resins), and unlabeled, unidentifiable bottles, jars, tubs, lids, and other rigid items such as containers for sport drinks, noncarbonated water, or other common liquid types packaged in CRV containers. Items must bear the CRV mark.

19. **Clean Other #3-7 Packaging: Non-CRV:** PVC, LDPE, PP, PS, other (#7, various resins), and unlabeled, unidentifiable bottles, jars, tubs, lids, and other rigid items such as some salad dressing, syrup and prescription bottles; CD cases; and auto parts. Items are typically constructed of a single plastic resin and smaller than a basketball. Items do not bear the CRV mark.
20. **Plastic Takeout Containers:** Rigid plastic containers used for serving or transporting single-use, ready-to-eat, prepared foods from a food service point-of-sale. This material type includes containers that could have been avoided had a customer brought a reusable food container to the point-of-sale. Examples include boxes and clamshells for items from the “hot food” bar or salad bar at a grocery store or deli, plastic tubs and bowls from fast food restaurants, and plastic to-go cups. This does not include items in plastic retail packaging like frozen foods and microwavable soups.
21. **Durable Plastic Products:** Large, rigid items made predominantly from plastic (usually a single resin) and intended for multiple uses. Examples include clothes hangers, buckets, lawn furniture, plastic pipe, and some toys.
22. **Contaminated Recyclable Plastic: CRV:** Plastic items normally accepted in the curbside recycle program that are too contaminated to be marketed. Examples include containers for distilled water, non-carbonated soft drinks (e.g., aloe vera drink), and juice. Items must bear the CRV mark.
23. **Contaminated Recyclable Plastic: Non-CRV:** Plastic items normally accepted in the curbside recycle program that are too contaminated to be marketed. Examples include yogurt tubs containing yogurt residue or milk jugs containing milk. Items do not bear the CRV mark.
24. **Expanded #6 Products & Packaging:** Styrofoam and other expanded polystyrene cups, plates, bowls, clamshells, packaging blocks and peanuts (except compostable ones), insulation, non-corrugated foamcore (includes material sandwiched between two layers of paper or plastic), and other rigid items.
25. **Compostable Plastic:** Polylactic acid (PLA) and other bags, cups, lids, plates, bowls, clamshells, trays, utensils, and other items labeled “compostable.”
26. **Other Composite Plastic:** Items that are predominantly rigid plastic but that contain more than one type of plastic and/or other material (e.g., metal) or film plastics not described elsewhere. Includes toothbrushes, disposable razors, pens, some toys, lighters, vinyl binders, hoses, foil, and plastic blister packs (such as for medications), and fiberglass products except insulation. Does not include appliances or electronics. Includes non-recyclable film like trash bags, condiment pouches, mailing pouches, shower curtains, woven polyethylene (e.g., grain bags, wipes, dryer sheets), and mylar balloons.
27. **Clean & Bagged Recyclable Film:** Single-layer clear or colored film without an inner foil or metallic layer that is accepted in Cupertino recycle containers. Film must also be bagged; free of dye, paint, and other coloration; and uncontaminated with food or garbage residue. Includes dry cleaner, newspaper, Ziploc, bread, cracker, and clear tortilla chip bags; stretch, shrink, and bubble wrap; plastic sheeting; frozen food; and clear or colored grocery, department store, and other retail and food establishment merchandise and to-go bags.
28. **Clean & Loose Recyclable Film:** Single-layer clear or colored film without an inner foil or metallic layer that is accepted in Cupertino recycle containers. Film in this material type must be loose; free of dye, paint, and other coloration; and uncontaminated with food or garbage residue. Includes dry cleaner, newspaper, Ziploc, bread, cracker, and clear tortilla chip bags; stretch, shrink, and bubble wrap; plastic sheeting; frozen food; and clear or colored grocery, department store, and other retail and food establishment merchandise and to-go bags.

29. **Contaminated Recyclable Film:** Single-layer clear or colored film without an inner foil or metallic layer that is accepted in Cupertino recycle containers, loose, and contaminated with paint or other coloration, food, or garbage residue. Includes dry cleaner, newspaper, Ziploc®, bread, cracker, and clear tortilla chip bags; stretch, shrink, and bubble wrap; plastic sheeting; frozen food; and clear or colored grocery, department store, and other retail and food establishment merchandise and to-go bags.
30. **Flexible Plastic Pouches: CRV:** Plastic pouches made of multi-layer flexible material that is thicker than potato chip bags and frozen vegetable bags. May have a flat bottom so that the package could stand up on its own, but not always. This CRV material type is specifically wine pouches. The wine pouch must still be in the box in order to qualify as CRV.
31. **Flexible Plastic Pouches: Non-CRV:** Plastic pouches made of a multi-layer flexible material that is thicker than potato chip bags and frozen vegetable bags. May have a flat bottom so that package could stand up on its own, but not always. Examples include plastic coffee bags like Starbucks and Peet's; Capri Sun pouches; baby food pouches (may have plastic screw top); soup pouches; salad dressing pouches; wine pouches; backpacking meals in pouches; soap refill pouches; laundry detergent pouches; and other similar items.
32. **Other Composite Film Plastics:** Items made of multi-layer, multi-material films, typically with a metallic or foil layer. Examples include potato chip bags, candy bar wrappers, energy bar wrappers, and anti-static electronics wrappers.

Glass

33. **Clean Glass Bottles: CRV:** Any empty container-grade glass bottles accepted for CRV. The types of beverages accepted are liquor, beer and malt beverages, wine and distilled spirit coolers, carbonated fruit drink (e.g., sparkling cider), carbonated water beverages (e.g., San Pellegrino), soda, water, juice and coffee and tea beverages. Items must bear the CRV mark.
34. **Clean Glass Containers: Non-CRV:** Any empty container-grade glass bottles and jars not accepted for CRV. Examples include containers for milk, vinegar, condiments, pickles, body care, and other products. Items do not bear the CRV mark.
35. **Contaminated Glass Bottles: CRV:** Glass items normally accepted for CRV and in the curbside recycle program that are too contaminated to be marketed. Contaminated means the container has enough liquid to soil other recyclables in the container. Items must bear the CRV mark. Does not include unopened containers, which are sorted as Edible Food: Potentially Donatable.
36. **Contaminated Glass Containers: Non-CRV:** Glass items not accepted for CRV but normally accepted in the curbside recycle program that are too contaminated to be marketed. Contaminated means the container has enough liquid to soil other recyclables in the container. Items do not bear the CRV mark. Does not include unopened food or beverage containers, which are sorted as Edible Food: Potentially Donatable.
37. **Other Composite Glass:** Items that are predominantly glass but have other material like wire mesh or plastic lamination (e.g., curved auto windshields, bus shelter and other safety glass), silvering (e.g., mirrors), or other components (e.g., incandescent and halogen bulbs). Includes items made only of clear or tinted glass that is not container glass. Includes drinking glasses, crystal, and laboratory ware; table tops; or blown glass. Includes tempered or toughened glass (such as flat side or rear window auto glass). Does not include mercury lamps, which are sorted as Other Hazardous Waste.

Metal

38. **Clean Aluminum Cans: CRV:** Empty aluminum cans for beverages accepted for CRV such as liquor, beer and malt beverages, wine and distilled spirit coolers (alcohol content of 7% or greater by volume is accepted), carbonated soft drinks, carbonated fruit drinks, carbonated water beverages, fruit juice, vegetable juice, and coffee and tea beverages. Items must bear the CRV mark.
39. **Clean Aluminum Cans & Foil: Non-CRV:** Non-beverage aluminum cans (e.g., pet food), non-CRV beverage cans, bi-metal cans made mostly of aluminum, empty aluminum aerosol cans for hazardous products, all (empty or full) aluminum aerosol cans with non-toxic contents, and aluminum food containers, trays, pie tins, and foil. Items do not bear the CRV mark.
40. **Clean Tin Cans: CRV:** Rigid containers accepted for CRV that are made mainly of steel. These items will stick to a magnet and may be tin-coated. This subtype is used to store beverages. Item must bear the CRV mark.
41. **Clean Tin Cans: Non-CRV:** Rigid containers made mainly of steel that are not accepted for CRV. These items will stick to a magnet and may be tin-coated. This subtype is used to store food, paint, and a variety of other household and consumer products. Examples include canned food, pet food cans, empty metal paint cans, empty spray paint and other aerosol containers, and bimetal containers with steel sides and aluminum ends. Full or partially full aerosol containers are sorted as Other Hazardous Waste.
42. **Clean Other Recyclable Metal:** Non-ferrous, ferrous, composite, etc. Any other metal not described above that is normally accepted in the curbside recycle program. Examples include aluminum trays or aluminum foil.
43. **Contaminated Recyclable Metal:** Metal items normally accepted in the curbside recycle program that are too contaminated to be marketed. Includes non-ferrous, ferrous, and composite metals. Any other metal not described above. Examples include aluminum trays and other aluminum containers. Does not include unopened food or beverage containers, which are sorted as Edible Food: Potentially Donatable.
44. **Other Composite Metal:** Other items predominately made of metal that are not accepted in the curbside recycle program. Examples include major appliances, window blinds, and car parts.

Organic Waste

45. **Plant Trimmings:** Prunings and cuttings from bushes, shrubs and trees, and non-woody plant material including grass clippings, sod, leaves, dead flowers, weeds, loose or rolled tobacco (without filters but including any rolling paper), cork, hemp rope, and other plant material. Includes all plant types and branches, trunks, and stumps of any size.
46. **Edible Food: Potentially Donatable:** Food products that are in a whole state (i.e., not partially consumed) and in the original unopened package. Potentially edible/donatable food includes cooked and uncooked fresh vegetables, fruit, fungi, eggs, dairy, dairy alternatives, uncooked or cooked meat (beef, poultry, pork, lamb), fish, and cooked/baked prepared perishable items. Examples include mixed fruit salad, whole apple, sliced fruits, sliced vegetables, head of lettuce, unopened package of mushrooms, milk, cheese, eggs, yogurt, soy milk, tofu, whole rotisserie chicken or raw meat in original unopened package, jerky, canned meat or fish, whole tray of lasagna, whole frozen pizza in original unopened package, whole loaves of bread, and

whole pastries. Also includes unopened perishable beverages such as fresh fruit or vegetable juice.

47. **Edible Food: Non-donatable:** Any food not in a whole state (i.e., partially consumed) or not in its original unopened package. Examples include a partially consumed rotisserie chicken, a hamburger, meat trimmings, fruit and vegetable peels, skins, and ends (e.g., banana peels, potato skins, cucumber end), partially consumed lasagna, or a half-eaten burrito. This category also includes any indistinguishable food.
48. **Non-edible Food:** Items typically not consumed by people (e.g., bones, pits, shells, coffee grounds, etc.). Note that small amounts of edible material associated with the inedible material are permitted to be included as “inedible.” Excludes fruit and vegetable peels, skins, trimmings, and ends (sorted as Edible Food: Non-donatable).
49. **Other Compostable Organics:** Includes bagasse food ware, candles, compostable packaging peanuts, hair, fingernails, etc.
50. **Untreated Wood:** Wood not treated with paint, stain, or other chemical finish. Includes scrap from production of prefabricated wood projects such as wood furniture or cabinets that have not been treated, untreated and unpainted fencing, recyclable demolition wood, and untreated or unpainted wood roofing and siding, as long as the wood material is not contaminated with another material (e.g., tar). May contain nails or other trace contaminants. Does not include treated wood, which is sorted into Construction & Demolition Debris.
51. **Natural Textiles:** Items made of thread, yarn, fabric, or cloth from natural material such as cotton, wool, or silk. Includes clothes, fabric trimmings, curtains, drapes, and linens. Does not include carpet, which is sorted into Carpet.
52. **Diapers:** Diapers made from a combination of synthetic and/or natural fibers, primarily for single use. Includes disposable baby diapers, adult protective undergarments, and feminine hygiene products. Includes diapers and any contents, including human feces not in diapers.
53. **Animal Feces & Litter:** Any non-human animal feces and litter such as cat feces and kitty litter, dog poop, bird droppings, horse manure and soiled bedding. Includes soiled paper and other litter material. Also includes animal carcasses not resulting from food storage or preparation.
54. **Other Composite Organics:** Predominantly organic items that are mixed with non-organic material and cannot easily be separated for composting.

Hazardous Waste

55. **Electronics:** All types of products which include one or more integrated circuits, circuit boards, or “chips” and/or have a visual display greater than (or equal to) four inches on the diagonal. Generally includes anything that can be programmed. Includes televisions, computer monitors, central processing units (CPUs) and computer peripherals, fax machines, stereo equipment, VCRs, and some games and toys. Does NOT include items powered by electricity (plug or battery), if the electronic circuitry or a video display are not present (e.g., non-robotic vacuum cleaners.) Note that there may be products intended for the same use of which some will be electronic waste and some will not – for example, coffeemakers (some just plug in and are switched on manually and some contain chips/boards because they have on/off/grind etc. features which can be programmed).
56. **Batteries:** All chemistries, including alkaline batteries, Ni-Cd, Ni-MH, lithium, lithium-ion, and small sealed lead acid (SSLA) batteries often used in battery backup units.

57. **Medicine:** All medicine intended for human or veterinary use, including prescription and non-prescription (over-the-counter) drugs as well as vitamins and nutritional products.
58. **Other Hazardous Waste:** Paint, mercury lamps, pesticides, cleaning products, motor oil, oil and fuel filters, medical waste, cold packs, and items and material not fitting into any of the other hazardous categories but that meet California's hazardous waste characteristic descriptions for ignitability, corrosivity, reactivity, or toxicity. Includes lab chemicals, solvents (paint thinner, nail polish, and nail polish remover), mercury thermometers and thermostats, adhesives, glues, fuel, non-empty and pressurized gas canisters and cylinders, antifreeze, asbestos-containing material, sharps, ammunition, writing and printing ink, and hair dye. Does NOT typically include cosmetics or personal care products, which are sorted into Other Composite Materials & Fines. Includes empty containers which previously contained hazardous material.

Other Materials

59. **Carpet:** Flooring applications consisting of various natural or synthetic fibers bonded to some type of backing material. This type does not include carpet padding or woven rugs with no backing.
60. **Construction & Demolition Debris:** Includes painted and treated wood, engineered wood, inerts, gypsum, roofing, construction and demolition glass, and other construction and demolition-related items.
61. **Other Textiles:** Other items made of thread, yard, fabric, or cloth from synthetic material such as rayon or polyester. Also includes items made of natural or synthetic leather such as shoes, handbags, and belts. Items made from natural fibers are sorted into Natural Textiles.
62. **Small Appliances:** Multi-material electric analog (not digital, no chips) appliances, primarily plastic, such as old toasters, power tools, curling irons, light fixtures, clocks, rechargeable toothbrushes, and dial telephones. Does not include items with integrated circuits or digital display, which are sorted into Electronics.
63. **Other Composite Materials & Fines:** All remaining, generally multi-material composite or indistinct items not elsewhere defined. Examples include items less than two inches in diameter on any side, whole filtered cigarettes and cigarette butts, dryer lint, tires, rubber, food delivery coolant packs, and personal care products (shampoo, cosmetics, soaps, toothpaste, etc.).

Recoverability Group Assignments

To identify additional diversion opportunities, material types are classified into five recoverability groups that consider the availability and potential methods of recovery based on how the material was received (Table 47). These assignments reflect recovery programs available in Cupertino in 2024.

- **Recyclable:** material currently accepted in the City's curbside recycle program. These material types are highlighted in blue throughout the tables and figures.
- **Contaminated Recyclable:** material that is currently accepted in the City's curbside recycle program but that is soiled, contaminated, or otherwise improperly prepared before being

discarded. This includes Recyclable material that is contaminated before being discarded into any stream. It also includes Clean & Loose Recyclable Film that is not bagged appropriately when placed in the recycle stream or in any stream. These material types are highlighted in light blue throughout the tables and figures.

- **Compostable:** material currently accepted in the City's curbside organics program. These material types are highlighted in green throughout the tables and figures.
- **Potentially Recoverable:** material that can be diverted from landfill through safe disposal, specialty take-back or drop-off recycling programs, or other recovery programs for material that cannot be recycled or composted curbside. These material types are highlighted in yellow throughout the tables and figures.
- **Non-recoverable:** material that is not readily recyclable or compostable or that faces other market, technology, or programmatic barriers to recovery. These material types are highlighted in brown throughout the tables and figures.

Table 47. Material Types by Recoverability Group

Recoverability Group	Included Material Types
Recyclable	Flattened Corrugated Cardboard; Unflattened Corrugated Cardboard; Clean Recyclable Paper; Clean #1 PET Containers: CRV; Clean #1 PET Packaging: Non-CRV; Clean #2 HDPE Containers: CRV; Clean #2 HDPE Packaging: Non-CRV; Clean Other #3-7 Container: CRV; Clean Other #3-7 Packaging: Non-CRV; Plastic Takeout Containers; Durable Plastic Products; Clean & Bagged Recyclable Film; Clean Glass Bottles: CRV; Clean Glass Containers: Non-CRV; Clean Aluminum Cans: CRV; Clean Aluminum Cans & Foil: Non-CRV; Clean Tin Cans: CRV; Clean Tin Cans: Non-CRV; Clean Other Recyclable Metal
Contaminated Recyclable	Contaminated Recyclable Paper; Contaminated Recyclable Plastic: CRV; Contaminated Recyclable Plastic: Non-CRV; Clean & Loose Recyclable Film; Contaminated Recyclable Film; Contaminated Glass Bottles: CRV; Contaminated Glass Containers: Non-CRV; Contaminated Recyclable Metal
Compostable	Pizza Boxes; Coated Corrugated Cardboard; Paper Takeout Containers; Coated Paper Cups; Paper Tissue & Towels; Other Compostable Paper; Plant Trimmings; Edible Food: Potentially Donatable; Edible Food: Non-donatable; Non-edible Food; Other Compostable Organics



Recoverability Group	Included Material Types
Potentially Recoverable	Untreated Wood; Natural Textiles; Electronics; Batteries; Medicine; Other Hazardous Waste; Carpet; Construction & Demolition Debris
Non-recoverable	Gable Top Cartons & Aseptics; Other Coated Paper; Other Composite Paper; Expanded #6 Products & Packaging; Compostable Plastic; Other Composite Plastic; Flexible Plastic Pouches: CRV; Flexible Plastic Pouches: Non-CRV; Other Composite Film Plastics; Other Composite Glass; Other Composite Metal; Diapers; Animal Feces & Litter; Other Composite Organics; Other Textiles; Small Appliances; Other Composite Materials & Fines

Appendix C. Study Design

This section presents the study design for the 2024 waste characterization study as delivered to the City before field work began.

Project Background

The City of Cupertino (City) is collaborating with Cascadia to conduct a waste characterization study that will encompass single-family, multifamily, commercial, and municipal sectors. The study will evaluate three streams: garbage, recycle, and organics. The City conducts a waste characterization study every 4 to 5 years to satisfy the requirement for the City's Climate Action Plan 2.0.

This study design includes protocols for a representative and unbiased approach to selecting routes and properties for sampling. This document also describes the sampling and data analysis methodologies. The study design is organized into the following sections:

- Project Background
- Project Definitions
- Selecting Routes for Sampling
- Field Sampling and Sorting Protocol
- Data Management and Analysis
- Example Field Forms

Project Definitions

Waste Sectors

- **Single-family:** residential properties with a single dwelling unit or fewer than five dwelling units. Each dwelling unit typically has its own set of garbage, recycle, and organics containers.
- **Multifamily:** residential properties with four or more dwelling units. Many dwelling units typically share garbage, recycle, and organics containers.
- **Commercial:** non-residential properties including businesses, industries (e.g., factories), and institutions (e.g., hospitals, churches, schools).
- **Municipal:** municipal properties including City government buildings and facilities (e.g., City Hall, highways, parks).

Waste Streams

- **Garbage:** material placed in gray or black containers that are hauled to a landfill with no processing. If generators correctly sorted waste material based on container signage and outreach materials, the material in garbage containers would not include any curbside-recyclable or curbside-compostable material.
- **Recycle:** material placed in blue containers that are collected by a certified or franchised hauler on a regular, contracted schedule. Material is hauled to a facility that specializes in removing the recoverable fraction. If generators correctly sorted material based on container signage and outreach materials, the material in recycle containers would only include curbside-recyclable material (e.g., paper and recyclable containers).
- **Organics:** material placed in green containers that are collected by a certified or franchised hauler on a regular, contracted schedule. Material is hauled to a facility that specializes in recovering the compostable fraction. If generators correctly sorted material based on signage and outreach materials, the material in organics containers would only include curbside-compostable material (e.g., food waste, food-soiled paper, yard waste).

Selecting Routes for Sampling

Sample Allocations

Table 1. Sample Allocation by Sector

Sector	Garbage	Recycle	Organics	Total
Single-family	20	20	20	60
Multifamily	Up to 20	Up to 20	Up to 20	Up to 60
Commercial	30	20	20	70
Municipal	Up to 10	Up to 10	Up to 10	Up to 30
Total	Up to 80	Up to 70	Up to 70	Up to 220

Multifamily and Municipal Sectors

Cascadia will obtain a list of multifamily properties and municipal sites along with accompanying service-level information from the hauler, Recology. Cascadia will randomly select properties and sites to sample from the list provided by the City.

Single-family and Commercial Sectors

Cascadia will obtain a list of single-family and commercial routes from the hauler, Recology. Cascadia will randomly select single-family and commercial routes to share with Recology to ensure they are all rerouted to the appropriate facility for sampling.

Field Sampling and Sorting Protocol

Staffing

The Cascadia field team will consist of a total of four crew members. The Sky Valley Associates (SVA) team will consist of five crew members. For the Cascadia field team, two members will collect samples early in the morning, while the other two will sort material until the sample collectors return with new samples. SVA will be stationed at the Recology station Rogers Avenue Transfer Station to collect and sort material.

Sampling Protocol

MULTIFAMILY AND MUNICIPAL SECTORS

The Cascadia field team will collect samples directly from the waste containers at multifamily properties and municipal sites. The proposed approach is the same for all three streams. The Cascadia field team will visit the selected properties and sites the day before or early in the morning of their normal collection day to ensure containers are as full as possible. The Cascadia field team will remove samples of material from the containers at the properties and transport them via box truck to the assigned sorting location:

- Garbage and organics: Rogers Avenue Transfer Station
- Recycle: GreenWaste Material Recovery Facility

This approach relies on the hauler (Recology) or the City providing Cascadia with access to containers that may be locked or in locked enclosures.

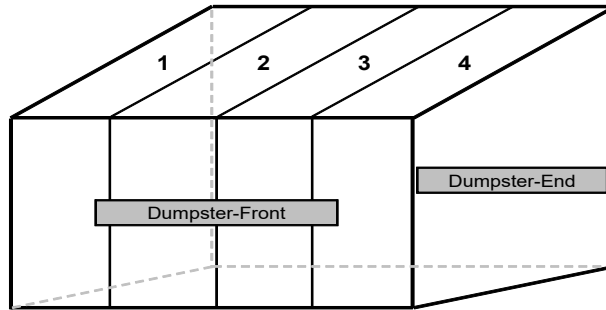
The Cascadia field team will utilize a box truck and tarps to transport the collected material back to the sorting site.

Characterize Discarded Waste

To characterize the discarded waste at each site, the Cascadia field team will obtain one or more waste samples to sort using a standard sample selection procedure, below:

- At participating sites with multiple containers for the same stream (e.g., three garbage containers), the field team will randomly select a single waste container for sampling.
- Once container(s) are selected, the field team will randomly choose a section of each selected container's contents to sample. Each sample will consist of a vertical cross section, or "slice," of the waste in the chosen container. This slice will include waste from the top to the bottom of the container. An illustration of the slices is shown in Figure 43. The field team will ensure that each sample weighs the appropriate weight (Table 48).

Figure 43. Example Dumpster with Slices Illustrated



- If a container's entire contents weigh less than the desired weight, the field team will draw waste from other containers in the same waste stream until the target weight is met. If a business has generated less than 150 pounds at the time of the visit, the field team will collect all available material and return for a second visit to collect the material needed to reach the target weight.

If at least 50 pounds are collected over the two site visits, the site will be included in the study as an underweight sample. If less than 50 pounds of material are collected over the two site visits, this site will be removed from the study and an additional site will be recruited in its place.

After identification and collection of each sample, the field team will secure the collected sample in a tarp to prevent cross contamination with other samples, label the sample with relevant details about its source using a placard, and transport the sample to the local City-provided site for hand-sorting (described below).

Note: In some cases, the field team will coordinate unique sampling arrangements with the site representative and/or its hauler to ensure that suitable samples are available for selection and sorting. For example, if the site uses a compactor, the field team will provide rolling collection containers for the site to deposit waste into for one or more days, instead of into the compactor. The field team will then select samples from the material that accumulates in the rolling containers.

Table 48. Target Weights for Multifamily and Municipal Sectors

Stream	Target Weight	Comments
Garbage	125 lbs.	125 lbs. or everything that can be collected in no more than two visits. Minimum 50 lbs.
Recycle	125 lbs.	125 lbs. or everything that can be collected in no more than two visits. Minimum 50 lbs.
Organics	125 lbs.	125 lbs. or everything that can be collected in no more than two visits. Minimum 50 lbs.

SINGLE-FAMILY AND COMMERCIAL SECTORS

Recology will collect material for all single-family and commercial samples and deliver that material to a transfer station where Sky Valley Associates (SVA) staff will sample and sort the material. The proposed approach for each stream is outlined below:

- **Garbage:** Recology operates multiple packer truck routes each day. Each route typically requires the driver to make at least two trips to the transfer station because the entire route is too large to fit in a single truckload. Each day, a route driver will finish the majority of their route as normal. After clearing their truck, they will return to their route and collect the final stretch of their route (single-family) or the final 12 commercial (non-multifamily, non-municipal) accounts on their route. The route driver will tip this material at the Recology Rogers Avenue Transfer Station. This process is repeated for each of the routes.
- **Recycle:** Recology operates multiple packer truck routes each day. Each route typically requires the driver to make at least two trips to the transfer station because the entire route is too large to fit in a single truckload. Each day, the route driver will run their route and tip at the GreenWaste Material Recovery Facility as normal. No special operations are required because Cascadia understand that there is very little mixing of single-family, commercial, and multifamily recycle and that municipal recycle is a de minimis portion of the daily recycle collection.
- **Organics:** Recology operates multiple packer truck routes each day. Each route typically requires the driver to make at least two trips to the transfer station because the entire route is too large to fit in a single truckload. Each day, a route driver will finish the majority of their route as normal. After clearing their truck, they will return to their route and collect the final stretch of their route (single-family) or the final 12 commercial (non-multifamily, non-municipal) accounts on their route. The route driver will tip this material at the Recology Rogers Avenue Transfer Station. This process is repeated for each of the routes.

The SVA field team will collect representative samples of material from each truck up to the target weight for each stream (Table 49).

Table 49. Target Weights for Single-family and Commercial Sectors

Sector	Garbage Target Weight	Recycle Target Weight	Organics Target Weight
Single-family	175 lbs.	125 lbs.	175 lbs.
Commercial	175 lbs.	125 lbs.	175 lbs.

FACILITY COORDINATION

Cascadia will coordinate with the two facilities to ensure there are allocated sorting spaces for the Cascadia and SVA field teams. Cascadia will be stationed at GreenWaste Material Recovery Facility and SVA will be stationed at the Recology Rogers Avenue Transfer Station.

The transfer station has two separate areas for garbage and organics. Recology has confirmed there is a sorting location for the SVA field team and will be able to support pushing sorted material into the dump pile and grabbing sample scoops from trucks.

Commercial garbage and organics trucks arrive early in the morning. Cascadia has randomly selected single-family routes and informed Recology. Recology will set aside the material from the trucks for the crew to sort when they arrive. Four garbage and one organics truck will be saved. Cascadia will have placards identifying the samples and will use those once the selected truck routes come in.

The Cascadia field team will first drop off multifamily and municipal garbage and organics samples to the transfer station for the SVA field team to sort and then return to the material recovery facility with the multifamily and municipal recycle samples for the Cascadia field team to sort (Table 50, Table 51).

Table 50. Sort Locations by Sector

Sector	Garbage	Recycle	Organics
Single-family	Recology	GreenWaste	Recology
Multifamily	Recology	GreenWaste	Recology
Commercial	Recology	GreenWaste	Recology
Municipal	Recology	GreenWaste	Recology

Table 51. Field Team by Sector

Sector	Garbage	Recycle	Organics
Single-family	SVA	Cascadia	SVA
Multifamily	SVA	Cascadia	SVA
Commercial	SVA	Cascadia	SVA
Municipal	SVA	Cascadia	SVA

Sorting Protocol

The Cascadia field team will hand-sort recycle samples at GreenWaste Material Recover Facility, and the SVA field team will hand-sort garbage and organics at the Recology Rogers Avenue Transfer Station. Recology and GreenWaste will provide a covered area for sorting large enough to accommodate incoming residential samples. The field teams will sort, weigh, and record each sample separately. Cascadia staff will be on-site during all sorting activities to ensure that field teams follow approved protocols and maintain consistency across samples and sampling events. The Field Team Lead will also brief personnel on any facility-specific health and safety requirements, personal protective equipment (PPE) requirements, and contingency protocols. The hand-sorting protocol follows the steps listed below:

- 1. Photograph the sample.** A member of the field team will take photographs of the sample using a digital camera. The Sample Placard identifying the sample will be positioned to be visible in each photo.

2. **Sort the sample.** The field team will sort samples by material type into plastic laundry baskets. The field team members typically specialize in groups of material, such as papers or plastics, and focus on sorting those material for the duration of the study to ensure accuracy and consistency. For material that is difficult to sort due to adhesion, wetness, or partial decomposition, the field team will make their best judgement to categorize the material. If it is practical to separate joined material (such as a zip lock bag with metal screws in it), the field team will do so.
3. **Quality check the sample.** The Field Team Lead will monitor the homogeneity of the sorted material as it accumulates in the containers, rejecting and re-sorting material that is improperly classified. Open containers allow the Field Team Lead to see the material at all times.
4. **Weigh and record data.** After each sample has been completely sorted, the Field Team Lead will weigh the material in each container and verify the homogeneity of each material type as it is weighed. The Field Team Lead will then store the weights in a custom, cloud-based data entry application.
5. **Clean sorting site.** The field team will thoroughly clean the sorting area at the end of each day.

Data Entry and QA/QC

Cascadia understands the importance of accurate information and protects data integrity during each step—collection, review, entry, calculation, and analysis. Easy-to-use data entry applications and rigorous data-entry protocols virtually eliminate errors. Cascadia’s quality assurance/quality control process includes:

- Assigning a unique sample number to each sample, maintaining a chain of custody for sample data as it moves from sample collection through data entry.
- Verifying that the Cascadia and SVA field teams complete data forms for each sample and review them every evening during the study for accuracy.
- Summing sample weights in real time so the field team can confirm whether the target weight is met for every sample.
- Automatically synchronizing data to cloud storage, which prevents data loss and reduces transcription errors.
- Conducting extensive data entry checks and random proofing to ensure error-free results.

Cascadia and SVA will enter data into a customized characterization database, and Cascadia will provide the City with a final accounting of all samples sorted at the conclusion of each sampling event.



Example Field Forms

Figure 44. Sample Placard

Cupertino WCS 2024		SEASON		
Circle Stream				
GARBAGE		RECYCLING		
Sample ID				
301				
Circle Vehicle Type				
Side Packer / Front or Rear Packer / Open Top Roll-off / Compactor				
Circle Date				
MON	TUE	WED	THU	FRI
xx/xx	xx/xx	xx/xx	xx/xx	xx/xx

Figure 45. Daily Sample Log

Cupertino WCS 2024				
Date		Location		
FW Lead		Start Time	End Time	
FW Team				
Sample ID	Stream	Generator	Dimensions (in x in x in)	Notes
1		GAR / ORG RCY	SF / COM MF / MUN	
2		GAR / ORG RCY	SF / COM MF / MUN	
3		GAR / ORG RCY	SF / COM MF / MUN	
4		GAR / ORG RCY	SF / COM MF / MUN	
5		GAR / ORG RCY	SF / COM MF / MUN	
6		GAR / ORG RCY	SF / COM MF / MUN	
7		GAR / ORG RCY	SF / COM MF / MUN	
8		GAR / ORG RCY	SF / COM MF / MUN	
9		GAR / ORG RCY	SF / COM MF / MUN	
10		GAR / ORG RCY	SF / COM MF / MUN	
11		GAR / ORG RCY	SF / COM MF / MUN	
12		GAR / ORG RCY	SF / COM MF / MUN	
13		GAR / ORG RCY	SF / COM MF / MUN	
14		GAR / ORG RCY	SF / COM MF / MUN	
15		GAR / ORG RCY	SF / COM MF / MUN	
16		GAR / ORG RCY	SF / COM MF / MUN	
17		GAR / ORG RCY	SF / COM MF / MUN	
Notes				

Figure 46. Back-up Paper Tally Sheet

Sample ID		Date	
Generator SF / COM / MF / MUNI		Stream GAR / ORG / RCY	
Paper	01. CLEAN, FLATTENED, UNCOATED CORRUGATED CARDBOARD		
	02. CLEAN, UNFLATTENED, UNCOATED CORRUGATED CARDBOARD		
	03. COATED CORRUGATED CARDBOARD		
	04. CLEAN RECYCLABLE PAPER		
	05. CLEAN COATED PAPER PRODUCTS		
	06. GABLE TOP CARTONS + ASEPTICS		
	07. CONTAMINATED RECYCLABLE PAPER		
	08. PAPER TISSUE + TOWELS		
	09. OTHER COMPOSTABLE PAPER		
	10. PAPER TAKEOUT CONTAINERS		
	11. COATED PAPER CUPS		
	12. PIZZA BOXES		
	13. OTHER COMPOSITE PAPER		
Plastic	23. DURABLE PLASTIC PRODUCTS		
	24. CONTAMINATED RECYCLABLE PLASTIC, CRV (includes #3-7)		
	25. CONTAMINATED RECYCLABLE PLASTIC, NON-CRV (includes #3-7)		
	26. EXPANDED #6 PRODUCTS AND PACKAGING		
	27. COMPOSTABLE PLASTIC		
	28. FLEXIBLE PLASTIC POUCHES, CRV		
Glass	32. CLEAN GLASS BOTTLES – CRV		
	33. CLEAN GLASS BOTTLES + JARS – NON CRV		
	34. CONTAMINATED RECYCLABLE GLASS BOTTLES + JARS, CRV		
Plastic	14. CLEAN #1 PETE CRV CONTAINERS		
	15. CLEAN #1 PETE PLASTIC PACKAGING, NON-CRV		
	16. CLEAN #2 HDPE CONTAINERS - CRV		
	17. CLEAN #2 HDPE PLASTIC PACKAGING – NON CRV		
	18. CLEAN OTHER #3-7 PLASTIC CRV CONTAINER		
	19. CLEAN OTHER #3-7 PLASTIC PACKAGING, NON-CRV		
Metal	37. CLEAN BEVERAGE ALUMINUM CANS, CRV		
	38. CLEAN ALUMINUM CANS + FOIL, NON-CRV		
	39. TIN CANS, CRV		
Metal	40. TIN CANS, NON CRV		
	41. CLEAN OTHER RECYCLABLE METAL		
	42. CONTAMINATED RECYCLABLE METAL		
Metal	43. OTHER METAL		
	44. PLANT TRIMMINGS		
	45. UNTREATED WOOD		
Organic Waste	46. FOOD - POTENTIALLY EDIBLE/DONATABLE		
	47. FOOD – NON-EDIBLE/DONATABLE		
	48. INEDIBLE FOOD SCRAPS		
Organic Waste	49. OTHER COMPOSTABLE ORGANICS		
	50. DIAPERS		
	51. NATURAL TEXTILES		
Other Materials	52. ANIMAL FECES + LITTER		
	53. OTHER ORGANIC		
	54. ELECTRONICS		
Hazardous Waste	55. BATTERIES		
	56. MEDICINE		
	57. OTHER HAZARDOUS WASTE		
Other Materials	58. OTHER TEXTILES		
	59. CARPET		
	60. NON-METAL APPLIANCES		
Other Materials	61. CONSTRUCTION AND DEMOLITION DEBRIS		
	62. OTHER MATERIALS		
	NOTES		

Appendix D. Description of Calculations and Statistical Protocols

Waste composition estimates were calculated using an aggregated averaging method within a given stratum. In the following descriptions of calculations, these variables are used frequently:

- i denotes an individual sample
- j denotes the material type
- c_j is the weight of the material type j in a sample
- w is the weight of an entire sample
- r_j is the composition estimate for material j (r stands for ratio)
- s denotes a particular combination of stream and sector (e.g., single-family organics)
- n denotes the number of samples in the particular group being analyzed at that step

Estimating Composition

For a given stratum (that is, for the samples belonging to the same stream from the same sector), the composition estimate denoted by r_j represents the ratio of the component's weight to the total weight of all the samples in the stratum. This estimate is derived by summing each component's weight across all the selected samples belonging to a given stratum and dividing by the sum of the total weight of waste for all of the samples in that stratum, as shown in the following equation:

$$r_j = \frac{\sum_i c_{ij}}{\sum_i w_i}$$

where:

- c = weight of particular component
- w = sum of all component weights
- for $i = 1$ to n , where n = number of selected samples
- for $j = 1$ to m , where m = number of components

For example, the following simplified scenario involves three samples. For the purposes of this example, only the weights of the component Plant Trimmings are shown.

Measurement	Sample 1	Sample 2	Sample 3
Weight (c) of Plant Trimmings (in lbs.)	5	3	4
Total sample weight (w) (in lbs.)	80	70	90

$$r_{\text{Plant Trimmings}} = \frac{5 + 3 + 4}{80 + 70 + 90} = 0.05$$

To find the composition estimate for the component Plant Trimmings, the weights for that material are added for all selected samples and divided by the total sample weights of those samples. The resulting composition is 0.05, or 5%. In other words, 5% of the sampled material, by weight, is Plant Trimmings. This finding is then projected onto the stratum being examined in this step of the analysis.

Confidence Intervals

Confidence intervals (error ranges) were calculated based on assumptions of normality in the composition estimates. The confidence interval for each composition estimate was derived in two steps. First, the variance around the estimate was calculated, accounting for the fact that the ratio included two random variables (the component and total sample weights). The variance of the ratio estimator equation follows:¹³

$$\text{Var}(r_j) \approx \left(\frac{1}{n}\right) \left(\frac{1}{\bar{w}^2}\right) \left(\frac{\sum_i (c_{ij} - r_j w_i)^2}{n - 1}\right)$$

where:

$$\bar{w} = \frac{\sum_i w_i}{n}$$

Second, precision levels at the 90% confidence level were calculated for a component's mean:

$$r_j \pm \left(z \sqrt{\text{Var}(r_j)}\right)$$

where z = the value of the z -statistic (1.645) corresponding to a 90% confidence level.

¹³ For more information regarding this equation, refer to *Sampling Techniques*, 3rd Edition by William G. Cochran (John Wiley & Sons, Inc., 1977).