City of Seattle
2022 Commercial Garbage Stream Composition Study

August 14, 2023

CASCADIA
CONSULTING GROUP

ACKNOWLEDGMENTS

LINKS TO PREVIOUS REPORTS

All past reports on Seattle's solid waste composition studies are available on the Seattle Public Utilities website.[1] Links to the eight previous commercial garbage stream studies are below. *Please note that links were published in July 2023 and are subject to change.*

- **2016 Commercial Waste Composition Study**
  www.seattle.gov/documents/Departments/SPU/Documents/Archive/2016CommercialWasteStreamCompositionStudy.pdf
- **2012 Commercial/Self-Haul Waste Stream Composition Study**
  www.seattle.gov/documents/Departments/SPU/Documents/Reports/CommercialandSelfHaulWasteStreamsCompositionStudy2012.pdf
- **2008 Commercial/Self-Haul Waste Stream Composition Study**
  www.seattle.gov/documents/Departments/SPU/Documents/Archive/2008CommercialandSelfHaulWasteStreamsCompositionStudy.pdf
- **2004 Commercial/Self-Haul Waste Stream Composition Study**
  www.seattle.gov/documents/Departments/SPU/Documents/Archive/2004CommercialandSelfHaulWasteStreamsCompositionStudy.pdf
- **2000 Commercial/Self-Haul Waste Stream Composition Study**
  www.seattle.gov/documents/Departments/SPU/Documents/Reports/2000CommercialandSelfHaulWasteStreamsCompositionStudy.pdf
- **1996 Commercial/Self-Haul Waste Stream Composition Study**
  www.seattle.gov/documents/Departments/SPU/Documents/Reports/1996CommercialandSelfHaulWasteStreamsCompositionStudy.pdf
- **1992 Commercial/Self-Haul Waste Stream Composition Study**
  www.seattle.gov/documents/Departments/SPU/Documents/Archive/1992CommercialandselfHaulWasteComp.pdf
- **1988–1989 Commercial/Self-Haul Waste Stream Composition Study**
  www.seattle.gov/documents/Departments/SPU/Documents/Archive/198889Residential%2CCommercialandSelfHaulWasteCompositionStudy.pdf

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[1] www.seattle.gov/utilities/about/reports/solid-waste/composition-studies

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EXECUTIVE SUMMARY

Why did we do this study?

This 2022 commercial garbage stream composition study is the City of Seattle's ninth study since 1988 to provide statistically reliable data on the composition of garbage collected from its businesses and commercial customers. These studies help Seattle Public Utilities (SPU) better understand the types and quantities of materials disposed in commercial garbage to measure progress and inform future waste prevention and diversion goals, programs, and policies.

How did we do this study?

In 2022, Seattle's commercial sector disposed of 104,509 tons of garbage. During 2022, Cascadia Consulting Group carried out 6 every-other-month sampling events in which we collected 271 samples of commercial garbage, each weighing 200-250 pounds. We hand-sorted these samples into 113 specific material types that were grouped into 10 broad material classes and 4 recoverability classes (see Appendix B). Cascadia used an industry-standard weighted-average procedure to calculate composition estimates for overall commercial garbage, vehicle types, high- and low-density commercial areas, seasons, and commercial sectors.[2]

How much of citywide commercial garbage is recoverable?

Overall, 68.3% by weight (71,333 tons) of commercial garbage in 2022 was recoverable, similar to what we found in 2016 (Figure 1). Recoverable garbage included curbside recyclable (21% or 21,875 tons), compostable (29% or 30,402 tons), or other recoverable (18% or 19,055 tons) materials. The largest three recoverable material types were non-coated or soiled paper products (7.2%), packaged edible other food waste (6.2%), and cardboard & kraft paper (5.1%).

Figure 1. Commercial Garbage Composition by Recoverability: 2016 and 2022

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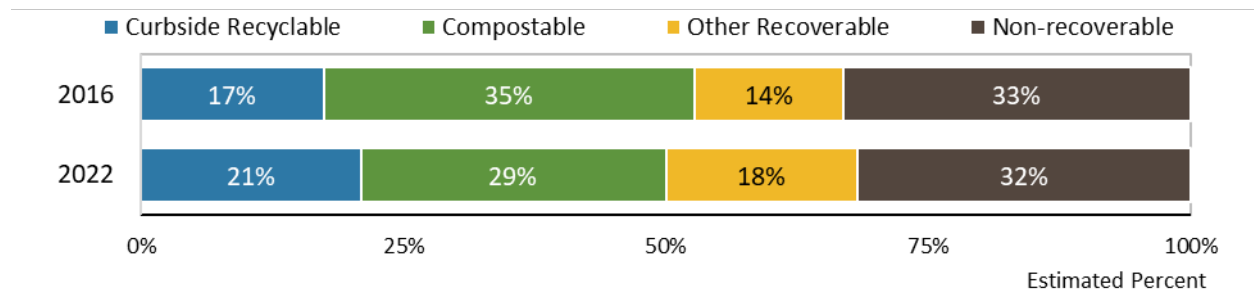
[2] To keep tables and figures readable, estimated tonnages are rounded to the nearest ton, and estimated percentages are rounded to the nearest percent or tenth of a percent. Percentages less than 0.05% are shown as 0.0%. Using rounded figures to calculate total may yield results that differ slightly from numbers in the report.

Seattle's 2022 Solid Waste Plan Update included recommendations to increase recovery for curbside recyclable materials and compostable organics with a special focus on food waste, food and beverage packaging, and construction debris, among other materials. Composition estimates for these materials in commercial garbage were:

- Total food waste: 19.2% (20,091 tons).
- Edible food waste alone: 13.6% (14,240 tons), a subset of the total food waste.
- Single-use food service items, packaging, and utensils: 3.2% (3,363 tons).
- Bottles, jars, cartons, and cans typically associated with beverages: 3.2% (3,339 tons).
- Recoverable construction debris: 6.1% (6,390 tons).

What materials are most common in commercial garbage?

In 2022, the largest material classes overall were paper (24%), compostable organics (21%), and plastic (19%), as shown in Figure 2. These material classes include both recoverable and non-recoverable materials.

Figure 2. Commercial Garbage Tons by Material Class and Recoverability Class

■ Curbside Recyclable (21%) ■ Compostable (29%) ■ Other Recoverable (18%) ■ Non-recoverable (32%)

Material Class	Annual Tons
Paper	24,777 (24%)
Plastic	20,038 (19%)
Glass	1,854 (2%)
Metal	6,593 (6%)
Compostable Organics	21,730 (21%)
Other Organics	9,817 (9%)
Furniture, Appliances, & Electronics	3,157 (3%)
Construction Debris	11,223 (11%)
Potentially Harmful Wastes	2,854 (3%)
Fines & Miscellaneous Materials	2,466 (2%)
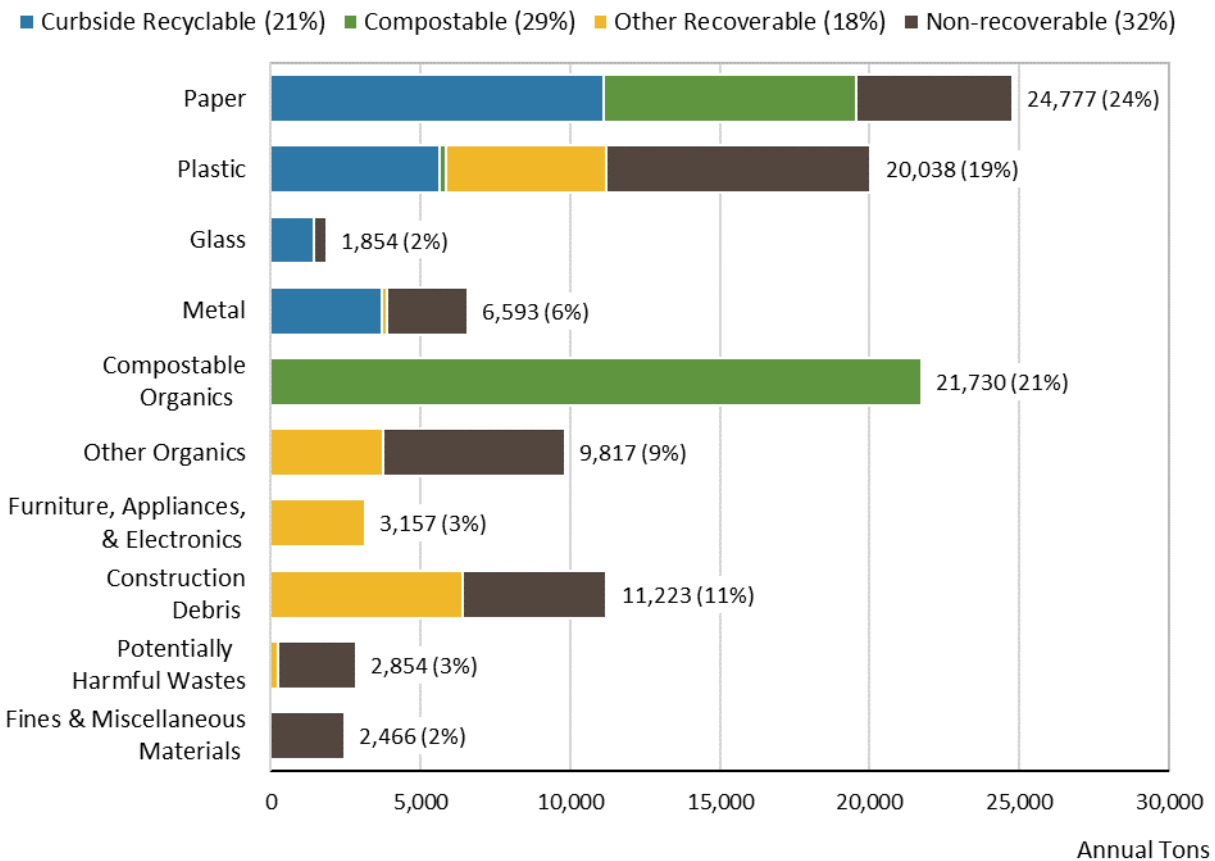
How has Seattle's garbage changed over time?

Garbage tons in 2022 were 14% lower than in 2016 and 55% lower than in 1988 (Figure 3). Garbage tons have decreased for each study period since 2000.

Figure 3. Commercial Garbage Tons: 1988 to 2022
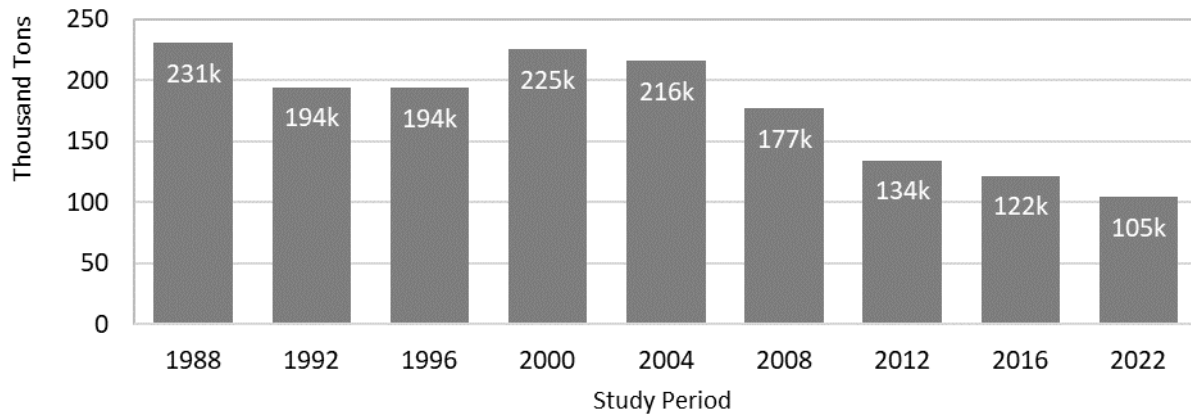
To compare across multiple study years, we developed a set of eight overall material groupings defined in Appendix A. These material groups, shown in Figure 4 below, are similar but not identical to those used in the 2022 study. Since 1988, tons of paper and CDL wastes (construction, demolition, and land-clearing) in commercial garbage have decreased dramatically. For CDL wastes, some part of the decrease is likely due to materials shifting from the commercial garbage stream to the separate CDL waste disposal stream. Tons of organics peaked in 2004 then decreased to their lowest level in 2022.

Figure 4. Trends in Commercial Garbage Tons by Material Grouping: 1988 to 2022
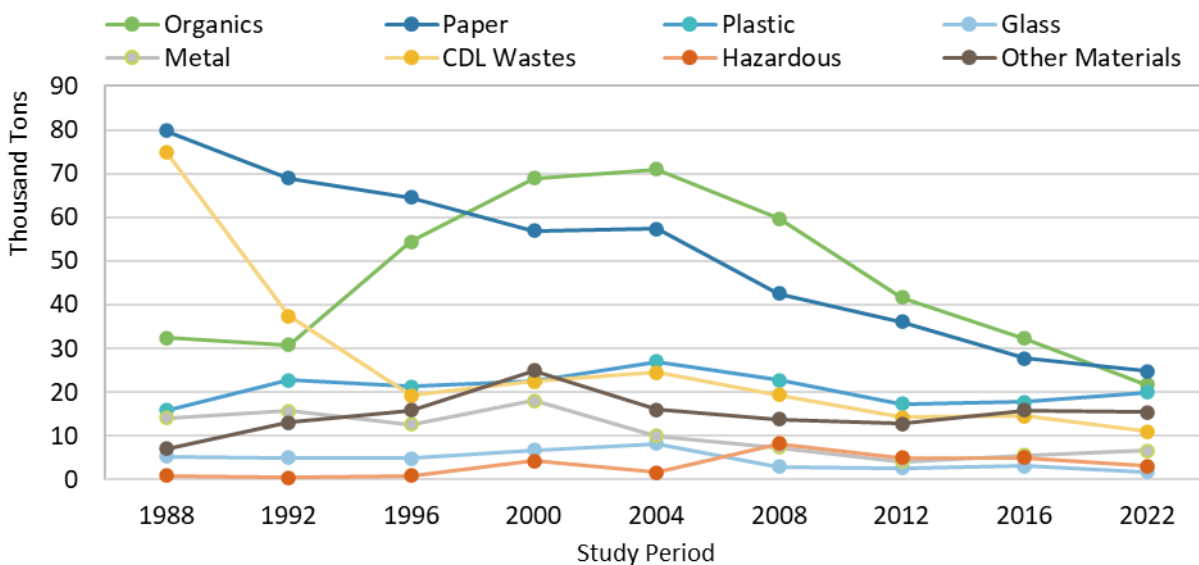
Cascadia compared composition percentages across studies as shown in Figure 5. Between the 2016 and 2022 studies, the percentage of organics in commercial garbage decreased, while plastic increased. Compared to 1988, commercial waste in 2022 had lower percentages of paper and CDL wastes and higher percentages of plastic, organics, hazardous materials, and other materials. For organics, total tons disposed decreased between 1988 and 2022 (with increases in the intervening years; Figure 4), but organics now makes up a larger share of garbage than it did in 1988 because tonnages of some other materials—particularly paper and CDL wastes— have decreased dramatically since 1988 (Figure 5).

Figure 5. Evolution of Commercial Garbage Composition by Material Grouping: 1988 to 2022

■ Paper ■ Plastic ■ Glass ■ Metal ■ Organics ■ CDL Wastes ■ Hazardous ■ Other Materials

Year	Paper	Plastic	Glass	Metal	Organics	CDL Wastes	Hazardous	Other Materials
1988	35%	7%		6%	14%	33%		3%
1992	35%	12%		8%	16%	19%		7%
1996	33%	11%		7%	28%	10%		8%
2000	25%	10%	3%	8%	31%	10%		11%
2004	27%	13%	4%	5%	33%	11%		7%
2008	24%	13%		4%	34%	11%	5%	8%
2012	27%	13%		3%	31%	11%	4%	10%
2016	23%	15%		5%	26%	12%	4%	13%
2022	24%	19%		6%	21%	11%	3%	15%

Estimated Percent
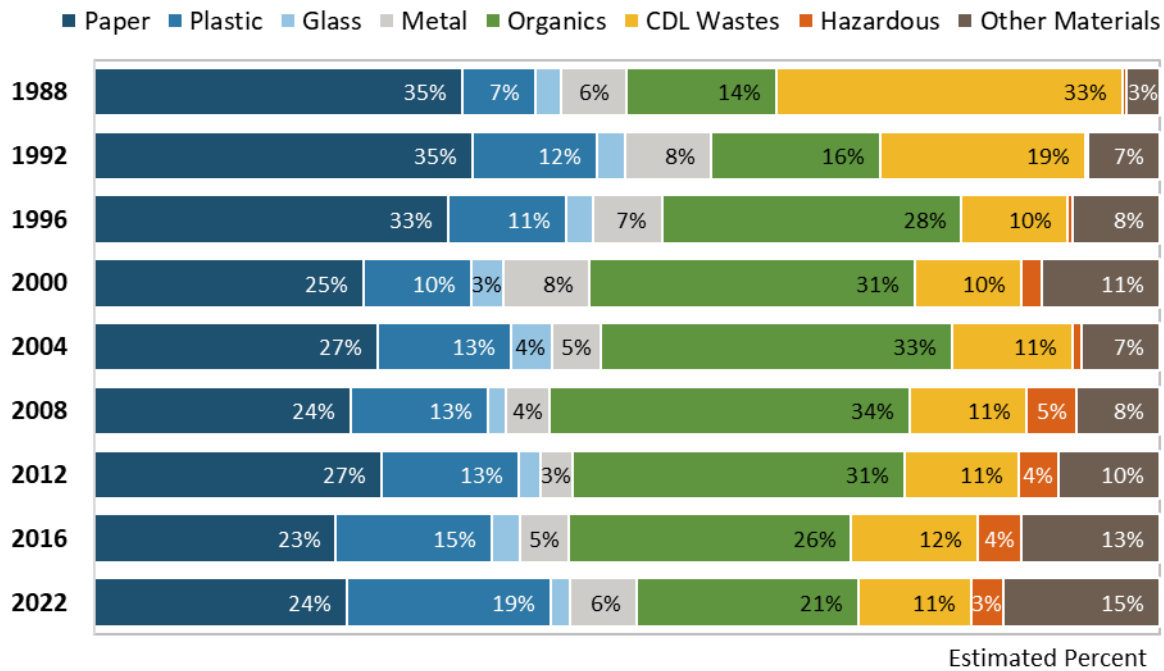
OVERVIEW

Seattle Public Utilities (SPU) contracts with two haulers, Recology and Waste Management, to collect garbage from business and commercial customers located within Seattle.[3] Seattle also plans and implements programs and policies for waste prevention, recycling, and composting to eliminate or minimize waste and to manage the remaining waste responsibly. Comprehensive solid waste composition studies, such as this one, help SPU guide its materials management efforts and assess progress toward its goals.

Introduction and Background

In 1989, Seattle adopted its first solid waste plan with recommendations for managing and recovering waste that were informed by Seattle's first solid waste composition study conducted in 1988. That first study included commercial, residential, and self-haul waste, which businesses and residents deliver directly to transfer stations. Over the last three decades, SPU has conducted many more studies to build one of the most extensive datasets in the United States for guiding its role in municipal solid waste contract management, planning, implementation, and evaluation.

This 2022 commercial garbage stream composition study (2022 commercial study) is the ninth study to provide statistically reliable data on the composition of garbage collected from businesses and commercial customers in Seattle. These studies help SPU better understand the types and quantities of material disposed in commercial garbage. SPU will use the results of this study to:

- Continue its long-term measurement of system performance and progress toward goals.
- Understand the potential for additional waste prevention and diversion to inform Seattle's Waste Prevention Strategic Plan and other future programs and policies.
- Inform the development of new metrics for quantifying waste prevention and diversion that SPU will use to replace the weight-based 70% diversion rate goal.[4]

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[3] Seattle Public Utilities, Business and Commercial Collection, https://www.seattle.gov/utilities/your-services/collection-and-disposal/garbage/business-and-commercial-collection
[4] Seattle City Council, Resolution 32082, https://seattle.legistar.com/View.ashx?M=F&ID=11980794&GUID=BE725536-B68B-4BB7-955B-06323DD335FE&G=FFE3B678-CEF6-4197-84AC-5204EA4CFC0C

Study Overview

As in past commercial garbage studies for Seattle, Cascadia Consulting Group characterized material that was generated at businesses and institutions and collected as garbage by SPU's contracted haulers. This study excluded material collected for recycling or composting, waste generated at multifamily residences, and most waste that businesses and institutions self-hauled for disposal or recovery. Waste from multifamily buildings is characterized as part of Seattle's residential waste composition studies.

In 2022, Seattle's commercial sector disposed of 104,509 tons of garbage. During 2022, Cascadia Consulting Group carried out 6 every-other-month sampling events in which it collected 271 samples of commercial garbage, each weighing 200-250 pounds consisting of 113 specific material types organized into 10 broad material classes and 4 recoverability classes (Appendix B).

Each of SPU's two contracted haulers serves two of four specific collection zones in Seattle, shown in Figure 6. This study sorted 123 samples from front and rear loader vehicles in higher-density commercial areas (zones 2 and 3), 116 samples from front and rear loader vehicles in lower-density commercial areas (zones 1 and 4), and 32 samples from roll-off container vehicles citywide.

Figure 6. Map of Collection Zones

(Adapted from https://www.seattle.gov/utilities/your-services/collection-and-disposal/garbage/business-and-commercial-collection)

Summary of Key Results

Contracted haulers collected 104,509 tons of material as garbage from Seattle commercial businesses in 2022. Overall, 68% (71,333 tons) of commercial garbage was recoverable (Figure 7). Recoverable garbage included materials that are curbside recyclable (21% or 21,875 tons), compostable (29.1% or 30,402 tons), or other recoverable (18% or 19,055 tons) materials.

Figure 7. Commercial Garbage Composition by Recoverability: 2016 and 2022
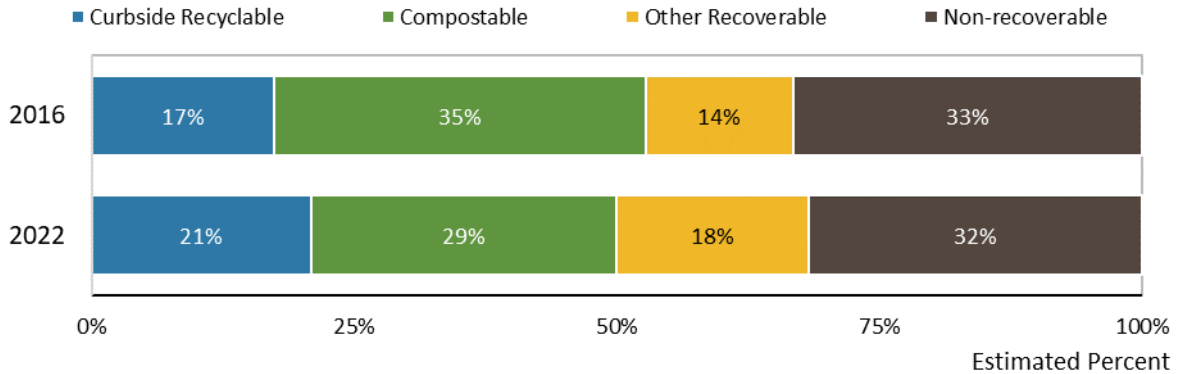
The 10 most common recoverable material types by weight made up 39.0% of all commercial garbage. The largest three recoverable material types were non-coated or soiled paper products (7.2%), packaged edible other food waste (6.2%), and cardboard & kraft paper (5.1%).

Seattle's 2022 Solid Waste Plan Update included recommendations to increase recovery for curbside recyclable materials and compostable organics with a special focus on food waste, food and beverage packaging, and construction debris, among other materials. Composition estimates for these materials in commercial garbage were:

- Total food waste: 19.2% (20,091 tons).
- Edible food waste alone: 13.6% (14,240 tons), a subset of the total food waste.
- Single-use food service and packaging and utensils, excluding bottles and jars: 3.2% (3,363 tons).
- Bottles, jars, cartons, and cans typically associated with beverages: 3.2% (3,339 tons).
- Recoverable construction debris 6.1% (6,390 tons).

In 2022, the largest material classes overall were paper (24%), compostable organics (21%), and plastic (19%), shown in Figure 8.

Figure 8. Commercial Garbage Composition by Material Class

Material Class	Annual Tons
Paper	24,777 (24%)
Plastic	20,038 (19%)
Glass	1,854 (2%)
Metal	6,593 (6%)
Compostable Organics	21,730 (21%)
Other Organics	9,817 (9%)
Furniture, Appliances, & Electronics	3,157 (3%)
Construction Debris	11,223 (11%)
Potentially Harmful Wastes	2,854 (3%)
Fines & Miscellaneous Materials	2,466 (2%)
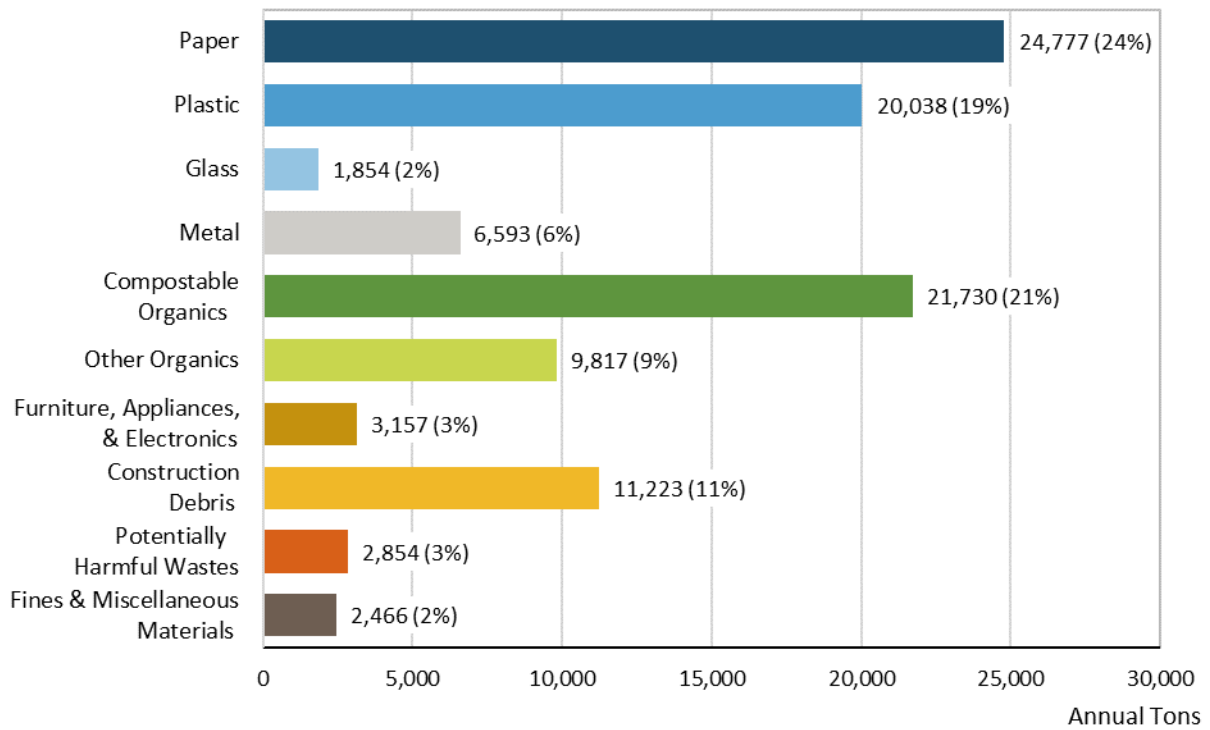
Garbage tons in 2022 were 14% lower than in 2016 and 55% lower than in 1988 (Figure 9). Garbage tons have decreased for each study period since 2000.

Figure 9. Commercial Garbage Tons: 1988 to 2022

Study Period	Thousand Tons
1988	231k
1992	194k
1996	194k
2000	225k
2004	216k
2008	177k
2012	134k
2016	122k
2022	105k
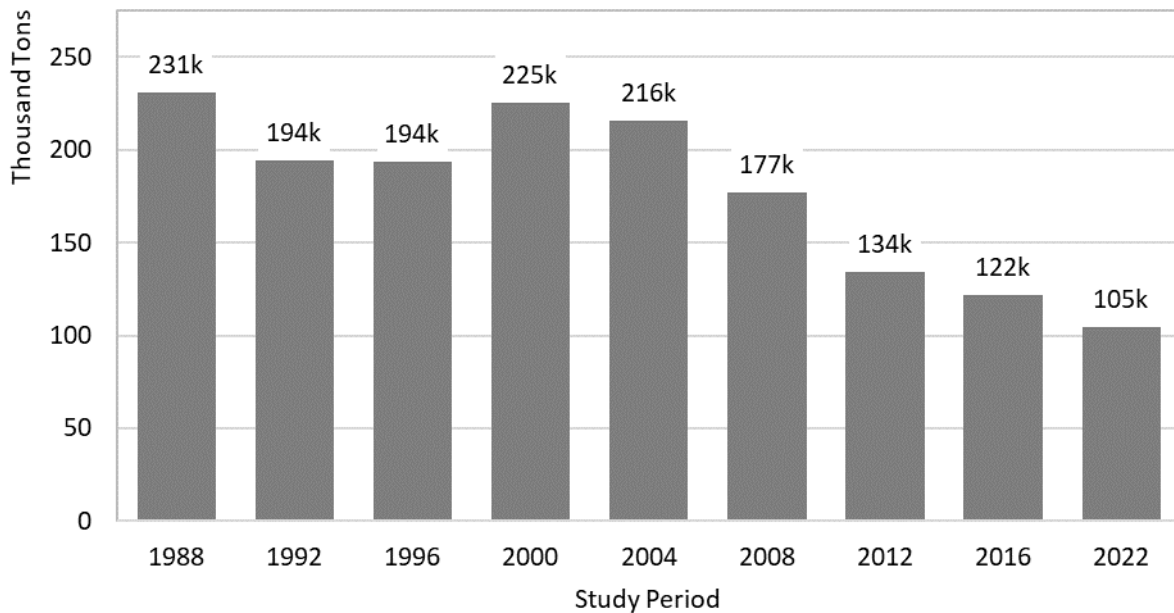
While the material list has changed since 1988, Cascadia organized material lists across the 10 commercial studies into one set of eight overall material classes to most closely align the material types and definitions across the studies. Figure 10 shows tons of garbage disposed by material class over time. Tons of paper and CDL wastes in commercial garbage have decreased dramatically since 1988. For CDL wastes, some part of the decrease is due to materials shifting from the commercial garbage stream to the separate CDL waste disposal stream. Tons of organics peaked in 2004 then decreased to their lowest level in 2022.

Figure 10. Trends in Commercial Garbage Tons by Material Grouping: 1988 to 2022
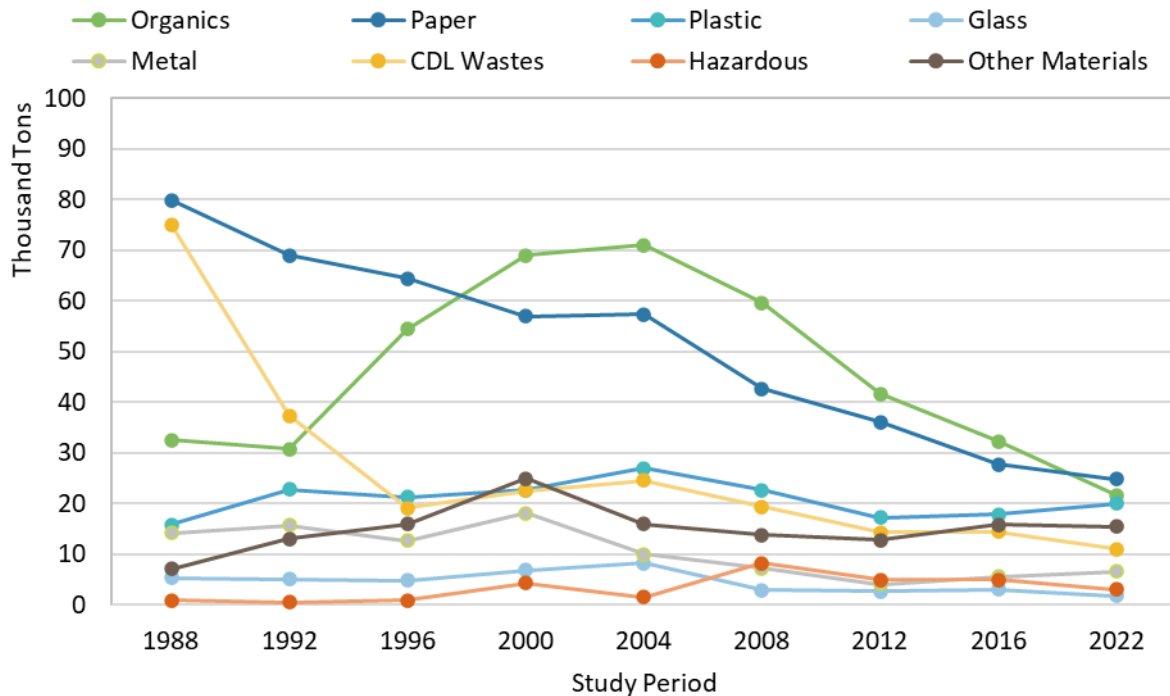
Cascadia compared composition percentages across studies as shown in Figure 11. Between the 2016 and 2022 studies, the percentage of organics in commercial garbage decreased while plastic increased. Compared to 1988, commercial waste in 2022 had lower percentages of paper and CDL wastes and higher percentages of plastic, organics, hazardous materials, and other materials. For organics, total tons disposed decreased between 1988 and 2022 (Figure 10) but organics now makes up a larger share of garbage because tonnages of some other materials—particularly paper and CDL wastes—decreased dramatically since 1988 (Figure 11). Accordingly, it is important to consider both total tons and composition percentages when assessing changes over time.

Figure 11. Evolution of Commercial Garbage Composition by Material Grouping: 1988 to 2022

Legend: ■ Paper ■ Plastic ■ Glass ■ Metal ■ Organics ■ CDL Wastes ■ Hazardous ■ Other Materials

Year	Paper	Plastic	Glass	Metal	Organics	CDL Wastes	Hazardous	Other Materials
1988	35%	7%		6%	14%	33%		3%
1992	35%	12%		8%	16%	19%		7%
1996	33%	11%		7%	28%	10%		8%
2000	25%	10%	3%	8%	31%	10%		11%
2004	27%	13%	4%	5%	33%	11%		7%
2008	24%	13%		4%	34%	11%	5%	8%
2012	27%	13%		3%	31%	11%	4%	10%
2016	23%	15%		5%	26%	12%	4%	13%
2022	24%	19%		6%	21%	11%	3%	15%

Estimated Percent
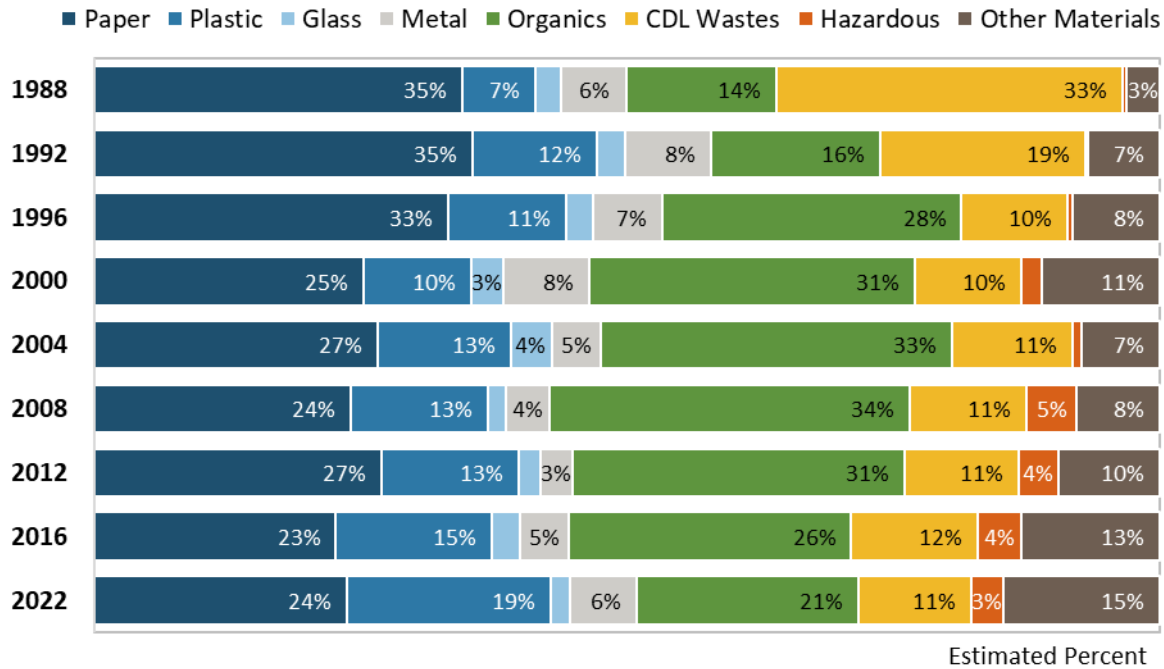
Report Outline

The remainder of this report presents the 2022 commercial study in the following sections:

- **Study Methodology** summarizes how we collected and analyzed data.
- **Composition Results** describes findings for citywide composition results, trends in citywide commercial garbage since 1988, and findings by vehicle type, commercial density, and commercial sectors.
- **Appendix A**, provides the detailed study methodology.
- **Appendix B** defines the 113 specific material types, 10 broad material classes, 4 recoverability classes, and changes from the previous 2016 study.
- **Appendix C** contains progress reports on samples collected for each of the six sampling events.
- **Appendix D** contains detailed waste composition tables for all analyses conducted, citywide and by vehicle type, commercial density, season, and commercial sector.

STUDY METHODOLOGY

This section summarizes the methodology for the 2022 commercial study, including the approach to the study design, fieldwork, data analysis, and reporting. This section also describes differences in the study design and conditions compared to the 2016 commercial study. Appendix A presents the study design with more details on the study methodology, and Appendix B lists the full material list, definitions, material classes, and recoverability classes.

Study Design

At the start of the project, SPU and Cascadia made key decisions about the study design. To the extent possible, methods and material definitions were aligned with past studies to be able to compare results. When developing the study design, we reviewed and updated:

- The material list, including material classes, material types, and recoverability classes.
- Planned allocations of samples across seasons, collection zones, and other factors.
- Procedures for selecting and scheduling loads to sample.
- Procedures for collecting and sorting samples from loads.
- Fieldwork protocols for health and safety.

The 10 material classes for the 2022 study were paper; plastic; glass; metal; compostable organics; other organics; furniture, appliances, and electronics; construction debris; potentially harmful wastes; and fines and miscellaneous materials. Each of the 113 material types was also categorized by recoverability class, as defined in Table 1.

Table 1. Material Recoverability Classifications

	Curbside Recyclable	Materials that are currently accepted in Seattle's curbside recycling program or are recycled through other commercial sector collection programs in Seattle.
	Compostable	Materials that are currently accepted in Seattle's curbside compost program or are composted through other commercial sector collection programs in Seattle.
	Other Recoverable	Materials that can be recovered through programs, markets, or streams other than current standard curbside or commercial recycle programs, such as scrap metal, electronics, or compact fluorescent lightbulbs.
	Non-Recoverable	Materials that are not readily recyclable or compostable or that face other market, technology, or programmatic related barriers.

Fieldwork

Cascadia collected and sorted 271 samples during 6 sampling events. Each sampling event consisted of 4 consecutive days every other month from February to December 2022.

Selecting and Scheduling Loads to Sample

The study design set quotas to allocate samples proportionally across 6 sampling events and Seattle's 4 collection zones (as shown in Figure 6 on page 6). It also set aspirational guidelines for allocating samples across shifts (day and night) and collection vehicle type (front loader, rear loader, and roll-off container).

To inform these sample allocation quotas and guidelines, SPU provided tonnage data from 2021 by collection truck type, commercial density area, and season. Cascadia used this tonnage data to convert percent composition into estimated tonnages. Samples were spread evenly across time with 44 to 48 samples in each of the 6 sampling events. Table 2 shows how samples were spread across truck types and commercial density areas.

Table 2. Seattle Commercial Garbage 2022 Tons and Sample Counts

	2022 Tons	% of Tons	Sample Count	% of Samples
Citywide Commercial Garbage	**104,509**	**100%**	**271**	**100%**
High-Density Commercial Areas	**29,696**	**28%**	**125**	**46%**
Front Loaders	20,289	19%	75	28%
Rear Loaders	9,407	9%	50	18%
Low-Density Commercial Areas	**34,208**	**33%**	**114**	**42%**
Front Loaders	29,597	28%	48	18%
Rear Loaders	4,610	4%	66	24%
Citywide Roll-offs	**40,604**	**39%**	**32**	**12%**
Compactors	25,639	24%	27	10%
Loose Roll-offs	14,966	14%	5	2%

Before each sampling day, we randomly pre-selected commercial collection routes for contracted haulers to deliver loads for sampling, including extra routes in case the originally selected routes could not be sampled. In some cases, haulers could fulfill the zone-based sampling quotas but did not have enough routes to fulfill the desired sample allocations for night shifts for roll-off container vehicles. To ensure we could identify purely commercial materials without multifamily garbage, we asked drivers to consolidate collection from commercial customers at the beginning or end of their route and sampled from the commercial material.

Collecting and Sorting Samples

When pre-selected commercial vehicles arrived at the South Transfer Station, Cascadia verified load information with the driver. A South Transfer Station staff person scooped up a 200- to 250-pound sample of waste tipped from the vehicle and put it on a tarp for sorting. Cascadia then hand-sorted the sample into 113 material types and weighed them. We recorded data electronically into a customized database and reviewed it for data entry errors.

Data Analysis and Reporting

After each sampling event, Cascadia again reviewed data to identify and address anomalies or potential errors. At the end of the study, Cascadia calculated waste composition estimates in percentage compositions and tonnages. We developed composition estimates by aggregating sampling data with a weighted-average procedure that used 2022 waste tonnage data provided by SPU.

The analysis resulted in composition tables that present overall estimated percent composition of each material class and type by weight, including the 90 percent confidence interval for each material type. Where data from SPU allowed, composition tables also include tonnages for each material type. Tonnages by material type were calculated by multiplying the estimated composition percentages by the estimated total tons of commercial garbage.

Cascadia also conducted statistical analysis to compare results from the 2022 study to results from the most recent commercial study in 2016 and the first commercial study in 1988.

Differences from the 2016 Commercial Study

The sampling methodology and field conditions for the 2022 study differed from the 2016 study primarily in the material list, the number and variety of vehicles available for contingency sampling, and the goals set for sample counts.

Material List Updates

The list of material types and their definitions were updated to provide more detail about certain priority materials, increase the reliability of results, or improve sorting efficiencies. Some key updates include distinguishing between products and packaging for paper and plastics where applicable, including more detailed plastics material types (particularly for plastic film and packaging), and providing more detail for the food waste material type. Appendix B presents a full description of changes to the material list.

Vehicles Available for Contingency Sampling

In the 2016 study, the North Transfer Station was closed for reconstruction and all collection vehicles from throughout Seattle used the South Transfer Station. These additional vehicles provided more opportunities for Cascadia to collect contingency samples to fulfill quotas by shift and vehicle type in 2016.

In 2022, the fieldwork for the commercial garbage study occurred at the same facility, the South Transfer Station. This larger site made fieldwork safer and less disruptive to facility operations and using a single site simplified fieldwork and hauler communications about where to send selected routes. However, with the North Transfer Station reopened and in use, there were fewer contingency options because fewer trucks overall were using the South Transfer Station.

Sample Count Goals

The number of samples allocated for the commercial garbage study in 2022 were affected by logistical constraints including changes in hauler and sorting facility operations. The 2022 study sorted 271 samples, a decrease from 292 samples in 2016 and similar to or higher than samples sorted in the 2004 through 2012 studies.

COMPOSITION RESULTS

This section presents composition results in tonnages and percentages for:

- **Citywide commercial garbage in 2022**, in tonnages and composition percentages by recoverability class, material class, and the most common recoverable materials.
- **Trends in commercial garbage since 1988**, in tonnages and composition percentages by material class and with statistical analysis.
- Commercial composition according to:
  - **Vehicle types**, in composition percentages by recoverability class and material class, with a comparison of the most common recoverable materials.
  - **Commercial density areas**, in composition percentages by recoverability class and material class, with a comparison of the most common recoverable materials.
  - **Specific commercial sectors**, in composition percentages by recoverability class and the three most common material classes.

Composition tables showing the estimated percentage of materials by weight also show the 90 percent confidence interval for each material type. To keep tables and figures readable, estimated tonnages are independently rounded to the nearest ton and estimated percentages are rounded to the nearest percent or tenth of a percent. Due to this rounding, the numbers presented in the report, when added together, may not exactly match the subtotals and totals shown.

Citywide Commercial Garbage in 2022

Overall Findings

A total of 104,509 tons of material was collected as garbage by contracted haulers from Seattle commercial businesses in 2022. The following figure and two tables summarize the composition findings for all 271 commercial samples characterized for the study, providing a picture of citywide commercial waste in Seattle.

Figure 12 visually summarizes the citywide composition by material class (such as paper or plastic) and by recoverability class (such as curbside recyclables or compostable). Overall, 68% (71,333 tons) of commercial garbage was recoverable. Recoverable garbage included materials that are curbside recyclable (21%), compostable (29%), or other recoverable (18%) materials. The remaining 32% of commercial garbage is considered non-recoverable. The largest material classes by weight are paper (24%), compostable organics (21%), and plastic (19%).

Figure 12. Commercial Garbage Tons by Material Class and Recoverability Class
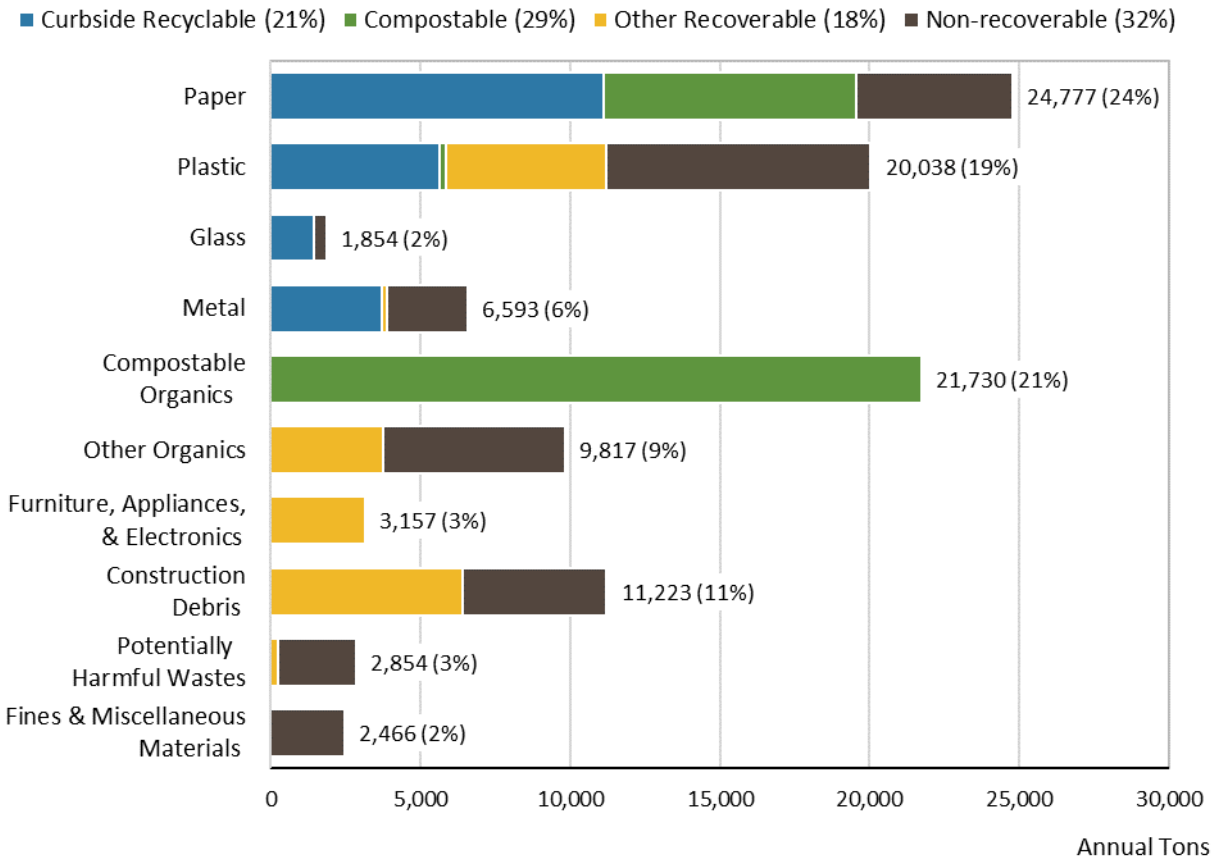
Table 3 lists the most common recoverable material types that made up the largest share of citywide commercial waste. The 10 most common recoverable material types by weight made up 39.0% of all commercial garbage. The largest three recoverable material types are non-coated or soiled paper products (7.2%), packaged edible other food waste (6.2%), and cardboard & kraft paper (5.1%).

Table 3. Commercial Garbage Most Common Recoverable Materials

Material	Est. %	+ / -	Est. Tons
Non-coated or Soiled Paper Products	7.2%	0.8%	7,526
Packaged Edible Other Food Waste	6.2%	2.1%	6,482
Cardboard & Kraft Paper	5.1%	0.9%	5,358
Edible Food Waste Other	4.6%	0.7%	4,847
Inedible Vegetative Food Waste	4.1%	1.0%	4,308
Paper Products	2.7%	0.6%	2,781
Other Ferrous	2.6%	0.7%	2,702
Textiles	2.4%	0.4%	2,545
Clean Engineered Wood	2.1%	0.6%	2,177
Large Durable Plastic Products	2.0%	0.5%	2,080
Total for Top Recoverable Materials	39.0%		40,805

Table 4 shows composition quantities for all 113 material types sorted in the study. After the table is a discussion of key findings for each recoverability class.

Table 4. Commercial Garbage Detailed Composition Table

Material	Est. %	+/-	Est. Tons	Material	Est. %	+/-	Est. Tons
Curbside Recyclable	**20.9%**	**1.7%**	**21,875**	**Compostable Organics**	**20.8%**	**2.8%**	**21,730**
Compostable	**29.1%**	**2.9%**	**30,402**	Leaves & Grass	1.1%	0.4%	1,146
Other Recoverable	**18.2%**	**1.9%**	**19,055**	Prunings	0.3%	0.3%	357
Non-recoverable	**31.7%**	**3.0%**	**33,176**	Packaged Edible Vegetative Food Waste	0.9%	0.3%	890
				Edible Vegetative Food Waste	1.9%	0.7%	2,021
Paper	**23.7%**	**2.0%**	**24,777**	Packaged Edible Other Food Waste	6.2%	2.1%	6,482
Newspaper	0.3%	0.1%	338	Edible Food Waste Other	4.6%	0.7%	4,847
Cardboard & Kraft Paper	5.1%	0.9%	5,358	Inedible Vegetative Food Waste	4.1%	1.0%	4,308
Grocery or Shopping Bags	0.7%	0.1%	688	Inedible Other Food Waste	0.9%	0.4%	985
Paper Packaging	1.5%	0.3%	1,566	Fats, Oils, & Grease	0.5%	0.5%	559
Paper Products	2.7%	0.6%	2,781	Other Compostable Organics	0.1%	0.0%	137
Aseptic Containers	0.1%	0.0%	103	**Other Organics**	**9.4%**	**2.5%**	**9,817**
Gable Top Containers	0.1%	0.0%	116	Textiles	2.4%	0.4%	2,545
Other Poly-coated Containers	0.1%	0.1%	154	Mixed Textiles	1.0%	0.2%	1,050
Non-coated or Soiled Paper Products	7.2%	0.8%	7,526	Tires	0.2%	0.1%	169
Non-coated Single-use Food Packaging	0.8%	0.2%	876	Diapers	4.3%	2.4%	4,454
Shredded Paper	0.0%	0.0%	47	Animal By-products	1.0%	0.3%	1,057
Waxed Cardboard	1.5%	0.7%	1,608	Rubber Products	0.5%	0.2%	542
Coated Single-use Food Packaging	0.9%	0.1%	965	**Furniture, Appliances, & Electronics**	**3.0%**	**0.9%**	**3,157**
Mixed or Other Paper	2.5%	0.6%	2,652	Furniture	1.3%	0.6%	1,383
Plastic	**19.2%**	**1.5%**	**20,038**	Mattresses	0.2%	0.2%	175
PET Bottles & Jars	0.7%	0.1%	762	Small Appliances	0.5%	0.2%	541
HDPE Natural Bottles & Jars	0.3%	0.1%	297	CFL Lights	0.0%	0.0%	3
HDPE Colored Bottles & Jars	0.2%	0.2%	247	LED Lighting	0.0%	0.0%	3
PP Bottles & Jars	0.1%	0.1%	116	Rechargeable Batteries	0.0%	0.0%	3
Other Plastic Bottles & Jars	0.0%	0.0%	11	Dry Cell Batteries	0.0%	0.0%	15
PET Non-bottle Packaging	0.4%	0.1%	462	Wet Cell Batteries	0.0%	0.0%	-
HDPE Non-bottle Packaging	0.8%	0.3%	795	E-Cycle WA Accepted Electronics	0.8%	0.5%	887
PP Non-bottle Packaging	0.8%	0.2%	810	Non-E-Cycle WA Accepted Electronics	0.1%	0.1%	148
Other Non Bottle Packaging	0.4%	0.1%	431	**Construction Debris**	**10.7%**	**1.6%**	**11,223**
Other Single-use Food Service Packaging	0.8%	0.2%	846	Clean Dimensional Lumber	1.0%	0.3%	994
Small Durable Plastic Products	0.8%	0.2%	848	Clean Engineered Wood	2.1%	0.6%	2,177
PLA Single-use Food Service Utensils	0.1%	0.0%	57	Pallets & Crates	1.5%	0.7%	1,536
PLA Single-use Food Service Packaging	0.1%	0.0%	97	Other Untreated Wood	0.0%	0.0%	16
Compostable Plastic Bags	0.1%	0.0%	71	New Gypsum Scrap	0.1%	0.1%	82
EPS Non Food Grade	0.4%	0.1%	459	Demo Gypsum Scrap	0.3%	0.2%	321
Rigid Foam Insulation	0.1%	0.1%	57	Carpet	0.8%	0.3%	788
Takeout & Retail Bags	0.3%	0.1%	293	Felt Carpet Pad	0.0%	0.0%	30
Stretch Wrap	0.8%	0.4%	854	Rock, Concrete, & Other Aggregates	0.2%	0.2%	250
Other Clean Polyethylene Film	1.5%	0.6%	1,608	Asphaltic Roofing	0.0%	0.0%	-
Large Durable Plastic Products	2.0%	0.5%	2,080	Liquid Latex Paint	0.2%	0.2%	196
EPS Food Grade	0.2%	0.1%	165	New Painted Wood	1.9%	0.7%	1,983
Other Single-use Food Service Utensils	0.1%	0.0%	110	Old Painted Wood	0.0%	0.0%	23
Plastic Pouches	0.1%	0.1%	116	Creosote Treated Wood	0.1%	0.1%	54
Plastic Mailers	0.1%	0.0%	67	Other Treated Wood	0.2%	0.1%	243
Garbage Bags	2.8%	0.2%	2,913	Contaminated Wood	0.7%	0.3%	772
Other Film	4.4%	0.7%	4,548	Fiberglass Insulation	0.3%	0.2%	291
Plastic Other Materials	0.9%	0.2%	918	Ceramics	0.2%	0.1%	161
Glass	**1.8%**	**0.4%**	**1,854**	Other Construction Debris	1.3%	0.4%	1,307
Clear Beverage Glass	0.6%	0.1%	656	**Potentially Harmful Wastes**	**2.7%**	**1.3%**	**2,854**
Green Beverage Glass	0.2%	0.1%	245	Oil Based Paints	0.0%	0.0%	3
Brown Beverage Glass	0.4%	0.1%	397	Medications	0.0%	0.0%	20
Container Glass	0.1%	0.0%	111	Other Harmful Wastes	0.2%	0.1%	225
Mixed Cullet	0.0%	0.0%	16	Medical Waste	2.3%	1.2%	2,359
Other Glass	0.4%	0.3%	428	Non Caustic Chemicals	0.0%	0.1%	52
Metal	**6.3%**	**1.3%**	**6,593**	Vitamins & Supplements	0.0%	0.0%	8
Aluminum Cans	0.4%	0.0%	388	Cosmetics	0.2%	0.1%	187
Aluminum Foil or Containers	0.2%	0.1%	247	**Fines & Miscellaneous Materials**	**2.4%**	**0.4%**	**2,466**
Steel Food Cans	0.3%	0.1%	297	Personal Protective Equipment	0.5%	0.1%	542
Empty Aerosol Cans	0.1%	0.0%	85	Soil & Dirt	0.6%	0.3%	597
Other Ferrous	2.6%	0.7%	2,702	Non-distinct Fines	0.4%	0.1%	389
Other Aluminum	0.1%	0.1%	129	Misc. Organics	0.5%	0.2%	512
Oil Filters	0.0%	0.0%	16	Misc. Inorganics	0.4%	0.1%	426
Other Nonferrous	0.1%	0.0%	86				
Mixed Metals	2.5%	0.9%	2,641				

Sample Count	*271*			**Total Tons**	**100%**		**104,509**

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

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Citywide Findings by Recoverability Class

Curbside Recyclable Materials

Curbside recyclable materials made up 20.9% (21,875 tons) of Seattle's commercial garbage. By weight, the most common curbside recyclable materials were:

- Cardboard and kraft paper: 5.1% (5,358 tons)
- Paper products: 2.7% (2,781 tons)
- Other ferrous metals: 2.6% (2,702 tons)

The curbside recyclable paper material types were the most common curbside recyclable materials in commercial garbage at 10.6% (11,104 tons). Another 5.4% (5,625 tons) of commercial garbage was curbside recyclable plastic material types.

Compostable Materials

Compostable materials made up 29.1% (30,402 tons) of Seattle's commercial garbage. By weight, the most common compostable materials were:

- Non-coated or soiled paper products: 7.2% (7,526 tons)
- Packaged edible other food waste: 6.2% (6,482 tons)
- Edible food waste other: 4.6% (4,847 tons)

In total, food waste made up 19.2% (20,091 tons) of commercial garbage, including edible and inedible food waste along with fats, oils, and greases. Edible food waste alone made up 13.6% (14,240 tons) of commercial garbage. Separately, compostable paper made up 8.1% (8,449 tons) of commercial garbage.

Other Recoverable Materials

Other recoverable materials made up 18.2% (19,055 tons) of Seattle's commercial garbage. These materials are not accepted in curbside recycling or composting, but businesses that generate large amounts of these materials can arrange for separate collection for recovery. By weight, the most common other recoverable materials were:

- Textiles: 2.4% (2,545 tons)
- Clean engineered wood: 2.1% (2,177 tons)
- Large durable plastic products: 2.0% (2,080 tons)

The other recoverable construction debris material types at 6.1% (6,390 tons) and other recoverable plastic material types at 5.1% (5,351 tons) were the most common other recoverable materials in commercial garbage. Other recoverable material types also included other organics material types at 3.6% (3,764 tons)—which includes textiles and tires—and furniture, appliances, and electronics material types at 3.0% (3,157 tons).

Non-recoverable Materials

Non-recoverable materials made up 31.7% (33,176 tons) of Seattle's commercial garbage. By weight, the most common non-recoverable materials were:

- Other film: 4.4% (4,548 tons)
- Diapers: 4.3% (4,454 tons)
- Garbage bags: 2.8% (2,913 tons)

The non-recoverable plastic material types at 8.5% (8,839 tons) were the most common non-recoverable materials in commercial garbage. Non-recoverable plastic included garbage bags, other film, and plastic other materials. Another 5.8% (6,052 tons) of commercial garbage was non-recoverable other organics material types, which included diapers and animal by-products.

Findings for Focus Materials from Seattle's 2022 Solid Waste Plan Update

Seattle's 2022 Solid Waste Plan Update included recommendations to increase recovery for curbside recyclable materials and compostable organics. The 2022 Plan Update also included recommendations for recovery, reuse, and waste prevention around specific types of materials including food waste, food and beverage packaging, and other items.

Total food waste and compostable paper made up 27.3% (28,539 tons) of Seattle's commercial garbage. Total food waste was 19.2% (20,091 tons) of commercial garbage, while edible food waste alone was 13.6% (14,240 tons).

Several recommendations address food and beverage packaging. Single-use food service and packaging, excluding bottles and jars, made up 3.2% (3,363 tons) of Seattle's commercial garbage. Bottles, jars, cartons, and cans typically associated with beverages made up 3.2% (3,339 tons).

Quantities for other items mentioned in 2022 Plan Update recommendations were:

- Recoverable construction debris: 6.1% (6,390 tons)
- Total textiles: 3.4% (3,595 tons)
- Recoverable plastic bags, wrap, and film: 2.6% (2,754 tons)
- Diapers: 4.3% (4,454 tons)

Trends in Commercial Garbage Composition since 1988

This section describes the trends in Seattle's commercial garbage stream over time, based on the total tonnage and composition data from the current study compared to previous studies of the commercial garbage. All previous commercial garbage studies followed the same basic methodology as the present study. Cascadia statistically compared 2022 percentage composition to results from the most recent previous study in 2016 and the first study in 1988. Table 5 shows the total tons of material disposed of in commercial garbage in each of study years along with the number of samples sorted during each study.

Table 5. Commercial Citywide Garbage Tons and Samples per Study

Year	Citywide Commercial Garbage Tons	Study Sample Counts
1988	230,780	121
1992	194,338	251
1996	193,793	348
2000	225,435	347
2004	215,921	270
2008	176,777	271
2012	134,089	259
2016	122,036	292
2022	104,509	271

Tonnage and Composition Changes

Total tons of commercial garbage have generally declined over the past 35 years since 1988, with some exceptions in the early 2000s (Figure 13). The highest tonnages were in 1988 and 2000. Garbage tons in 2022 were 14% lower than the previous study in 2016 and 55% lower than the first study in 1988. During the COVID-19 pandemic that started in 2020, many businesses closed, and many employees started working from home. These changes eliminated some waste generation entirely and shifted other waste generation from commercial to the residential sector. While onsite commercial activity has been recovering, it remains lower than before the pandemic. As a result, it is not possible to know how much of the decrease in garbage disposal could be due to Seattle's efforts on waste prevention and diversion relative to adverse effects on businesses from the COVID-19 pandemic or other changes in the nature of the waste stream during this time. For example, tons of newspaper, office-type paper, and several other types of printed paper generated in the United States have declined since 2000.[5]

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[5] United States Environmental Protection Agency, Advancing Sustainable Materials Management: Facts and Figures 2018, Table 18. https://www.epa.gov/sites/default/files/2021-01/documents/2018_tables_and_figures_dec_2020_fnl_508.pdf

Since 1990, nationwide tons generated of glass and steel packaging have declined slightly while plastic packaging has more than doubled.[6]

Figure 13. Commercial Garbage Tons: 1988 to 2022
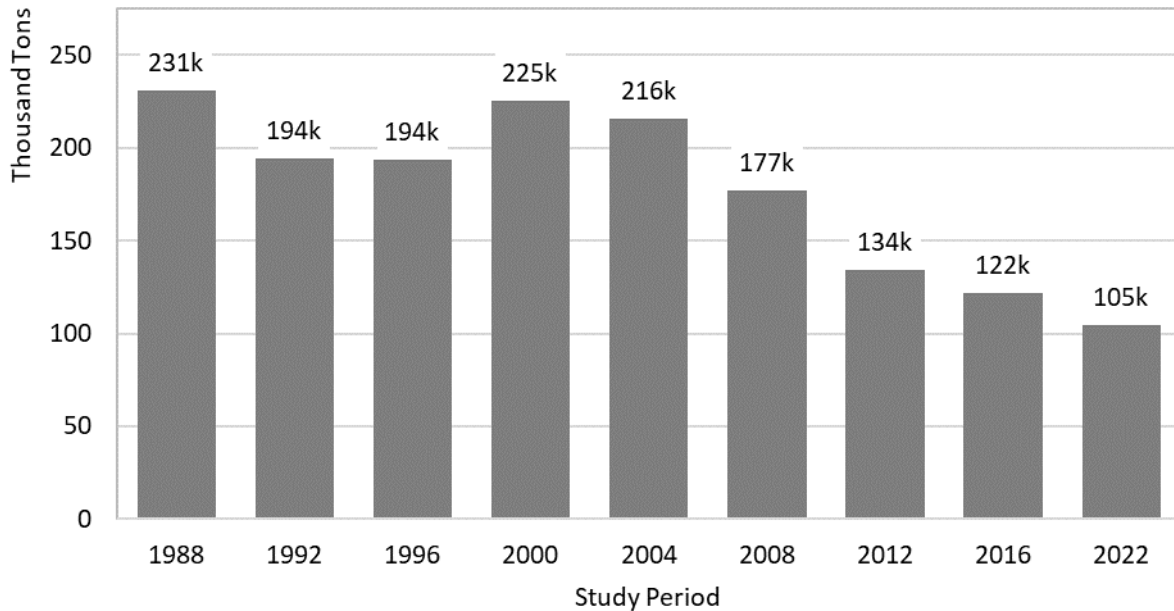
Since the first commercial study in 1988, the material list has increased from 52 to 113 material types and been reorganized into different material classes. Over time, SPU and Cascadia split, combined, and created new material classes to meet evolving study needs. To allow for comparisons across years, Cascadia organized material lists across the 10 commercial studies into a set of 8 overall material classes to most closely align with the material types and definitions used in each study.

Five of the material classes used in the trends comparison align closely with the current 2022 list: paper, plastic, glass, metal, and organics (which aligns with the current compostable organics class). The other three material classes more closely align with prior studies: CDL waste, hazardous, and other materials. For example, CDL waste is largely construction debris but does not reflect changes that added or removed material types from this class in 2022. The other materials class includes material types such as textiles, diapers, furniture, mattresses, appliances, and carpet.

Figure 14 shows the citywide disposed garbage tons in the commercial sector from 1988 to 2022, by material class. Total garbage tons have decreased in each study period since 2000.

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[6] Ibid., Table 22.

Figure 14. Commercial Garbage Tons by Material Grouping: 1988 to 2022
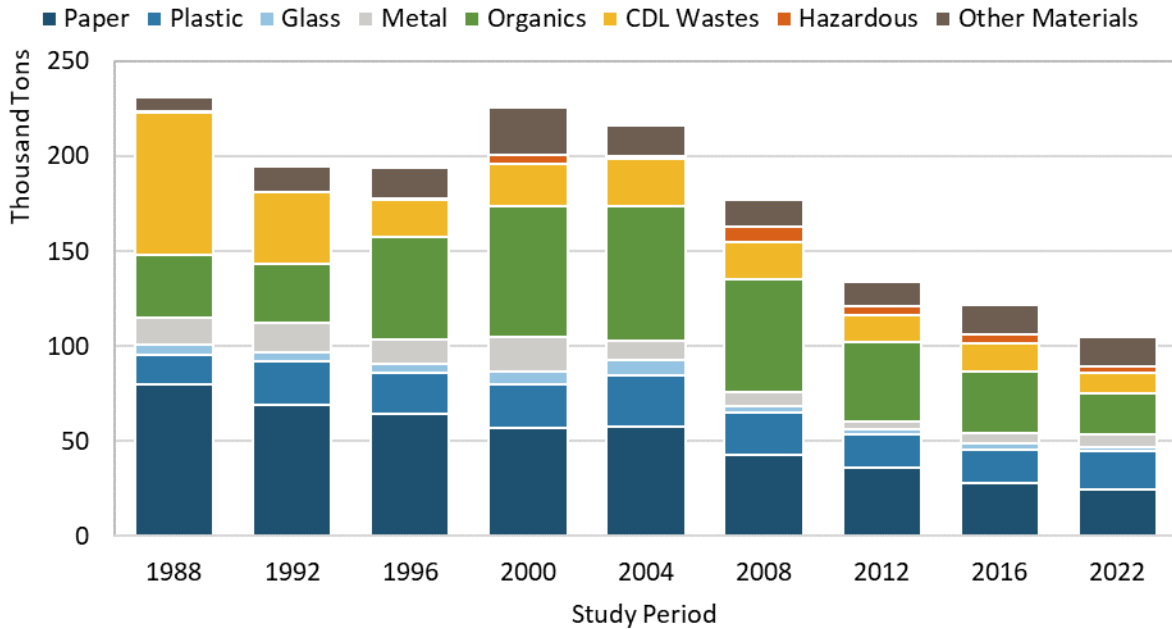
Table 6 compares estimated tons by material class for 1988 and 2022.

Table 6. Change in Commercial Garbage Tons by Material Grouping: 1988 to 2022

Material Class	Estimated Tons		Change in Composition		
	1988	2022		Absolute	Relative
Paper	79,827	24,777	▼	-55,050	-69%
Plastic	15,878	20,038	▲	4,160	26%
Glass	5,308	1,854	▼	-3,454	-65%
Metal	14,170	6,593	▼	-7,577	-53%
Organics	32,517	21,730	▼	-10,787	-33%
CDL Wastes	75,004	11,034	▼	-63,970	-85%
Hazardous	923	3,068	▲	2,145	232%
Other Materials	7,154	15,415	▲	8,261	115%
Total	**230,780**	**104,509**	▼	**-126,271**	**-55%**
Sample Count	121	271			

Figure 15 shows tons of garbage disposed by material class over time in a line graph. Tons of paper and CDL wastes in commercial garbage have decreased dramatically since 1988. For CDL wastes, some part of the decrease is due to materials shifting from the commercial garbage stream to the separate CDL waste disposal stream. Tons of organics peaked in 2004 and then decreased to their lowest level in 2022.

Figure 15. Trends in Commercial Garbage Tons by Material Grouping: 1988 to 2022
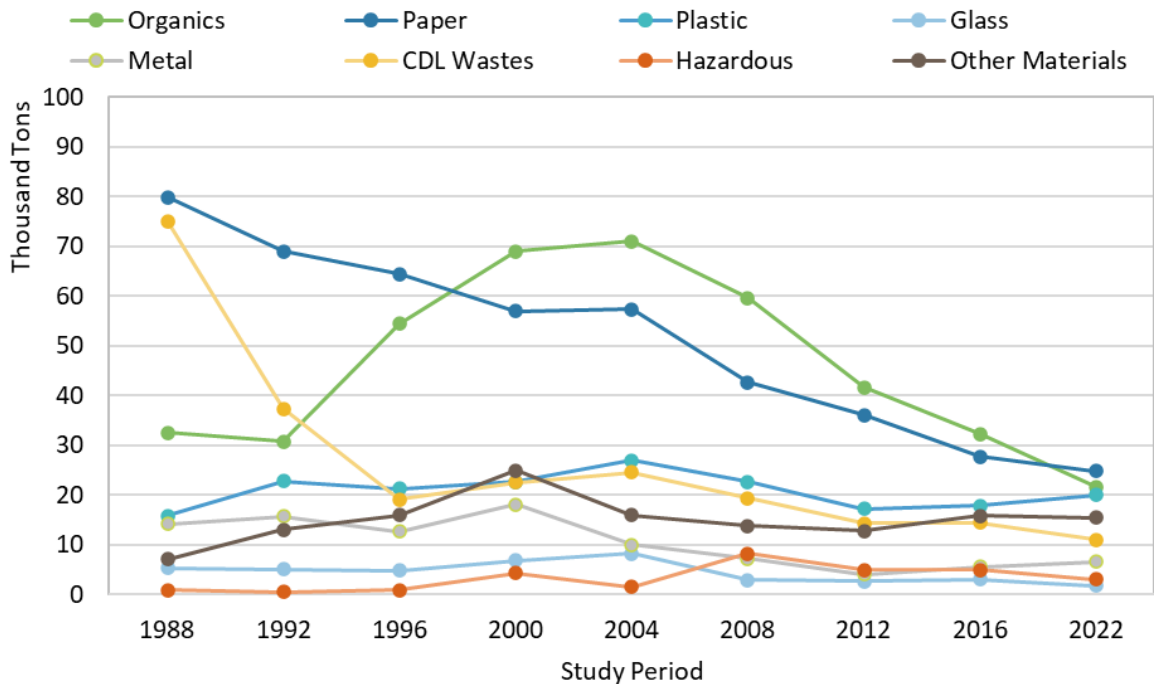
Findings for each material class are as follows:

- **Paper.** Between 1988 and 2022, the tons of disposed paper decreased by 69%. The amount of disposed paper decreased consistently from 79,827 tons in 1988 to 24,777 tons in 2022.
- **Plastic.** The tonnage of disposed plastic has fluctuated between study years. Overall, between 1988 and 2022, the amount of disposed plastic has increased by 26%. Disposed plastic tonnage was lowest in 1988 (15,878 tons) and highest in 2004 (27,019 tons).
- **Glass.** Since 1988, tons of disposed glass have decreased by 65%. Disposed glass tonnage was lowest in 2022 at 1,854 tons.
- **Metal.** Disposed metal tonnage has decreased by 53% since 1988. Disposed metal tonnage was lowest in 2012 at 4,112 tons.
- **Organics.** The tonnage of organics in the commercial garbage stream decreased by 33% since 1988 and decreased by 69% from its peak of 70,941 tons in 2004. Disposed organics tonnage was highest in 2004 and lowest in 2022 (21,730 tons).
- **CDL Wastes.** Tons disposed CDL Wastes decreased by 85% compared to 1988. Disposed CDL waste tonnage was lowest in 2022 (11,034 tons).
- **Hazardous.** Disposed hazardous waste more than tripled from 923 tons in 1988 to 3,068 tons in 2022. Tons of hazardous waste was highest in 2008 (8,280 tons), about nine times its quantity in 1988.
- **Other Materials.** Disposed other materials more than doubled from 7,154 tons in 1988 to 15,415 tons in 2022.

Statistical Analysis of Composition Changes

The findings from the 2022 study were compared to findings from earlier studies to identify changes in the percentage composition of Seattle's commercial garbage over time. Figure 16 shows the percentage compositions by material class over time.

Figure 16. Evolution of Commercial Garbage Composition by Material Grouping: 1988 to 2022
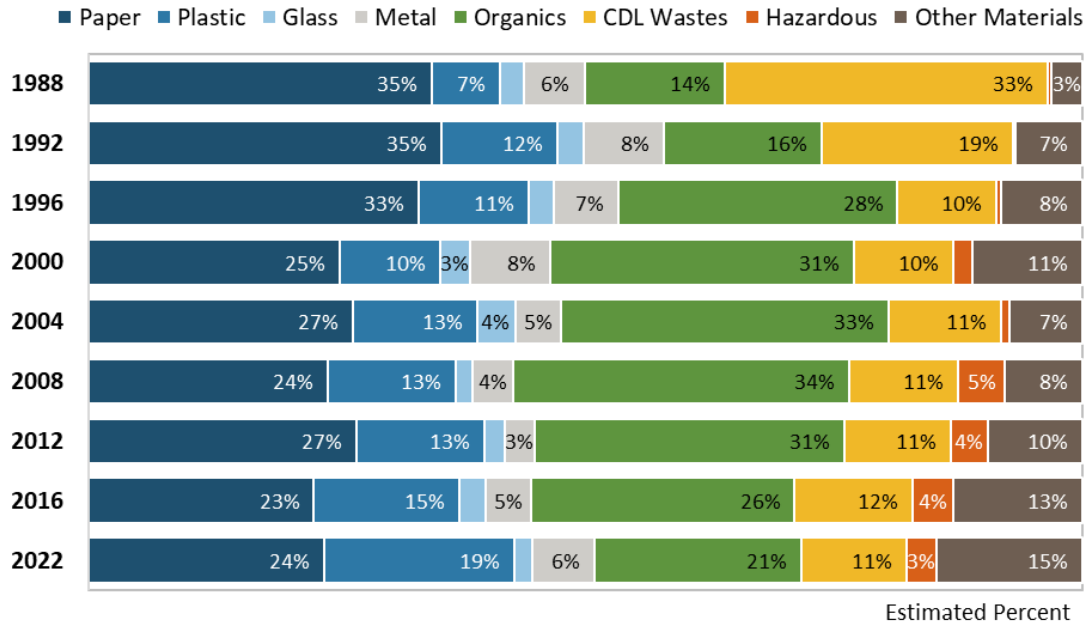
Table 7 compares changes in composition percentages between the 2016 and 2022 studies, identifying which changes are statistically significant. Percentage composition changes were statistically significant for the following materials (indicated in bold in the table):

- Decrease in organics from 26.5% to 20.8%.
- Increase in plastic from 14.6% to 19.2%.
- Increase in metal from 4.6% to 6.3%.

Table 7. Commercial Garbage Composition Changes and Trends: 2016 and 2022

Material Class	Composition		Change in Composition			Statistical Significance		
	2016	2022		Absolute	Relative	t-statistic	p-value	Strength of Results*
Paper	22.7%	23.7%	▲	1.0%	4.4%	0.63	0.532	not significant
Plastic	**14.6%**	**19.2%**	▲	**4.5%**	**31.0%**	**4.98**	**0.000**	**stat. significant**
Glass	2.6%	1.8%	▼	-0.8%	-31.1%	1.98	0.049	not significant
Metal	**4.6%**	**6.3%**	▲	**1.7%**	**36.0%**	**4.03**	**0.000**	**stat. significant**
Organics	**26.5%**	**20.8%**	▼	**-5.7%**	**-21.5%**	**6.35**	**0.000**	**stat. significant**
CDL Wastes	11.9%	10.6%	▼	-1.3%	-11.1%	1.85	0.065	not significant
Hazardous	4.1%	2.9%	▼	-1.2%	-28.5%	0.95	0.344	not significant
Other Materials	13.0%	14.7%	▲	1.8%	13.8%	0.89	0.374	not significant
Total	**100.0%**	**100.0%**						
Sample Count	292	271				*Statistically significant difference <= 0.0125*		

Weighted results are used to report change in composition. Composition data is unweighted for the t-test analysis.

Table 8 compares composition percentages between 1988 and 2022 studies, identifying which changes are statistically significant. Percentage composition changes were statistically significant for the following materials:

- Decrease in paper from 34.6% to 23.7%.
- Decrease in CDL wastes from 32.5% to 10.6%.
- Increase in plastic from 6.9% to 19.2%.
- Increase in organics from 14.1% to 20.8%.
- Increase in hazardous materials from 0.4% to 2.9%
- Increase in other materials from 3.1% to 14.7%

For organics, although total tons disposed decreased between 1988 and 2022, organics now makes up a larger share of garbage because tonnages of some other materials—particularly paper and CDL wastes—decreased dramatically since 1988.

Table 8. Commercial Garbage Composition Changes and Trends: 1988 and 2022

Material Class	Composition		Change in Composition			Statistical Significance		
	1988	2022		Absolute	Relative	t-statistic	p-value	Strength of Results*
Paper	**34.6%**	**23.7%**	▼	**-10.9%**	**-31.5%**	**5.02**	**0.000**	**stat. significant**
Plastic	**6.9%**	**19.2%**	▲	**12.3%**	**178.7%**	**10.85**	**0.000**	**stat. significant**
Glass	2.3%	1.8%	▼	-0.5%	-22.9%	1.71	0.088	not significant
Metal	6.1%	6.3%	▲	0.2%	2.7%	0.49	0.623	not significant
Organics	**14.1%**	**20.8%**	▲	**6.7%**	**47.6%**	**3.53**	**0.000**	**stat. significant**
CDL Wastes	**32.5%**	**10.6%**	▼	**-21.9%**	**-67.5%**	**7.72**	**0.000**	**stat. significant**
Hazardous	**0.4%**	**2.9%**	▲	**2.5%**	**634.0%**	**3.29**	**0.001**	**stat. significant**
Other Materials	**3.1%**	**14.7%**	▲	**11.6%**	**375.8%**	**9.40**	**0.000**	**stat. significant**
Total	100.0%	100.0%						
Sample Count	121	271				*Statistically significant difference <= 0.0125*		

Weighted results are used to report change in composition. Composition data is unweighted for the t-test.

Commercial Composition by Subpopulation

The 2022 commercial study analyzed subsets of samples based on several characteristics. This section compares composition results based on the vehicle type used to collect the waste and the commercial density of the zone where it was collected. It also briefly presents observations for specific commercial sectors. Appendix D provides full detailed composition tables for these subsets and for composition by season.

Composition by Vehicle Type

Most commercial garbage handled by commercial haulers in Seattle is collected by one of three vehicle types:

- **Front loaders** collect 48% of Seattle's commercial garbage. They empty waste from dumpsters that typically hold 1 to 10 yards of waste. Front loaders represented 123 of the 271 samples in this study.
- **Rear loaders** collect 13% of Seattle's commercial garbage. They empty waste from both dumpsters and roll-carts that hold 96 gallons or less of waste. They are also used in areas that have narrow streets or alleys, require backing up, or are otherwise harder to collect using front loaders. Rear loaders were 116 samples in this study.
- **Roll-off container vehicles** collect 39% of Seattle's commercial garbage. They pick up compacting roll-offs and loose drop boxes that typically hold 10 or more yards of waste. Roll-offs are represented by 32 samples in this study (27 compacting and 5 loose).

Overall, the recoverability of commercial garbage (Figure 17) did not differ much across the three vehicle types. Garbage from front loaders was 70% recoverable, while garbage from rear loaders and roll-offs were each 67% recoverable. Apparent differences in composition percentages, such as for curbside recyclables in rear loaders and roll-offs, are not considered statistically significant if the error ranges for those numbers overlap. Detailed composition tables in Appendix D include error ranges.

Two notable differences in recoverability classes were:

- **Compostable materials**: roll-offs had 37%, while rear and front loaders had 22% to 25%.
- **Other recoverable materials**: roll-offs had 8%, while front and rear loaders had 24% to 27%.

Figure 17. Composition by Recoverability Class and Vehicle Type

Legend: ■ Curbside Recyclable ■ Compostable ■ Other Recoverable ■ Non-recoverable

Vehicle Type	Curbside Recyclable	Compostable	Other Recoverable	Non-recoverable
Front Loaders (48%)	21%	25%	24%	30%
Rear Loaders (13%)	18%	22%	27%	33%
Roll-offs (39%)	22%	37%	8%	33%
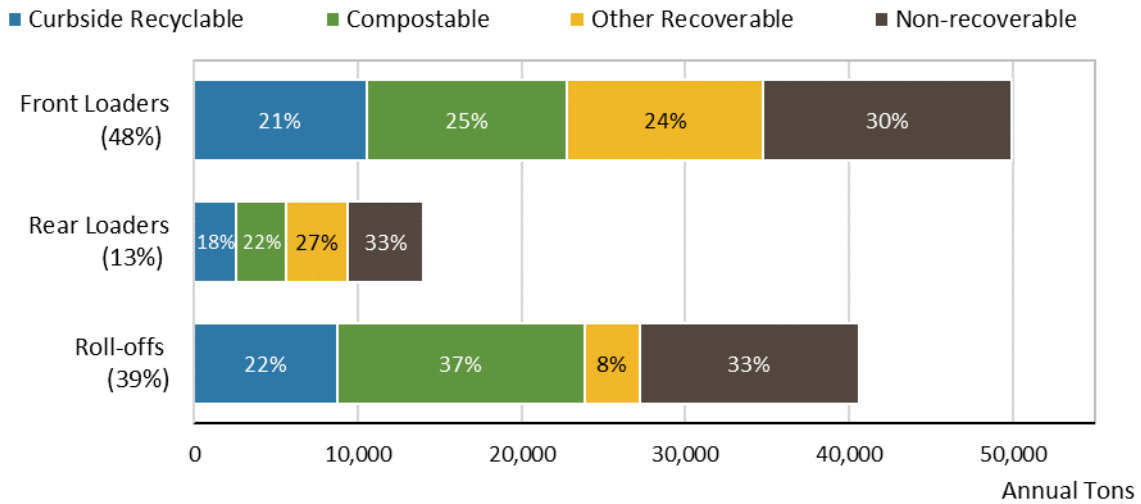
Similarly, composition was similar across vehicle types for most material classes (Table 9), after considering error ranges. The three notable differences in material classes aligned with the differences in recoverability classes:

- **Paper**: roll-offs had 27%, while rear loaders had 19% and front loaders had 23%.
- **Compostable organics**: roll-offs had 27%, while rear and front loaders had 15% to 17%.
- **Construction debris**: roll-offs had 3%, while front and rear loaders had 15% to 20%.

Table 9. Composition by Material Class and Vehicle Type

	Front Loaders Tons		Rear Loaders Tons		Roll-offs Tons	
Paper		23%		19%		27%
Plastic		19%		17%		20%
Glass		2%		2%		1%
Metal		7%		7%		5%
Compostable Organics		17%		15%		27%
Other Organics		8%		9%		11%
Furniture, Appliances, & Electronics		4%		5%		1%
Construction Debris		15%		20%		3%
Potentially Harmful Wastes		2%		4%		4%
Fines & Miscellaneous Materials		2%		3%		2%
Total Tons	**49,887**	100%	**14,017**	100%	**40,604**	100%

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While there were some differences in the type and ranking of the most common recoverable materials, the most common materials by vehicle type were largely similar to the most common materials citywide (Table 10). Notable differences and the three most common material types for each vehicle type are summarized below.

Front loaders shared all 10 of the same materials that are the most common recoverable materials citywide, but a few materials changed order. The three most common recoverable material types for front loaders were non-coated or soiled paper products (6.1%), packaged edible other food waste (4.7%), and cardboard & kraft paper (4.7%).

Rear loaders shared 9 of the 10 most common recoverable materials citywide. Instead of paper products, rear loaders had carpet as a common recoverable material. The three most common material types for rear loaders were non-coated or soiled paper products (5.6%), edible food waste other (5.3%), and cardboard & kraft paper (5.1%).

Roll-offs were the most different, while still sharing 7 of the 10 most common recoverable materials citywide. Roll-offs did not have textiles, clean engineered wood, or large durable plastic products as common recoverable materials. Instead, roll-offs had edible vegetative food waste, other clean polyethylene film, and paper packaging. These materials were ranked 11 through 13 on the citywide list. The most common recoverable material types for roll-offs were packaged edible other food waste (9.2%), non-coated or soiled paper products (9.1%), and inedible vegetative food waste (5.8%).

Table 10. Most Common Recoverable Materials: Citywide and by Vehicle Type

Material Type	Material Type Rank			
	Citywide Commercial	Front Loaders	Rear Loaders	Roll-offs
Non-coated or Soiled Paper Products	1	1	1	2
Packaged Edible Other Food Waste	2	2	8	1
Cardboard & Kraft Paper	3	3	3	4
Edible Food Waste Other	4	4	2	5
Inedible Vegetative Food Waste	5	6	6	3
Paper Products	6	7	13	7
Other Ferrous	7	5	10	9
Textiles	8	8	5	11
Clean Engineered Wood	9	9	4	27
Large Durable Plastic Products	10	10	9	18
Edible Vegetative Food Waste	11	20	22	6
Other Clean Polyethylene Film	12	13	23	10
Paper Packaging	13	17	15	8
Carpet	28	31	7	43

Gray shading indicates rankings lower than the 10 most common recoverable materials.

Detailed composition tables by vehicle type are included in Appendix D.

Composition by Commercial Density

Garbage collection in Seattle is divided into four geographic zones. Two of the zones have a comparatively high density of commercial businesses, while the other two zones have a comparatively low density of commercial businesses. This section compares the composition of garbage collected in front and rear loaders from the high- and low- density commercial areas. Garbage collected in roll-off containers is excluded from this analysis because tonnages collected by zone are not available.

Overall, 28% of Seattle's commercial garbage is collected in front and rear loaders from high-density commercial areas, while 33% is collected in front and rear loaders from low-density commercial areas.

While the calculated percentages for recoverability classes appear slightly different between commercial density areas, the error ranges, reported in the detailed composition tables, suggest these differences are not statistically significant (Figure 18).

Figure 18. Composition by Recoverability Class and Commercial Density
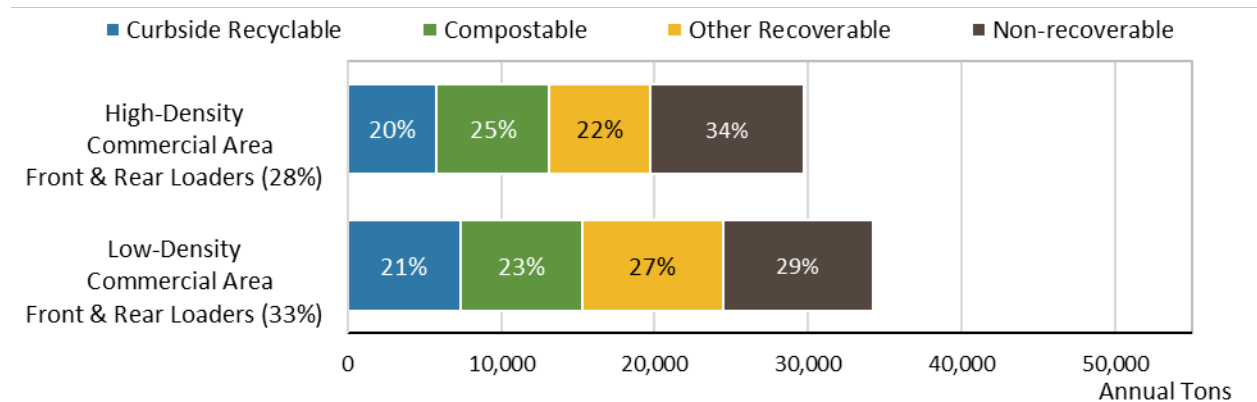
Similarly, composition was similar between commercial density areas for most material classes (Table 11). The notable differences for material classes align with the differences in recoverability classes:

- Plastic: high-density areas had 16%, while low-density areas had 21%.
- Other organics: high-density areas had 11%, while low-density areas had 6%.

Table 11. Composition by Material Class and Commercial Density

	High-Density Commercial Area Tons		Low-Density Commercial Area Tons	
Paper		21%		22%
Plastic		16%		21%
Glass		2%		3%
Metal		7%		7%
Compostable Organics		17%		16%
Other Organics		11%		6%
Furniture, Appliances, & Electronics		4%		5%
Construction Debris		15%		16%
Potentially Harmful Wastes		3%		1%
Fines & Miscellaneous Materials		3%		2%
Total Tons	**29,696**	100%	**34,208**	100%

While there were some differences in the type and ranking of the 10 most common recoverable materials, the top materials by commercial density area were mostly the same as the top materials citywide (Table 12).

High-density commercial areas shared the same ten materials that were the most common recoverable materials citywide, but several materials changed order. The most common material types were non-coated or soiled paper products (6.0%), edible food waste other (5.2%), and cardboard & kraft paper (4.4%).

Low-density commercial areas shared nine of the ten most common recoverable materials citywide. Instead of textiles as a top material, low-density commercial areas had pallets & crates. The most common material types were non-coated or soiled paper products (6.0%), cardboard & kraft paper (5.1%), and packaged edible other food waste (4.5%).

Table 12. Most Common Recoverable Materials: Citywide and by Commercial Density

Material Type	Material Type Rank		
	Citywide Commercial	High-Density Commercial Area	Low-Density Commercial Area
Non-coated or Soiled Paper Products	1	1	1
Packaged Edible Other Food Waste	2	4	3
Cardboard & Kraft Paper	3	3	2
Edible Food Waste Other	4	2	4
Inedible Vegetative Food Waste	5	6	10
Paper Products	6	9	5
Other Ferrous	7	7	9
Textiles	8	5	11
Clean Engineered Wood	9	8	8
Large Durable Plastic Products	10	10	6
Pallets & Crates	14	18	7

Detailed composition tables by commercial density area are included in Appendix D.

Observations for Specific Commercial Sectors

During sampling, the field crew spoke with each collection vehicle driver, observed materials in each sample, and took photos of the sample to try to identify the specific commercial sector that had disposed of the garbage. Because commercial garbage trucks often collect waste from a mix of business types, only 59 of the 271 samples collected could be assigned to a specific commercial sector. Because the study was not designed to sample all sectors in Seattle, some commercial sectors are not represented in the results.

Figure 19 presents the recoverability of garbage for sectors sampled and for commercial waste citywide. Because these commercial sector analyses are based on a very small number of samples, they provide rough estimates only, with a relatively wide margin of error. Despite these large error ranges, notable differences for each sector compared to citywide commercial garbage are summarized below.

Manufacturing (4 samples) had less other recoverable materials (7%) than citywide garbage. Manufacturing garbage was 52% recoverable. The three largest material classes for the manufacturing sector were paper (24.1%), compostable organics (23.5%), and plastic (22.0%).

Wholesale (11 samples) had less compostable materials (12%) and more other recoverable materials (35%) than citywide garbage. Wholesale garbage was 74% recoverable. The three largest material classes for the wholesale sector were plastic (34.0%), paper (27.1%), and construction debris (19.4%).

Retail trade and grocery (13 samples) garbage did differ in recoverability classes, after considering the margins of error. Retail trade and grocery garbage was 74% recoverable. The three largest material classes for the retail trade and grocery sector were paper (31.1%), compostable organics (30.6%), and plastic (26.8%).

Health care (9 samples) had more non-recoverable materials (58%) and less curbside recyclable materials (11%) than citywide garbage. Health care garbage was 42% recoverable. The three largest material classes for the health care sector were other organics (34.7%), paper (18.0%), and compostable organics (11.9%). Nearly one-third of garbage from health care samples was diapers (32.4%), while garbage from other commercial sectors was 1.0% or less diapers.

Offices and other services (6 samples) had more curbside recyclable materials (34%) and less non-recoverable materials (18%) than citywide garbage. Offices and other services garbage was 82% recoverable. The three largest material classes for the offices and other services sector were paper (35.7%), compostable organics (19.1%), and plastic (17.1%).

Construction (16 samples) had more other recoverable materials (34%) and less compostable materials (16%) than citywide garbage. Construction garbage was 71% recoverable. The three largest material classes for the construction sector were construction debris (24.4%), paper (20.3%), and plastic (17.8%).

Figure 19. Composition of Observed Commercial Sectors
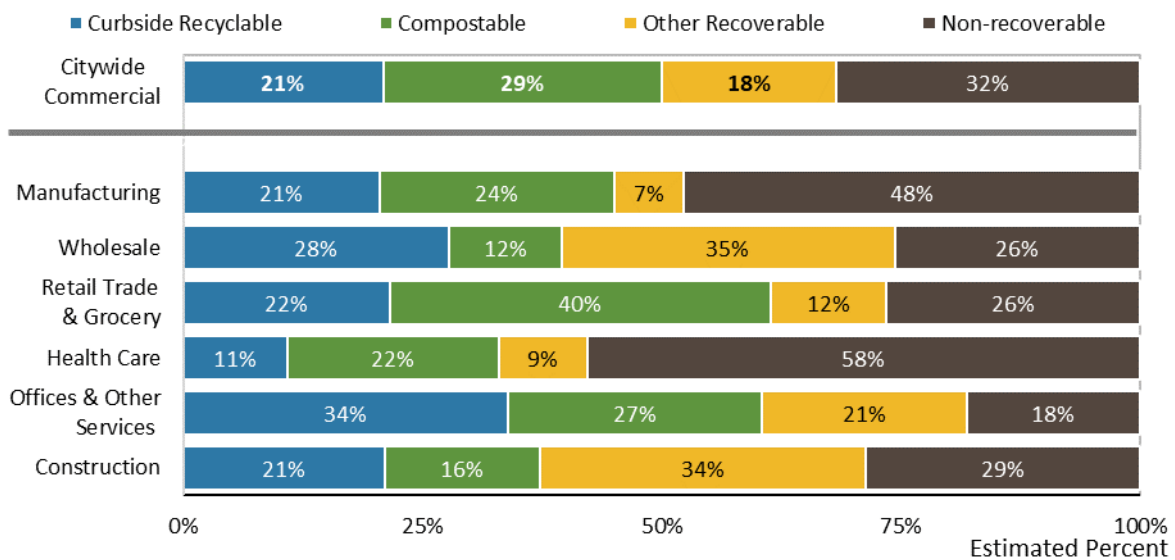
APPENDIX A. STUDY DESIGN

The objective of the 2022 Seattle Waste Composition Study was to provide statistically significant data on the composition of disposed commercial garbage originating within Seattle city limits. Commercial waste was last sampled in 2016, and sampling was delayed due to COVID-19 pandemic impacts until 2022. This project followed the same basic methodology as the 2016 commercial study, though the material types and definitions were revised in 2020 for the residential disposal and recycling studies.

Study Design and Sampling Plan

Substream Definition

For any specific geographic area, the total waste stream is composed of various substreams. A "substream" is determined by the particular generation, collection, or composition characteristics that make it a unique portion of the total waste stream. This study was focused on Seattle's commercial substream. The commercial substream encompasses waste that is both 1) disposed of by businesses and institutions and 2) collected by the SPU's contracted hauling companies.

SPU contracts with two haulers, each serving two of four distinct geographic zones in Figure 20. One of the contracted haulers is responsible for Zone 1 and Zone 4, and the other hauler is responsible for Zone 2 and Zone 3.[7]

The commercial substream can be further divided into 24 subpopulations. Subpopulations are defined according to three groupings: city collection zone (Zone 1, 2, 3, or 4), collection shift (day or night), and vehicle type (front loader, rear loader, or roll-off).

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[7] Through the Clear Alleys Program, commercial waste from select neighborhoods is collected in bags. This waste was excluded from the study due to the difficulty of segregating and obtaining representative samples of this material and since it represents a small portion (about 3% of 2022 tons) of Seattle's commercial waste.

Figure 20. Seattle's Collection Zones

(Adapted from https://www.seattle.gov/utilities/your-services/collection-and-disposal/garbage/business-and-commercial-collection)

Unlike in the 2016 study when the North Transfer Station was closed, in 2022 commercial garbage was hauled to the two City-owned disposal stations: North Transfer Station and South Transfer Station. For logistical reasons, all sorting in the 2022 commercial study occurred at the South Transfer Station, as in the 2016 study.

Sample Allocation

This study had a goal of characterizing a total of 270 commercial samples. These samples were allocated to the 24 commercial subpopulations using the following steps:

1. Samples were allocated equally to each of the four collection zones: either 67 or 68 samples were allocated to each zone. An equivalent number of samples in each collection zone provides a comparable level of precision (e.g., similar error rates) in the resulting composition data for each of these geographic service areas.

2. Within each zone, samples were assigned to vehicle types: front loaders, rear loaders, or roll-offs. Samples were distributed across vehicle types proportionally by tonnage. SPU provided 2021 commercial tonnages used for allocating samples in the study.

3. To maintain comparability with the previous study conducted in 2016, a third of the samples (90 samples) were assigned to night shifts. These samples were assigned to zones and vehicle types as described above.

The numbers of samples allocated to the various subpopulations are detailed in Table 13.

Table 13. Planned Commercial Sample Allocation

Collection Zone	Vehicle Type	Day Shift	Night Shift
1	Front Loader	41	2
1	Rear Loader	5	0
1	Roll-off	13	6
2	Front Loader	25	3
2	Rear Loader	8	2
2	Roll-off	10	19
3	Front Loader	22	1
3	Rear Loader	6	5
3	Roll-off	7	27
4	Front Loader	22	14
4	Rear Loader	4	2
4	Roll-off	15	11
	TOTAL	**178**	**81**

Sampling Calendar

The field crew sorted a total of 271 commercial samples, which took 24 sampling days, or 4 consecutive days every other month evenly distributed across the 4 seasons. A total of 6 of the 24 days of sampling took place during the night shift.

Sampling dates for each sampling month were selected using a random number generator, and then refined so that the distribution across the weeks of the month and days of the week were roughly even. The sampling calendar was designed using the following steps:

1. The week of the month was randomly selected using the Rand() function in Excel.

2. The start day of each month's sampling was randomly selected to be a Monday, Tuesday, or Wednesday.

3. The six nighttime sampling events were randomly assigned over the six, bimonthly sampling events.

4. Two weekend sampling events (one day and one night) were scheduled.

5. Finally, a random selection method was used to adjust the sampling events to achieve a balanced distribution across days of the week and weeks of the month.

For efficiency, the sampling dates were adjusted for each sampling month in accordance with the facility and hauler schedules, taking into account major holidays and the sorting crew's availability. Also, Cascadia scheduled the commercial waste study fieldwork contiguously with the organics study fieldwork events to optimize field coordination and data management.

The preliminary sampling calendar is shown in Table 14. The resulting allocation of waste sampling days, by day and night shift is shown in Table 15. Over the course of the study, Cascadia revised the sampling calendar and target number of samples as needed and in coordination with SPU. Appendix C shows the final dates and number of samples collected in each sampling event and season.

Table 14. Preliminary Sampling Calendar for 2022 Commercial Waste Composition Study

Date	Sector	Day/Night	No. of Samples	Day of the Week	Week of the Month	Season
2/14/22	COM	Day	11	Monday	2	Winter
2/15/22	COM	Day	11	Tuesday	2	Winter
2/16/22	COM	Night	11	Wednesday	2	Winter
2/17/22	COM	Day	11	Thursday	2	Winter
4/5/22	COM	Day	11	Tuesday	1	Spring
4/6/22	COM	Day	11	Wednesday	1	Spring
4/7/22	COM	Night	11	Thursday	1	Spring
4/8/22	COM	Day	11	Friday	1	Spring
6/13/22	COM	Night	11	Monday	2	Summer
6/14/22	COM	Day	11	Tuesday	2	Summer
6/15/22	COM	Day	11	Wednesday	2	Summer
6/16/22	COM	Day	11	Thursday	2	Summer
8/16/22	COM	Day	11	Tuesday	3	Summer
8/17/22	COM	Night	11	Wednesday	3	Summer
8/18/22	COM	Day	11	Thursday	3	Summer
8/19/22	COM	Day	11	Friday	3	Summer
10/10/22	COM	Day	11	Monday	2	Fall
10/11/22	COM	Day	11	Tuesday	2	Fall
10/12/22	COM	Night	11	Wednesday	2	Fall

Date	Sector	Day/Night	No. of Samples	Day of the Week	Week of the Month	Season
10/13/22	COM	Day	11	Thursday	2	Fall
12/6/22	COM	Day	11	Tuesday	1	Winter
12/7/22	COM	Night	11	Wednesday	1	Winter
12/8/22	COM	Day	11	Thursday	1	Winter
12/9/22	COM	Day	11	Friday	1	Winter

Table 15. Preliminary Distribution of Commercial Sampling Shifts

Shift	Week of Month	Sun	Mon	Tues	Wed	Thurs	Fri	Sat	Total
Day	1			2	1	1	2		6
Day	2		2	3	1	3			9
Day	3			1		1	1		3
Day	4								
TOTAL			**2**	**6**	**2**	**5**	**3**		**18**
Night	1				1	1			2
Night	2		1		2				3
Night	3				1				1
Night	4								
TOTAL			**1**		**4**	**1**			**6**

Schedule and Collect Loads

Hauler and Transfer Station Participation

The 2022 sampling schedule was shared with SPU's transfer stations and contracted haulers. Sampling occurred every other month starting in February 2022. Prior to each sampling event, the affected haulers were sent a vehicle selection sheet. The haulers were then asked to notify the drivers of the loads selected for sampling and record the estimated time of arrival for each load on the vehicle selection sheet to assist the Field Supervisor in identifying sample trucks. Drivers were asked to place a sample placard in their window to help identify selected trucks when they arrived at the transfer station (Figure 21).

Figure 21. Sample Truck Placard

Seattle Waste Composition Study 2022	
Route #: RO	Sector: COM
Zone: 1	Stream: G
SAMPLE ID:	
CMG6101	
Truck: FL / RL / RO	
Date: 12/5/2022	Hauler: WM
Facility: STS	Shift: Day / Night

This study was designed to sample "pure" loads of commercial garbage only. Both contracted haulers also operate vehicles that service both commercial customers and multifamily residences combined. During sampling events, selected vehicles either delivered pure commercial loads or made a series of commercial stops at the beginning or end of their route, so that the sorting crew could capture a pure commercial sample.

Load Selection

Commercial collection vehicles typically transport more than one load per shift to the receiving transfer station. Since there were more vehicles per shift than the sampling quota, the field team used numerical identifiers assigned to every expected load on a given sampling day to select specific loads for sampling. A random number generator sorted the identifiers by vehicle type; loads were then selected in that randomly sorted sequence until the quota for each vehicle type was filled. Selected loads for a sampling day were summarized on vehicle selection sheets such as the one shown in Figure 22.

Figure 22. Commercial Vehicle Selection Sheet

Sample ID	Sector	Zone	Hauler	Truck No.	Truck Type	Driver	Route	Notes/Biz Names
	COM	2	CS	███	RL	███	242	
	COM	2	CS	███	RL	███	248	
	COM	3	CS	███	FL	███	223	
contingency	COM	3	CS	███	FL	███	220	
	COM	2	CS		RO			
	COM	2	CS		RO			
	COM	3	CS		RO			
	COM	3	CS		RO			
	COM	1	WM					
	COM	1	WM					
contingency	COM	1	WM					
	COM	4	WM					
	COM	4	WM					
	COM	1	WM		RO		RO	
	COM	1	WM		RO		RO	
	COM	4	WM		RO		RO	
	COM	4	WM		RO		RO	

Vehicle Selection Sheet — Wednesday, February 24, 2016
Seattle Commercial Waste Composition Study — SRDS

Today's Sampling Plan: 15 Samples

Several accounts are not serviced under SPU hauler contracts. These "non-contract" tons were treated as follows for the purposes of this study:

- University of Washington waste is collected by Waste Management but is included in SPU reports as self-haul. This waste was sampled as part of the commercial substream, and the tons were added to the commercial total.
- Seattle Public Schools waste is collected by Waste Management but is included in SPU reports as self-haul. This waste was sampled as part of the commercial substream, and the tons were added to the commercial total.
- Waste from the Coast Guard and the Veterans Administration Hospital is collected by Waste Management and hauled to its Eastmont Transfer Station, located nearby Seattle's South Transfer Station. When feasible, this waste was sampled as part of the commercial substream.

Field Procedures

The Field Supervisor coordinated vehicle selection, sample extraction, sorting, and disposal of sorted waste with the transfer station manager. When a vehicle selected for sampling arrived, the Field Supervisor confirmed the route number, collection zone, truck type, and route details. The Field Supervisor asked drivers to identify whether the garbage came from only one type of business and, if so, to identify that business type. Table 16 lists codes from the North American Industry Classification System (NAICS) that Cascadia referenced during the study. In some cases, drivers identified that waste came from an office, but could not identify the specific industry

sector. In most cases, drivers reported that waste came from a mix of business types. Information collected from each driver, including business type, was recorded on the load's corresponding data entry form, shown in Figure 24 on page 45.

Table 16. NAICS Codes and Sector Descriptions

2-digit Code	NAICS Sector Description
11	Agriculture, Forestry, Fishing and Hunting
21	Mining, Quarrying, and Oil and Gas Extraction
22	Utilities
23	Construction
31-33	Manufacturing
42	Wholesale Trade
44-45	Retail Trade
48-49	Transportation and Warehousing
51	Information
52	Finance and Insurance
53	Real Estate and Rental and Leasing
54	Professional, Scientific, and Technical Services
55	Management of Companies and Enterprises
56	Administrative and Support and Waste Management and Remediation Services
61	Educational Services
62	Health Care and Social Assistance
71	Arts, Entertainment, and Recreation
72	Accommodation and Food Services
81	Other Services (except Public Administration)
92	Public Administration

Sample Selection

When a selected vehicle tipped its load, the Field Supervisor directed the transfer station's front loader operator to scoop a 200- to 250-pound cross-section of the waste being emptied from the vehicle.

The field supervisor chose the sample for extraction using an imaginary 16-cell grid (Figure 23). superimposed over the tipped material. The field supervisor identified a random pre-selected "cell" from the tipped load, representing a cross-section of material from top to bottom. If the site constraints blocked the designated cell, then the field supervisor randomly selected an alternate cell. The field supervisor then instructed the loader operator at the facility to extract the sample from the chosen cell. Approximately 200–250 pounds of material were extracted for garbage samples.

Figure 23. 16-Cell Grid Applied to Selected Loads
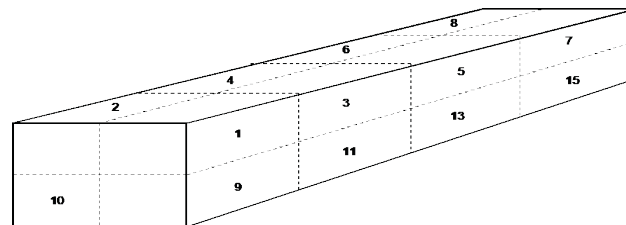
To meet the sampling goals outlined in Table 13, sometimes it was necessary to capture two samples from selected loads. These samples were extracted from two randomly selected cells from the same load only for loads bringing garbage from multiple businesses. This only occurred on a limited, as-needed basis, and only when there were fewer vehicles available than the number of desired samples.

Field supervisors consistently communicated with the hauler contacts throughout the day to receive updated information about the selected routes' estimated times of arrival to the facility. If trucks from the selected routes were to arrive late in the evening, Cascadia developed contingency plans to meet sampling targets. These plans included double-sampling selected routes that arrived at the facility if they met zone and commercial type specifications.

If many selected routes would be arriving in the late evening, the field supervisor also surveyed vehicles arriving at the facility that were not pre-selected by Cascadia, asking the driver for their route number, collection zone, and commercial type. The field supervisor had the complete list of routes from the hauler and would review the truck's route information to determine if it met the zone and commercial type necessary to meet the sampling targets. If the route met the specifications, the field supervisor would select that route for sampling and record the route's information.

Sorting Procedures

The loader operator deposited each sample on a tarp for sorting. The Field Supervisor performed a visual check to verify that the sampled material appeared to be from commercial generators. If it did not appear to be from commercial generators, the sample was discarded.

Each sample was sorted by hand into the 113 material types as defined in Appendix A. Materials were placed in plastic laundry baskets to be weighed and recorded. The Field Supervisor monitored the homogeneity of the baskets as material accumulated, rejecting items that are improperly classified. Open laundry baskets allowed the Field Supervisor to always see sampled materials.

Training

At the outset of each sampling event, the Field Supervisor and sorting crew familiarized themselves with the materials list, field forms, and any unique sorting protocols that were planned for each sampling event. The Field Supervisor was also present onsite to provide continual support and supervision. Training for this study also addressed:

- General facility overviews.
- Facility-specific health and safety requirements.
- Personal protective equipment (PPE) requirements.
- Garbage handling techniques.
- Productivity strategies and daily sorting quotas.

The Field Supervisor closely evaluated each individual sample to ensure that the sorting crew understood each material type and how to properly interpret uniformly by each sorting crew member.

Health and Safety

The team followed a strict health and safety plan that met Occupational Safety and Health Administration (OSHA) standards. Additionally, the Field Supervisor ensured that all fieldwork adhered to COVID-19 pandemic health and safety requirements from local and state public health officials.

Data Management and Analysis

Managing Data

The standard process for characterizing sampled materials included the following steps.

The Field Supervisor continually conducted quality control review of entered data, flagging and reviewing any anomalies, and ensuring completeness of all information for each sample. For study integrity, all samples collected were included in the analysis unless Cascadia determined that the underlying sample data was incorrect.

Following each fieldwork sampling event, the Field Supervisor recorded all data into a cloud-based database management system customized for this study.

An **Electronic Tally Sheet** included a list of all materials and cells to record the weights for each material. The Field Supervisor recorded the weight on a digital sampling form on Cascadia's cloud-based database management system customized for this study (Figure 24).

Figure 24. Data Entry Form

Cascadia's cloud-based database management system contains built-in logic and error-checking to prevent data entry errors. It also sums sample weights so that the field supervisor can confirm weight targets are achieved. The data is automatically synced to a cloud-based database, reducing data loss and transcription errors.

The Data Manager verified that all required data are recorded properly and supervised the data entry and data quality control process. As an additional quality control step, randomly selected sampling records were inspected in detail to monitor the accuracy of the data entry process.

Ongoing Progress Reporting

Cascadia performed the following project management responsibilities for this study:

- Organizing and conducting waste sampling including all coordination with contractors and transfer station staff making sure to give all affected parties ample notice and reminders of when and how sampling will occur.
- Compiling, checking, and entering data into the study database, and submitting regular reporting of sampling data with a short report following sampling events, and including any anomalies or problems encountered.
- This report also included a table showing samples sorted each month and the total to date.
- We also provided photos and other related data, such as geo-locations and other GIS layers associated with each sample.
- Cascadia submitted these progress reports and invoices within 30 days of the last day of the sampling month (see Appendix C for sampling progress reports).
- Scheduling sampling events every other month.
- Notifying transfer station personnel of sampling events.
- Obtaining field data and managing data entry.
- Reviewing and performing quality control (QC) on sampling data.
- Submitting final data to SPU.

Waste Composition Calculations

The composition estimates represent the ratio of the components' weight to the total waste for each noted sub-stream. They were derived by summing each component's weight across all the selected records and dividing by the sum of the total weight of waste, 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

The confidence interval for this estimate is derived in two steps. First, the variance around the estimate is calculated, accounting for the fact that the ratio includes two random variables (the component and total sample weights). The variance of the ratio estimator equation follows:

$$\hat{V}_{r_j} = \left(\frac{1}{n}\right) \cdot \left(\frac{1}{\overline{w}^2}\right) \cdot \left(\frac{\sum_i \left(c_{ij} - r_j w_i\right)^2}{n-1}\right)$$

where,

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

Second, confidence intervals at the 90% confidence level are calculated for a component's mean as follows:

$$r_j \pm \left(t \cdot \sqrt{\hat{V}_{r_j}}\right)$$

where,

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

For more detail, please refer to Chapter 6 "Ratio, Regression and Difference Estimation" of Elementary Survey Sampling by R.L. Scheaffer, W. Mendenhall and L. Ott (PWS Publishers, 1986).

The overall commercial waste composition estimates were calculated by performing a weighted average across the relevant substreams: each zone, vehicle type, and shift.

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SPU provided an estimate of tonnage disposed by the commercial substream for the study period (January through December 2022). The composition estimates for each substream and subpopulation were applied to the relevant tonnages to estimate the amount of waste disposed for each component category.

The weighted average for an overall composition estimate is performed as follows:

$$O_j = \left(p_1 * r_{j1} \right) + \left(p_2 * r_{j2} \right) + \left(p_3 * r_{j3} \right) + ...$$

where,

p = the proportion of tonnage contributed by the noted substream

r = ratio of component weight to total waste weight in the noted substream

for,

j = 1 to m

where,

m = number of components

The variance of the weighted average is calculated:

$$VarO_j = \left(p_1^2 * \hat{V}_{r_{j1}} \right) + \left(p_2^2 * \hat{V}_{r_{j2}} \right) + \left(p_3^2 * \hat{V}_{r_{j3}} \right) + ...$$

The weighting percentages used to perform the composition calculations were developed based on SPU-provided 2022 commercial disposal tonnages. Weighting percentages were not used to perform composition calculations on sampling data by generator type (e.g., grocery, restaurant) or season.

Trends Calculations for Comparing Results from Current and Previous Studies

Cascadia compared the findings from 2022 commercial study with findings from the 2016 study and the 1988 study. This comparison examined whether the composition of Seattle's commercial garbage stream had changed over time. We examined statistical differences, using *t*-tests, between the studies to determine if changes in the composition were statistically significant.

Introduction

Cascadia compared percentage estimates of broad material classes in commercial garbage to identify statistically significant changes, if any existed. The study compared percentage estimates, not tonnage, to control for population changes and other factors that may influence

the total amount of garbage disposed from year to year. The reasons why or how these changes occurred are not investigated. Future studies could be designed to identify the potential causes of these variations. The changes may be due to a variety of factors such as consumer preferences, technological changes, population changes, relative increase or decrease in percentage of other material types, and extremely rare events such as a pandemic.

The material list has increased from 52 material types in 1988 to 113 types in 2022. Material types are now organized into 10 material classes, up from 8 classes in 1988, with some classes split and others combined. To allow for comparisons across years, Cascadia organized material lists across these studies into a set of 8 overall material classes.

Calculations

The *t*-test examines a hypothesis about each of the eight material classes. As an example, the hypothesis for paper is: "There is no statistically significant difference, between the 2022 and 2016 study periods, in the percentage of commercial garbage made up of paper."

The *t*-tests (modified for ratio estimation) were used to examine year-to-year variation across studies. Identifying statistically significant differences requires a two-step calculation. First, assuming that the two groups to be compared have the same variance, a **pooled sample variance** was calculated:

$$S_{pool}^2 = \frac{\left[(n1-1)\cdot\left(n1\cdot\hat{V}_{r_j1}\right)\right]+\left[(n2-1)\cdot\left(n2\cdot\hat{V}_{r_j2}\right)\right]}{n1+n2-2}$$

Next, the **t-statistic** was constructed:

$$t = \frac{(r1-r2)}{\sqrt{\dfrac{S_{pool}^2}{n1}+\dfrac{S_{pool}^2}{n2}}}$$

Statistical Considerations

The *t*-test was based on an assumption of normality and on conducting multiple *t*-tests.

It was assumed that the material types followed normal distribution. The *t*-tests will accurately determine departures from this assumption, particularly with large sample sizes. In addition, most of the selected categories were sums of several individual material types, which improved our ability to meet the assumptions of normality.

The year-to-year comparison required conducting several t-tests (one for each material type), each of which carries that risk of type I error (getting false-positive results) when multiple t-tests are performed on a single set of data. However, SPU was willing to accept only a 10% chance

overall of making an incorrect conclusion. Therefore, each test was adjusted by setting the significance threshold to $\dfrac{0.10}{w}$ where, w = the number of t-tests.[8]

Interpreting the Calculation Results

The larger the absolute value of the t-statistic, the less likely it is that the two populations have the same mean. The p-value describes the probability of observing the calculated t-statistic if there were no true difference between the population means. This report does not attempt an in-depth examination of potential causes of the changes in material composition over time.

The statistical tests used assumed that there has been no change. For example, "There is no statistically significant difference between the 2022 and 2016 study periods in the percentage of commercial garbage made up of paper." Statistics were then used to look for evidence disproving the no-change hypothesis. A "significant" result meant that there was enough evidence to disprove the hypothesis and that Cascadia could conclude that there is a true difference in composition over time. "Insignificant" results showed that either 1) there was no true difference, or 2) even though there may have appeared to be a difference, there was not enough evidence to prove it because the findings were limited by sample size. It is also possible that changes occurred in material types that were not considered in this part of the analysis. For the purposes of this study, only those calculation results with a p-value of less than 1.25% were considered statistically significant.

Material Classifications for Comparing Current and Previous Studies

Material Grouping	2022 Material Types
Paper	Newspaper; Cardboard & Kraft Paper; Grocery or Shopping Bags; Paper Packaging; Paper Products; Aseptic Containers; Gable Top Containers; Other Poly-coated Containers; Non-coated or Soiled Paper Products; Non-coated Single-use Food Packaging; Shredded Paper; Waxed Cardboard; Coated Single-use Food Packaging; Mixed or Other Paper
Plastic	PET Bottles & Jars; HDPE Natural Bottles & Jars; HDPE Colored Bottles & Jars; PP Bottles & Jars; Other Plastic Bottles & Jars; PET Non-bottle Packaging; HDPE Non-bottle Packaging; PP Non-bottle Packaging; Other Non Bottle Packaging; Other Single-use Food Service Packaging; Small Durable Plastic Products; PLA Single-use Food Service Utensils; PLA Single-use Food Service Packaging; Compostable Plastic Bags; EPS Non Food Grade; Rigid Foam Insulation; Takeout & Retail Bags; Stretch Wrap; Other Clean Polyethylene Film; Large Durable Plastic Products; EPS Food Grade; Other Single-use Food Service Utensils; Plastic Pouches; Plastic Mailers; Garbage Bags; Other Film; Plastic Other Materials
Glass	Clear Beverage Glass; Green Beverage Glass; Brown Beverage Glass; Container Glass; Mixed Cullet; Other Glass

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[8] For more detail about this issue, please refer to Section 11.2 "The Multiplicity Problem and the Bonferroni Inequality" of An Introduction to Contemporary Statistics by L.H. Koopmans (Duxbury Press, 1981).

Material Grouping	2022 Material Types
Metal	Aluminum Cans; Aluminum Foil or Containers; Steel Food Cans; Empty Aerosol Cans; Other Ferrous; Other Aluminum; Oil Filters; Other Nonferrous; Mixed Metals
Organics	Leaves & Grass; Prunings; Packaged Edible Vegetative Food Waste; Edible Vegetative Food Waste; Packaged Edible Other Food Waste; Edible Food Waste Other; Inedible Vegetative Food Waste; Inedible Other Food Waste; Fats, Oils, & Grease; Other Compostable Organics
Other Materials	Textiles; Mixed Textiles; Tires; Diapers; Animal By-products; Rubber Products; Furniture; Mattresses; Small Appliances; CFL Lights; LED Lighting; E-Cycle WA Accepted Electronics ; Non-E-Cycle WA Accepted Electronics; Carpet; Felt Carpet Pad; Ceramics; Personal Protective Equipment; Misc. Organics; Misc. Inorganics
CDL Wastes	Clean Dimensional Lumber; Clean Engineered Wood; Pallets & Crates; Other Untreated Wood; New Gypsum Scrap; Demo Gypsum Scrap; Rock, Concrete, & Other Aggregates; Asphaltic Roofing; New Painted Wood; Old Painted Wood; Creosote Treated Wood; Other Treated Wood; Contaminated Wood; Fiberglass Insulation; Other Construction Debris; Soil & Dirt; Non-distinct Fines
Hazardous	Rechargeable Batteries; Dry Cell Batteries; Wet Cell Batteries; Liquid Latex Paint; Oil Based Paints; Medications; Other Harmful Wastes; Medical Waste; Non Caustic Chemicals; Vitamins & Supplements; Cosmetics

Reported Numbers and Rounding

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

Except where noted, composition tables also present estimated tons of each material in the commercial garbage stream, calculated by applying estimated composition percentages to the estimated total tons of materials disposed in commercial garbage stream during the relevant study period, provided by SPU.

To keep the waste 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. Due to this rounding, the tonnages presented in the report, when added together, may not exactly match the subtotals and totals shown. Similarly, the percentages, when added together, may not exactly match the totals shown. Percentages less than 0.05% are shown as 0.0%. Each number reported in the text is accurate and has been rounded only after finishing all calculations using more precise percentages in the data workbooks. Using the rounded percentages to calculate tonnages or sums may yield results that differ from the numbers shown in the report.

APPENDIX B. MATERIAL LIST AND DEFINITIONS

The 2022 commercial study used a list of 113 material types organized into 10 material classes and 4 recoverability classes. The material classes were:

- Paper
- Plastic
- Glass
- Metal
- Compostable organics
- Other organics
- Furniture, appliances, and electronics
- Construction debris
- Potentially harmful wastes
- Fines and miscellaneous materials

The recoverability classes were:

- **Curbside Recyclable:** Materials that are currently accepted in residential curbside and multifamily recycling programs in Seattle or are recycled through commercial sector collection programs. For example, corrugated cardboard and aluminum cans belong in this class.
- **Compostable:** Materials that are currently accepted in residential curbside and multifamily compost programs in Seattle or are composted through commercial sector collection programs. For example, food scraps, compostable food service items, and yard waste fit in this class.
- **Other Recoverable:** Materials that can be recovered through programs, markets, or streams other than current standard curbside or commercial recycle programs, such as City-run drop-off and special item collections for scrap metal, appliances and electronics, compact fluorescent (CFL) bulbs and batteries, expanded polystyrene (EPS) foam blocks, used oil, and other specialty items; City-run and private drop-off programs for drop-off collection through EPR programs such as for e-waste, paint, and pharmaceuticals; privately-run textile donation acceptance for reuse/recycling, store take-back of recyclable plastic film, and construction & demolition recycling at private facilities.
- **Non-recoverable:** Materials that are not readily recyclable or face other market, technology, or programmatic related barriers (e.g., medical waste).

A summary of changes made to the 2022 material list compared to the 2016 list follows the current material definitions.

Paper

The paper material class has 14 material types.

Material	Definition	Recoverability
Newspaper	Printed ground wood newsprint. Includes advertising "slicks" (glossy paper), if found mixed with newspaper; otherwise, ad slicks are included with paper products.	Curbside Recyclable
Cardboard & Kraft Paper	Old unwaxed/uncoated corrugated container boxes and Kraft paper.	Curbside Recyclable
Grocery or Shopping Bags	Paper grocery and shopping bags. Includes all brown paper bags and bags with non-paper handles.	Curbside Recyclable
Paper Packaging	High-grade paper and mixed low-grade paper packaging. Includes cereal and cracker boxes, egg cartons, frozen/refrigerator packaging, and bleached Kraft. Excludes juice concentrate cans.	Curbside Recyclable
Paper Products	High-grade paper and mixed low-grade paper products. Includes white and lightly colored bond, rag, or stationary grade paper, including white or lightly colored sulfite/sulfate bond, copy papers, carbonless copy paper, notebook paper, envelopes, mailing tubes, continuous-feed sulfite/sulfate computer printouts and forms, junk mail, magazines, colored papers, ground wood computer printouts, paperback books, telephone directories, and spiral notebooks. Excludes carbon copy paper.	Curbside Recyclable
Aseptic Containers	Multi-layer paper packing designed to keep food and other putrescible contents fresh, including those with plastic spouts attached. Includes items like paper soup cartons and paper juice cartons.	Curbside Recyclable
Gable Top Containers	Polycoated paper packaging often used for liquid products such as milk, plant-based beverages, and juice, including those with plastic spouts attached. Most are opened by pushing open with a screw top closure or the gables at the top back and pulling the top (spout) out.	Curbside Recyclable
Other Poly-coated Containers	Polycoated containers that are not aseptic containers or gable top containers. Includes items like ice cream cartons.	Curbside Recyclable
Non-coated or Soiled Paper Products	Paper towels, waxed paper, tissues, and other papers that were soiled with food during use.	Compostable
Non-coated Single-use Food Packaging	Pizza boxes, pizza box inserts, paper plates, bowls, and cups, including wax-coated paper plates, bowls and cups and items labeled "compostable." Excludes items with visible plastic coating or lining unless the item is clearly labeled compostable.	Compostable

Material	Definition	Recoverability
Shredded Paper	Long shreds (at least 8 ½ inches long and ¼ inch wide) in a clear plastic bag, tied off. Does not include confetti or crosscut shreds.	Compostable
Waxed Cardboard	Old waxed/coated corrugated container boxes and Kraft paper.	Non-recoverable
Coated Single-use Food Packaging	Paper plates, bowls, and cups not labeled "compostable" and that appear to have a plastic lining or coating.	Non-recoverable
Mixed or Other Paper	Predominantly paper with other materials attached (e.g., orange juice cans), and other non-recyclable papers such as carbon copy paper, hardcover books, and photographs. Includes shredded paper that is less than 8 ½ inches long and ¼ inch wide (confetti and crosscut shreds).	Non-recoverable

Plastic

The plastic material class has 27 material types.

Material	Definition	Recoverability
PET Bottles & Jars	Blow-molded polyethylene terephthalate (#1) bottles and jars excluding toxic product containers. When marked for identification, it bears the number "1" in the center of the triangular recycling symbol and may also bear the letters "PETE" or "PET." Examples include plastic water, soda, and juice bottles.	Curbside Recyclable
HDPE Natural Bottles & Jars	Blow-molded high-density translucent polyethylene (#2) bottles and jars excluding toxic product containers. When marked for identification, it bears the number "2" in the triangular recycling symbol and may also bear the letters "HDPE." These bottles and jars are a cloudy white color, allowing light to pass through them. Examples include milk, juice, beverage, oil, vinegar, and distilled water.	Curbside Recyclable
HDPE Colored Bottles & Jars	Blow-molded high-density colored polyethylene (#2) bottles and jars excluding toxic product containers. When marked for identification, it bears the number "2" in the triangular recycling symbol and may also bear the letters "HDPE." These bottles and jars are a solid color, preventing light from passing through them. Examples include liquid detergent bottles and some hair care bottles.	Curbside Recyclable
PP Bottles & Jars	Blow-molded polypropylene (#5) bottles and jars excluding toxic product containers. When marked for identification, it bears the number "5" in the triangular recycling symbol and may also bear the letters "PP." Examples include condiment bottles.	Curbside Recyclable

Material	Definition	Recoverability
Other Plastic Bottles & Jars	Blow-molded bottles and jars made of types of plastic other than HDPE, PET, or polypropylene. When marked for identification, these items may bear the number "3", "4", "6", or "7" in the triangular recycling symbol. This material type also includes unmarked plastic bottles. Examples include baby wipe containers, food containers, prescription vials, and shampoo bottles. Excludes toxic product containers and #7 PLA bottles.	Curbside Recyclable
PET Non-bottle Packaging	Polyethylene terephthalate (#1) non-bottle packaging. When marked for identification, it bears the number "1" in the center of the triangular recycling symbol and may also bear the letters "PETE" or "PET." Excludes toxic product containers. Examples include salsa tubs. Includes #1 PET lids greater than 3 inches in diameter.	Curbside Recyclable
HDPE Non-bottle Packaging	High-density translucent polyethylene (#2) non-bottle packaging. When marked for identification, it bears the number "2" in the triangular recycling symbol and may also bear the letters "HDPE." Excludes toxic product containers. Examples include yogurt and margarine tubs. Includes #2 HDPE lids greater than 3 inches in diameter.	Curbside Recyclable
PP Non-bottle Packaging	Polypropylene (#5) non-bottle packaging. When marked for identification, it bears the number "5" in the triangular recycling symbol and may also bear the letters "PP." Excludes toxic product containers. Examples include yogurt containers. Includes #5 PP lids greater than 3 inches in diameter.	Curbside Recyclable
Other Non Bottle Packaging	Non-bottle packaging made of types of plastic other than HDPE, PET, or polypropylene. When marked for identification, these items may bear the number "3", "4", "6", or "7" in the triangular recycling symbol. This material type also includes unmarked plastic non-bottle packaging. Examples include cookie tray inserts, plastic spools, plastic frozen food trays, plastic toothpaste tubes, and disposable plant pots. Includes #3, 4, 6, and 7 lids greater than 3 inches in diameter. Excludes toxic product containers and #7 PLA non-bottle packaging.	Curbside Recyclable
Other Single-use Food Service Packaging	Includes clamshells, cups, cup lids, plates, bowls, salad trays, and other food service packaging not labeled "compostable." Excludes clamshells, cups, plates, bowls, and other food service items made of Styrofoam.	Curbside Recyclable
Small Durable Plastic Products	Finished plastic products, less than two gallons and greater than two inches in size, made entirely of plastic, such as clothes hangers and small plastic toys.	Curbside Recyclable
PLA Single-use Food Service Utensils	Includes forks, spoons, knives, and straws labeled "compostable."	Compostable
PLA Single-use Food Service Packaging	Includes clamshells, cups, cup lids, plates, bowls, salad trays, and other food service packaging labeled "compostable."	Compostable
Compostable Plastic Bags	Film "plastic" bags made of materials such as corn starch or soy designed to compost (e.g., BioBag, EcoSafe).	Compostable

Material	Definition	Recoverability
EPS Non Food Grade	Includes non-food packaging and finished products made of expanded polystyrene. Excludes Styrofoam products such as cups, plates, and bowls and rigid foam insulation.	Other Recoverable
Rigid Foam Insulation	Rigid panels of expanded polystyrene used to insulate walls and roofs. Excludes non-polystyrene rigid foam insulation.	Other Recoverable
Takeout & Retail Bags	Grocery, shopping, and merchandise plastic bags.	Other Recoverable
Stretch Wrap	Polyethylene pallet wrap or stretch wrap.	Other Recoverable
Other Clean Polyethylene Film	Polyethylene film and bags, other than those identified above, which were not contaminated with food, liquid, or grit during use. Includes clean plastic sheeting, clean trash bags, mattress packaging, dry cleaner plastic bags, newspaper polyethylene film bags, and bubble wrap.	Other Recoverable
Large Durable Plastic Products	Finished plastic products, greater than two gallons in size, made entirely of plastic such as large plastic toys, vinyl hose, plastic lawn furniture, plastic pails, and foam mattresses. Includes fiberglass resin products and materials, and durable plastic pots. Includes large foam carpet padding and plastic pipes.	Other Recoverable
EPS Food Grade	"Styrofoam" products used to contain food such as "clamshells," cups, plates, and bowls.	Non-recoverable
Other Single-use Food Service Utensils	Includes forks, spoons, knives, and straws not labeled "compostable."	Non-recoverable
Plastic Pouches	Plastic pouches made of thicker, multi-layer flexible material. May have a flat bottom so that package would stand up on its own, but not always. Material is thicker than potato chip bags and frozen vegetable bags. Includes plastic coffee bags like Starbucks and Peets; 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.	Non-recoverable
Plastic Mailers	Flexible plastic film mailers used for mailing. Examples include film mailers from e-commerce services.	Non-recoverable
Garbage Bags	Any plastic bag that was originally sold as a trash can liner or to hold garbage. Does not include bags originally provided for other purposes that are used for garbage.	Non-recoverable
Other Film	Film packaging not defined above, or: was contaminated with food, liquid, or grit during use; is woven together (e.g., grain bags); or that contains multiple layers of film or other materials that have been fused together (e.g., potato chip bags). This material type also includes contaminated plastic sheeting, photographic negatives, shower curtains, Ziploc bags, and any bags used to contain food or liquid (e.g., produce).	Non-recoverable

Material	Definition	Recoverability
Plastic Other Materials	Items that are predominately plastic with other materials attached such as toothbrushes, disposable razors, pens, lighters, toys, and 3-ring binders. Includes lids and loose bottle caps smaller than 3 inches in diameter. Also includes toxic product containers, such as for motor oil or antifreeze.	Non-recoverable

Glass

The glass material class has 6 material types.

Material	Definition	Recoverability
Clear Beverage Glass	Bottles that are clear in color, including pop, liquor, wine, juice, beer, and vinegar bottles greater than approximately 1 inch in most dimensions. Also includes clear glass greater than 1 inch in most dimensions when it cannot be determined if the glass is from a bottle or a container.	Curbside Recyclable
Green Beverage Glass	Bottles that are green in color, including green pop, liquor, wine, beer, and lemon juice bottles greater than approximately 1 square inch. Also includes green glass greater than 1 inch in most dimensions when it cannot be determined if the glass is from a bottle or a container.	Curbside Recyclable
Brown Beverage Glass	Bottles that are brown in color, including brown pop, beer, liquor, juice, and extract bottles greater than approximately 1 inch in most dimensions. Also includes brown glass greater than 1 inch in most dimensions when it cannot be determined if the glass is from a bottle or a container.	Curbside Recyclable
Container Glass	Any glass bottle that is not clear, green, or brown as well as non-bottle glass containers of all colors greater than approximately 1 inch in most dimensions. Examples include blue wine bottles or pink pre-mixed cocktail bottles. Also includes mayonnaise, peanut butter, pickle, and facial cream jars.	Curbside Recyclable
Mixed Cullet	Broken glass of any color that can be readily distinguished and separated from other materials and that are less than approximately 1 inch in any dimension. The mixed cullet will be mostly 1" minus glass with small amounts of non-glass contamination that cannot be readily separated. Glass fines and other small pieces of glass that cannot be readily distinguished and separated from other materials will be included in the nondistinct fines material type.	Curbside Recyclable
Other Glass	Mirrors, glassware, glass windowpanes, doors and tabletops, safety glass, architectural glass, and windshield and side window auto glass. Excludes LED, fluorescent, and compact fluorescent (CFL) light bulbs. These have their own dedicated material types.	Non-recoverable

Metal

The metal material class has 9 material types.

Material	Definition	Recoverability
Aluminum Cans	Aluminum beverage cans (UBC) and bi-metal cans made mostly of aluminum. Includes can lids partially attached to the can or pushed into the can.	Curbside Recyclable
Aluminum Foil or Containers	Aluminum food containers, trays, and foil.	Curbside Recyclable

Material	Definition	Recoverability
Steel Food Cans	Steel food containers, including bi-metal cans made mostly of steel. Includes can lids partially attached to the can or pushed into the can.	Curbside Recyclable
Empty Aerosol Cans	Empty, mixed material/metal aerosol cans. Aerosols that still contain product are sorted according to that material—for instance, solvent-based paint.	Curbside Recyclable
Other Ferrous	Ferrous and alloyed ferrous scrap metals to which a magnet adheres, and which are not significantly contaminated with other metals or materials.	Curbside Recyclable
Other Aluminum	Aluminum products and scrap such as window frames, cookware.	Other Recoverable
Oil Filters	Metal oil filters used in cars and other automobiles.	Other Recoverable
Other Nonferrous	Metals not derived from iron, to which a magnet will not adhere, and which are not significantly contaminated with other metals or materials.	Non-recoverable
Mixed Metals	Items that are predominately metal with other materials attached such as motors, insulated wire, and finished products containing a mixture of metals, or metals and other materials. Includes loose can lids. White goods are banned from Seattle's disposal. However, segments of large appliances are occasionally found; they are included in this material type.	Non-recoverable

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Compostable Organics

The compostable organics material class has 10 material type.

Material	Definition	Recoverability
Leaves & Grass	Non-woody plant materials from a yard or garden area, including grass clippings, leaves, weeds, and garden wastes.	Compostable
Prunings	Cut prunings, 6" or less in diameter, from bushes, shrubs, and trees.	Compostable
Packaged Edible Vegetative Food Waste	The components of fruits and vegetables that, in a particular food supply chain, are intended to be consumed by humans. Includes edible vegetative food that is enclosed in plastic, paper, glass, or other packaging, regardless of whether it is in its original packaging. Examples include packaged salad, packaged frozen vegetables, and bags of coffee beans.	Compostable
Edible Vegetative Food Waste	The components of fruits and vegetables that, in a particular food supply chain, are intended to be consumed by humans. Includes edible vegetative food that is not enclosed in plastic, paper, glass, or other packaging. Examples include loose vegetables and fruits, and tree fruit.	Compostable
Packaged Edible Other Food Waste	Non-vegetative food, such as breads, meats, pastas, dairy products, etc. The components of food that, in a particular food supply chain, are intended to be consumed by humans. Includes edible food that is enclosed in plastic, paper, glass, or other packaging, regardless of whether it is in its original packaging.	Compostable
Edible Food Waste Other	Non-vegetative food, such as breads, meats, pastas, dairy products, etc. The components of food that, in a particular food supply chain, are intended to be consumed by humans. Includes edible food that is not enclosed in plastic, paper, glass, or other packaging.	Compostable
Inedible Vegetative Food Waste	The non-edible portions of food material. Examples include fruit peels, vegetable peelings and potato skins, pits, cores, juiced oranges. Includes non-edible food whether it is packaged or non-packaged. Coffee and tea grounds are included.	Compostable
Inedible Other Food Waste	The non-edible portions of food material. Examples include eggshells, bones, gristle and meat trimmings, fish skins, and seafood shells. Includes non-edible food whether it is packaged or non-packaged.	Compostable
Fats, Oils & Grease	Fatty by-products of food preparation. Includes cooking oil, butter, lard, and gravy. Can be in liquid or solid form. Can be packaged and non-packaged. Can be edible or non-edible.	Compostable
Other Compostable Organics	Wooden chopsticks, popsicle sticks, toothpicks, and coffee stirrers.	Compostable

Other Organics

The other organics material class has 6 material types.

Material	Definition	Recoverability
Textiles	Rag stock fabric materials including natural and synthetic textiles such as cotton, wool, silk, woven nylon, rayon, and polyester.	Other Recoverable

Material	Definition	Recoverability
Mixed Textiles	Non-rag stock grade textiles such as upholstered items, non-leather shoes and handbags, heavy linens, and draperies.	Other Recoverable
Tires	Vehicle tires of all types. Tubes are put into the rubber material type.	Other Recoverable
Diapers	Diapers made from a combination of fibers, synthetic, and/or natural, and made for the purpose of single use. This includes disposable baby diapers and adult protective undergarments.	Non-recoverable
Animal By-products	Animal carcasses not resulting from food storage or preparation, animal wastes, and kitty litter.	Non-recoverable
Rubber Products	Finished products and scrap materials made of natural and synthetic rubber, such as bathmats, inner tubes, rubber hoses, rubber carpet padding, and foam rubber.	Non-recoverable

Furniture, Appliances & Electronics

The furniture, appliances & electronics material class has 10 material types.

Material	Definition	Recoverability
Furniture	Mixed-material furniture such as upholstered chairs. Furniture that is made purely of one material, such as plastic or metal, would be categorized according to that material (e.g., plastic products or other ferrous metal).	Other Recoverable
Mattresses	Mattresses and box springs.	Other Recoverable
Small Appliances	Small electric appliances such as toasters, microwave ovens, power tools, and curling irons.	Other Recoverable
CFL Lights	Fluorescent light tubes and compact fluorescent lights, which are small, fluorescent bulbs similar in appearance to incandescent bulbs. These bulbs typically have a spiral or tubular design.	Other Recoverable
LED Lighting	Any light-emitting diode (LED) light bulb or lighting fixture. They usually are not coiled in appearance and have an integrated ballast in the base.	Other Recoverable
Rechargeable Batteries	Rechargeable batteries, such as those found in cordless power tools, cell phones, laptops, digital cameras, toothbrushes, and remote-control toys.	Other Recoverable
Dry Cell Batteries	Dry-cell batteries of various sizes and types as commonly used in households. Includes button cell batteries, such as those found in watches and hearing aids.	Other Recoverable
Wet Cell Batteries	Wet-cell batteries of various sizes and types as commonly used in automobiles.	Other Recoverable
E-Cycle WA Accepted Electronics	Televisions, computers, laptops, monitors, tablets, e-readers, and portable DVD players, which are accepted through E-Cycle WA.	Other Recoverable
Non-E-Cycle WA Accepted Electronics	Cell phones; audio/visual equipment including stereos, radios, tape decks, non-portable DVD players, VCRs, camcorders, and digital cameras; and computer peripherals such as processors, mice and mouse pads, keyboards, disk drives, and printers.	Other Recoverable

Construction Debris

The construction debris material class has 19 material types.

Material	Definition	Recoverability
Clean Dimensional Lumber	Milled lumber commonly used in construction for framing and related uses, including 2 x 4's, 2 x 6's, that is clean (only including trace amounts of paint, nails, and other contaminants). Includes 2 x 4's with painted ends.	Other Recoverable
Clean Engineered Wood	Sheets of plywood, strandboard, particleboard, and other wood created using glue that are clean (only including trace amounts of paint, nails, and other contaminants).	Other Recoverable
Pallets & Crates	Includes untreated wood pallets, whole and broken, untreated crates, pieces of crates, and other packaging lumber/panelboard.	Other Recoverable
Other Untreated Wood	Compostable prunings or stumps 6" or greater in diameter.	Other Recoverable
New Gypsum Scrap	Calcium sulfate dehydrate sandwiched between heavy layers of Kraft-type paper. Also known as drywall. This material type includes new drywall that has not been painted or treated in other ways. Excludes GP DensGlass (and other brands) of exterior or roof paneling which is gypsum sandwiched between a fiberglass-reinforced coating.	Other Recoverable
Demo Gypsum Scrap	Used or demolition gypsum wallboard scrap that has been painted or treated.	Other Recoverable
Carpet	General flooring applications and non-rag stock textiles consisting of various natural or synthetic fibers bonded to some type of backing material.	Other Recoverable
Felt Carpet Pad	Fiber carpet pads made of jute, hair, or synthetic materials, such as recycled carpet fibers. This material may be coated with latex or other resin.	Other Recoverable
Rock, Concrete & Other Aggregates	Concrete, asphalt paving, rock gravel larger than 2" in diameter, and aggregates such as bricks, masonry tile, and clay roofing tiles. Also includes concrete and asphalt paving containing steel mesh and/or reinforcement bars, or "rebar."	Other Recoverable
Asphaltic Roofing	Includes asphalt shingles, which is roofing material composed of fiberglass or organic felts saturated with asphalt and covered with inert aggregates as well as attached roofing tar and tar paper. Commonly known as three-tab roofing shingles but including older designs as well. Also includes other asphaltic roofing material made with layers of felt, asphalt, aggregates, and attached roofing tar and tar paper normally used on flat/low pitched roofs usually on commercial buildings. Includes tar and gravel or "built-up roof membranes" as well as other asphaltic roofing membranes.	Other Recoverable
Liquid Latex Paint	Water-based paints and similar products in liquid form. Excludes empty paint containers and paint that is outweighed by that of the container.	Other Recoverable

Material	Definition	Recoverability
New Painted Wood	Lumber and wood products from new construction that have been painted so as to render them difficult to compost.	Non-recoverable
Old Painted Wood	Painted wood from demolition jobs. May be flaky and oxidized. Includes lead-based painted wood.	Non-recoverable
Creosote Treated Wood	Lumber and wood products that have been treated with creosote so as to render them difficult to compost (with generally 50% or more of the surface area treated).	Non-recoverable
Other Treated Wood	Lumber and wood products that have been treated (other than painted or treated with creosote) so as to render them difficult to compost. This includes chemically treated lumber.	Non-recoverable
Contaminated Wood	Predominantly wood and lumber products that are mixed with other materials in such a way that they cannot easily be separated. This includes wood with metal, gypsum, concrete, or other contaminants that would not compost easily.	Non-recoverable
Fiberglass Insulation	Fiberglass building and mechanical insulation, batt or rigid.	Non-recoverable
Ceramics	Finished ceramic or porcelain products such as toilets, sinks, and some dishware.	Non-recoverable
Other Construction Debris	Construction debris (other than wood) that cannot be classified elsewhere and mixed fine building material scraps. For example, floor sweepings from construction activities containing sawdust, nails, wire, etc. Includes GP DensGlass (and other brands) of exterior or roof paneling which is gypsum sandwiched between a fiberglass-reinforced coating. This material type also includes cement fiber board, single-ply roofing membranes, ceiling tiles, and dried latex paints.	Non-recoverable

Potentially Harmful Wastes

The potentially harmful wastes material class has 7 material types.

Material	Definition	Recoverability
Oil-Based Paints	Oil-based house paint and primers, stains, deck and concrete sealers, and clear finishes (e.g., shellac and varnish) that are covered under Washington's PaintCare architectural paint recycling program. These architectural paint products must be in containers that are no larger than 5 gallons in size. Excludes paint thinners, solvents, aerosol paints, auto and marine paints, art and craft paints, caulking compounds, epoxies, glues, adhesives, paint additives, colorants, tints, resins, wood preservatives, and deck cleaners.	Other Recoverable
Medications	Vitamins and supplements in all forms, including pills, liquid supplements, creams, and ointments. Does not include containers for these items, except for tubes for creams and ointments and other containers that cannot be easily separated from the product they contain.	Other Recoverable

Material	Definition	Recoverability
Other Harmful Wastes	Other chemicals or potentially harmful wastes that do not fit into the above material types, including unidentifiable materials. Examples include pesticides and herbicides, gasoline, kerosene, motor oil and diesel oil, asbestos, and explosives. Includes solvent-based paints, varnishes, and similar products not covered under Washington's PaintCare recycling program. Includes solvent-based adhesives and glues, including epoxy, rubber cement, two-part glues and sealers, and auto body fillers. Includes water-based glues, caulking compounds, grouts, and Spackle. Includes caustic cleaners whose primary purpose is to clean surfaces, unclog drains, or perform other actions.	Other Recoverable
Medical Waste	Materials typically discarded in a health care setting such as I.V. tubing and patient drapes, specimen containers, and Petri dishes. Medical wastes that could be considered a biohazard are weighed, but not further sorted.	Non-recoverable
Non-caustic Chemicals	Non-caustic cleaners and other household chemicals that are non-corrosive. Excludes drain cleaners and alkaline cleaning agents.	Non-recoverable
Vitamins & Supplements	Both prescription and over-the-counter medications in all forms, both brand name and generic, including pills, liquid medications, creams, and ointments that residents use in their homes or other residential settings. Includes legally prescribed controlled substances such as OxyContin, Vicodin, Valium, Ritalin, and stimulants. Does not include containers for these items, except for tubes for creams and ointments and other containers that cannot be easily separated from the product they contain. Excludes vitamins, herbal-based remedies, and homeopathic drugs, products, or remedies.	Non-recoverable
Cosmetics	Hygiene and grooming products, including bar soap, shower gel, shampoo, conditioner, hairspray, deodorant, body powder, lotions, nail polish and remover, makeup, etc. Does not include containers for these items, except when containers cannot be easily separated from the product they contain.	Non-recoverable

Fines & Miscellaneous Materials

The fines & miscellaneous materials material class has 5 material types.

Material	Definition	Recoverability
Personal Protective Equipment	Equipment worn to minimize exposure to a variety of hazards. In this definition, PPE refers to protective equipment worn by residents to minimize exposure to and the transmission of viruses, rather than equipment used in a medical or workplace setting. This includes face protection, such as cloth face coverings, face masks, and face shields. This also includes hand protection, such as nitrile or latex gloves, and bulk quantities of disinfectant and antibacterial wipes. This material type excludes medical supplies, such as tubing, drapes, pipettes, saline drip bags, bandages, scrubs, and gowns. PPE that is mixed with medical waste will not be separated or further sorted. Only bags of PPE or loose PPE are sorted into this material type.	Non-recoverable
Soil & Dirt	Sand, soil, dirt, and gravel smaller than 2" in diameter.	Non-recoverable
Non-distinct Fines	Mixed garbage fines smaller than approximately 2" in diameter. This includes glass fines and other small pieces of glass that cannot be readily sorted.	Non-recoverable
Misc. Organics	Combustible materials including wax; cigarette butts; scraps of leather and leather products including shoes and belts; feminine hygiene products; briquettes; fireplace, burn barrel and fire pit ash; and other organic materials not classified elsewhere, such as cork, organic rope, pet food, and hair.	Non-recoverable
Misc. Inorganics	Other inorganic, non-combustible materials not classified elsewhere, such as dryer sheets/Swifter sheets.	Non-recoverable

Changes to the 2022 Material List

The material types in the 2022 commercial study are based on those used in Seattle's 2016 commercial study, with updates to provide more detail about certain priority materials, increase the reliability of results, or improve sorting efficiencies. When updating the material list, Cascadia reviewed SPU's 2021 residential garbage and recycling composition study and recent material lists for studies by other jurisdictions including King County, Washington State, Metro (Oregon), and New York City. Changes are listed below by material class.

Paper

We split potentially compostable single-use food service into:

- Non-coated single-use food packaging
- Shredded paper

We split poly-coated paper into:

- Aseptic containers
- Gable top containers
- Other poly-coated containers

We updated the material type definitions for the following three material types to ensure it is explicit that the mixed/other paper (non-conforming) material type contains only contaminant materials, whereas the paper packaging and paper products contain only recyclable materials:

- Mixed/other paper (non-conforming): predominantly paper with other materials attached (e.g., orange juice cans), and other non-recyclable papers such as carbon copy paper, hardcover books, and photographs. Includes shredded paper that is less than 8½ inches long and ¼ inch wide (confetti and crosscut shreds).
- Paper packaging: high-grade paper and mixed low-grade paper packaging. Includes cereal and cracker boxes, egg cartons, frozen/refrigerator packaging, and bleached kraft. Excludes juice concentrate cans.
- Paper products: high-grade paper and mixed low-grade paper products. Includes white and lightly colored bond, rag, or stationary grade paper, including white or lightly colored sulfite/sulfate bond, copy papers, carbonless copy paper, notebook paper, envelopes, mailing tubes, continuous-feed sulfite/sulfate computer printouts and forms, junk mail, magazines, colored papers, ground wood computer printouts, paperback books, telephone directories, and spiral notebooks. Excludes carbon copy paper.

Plastic

We split polypropylene (PP) bottles and jars from other plastic bottles and jars.

We split non-bottle packaging by resin type (PET, HDPE, and PP).

We divided the *plastic film* material types into additional components:

- Compostable plastic bags
- Plastic pouches
- Plastic mailers
- Other film

We split garbage bags from the other clean polyethylene film component.

We divided the two single-use food-service material types (compostable PLA and "other") into four material type groups based on the whether material consisted of utensils or packaging.

Glass

We split mixed glass cullet into its own material type and added automotive glass and flat glass into the remaining other glass material type.

Metal

We revised the definition of other aluminum to ensure it is explicit that the other aluminum material type contains only recyclable materials, including aluminum products and scrap such as window frames or cookware. Please note that when comparing to the 2016 study, these items were sorted into the non-conforming metal component, which was categorized as a contaminant, or non-conforming, for that study.

Compostable Organics

We split the food material type into six types of food based on whether it was packaged, edible or inedible, and vegetative or other plus a seventh material type for other compostable organics.

Furniture, Appliances & Electronics

We reorganized batteries and electronics material types to:

- Provide more detail on LED lighting and batteries by type.
- Combine the remaining electronics, such as cell phones and televisions, into two material types based on whether they are accepted by E-Cycle Washington.

Other Material Classes

We combined material types for which little or no material was sorted in prior studies to produce more reliable composition estimates and boost sorting efficiencies. The new or further consolidated material types are:

- Pallets and crates
- Rock, concrete, and other aggregates
- Asphaltic roofing
- Other construction debris
- Other harmful wastes
- Large durable plastic products
- Small durable plastic products

APPENDIX C. SAMPLING PROGRESS REPORTS

This section documents the progress reports that Cascadia sent to the SPU project manager every other month throughout the project study period compared to sampling targets, which were set by season and zone. Each summary presents dates of sampling, the total number of samples sorted compared to the target for that sampling event, and whether any samples were missed or replaced by a different zone. Each section also includes a discussion of plans for future sampling events to adapt for differences between the target and actual survey counts.

Fieldwork Sampling Event 1 (February 14–18, 2022, Winter)

Sample Count	Target	Actual
Collector A	**22**	**24**
Zone 1	11	9
Zone 4	11	15
Collector B	**23**	**23**
Zone 2	11	10
Zone 3	12	13
Grand Total	**45**	**47**

Reason for difference between planned and actual sample counts, if any:

Overall, we collected all 45 samples that were planned for the sampling event, plus an additional 2 samples. There were some alterations in how many samples were collected from each zone due to changes in vehicle arrivals on-site. Zones that were altered during this sampling event will be taken into consideration during subsequent sampling events to ensure that samples taken continue to meet or exceed sampling goals.

Fieldwork Sampling Event 2 (April 11–15, 2022, Spring)

Sample Count	Target	Actual
Collector A	**22**	**23**
Zone 1	11	11
Zone 4	11	12
Collector B	**23**	**22**
Zone 2	11	11
Zone 3	12	11
Grand Total	**45**	**45**

Reason for difference between planned and actual sample counts, if any:

Overall, we collected all samples that were planned for the sampling event. There were some alterations in how many samples were collected from each zone due to changes in vehicle arrivals on-site. Zones that were altered during this sampling event will be taken into consideration during subsequent sampling events to ensure that samples taken continue to meet or exceed sampling goals.

Fieldwork Sampling Event 3 (June 6–9, 2022, Summer)

Sample Count	Target	Actual
Collector A	**23**	**21**
Zone 1	11	11
Zone 4	12	10
Collector B	**22**	**24**
Zone 2	11	12
Zone 3	11	12
Grand Total	**45**	**45**

Reason for difference between planned and actual sample counts, if any:

Overall, Cascadia collected all 45 samples that were planned for the sampling event. There were some alterations in how many samples were collected from each zone due to changes in vehicle arrivals on-site. The goal to collect 11 samples from Zone 1 was met, and in the case of Zone 3 and Zone 2, exceeded by one sample. Two fewer samples were taken from Zone 4 than the target. Zones that were altered during this sampling event will be taken into consideration during subsequent sampling events to ensure that samples taken continue to meet or exceed sampling goals.

Fieldwork Sampling Event 4 (August 15–19, 2022, Summer)

Sample Count	Target	Actual
Collector A	**22**	**25**
Zone 1	11	12
Zone 4	11	13
Collector B	**23**	**20**
Zone 2	12	10
Zone 3	11	10
Grand Total	**45**	**45**

Reason for difference between planned and actual sample counts, if any:

Cascadia field crew captured and sorted the commercial waste samples at Seattle's South Transfer Station. There were some alterations in how many samples were collected from each zone due to changes in vehicle arrivals on-site. Zones that were altered during this sampling event will be taken into consideration during subsequent sampling events to ensure that samples taken continue to meet or exceed sampling goals.

Fieldwork Sampling Event 5 (October 10–14, 2022, Fall)

Sample Count	Target	Actual
Collector A	**23**	**22**
Zone 1	12	11
Zone 4	11	11
Collector B	**22**	**22**
Zone 2	11	11
Zone 3	11	11
Grand Total	**45**	**44**

Reason for difference between planned and actual sample counts, if any:

Cascadia field crew captured and sorted the commercial garbage samples at Seattle's South Transfer Station. There were some alterations in how many samples were collected from each zone due to changes in vehicle arrivals on-site. Zones that were altered during this sampling event will be taken into consideration during subsequent sampling events to ensure that samples taken continue to meet or exceed sampling goals.

Fieldwork Sampling Event 6 (December 5–9, 2022, Winter)

Sample Count	Target	Actual
Collector A	**23**	**23**
Zone 1	12	12

Zone 4	11	11
Collector B	**22**	**22**
Zone 2	11	11
Zone 3	11	11
Grand Total	**45**	**45**

Reason for difference between planned and actual sample counts, if any:

Cascadia field crew captured and sorted the commercial garbage samples at Seattle's South Transfer Station. There were some alterations in how many samples were collected from each zone due to changes in vehicle arrivals on-site. Overall, Cascadia collected all 45 samples that were planned for the sampling event.

APPENDIX D. DETAILED COMPOSITION TABLES

This section shows detailed composition tables for the overall commercial garbage stream and by sub-sector categories:

- Vehicle type (front loaders, rear loaders, or roll-offs)
- Commercial Density (high or low)
- Detailed Commercial Sectors (manufacturing, wholesale trade, retail trade and grocery, health care, offices and other services, or construction)
- Season (spring, summer, fall, or winter)

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

Except where noted, composition tables also present estimated tons of each material in the commercial garbage stream, calculated by applying estimated composition percentages to the estimated total tons of materials disposed in commercial garbage stream during the relevant study period, provided by SPU.

Table 17. Detailed Composition Table: Citywide Commercial

Material	Est. %	+ / -	Est. Tons	Material	Est. %	+ / -	Est. Tons
Curbside Recyclable	**20.9%**	**1.7%**	**21,875**	**Compostable Organics**	**20.8%**	**2.8%**	**21,730**
Compostable	**29.1%**	**2.9%**	**30,402**	Leaves & Grass	1.1%	0.4%	1,146
Other Recoverable	**18.2%**	**1.9%**	**19,055**	Prunings	0.3%	0.3%	357
Non-recoverable	**31.7%**	**3.0%**	**33,176**	Packaged Edible Vegetative Food Waste	0.9%	0.3%	890
				Edible Vegetative Food Waste	1.9%	0.7%	2,021
Paper	**23.7%**	**2.0%**	**24,777**	Packaged Edible Other Food Waste	6.2%	2.1%	6,482
Newspaper	0.3%	0.1%	338	Edible Food Waste Other	4.6%	0.7%	4,847
Cardboard & Kraft Paper	5.1%	0.9%	5,358	Inedible Vegetative Food Waste	4.1%	1.0%	4,308
Grocery or Shopping Bags	0.7%	0.1%	688	Inedible Other Food Waste	0.9%	0.4%	985
Paper Packaging	1.5%	0.3%	1,566	Fats, Oils, & Grease	0.5%	0.5%	559
Paper Products	2.7%	0.6%	2,781	Other Compostable Organics	0.1%	0.0%	137
Aseptic Containers	0.1%	0.0%	103	**Other Organics**	**9.4%**	**2.5%**	**9,817**
Gable Top Containers	0.1%	0.0%	116	Textiles	2.4%	0.4%	2,545
Other Poly-coated Containers	0.1%	0.1%	154	Mixed Textiles	1.0%	0.2%	1,050
Non-coated or Soiled Paper Products	7.2%	0.8%	7,526	Tires	0.2%	0.1%	169
Non-coated Single-use Food Packaging	0.8%	0.2%	876	Diapers	4.3%	2.4%	4,454
Shredded Paper	0.0%	0.0%	47	Animal By-products	1.0%	0.3%	1,057
Waxed Cardboard	1.5%	0.7%	1,608	Rubber Products	0.5%	0.2%	542
Coated Single-use Food Packaging	0.9%	0.1%	965	**Furniture, Appliances, & Electronics**	**3.0%**	**0.9%**	**3,157**
Mixed or Other Paper	2.5%	0.6%	2,652	Furniture	1.3%	0.6%	1,383
Plastic	**19.2%**	**1.5%**	**20,038**	Mattresses	0.2%	0.2%	175
PET Bottles & Jars	0.7%	0.1%	762	Small Appliances	0.5%	0.2%	541
HDPE Natural Bottles & Jars	0.3%	0.1%	297	CFL Lights	0.0%	0.0%	3
HDPE Colored Bottles & Jars	0.2%	0.2%	247	LED Lighting	0.0%	0.0%	3
PP Bottles & Jars	0.1%	0.1%	116	Rechargeable Batteries	0.0%	0.0%	3
Other Plastic Bottles & Jars	0.0%	0.0%	11	Dry Cell Batteries	0.0%	0.0%	15
PET Non-bottle Packaging	0.4%	0.1%	462	Wet Cell Batteries	0.0%	0.0%	-
HDPE Non-bottle Packaging	0.8%	0.3%	795	E-Cycle WA Accepted Electronics	0.8%	0.5%	887
PP Non-bottle Packaging	0.8%	0.2%	810	Non-E-Cycle WA Accepted Electronics	0.1%	0.1%	148
Other Non Bottle Packaging	0.4%	0.1%	431	**Construction Debris**	**10.7%**	**1.6%**	**11,223**
Other Single-use Food Service Packaging	0.8%	0.2%	846	Clean Dimensional Lumber	1.0%	0.3%	994
Small Durable Plastic Products	0.8%	0.2%	848	Clean Engineered Wood	2.1%	0.6%	2,177
PLA Single-use Food Service Utensils	0.1%	0.0%	57	Pallets & Crates	1.5%	0.7%	1,536
PLA Single-use Food Service Packaging	0.1%	0.0%	97	Other Untreated Wood	0.0%	0.0%	16
Compostable Plastic Bags	0.1%	0.0%	71	New Gypsum Scrap	0.1%	0.1%	82
EPS Non Food Grade	0.4%	0.1%	459	Demo Gypsum Scrap	0.3%	0.2%	321
Rigid Foam Insulation	0.1%	0.1%	57	Carpet	0.8%	0.3%	788
Takeout & Retail Bags	0.3%	0.1%	293	Felt Carpet Pad	0.0%	0.0%	30
Stretch Wrap	0.8%	0.4%	854	Rock, Concrete, & Other Aggregates	0.2%	0.2%	250
Other Clean Polyethylene Film	1.5%	0.6%	1,608	Asphaltic Roofing	0.0%	0.0%	-
Large Durable Plastic Products	2.0%	0.5%	2,080	Liquid Latex Paint	0.2%	0.2%	196
EPS Food Grade	0.2%	0.1%	165	New Painted Wood	1.9%	0.7%	1,983
Other Single-use Food Service Utensils	0.1%	0.0%	110	Old Painted Wood	0.0%	0.0%	23
Plastic Pouches	0.1%	0.1%	116	Creosote Treated Wood	0.1%	0.1%	54
Plastic Mailers	0.1%	0.0%	67	Other Treated Wood	0.2%	0.1%	243
Garbage Bags	2.8%	0.2%	2,913	Contaminated Wood	0.7%	0.3%	772
Other Film	4.4%	0.7%	4,548	Fiberglass Insulation	0.3%	0.2%	291
Plastic Other Materials	0.9%	0.2%	918	Ceramics	0.2%	0.1%	161
Glass	**1.8%**	**0.4%**	**1,854**	Other Construction Debris	1.3%	0.4%	1,307
Clear Beverage Glass	0.6%	0.1%	656	**Potentially Harmful Wastes**	**2.7%**	**1.3%**	**2,854**
Green Beverage Glass	0.2%	0.1%	245	Oil Based Paints	0.0%	0.0%	3
Brown Beverage Glass	0.4%	0.1%	397	Medications	0.0%	0.0%	20
Container Glass	0.1%	0.0%	111	Other Harmful Wastes	0.2%	0.1%	225
Mixed Cullet	0.0%	0.0%	16	Medical Waste	2.3%	1.2%	2,359
Other Glass	0.4%	0.3%	428	Non Caustic Chemicals	0.0%	0.1%	52
Metal	**6.3%**	**1.3%**	**6,593**	Vitamins & Supplements	0.0%	0.0%	8
Aluminum Cans	0.4%	0.0%	388	Cosmetics	0.2%	0.1%	187
Aluminum Foil or Containers	0.2%	0.1%	247	**Fines & Miscellaneous Materials**	**2.4%**	**0.4%**	**2,466**
Steel Food Cans	0.3%	0.1%	297	Personal Protective Equipment	0.5%	0.1%	542
Empty Aerosol Cans	0.1%	0.0%	85	Soil & Dirt	0.6%	0.3%	597
Other Ferrous	2.6%	0.7%	2,702	Non-distinct Fines	0.4%	0.1%	389
Other Aluminum	0.1%	0.1%	129	Misc. Organics	0.5%	0.2%	512
Oil Filters	0.0%	0.0%	16	Misc. Inorganics	0.4%	0.1%	426
Other Nonferrous	0.1%	0.0%	86				
Mixed Metals	2.5%	0.9%	2,641				
Sample Count	*271*			**Total Tons**	**100%**		**104,509**

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

Vehicle Type

Front Loaders

Table 18. Detailed Composition Table: Front Loaders

Material	Est. %	+/-	Est. Tons	Material	Est. %	+/-	Est. Tons
Curbside Recyclable	**21.1%**	**2.1%**	**10,532**	**Compostable Organics**	**17.4%**	**2.5%**	**8,680**
Compostable	**24.6%**	**3.0%**	**12,253**	Leaves & Grass	1.5%	0.8%	764
Other Recoverable	**24.0%**	**3.3%**	**11,971**	Prunings	0.3%	0.3%	152
Non-recoverable	**30.3%**	**2.8%**	**15,132**	Packaged Edible Vegetative Food Waste	0.9%	0.5%	443
				Edible Vegetative Food Waste	1.1%	0.3%	546
Paper	**22.6%**	**2.5%**	**11,288**	Packaged Edible Other Food Waste	4.7%	1.3%	2,344
Newspaper	0.4%	0.2%	206	Edible Food Waste Other	4.5%	0.9%	2,250
Cardboard & Kraft Paper	4.7%	0.8%	2,339	Inedible Vegetative Food Waste	3.0%	0.9%	1,520
Grocery Or Shopping Bags	0.7%	0.1%	373	Inedible Other Food Waste	0.8%	0.3%	406
Paper Packaging	1.3%	0.3%	649	Fats, Oils, & Grease	0.4%	0.3%	180
Paper Products	3.0%	1.1%	1,510	Other Compostable Organics	0.2%	0.1%	75
Aseptic Containers	0.1%	0.0%	43	**Other Organics**	**8.1%**	**1.2%**	**4,063**
Gable Top Containers	0.1%	0.0%	46	Textiles	2.9%	0.6%	1,465
Other Poly-coated Containers	0.2%	0.3%	125	Mixed Textiles	1.3%	0.3%	635
Non-coated or Soiled Paper Products	6.1%	0.9%	3,063	Tires	0.2%	0.3%	119
Non-coated Single-use Food Packaging	0.7%	0.2%	367	Diapers	1.6%	0.5%	775
Shredded Paper	0.1%	0.1%	38	Animal By-products	1.6%	0.5%	797
Waxed Cardboard	1.0%	1.0%	512	Rubber Products	0.5%	0.2%	272
Coated Single-use Food Packaging	0.9%	0.2%	462	**Furniture, Appliances, & Electronics**	**4.5%**	**1.6%**	**2,235**
Mixed Or Other Paper	3.1%	0.9%	1,556	Furniture	1.8%	1.0%	881
Plastic	**18.9%**	**1.9%**	**9,444**	Mattresses	0.3%	0.4%	152
PET Bottles & Jars	0.7%	0.1%	346	Small Appliances	0.8%	0.4%	388
HDPE Natural Bottles & Jars	0.2%	0.1%	123	CFL Lights	0.0%	0.0%	1
HDPE Colored Bottles & Jars	0.1%	0.0%	58	LED Lighting	0.0%	0.0%	3
PP Bottles & Jars	0.0%	0.0%	21	Rechargeable Batteries	0.0%	0.0%	1
Other Plastic Bottles & Jars	0.0%	0.0%	6	Dry Cell Batteries	0.0%	0.0%	9
PET Non-bottle Packaging	0.3%	0.1%	138	Wet Cell Batteries	0.0%	0.0%	-
HDPE Non-bottle Packaging	0.7%	0.2%	349	E-Cycle WA Accepted Electronics	1.4%	1.0%	720
PP Non-bottle Packaging	0.4%	0.1%	197	Non-E-Cycle WA Accepted Electronics	0.2%	0.1%	80
Other Non Bottle Packaging	0.4%	0.1%	197	**Construction Debris**	**14.7%**	**2.6%**	**7,310**
Other Single-use Food Service Packaging	0.7%	0.2%	348	Clean Dimensional Lumber	1.4%	0.6%	708
Small Durable Plastic Products	1.0%	0.4%	501	Clean Engineered Wood	2.8%	1.2%	1,403
PLA Single-use Food Service Utensils	0.1%	0.0%	26	Pallets & Crates	2.7%	1.6%	1,322
PLA Single-use Food Service Packaging	0.1%	0.1%	51	Other Untreated Wood	0.0%	0.0%	5
Compostable Plastic Bags	0.1%	0.0%	29	New Gypsum Scrap	0.1%	0.1%	54
EPS Non Food Grade	0.2%	0.1%	121	Demo Gypsum Scrap	0.5%	0.3%	247
Rigid Foam Insulation	0.0%	0.0%	3	Carpet	0.7%	0.5%	343
Takeout & Retail Bags	0.2%	0.1%	118	Felt Carpet Pad	0.0%	0.0%	23
Stretch Wrap	1.2%	0.7%	579	Rock, Concrete, & Other Aggregates	0.1%	0.1%	69
Other Clean Polyethylene Film	1.7%	1.0%	836	Asphaltic Roofing	0.0%	0.0%	-
Large Durable Plastic Products	2.7%	0.8%	1,345	Liquid Latex Paint	0.3%	0.3%	168
EPS Food Grade	0.1%	0.0%	58	New Painted Wood	2.3%	1.0%	1,137
Other Single-use Food Service Utensils	0.1%	0.0%	50	Old Painted Wood	0.0%	0.0%	8
Plastic Pouches	0.1%	0.0%	29	Creosote Treated Wood	0.0%	0.0%	4
Plastic Mailers	0.1%	0.0%	32	Other Treated Wood	0.3%	0.2%	157
Garbage Bags	2.4%	0.3%	1,190	Contaminated Wood	1.2%	0.6%	598
Other Film	4.3%	1.0%	2,132	Fiberglass Insulation	0.4%	0.4%	206
Plastic Other Materials	1.1%	0.3%	562	Ceramics	0.2%	0.1%	105
Glass	**2.3%**	**0.8%**	**1,164**	Other Construction Debris	1.5%	0.7%	754
Clear Beverage Glass	0.8%	0.3%	409	**Potentially Harmful Wastes**	**1.6%**	**0.5%**	**797**
Green Beverage Glass	0.3%	0.1%	173	Oil Based Paints	0.0%	0.0%	3
Brown Beverage Glass	0.4%	0.2%	214	Medications	0.0%	0.0%	6
Container Glass	0.1%	0.0%	38	Other Harmful Wastes	0.2%	0.1%	92
Mixed Cullet	0.0%	0.0%	15	Medical Waste	1.2%	0.5%	598
Other Glass	0.6%	0.6%	316	Non Caustic Chemicals	0.0%	0.0%	15
Metal	**7.5%**	**1.6%**	**3,726**	Vitamins & Supplements	0.0%	0.0%	7
Aluminum Cans	0.4%	0.1%	181	Cosmetics	0.2%	0.1%	75
Aluminum Foil Or Containers	0.3%	0.1%	132	**Fines & Miscellaneous Materials**	**2.4%**	**0.7%**	**1,180**
Steel Food Cans	0.2%	0.0%	96	Personal Protective Equipment	0.4%	0.1%	201
Empty Aerosol Cans	0.1%	0.0%	47	Soil & Dirt	0.8%	0.6%	416
Other Ferrous	3.3%	1.0%	1,654	Non-distinct Fines	0.3%	0.1%	168
Other Aluminum	0.1%	0.1%	57	Misc. Organics	0.5%	0.2%	230
Oil Filters	0.0%	0.0%	14	Misc. Inorganics	0.3%	0.1%	165
Other Nonferrous	0.1%	0.1%	68				
Mixed Metals	3.0%	1.1%	1,476				
Sample Count	*123*			**Total Tons**	**100%**		**49,887**

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

Rear Loaders

Table 19. Detailed Composition Table: Rear Loaders

Material	Est. %	+ / -	Est. Tons	Material	Est. %	+ / -	Est. Tons
Curbside Recyclable	**18.5%**	**2.0%**	**2,592**	**Compostable Organics**	**14.9%**	**1.9%**	**2,085**
Compostable	**21.6%**	**2.6%**	**3,031**	Leaves & Grass	0.6%	0.4%	87
Other Recoverable	**26.9%**	**4.1%**	**3,768**	Prunings	0.3%	0.2%	42
Non-recoverable	**33.0%**	**3.0%**	**4,626**	Packaged Edible Vegetative Food Waste	0.8%	0.2%	119
				Edible Vegetative Food Waste	0.9%	0.2%	132
Paper	**18.8%**	**1.9%**	**2,640**	Packaged Edible Other Food Waste	2.7%	0.5%	382
Newspaper	0.2%	0.1%	31	Edible Food Waste Other	5.3%	1.3%	741
Cardboard & Kraft Paper	5.1%	1.0%	720	Inedible Vegetative Food Waste	3.2%	0.7%	442
Grocery Or Shopping Bags	0.6%	0.1%	86	Inedible Other Food Waste	0.7%	0.2%	102
Paper Packaging	1.3%	0.2%	181	Fats, Oils, & Grease	0.0%	0.1%	6
Paper Products	1.8%	0.4%	245	Other Compostable Organics	0.2%	0.1%	32
Aseptic Containers	0.1%	0.0%	9	**Other Organics**	**9.5%**	**2.0%**	**1,330**
Gable Top Containers	0.1%	0.0%	13	Textiles	3.5%	0.7%	490
Other Poly-coated Containers	0.1%	0.0%	9	Mixed Textiles	1.8%	0.5%	251
Non-coated or Soiled Paper Products	5.6%	0.9%	782	Tires	0.4%	0.4%	50
Non-coated Single-use Food Packaging	0.9%	0.3%	133	Diapers	2.0%	1.4%	276
Shredded Paper	0.1%	0.0%	9	Animal By-products	1.2%	0.4%	162
Waxed Cardboard	0.2%	0.2%	35	Rubber Products	0.7%	0.3%	101
Coated Single-use Food Packaging	0.8%	0.2%	118	**Furniture, Appliances, & Electronics**	**4.5%**	**1.9%**	**633**
Mixed Or Other Paper	1.9%	0.5%	269	Furniture	1.7%	1.0%	238
Plastic	**16.6%**	**1.4%**	**2,330**	Mattresses	0.2%	0.2%	22
PET Bottles & Jars	0.6%	0.1%	81	Small Appliances	1.0%	0.5%	143
HDPE Natural Bottles & Jars	0.3%	0.1%	36	CFL Lights	0.0%	0.0%	1
HDPE Colored Bottles & Jars	0.1%	0.0%	19	LED Lighting	0.0%	0.0%	0
PP Bottles & Jars	0.1%	0.0%	11	Rechargeable Batteries	0.0%	0.0%	0
Other Plastic Bottles & Jars	0.0%	0.0%	3	Dry Cell Batteries	0.0%	0.0%	3
PET Non-bottle Packaging	0.3%	0.1%	49	Wet Cell Batteries	0.0%	0.0%	-
HDPE Non-bottle Packaging	0.5%	0.1%	66	E-Cycle WA Accepted Electronics	1.1%	1.5%	161
PP Non-bottle Packaging	0.4%	0.1%	61	Non-E-Cycle WA Accepted Electronics	0.5%	0.4%	65
Other Non Bottle Packaging	0.4%	0.1%	59	**Construction Debris**	**20.0%**	**4.1%**	**2,804**
Other Single-use Food Service Packaging	0.6%	0.1%	84	Clean Dimensional Lumber	1.9%	0.6%	269
Small Durable Plastic Products	1.0%	0.2%	139	Clean Engineered Wood	4.0%	1.7%	554
PLA Single-use Food Service Utensils	0.1%	0.0%	9	Pallets & Crates	1.1%	0.6%	151
PLA Single-use Food Service Packaging	0.1%	0.0%	8	Other Untreated Wood	0.1%	0.1%	11
Compostable Plastic Bags	0.0%	0.0%	6	New Gypsum Scrap	0.0%	0.0%	-
EPS Non Food Grade	0.5%	0.2%	71	Demo Gypsum Scrap	0.5%	0.4%	68
Rigid Foam Insulation	0.0%	0.0%	-	Carpet	2.7%	1.6%	382
Takeout & Retail Bags	0.2%	0.0%	33	Felt Carpet Pad	0.1%	0.1%	7
Stretch Wrap	0.3%	0.2%	48	Rock, Concrete, & Other Aggregates	1.3%	1.2%	180
Other Clean Polyethylene Film	0.9%	0.4%	120	Asphaltic Roofing	0.0%	0.0%	-
Large Durable Plastic Products	2.6%	0.9%	366	Liquid Latex Paint	0.2%	0.1%	25
EPS Food Grade	0.3%	0.3%	45	New Painted Wood	2.2%	0.9%	311
Other Single-use Food Service Utensils	0.1%	0.0%	18	Old Painted Wood	0.1%	0.1%	15
Plastic Pouches	0.1%	0.1%	12	Creosote Treated Wood	0.4%	0.4%	50
Plastic Mailers	0.1%	0.0%	7	Other Treated Wood	0.3%	0.2%	48
Garbage Bags	2.1%	0.3%	291	Contaminated Wood	1.0%	0.5%	136
Other Film	3.6%	0.5%	509	Fiberglass Insulation	0.1%	0.1%	14
Plastic Other Materials	1.3%	0.4%	178	Ceramics	0.3%	0.3%	48
Glass	**2.1%**	**0.7%**	**299**	Other Construction Debris	3.8%	1.7%	534
Clear Beverage Glass	0.5%	0.2%	67	**Potentially Harmful Wastes**	**3.9%**	**2.3%**	**553**
Green Beverage Glass	0.3%	0.1%	37	Oil Based Paints	0.0%	0.0%	-
Brown Beverage Glass	0.7%	0.2%	93	Medications	0.1%	0.1%	11
Container Glass	0.1%	0.0%	20	Other Harmful Wastes	0.1%	0.1%	19
Mixed Cullet	0.0%	0.0%	2	Medical Waste	3.2%	2.1%	451
Other Glass	0.6%	0.4%	81	Non Caustic Chemicals	0.0%	0.0%	2
Metal	**6.8%**	**1.2%**	**950**	Vitamins & Supplements	0.0%	0.0%	1
Aluminum Cans	0.3%	0.1%	46	Cosmetics	0.5%	0.6%	67
Aluminum Foil Or Containers	0.3%	0.1%	38	**Fines & Miscellaneous Materials**	**2.8%**	**0.9%**	**393**
Steel Food Cans	0.4%	0.1%	56	Personal Protective Equipment	0.5%	0.2%	74
Empty Aerosol Cans	0.1%	0.1%	20	Soil & Dirt	0.4%	0.5%	57
Other Ferrous	2.2%	0.7%	312	Non-distinct Fines	0.6%	0.2%	80
Other Aluminum	0.2%	0.1%	23	Misc. Organics	0.5%	0.2%	64
Oil Filters	0.0%	0.0%	2	Misc. Inorganics	0.8%	0.6%	118
Other Nonferrous	0.1%	0.2%	18				
Mixed Metals	3.1%	0.8%	435				
Sample Count	*116*			**Total Tons**	**100%**		**14,017**

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

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Roll-offs

Table 20. Detailed Composition Table: Roll-offs

Material	Est. %	+/-	Est. Tons	Material	Est. %	+/-	Est. Tons
Curbside Recyclable	**21.6%**	**3.5%**	**8,752**	**Compostable Organics**	**27.0%**	**6.4%**	**10,965**
Compostable	**37.2%**	**6.4%**	**15,118**	Leaves & Grass	0.7%	0.5%	296
Other Recoverable	**8.2%**	**2.5%**	**3,316**	Prunings	0.4%	0.6%	163
Non-recoverable	**33.0%**	**7.0%**	**13,418**	Packaged Edible Vegetative Food Waste	0.8%	0.4%	328
				Edible Vegetative Food Waste	3.3%	1.8%	1,343
Paper	**26.7%**	**3.9%**	**10,848**	Packaged Edible Other Food Waste	9.2%	5.2%	3,755
Newspaper	0.2%	0.1%	101	Edible Food Waste Other	4.6%	1.3%	1,856
Cardboard & Kraft Paper	5.7%	2.0%	2,298	Inedible Vegetative Food Waste	5.8%	2.2%	2,346
Grocery Or Shopping Bags	0.6%	0.2%	228	Inedible Other Food Waste	1.2%	0.8%	477
Paper Packaging	1.8%	0.7%	737	Fats, Oils, & Grease	0.9%	1.3%	372
Paper Products	2.5%	0.8%	1,025	Other Compostable Organics	0.1%	0.0%	29
Aseptic Containers	0.1%	0.1%	51	**Other Organics**	**10.9%**	**6.3%**	**4,424**
Gable Top Containers	0.1%	0.1%	58	Textiles	1.5%	0.8%	590
Other Poly-coated Containers	0.1%	0.0%	21	Mixed Textiles	0.4%	0.3%	164
Non-coated or Soiled Paper Products	9.1%	1.7%	3,681	Tires	0.0%	0.0%	-
Non-coated Single-use Food Packaging	0.9%	0.4%	376	Diapers	8.4%	6.1%	3,403
Shredded Paper	0.0%	0.0%	-	Animal By-products	0.2%	0.2%	98
Waxed Cardboard	2.6%	1.3%	1,061	Rubber Products	0.4%	0.5%	169
Coated Single-use Food Packaging	0.9%	0.3%	385	**Furniture, Appliances, & Electronics**	**0.7%**	**1.0%**	**288**
Mixed Or Other Paper	2.0%	0.9%	827	Furniture	0.7%	1.0%	264
Plastic	**20.4%**	**3.0%**	**8,264**	Mattresses	0.0%	0.0%	-
PET Bottles & Jars	0.8%	0.2%	335	Small Appliances	0.0%	0.0%	11
HDPE Natural Bottles & Jars	0.3%	0.1%	138	CFL Lights	0.0%	0.0%	1
HDPE Colored Bottles & Jars	0.4%	0.6%	170	LED Lighting	0.0%	0.0%	-
PP Bottles & Jars	0.2%	0.2%	84	Rechargeable Batteries	0.0%	0.0%	1
Other Plastic Bottles & Jars	0.0%	0.0%	1	Dry Cell Batteries	0.0%	0.0%	3
PET Non-bottle Packaging	0.7%	0.3%	275	Wet Cell Batteries	0.0%	0.0%	-
HDPE Non-bottle Packaging	0.9%	0.7%	380	E-Cycle WA Accepted Electronics	0.0%	0.0%	6
PP Non-bottle Packaging	1.4%	0.6%	552	Non-E-Cycle WA Accepted Electronics	0.0%	0.0%	2
Other Non Bottle Packaging	0.4%	0.1%	175	**Construction Debris**	**2.7%**	**2.1%**	**1,108**
Other Single-use Food Service Packaging	1.0%	0.4%	415	Clean Dimensional Lumber	0.0%	0.0%	16
Small Durable Plastic Products	0.5%	0.3%	208	Clean Engineered Wood	0.5%	0.6%	221
PLA Single-use Food Service Utensils	0.1%	0.0%	22	Pallets & Crates	0.2%	0.1%	63
PLA Single-use Food Service Packaging	0.1%	0.1%	37	Other Untreated Wood	0.0%	0.0%	-
Compostable Plastic Bags	0.1%	0.0%	36	New Gypsum Scrap	0.1%	0.1%	28
EPS Non Food Grade	0.7%	0.4%	267	Demo Gypsum Scrap	0.0%	0.0%	6
Rigid Foam Insulation	0.1%	0.2%	55	Carpet	0.2%	0.3%	64
Takeout & Retail Bags	0.3%	0.2%	142	Felt Carpet Pad	0.0%	0.0%	-
Stretch Wrap	0.6%	0.6%	227	Rock, Concrete, & Other Aggregates	0.0%	0.0%	-
Other Clean Polyethylene Film	1.6%	0.9%	651	Asphaltic Roofing	0.0%	0.0%	-
Large Durable Plastic Products	0.9%	0.7%	369	Liquid Latex Paint	0.0%	0.0%	3
EPS Food Grade	0.2%	0.1%	62	New Painted Wood	1.3%	1.3%	535
Other Single-use Food Service Utensils	0.1%	0.0%	42	Old Painted Wood	0.0%	0.0%	-
Plastic Pouches	0.2%	0.2%	75	Creosote Treated Wood	0.0%	0.0%	-
Plastic Mailers	0.1%	0.1%	28	Other Treated Wood	0.1%	0.1%	38
Garbage Bags	3.5%	0.5%	1,432	Contaminated Wood	0.1%	0.1%	38
Other Film	4.7%	1.1%	1,907	Fiberglass Insulation	0.2%	0.3%	71
Plastic Other Materials	0.4%	0.2%	178	Ceramics	0.0%	0.0%	8
Glass	**1.0%**	**0.4%**	**391**	Other Construction Debris	0.0%	0.1%	19
Clear Beverage Glass	0.4%	0.2%	181	**Potentially Harmful Wastes**	**3.7%**	**3.1%**	**1,505**
Green Beverage Glass	0.1%	0.1%	36	Oil Based Paints	0.0%	0.0%	-
Brown Beverage Glass	0.2%	0.2%	90	Medications	0.0%	0.0%	2
Container Glass	0.1%	0.1%	54	Other Harmful Wastes	0.3%	0.2%	114
Mixed Cullet	0.0%	0.0%	-	Medical Waste	3.2%	3.1%	1,310
Other Glass	0.1%	0.1%	31	Non Caustic Chemicals	0.1%	0.1%	35
Metal	**4.7%**	**2.5%**	**1,917**	Vitamins & Supplements	0.0%	0.0%	-
Aluminum Cans	0.4%	0.1%	162	Cosmetics	0.1%	0.1%	45
Aluminum Foil Or Containers	0.2%	0.1%	77	**Fines & Miscellaneous Materials**	**2.2%**	**0.7%**	**893**
Steel Food Cans	0.4%	0.2%	145	Personal Protective Equipment	0.7%	0.3%	267
Empty Aerosol Cans	0.0%	0.0%	19	Soil & Dirt	0.3%	0.4%	125
Other Ferrous	1.8%	1.4%	736	Non-distinct Fines	0.3%	0.1%	141
Other Aluminum	0.1%	0.1%	48	Misc. Organics	0.5%	0.4%	218
Oil Filters	0.0%	0.0%	-	Misc. Inorganics	0.3%	0.2%	142
Other Nonferrous	0.0%	0.0%	0				
Mixed Metals	1.8%	1.8%	730				
Sample Count	*32*			**Total Tons**	**100%**		**40,604**

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

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Commercial Density

High-Density Commercial Areas

Table 21. Detailed Composition Table: High-Density Commercial Areas

Material	Est. %	+/-	Est. Tons	Material	Est. %	+/-	Est. Tons
Curbside Recyclable	**19.5%**	**2.2%**	**5,801**	**Compostable Organics**	**17.4%**	**2.3%**	**5,156**
Compostable	**24.7%**	**3.0%**	**7,344**	Leaves & Grass	1.5%	0.7%	449
Other Recoverable	**22.1%**	**2.9%**	**6,559**	Prunings	0.3%	0.2%	88
Non-recoverable	**33.6%**	**3.2%**	**9,993**	Packaged Edible Vegetative Food Waste	1.0%	0.2%	300
				Edible Vegetative Food Waste	1.0%	0.3%	297
Paper	**21.4%**	**2.4%**	**6,357**	Packaged Edible Other Food Waste	4.0%	0.9%	1,198
Newspaper	0.6%	0.4%	173	Edible Food Waste Other	5.2%	1.0%	1,537
Cardboard & Kraft Paper	4.4%	0.9%	1,316	Inedible Vegetative Food Waste	3.4%	1.2%	1,016
Grocery Or Shopping Bags	0.8%	0.1%	226	Inedible Other Food Waste	0.6%	0.2%	185
Paper Packaging	1.4%	0.4%	417	Fats, Oils, & Grease	0.2%	0.2%	47
Paper Products	1.9%	0.5%	576	Other Compostable Organics	0.1%	0.0%	39
Aseptic Containers	0.1%	0.0%	25	**Other Organics**	**10.7%**	**1.5%**	**3,171**
Gable Top Containers	0.1%	0.0%	37	Textiles	3.6%	0.6%	1,074
Other Poly-coated Containers	0.4%	0.5%	113	Mixed Textiles	1.6%	0.4%	489
Non-coated or Soiled Paper Products	6.0%	1.0%	1,783	Tires	0.2%	0.2%	50
Non-coated Single-use Food Packaging	1.0%	0.3%	300	Diapers	2.8%	1.0%	821
Shredded Paper	0.1%	0.0%	18	Animal By-products	2.0%	0.5%	595
Waxed Cardboard	1.3%	1.6%	379	Rubber Products	0.5%	0.2%	143
Coated Single-use Food Packaging	0.9%	0.2%	264	**Furniture, Appliances, & Electronics**	**4.3%**	**1.5%**	**1,262**
Mixed Or Other Paper	2.5%	0.6%	729	Furniture	1.5%	1.1%	450
Plastic	**16.0%**	**1.5%**	**4,746**	Mattresses	0.2%	0.2%	61
PET Bottles & Jars	0.7%	0.1%	199	Small Appliances	0.9%	0.4%	259
HDPE Natural Bottles & Jars	0.2%	0.0%	55	CFL Lights	0.0%	0.0%	1
HDPE Colored Bottles & Jars	0.1%	0.0%	38	LED Lighting	0.0%	0.0%	2
PP Bottles & Jars	0.1%	0.0%	18	Rechargeable Batteries	0.0%	0.0%	1
Other Plastic Bottles & Jars	0.0%	0.0%	5	Dry Cell Batteries	0.0%	0.0%	8
PET Non-bottle Packaging	0.4%	0.1%	112	Wet Cell Batteries	0.0%	0.0%	-
HDPE Non-bottle Packaging	0.5%	0.1%	147	E-Cycle WA Accepted Electronics	1.3%	1.0%	377
PP Non-bottle Packaging	0.5%	0.1%	143	Non-E-Cycle WA Accepted Electronics	0.4%	0.2%	105
Other Non Bottle Packaging	0.4%	0.1%	106	**Construction Debris**	**15.2%**	**2.6%**	**4,527**
Other Single-use Food Service Packaging	0.7%	0.1%	205	Clean Dimensional Lumber	1.2%	0.4%	348
Small Durable Plastic Products	0.6%	0.1%	185	Clean Engineered Wood	2.7%	1.0%	804
PLA Single-use Food Service Utensils	0.1%	0.0%	22	Pallets & Crates	1.0%	0.8%	305
PLA Single-use Food Service Packaging	0.2%	0.1%	47	Other Untreated Wood	0.1%	0.1%	16
Compostable Plastic Bags	0.1%	0.0%	17	New Gypsum Scrap	0.2%	0.2%	54
EPS Non Food Grade	0.3%	0.1%	100	Demo Gypsum Scrap	0.7%	0.5%	210
Rigid Foam Insulation	0.0%	0.0%	1	Carpet	1.5%	0.8%	457
Takeout & Retail Bags	0.3%	0.1%	82	Felt Carpet Pad	0.1%	0.1%	16
Stretch Wrap	0.3%	0.1%	77	Rock, Concrete, & Other Aggregates	0.7%	0.6%	194
Other Clean Polyethylene Film	0.9%	0.4%	263	Asphaltic Roofing	0.0%	0.0%	-
Large Durable Plastic Products	1.8%	0.5%	532	Liquid Latex Paint	0.6%	0.6%	166
EPS Food Grade	0.2%	0.2%	71	New Painted Wood	1.9%	0.6%	561
Other Single-use Food Service Utensils	0.1%	0.0%	37	Old Painted Wood	0.0%	0.0%	8
Plastic Pouches	0.1%	0.0%	24	Creosote Treated Wood	0.2%	0.2%	51
Plastic Mailers	0.1%	0.0%	21	Other Treated Wood	0.6%	0.4%	171
Garbage Bags	2.5%	0.4%	750	Contaminated Wood	1.3%	0.6%	372
Other Film	3.8%	1.1%	1,117	Fiberglass Insulation	0.2%	0.2%	58
Plastic Other Materials	1.2%	0.4%	370	Ceramics	0.2%	0.1%	61
Glass	**2.0%**	**0.4%**	**600**	Other Construction Debris	2.3%	1.0%	675
Clear Beverage Glass	0.7%	0.2%	198	**Potentially Harmful Wastes**	**3.0%**	**1.1%**	**877**
Green Beverage Glass	0.4%	0.2%	124	Oil Based Paints	0.0%	0.0%	3
Brown Beverage Glass	0.6%	0.2%	178	Medications	0.1%	0.0%	15
Container Glass	0.1%	0.0%	24	Other Harmful Wastes	0.1%	0.0%	23
Mixed Cullet	0.0%	0.1%	15	Medical Waste	2.4%	1.0%	703
Other Glass	0.2%	0.1%	62	Non Caustic Chemicals	0.0%	0.0%	1
Metal	**7.5%**	**1.6%**	**2,227**	Vitamins & Supplements	0.0%	0.0%	4
Aluminum Cans	0.3%	0.1%	96	Cosmetics	0.4%	0.3%	129
Aluminum Foil Or Containers	0.2%	0.0%	67	**Fines & Miscellaneous Materials**	**2.6%**	**0.9%**	**773**
Steel Food Cans	0.3%	0.1%	82	Personal Protective Equipment	0.4%	0.1%	107
Empty Aerosol Cans	0.1%	0.0%	38	Soil & Dirt	0.9%	0.7%	264
Other Ferrous	3.0%	1.1%	883	Non-distinct Fines	0.4%	0.1%	122
Other Aluminum	0.0%	0.0%	8	Misc. Organics	0.4%	0.2%	108
Oil Filters	0.0%	0.0%	11	Misc. Inorganics	0.6%	0.3%	173
Other Nonferrous	0.2%	0.1%	45				
Mixed Metals	3.4%	1.3%	997				
Sample Count	*125*			**Total Tons**	**100%**		**29,696**

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

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Low-Density Commercial Areas

Table 22. Detailed Composition Table: Low-Density Commercial Areas

Material	Est. %	+ / -	Est. Tons	Material	Est. %	+ / -	Est. Tons
Curbside Recyclable	**21.4%**	**2.6%**	**7,323**	**Compostable Organics**	**16.4%**	**3.2%**	**5,608**
Compostable	**23.2%**	**3.6%**	**7,940**	Leaves & Grass	1.2%	1.0%	402
Other Recoverable	**26.8%**	**4.4%**	**9,180**	Prunings	0.3%	0.4%	106
Non-recoverable	**28.5%**	**3.3%**	**9,765**	Packaged Edible Vegetative Food Waste	0.8%	0.7%	262
				Edible Vegetative Food Waste	1.1%	0.5%	381
Paper	**22.1%**	**3.2%**	**7,571**	Packaged Edible Other Food Waste	4.5%	1.8%	1,528
Newspaper	0.2%	0.1%	64	Edible Food Waste Other	4.3%	1.2%	1,454
Cardboard & Kraft Paper	5.1%	1.0%	1,743	Inedible Vegetative Food Waste	2.8%	0.9%	946
Grocery Or Shopping Bags	0.7%	0.2%	234	Inedible Other Food Waste	0.9%	0.5%	322
Paper Packaging	1.2%	0.2%	413	Fats, Oils, & Grease	0.4%	0.5%	139
Paper Products	3.4%	1.5%	1,180	Other Compostable Organics	0.2%	0.1%	69
Aseptic Containers	0.1%	0.0%	26	**Other Organics**	**6.5%**	**1.5%**	**2,222**
Gable Top Containers	0.1%	0.0%	22	Textiles	2.6%	0.7%	881
Other Poly-coated Containers	0.1%	0.0%	20	Mixed Textiles	1.2%	0.4%	398
Non-coated or Soiled Paper Products	6.0%	1.1%	2,061	Tires	0.3%	0.4%	119
Non-coated Single-use Food Packaging	0.6%	0.1%	200	Diapers	0.7%	0.4%	230
Shredded Paper	0.1%	0.1%	29	Animal By-products	1.1%	0.6%	364
Waxed Cardboard	0.5%	0.3%	168	Rubber Products	0.7%	0.3%	230
Coated Single-use Food Packaging	0.9%	0.2%	316	**Furniture, Appliances, & Electronics**	**4.7%**	**2.0%**	**1,606**
Mixed Or Other Paper	3.2%	1.2%	1,096	Furniture	2.0%	1.2%	669
Plastic	**20.5%**	**2.5%**	**7,028**	Mattresses	0.3%	0.5%	114
PET Bottles & Jars	0.7%	0.2%	228	Small Appliances	0.8%	0.4%	272
HDPE Natural Bottles & Jars	0.3%	0.1%	103	CFL Lights	0.0%	0.0%	1
HDPE Colored Bottles & Jars	0.1%	0.0%	38	LED Lighting	0.0%	0.0%	1
PP Bottles & Jars	0.0%	0.0%	14	Rechargeable Batteries	0.0%	0.0%	-
Other Plastic Bottles & Jars	0.0%	0.0%	5	Dry Cell Batteries	0.0%	0.0%	5
PET Non-bottle Packaging	0.2%	0.0%	75	Wet Cell Batteries	0.0%	0.0%	-
HDPE Non-bottle Packaging	0.8%	0.3%	268	E-Cycle WA Accepted Electronics	1.5%	1.3%	504
PP Non-bottle Packaging	0.3%	0.1%	116	Non-E-Cycle WA Accepted Electronics	0.1%	0.1%	41
Other Non Bottle Packaging	0.4%	0.1%	149	**Construction Debris**	**16.3%**	**3.5%**	**5,588**
Other Single-use Food Service Packaging	0.7%	0.3%	226	Clean Dimensional Lumber	1.8%	0.8%	629
Small Durable Plastic Products	1.3%	0.6%	455	Clean Engineered Wood	3.4%	1.6%	1,153
PLA Single-use Food Service Utensils	0.0%	0.0%	13	Pallets & Crates	3.4%	2.2%	1,169
PLA Single-use Food Service Packaging	0.0%	0.0%	13	Other Untreated Wood	0.0%	0.0%	0
Compostable Plastic Bags	0.0%	0.0%	17	New Gypsum Scrap	0.0%	0.0%	-
EPS Non Food Grade	0.3%	0.1%	92	Demo Gypsum Scrap	0.3%	0.3%	105
Rigid Foam Insulation	0.0%	0.0%	1	Carpet	0.8%	0.6%	267
Takeout & Retail Bags	0.2%	0.0%	69	Felt Carpet Pad	0.0%	0.0%	14
Stretch Wrap	1.6%	1.0%	550	Rock, Concrete, & Other Aggregates	0.2%	0.1%	56
Other Clean Polyethylene Film	2.0%	1.5%	694	Asphaltic Roofing	0.0%	0.0%	-
Large Durable Plastic Products	3.4%	1.2%	1,179	Liquid Latex Paint	0.1%	0.0%	28
EPS Food Grade	0.1%	0.0%	33	New Painted Wood	2.6%	1.4%	887
Other Single-use Food Service Utensils	0.1%	0.0%	31	Old Painted Wood	0.0%	0.0%	15
Plastic Pouches	0.1%	0.0%	17	Creosote Treated Wood	0.0%	0.0%	3
Plastic Mailers	0.1%	0.0%	18	Other Treated Wood	0.1%	0.1%	34
Garbage Bags	2.1%	0.3%	731	Contaminated Wood	1.1%	0.7%	362
Other Film	4.5%	1.1%	1,525	Fiberglass Insulation	0.5%	0.5%	162
Plastic Other Materials	1.1%	0.4%	369	Ceramics	0.3%	0.2%	91
Glass	**2.5%**	**1.1%**	**863**	Other Construction Debris	1.8%	0.8%	613
Clear Beverage Glass	0.8%	0.3%	278	**Potentially Harmful Wastes**	**1.4%**	**0.6%**	**472**
Green Beverage Glass	0.3%	0.1%	86	Oil Based Paints	0.0%	0.0%	-
Brown Beverage Glass	0.4%	0.3%	130	Medications	0.0%	0.0%	3
Container Glass	0.1%	0.0%	33	Other Harmful Wastes	0.3%	0.2%	89
Mixed Cullet	0.0%	0.0%	2	Medical Waste	1.0%	0.6%	347
Other Glass	1.0%	0.9%	335	Non Caustic Chemicals	0.0%	0.1%	16
Metal	**7.2%**	**1.9%**	**2,448**	Vitamins & Supplements	0.0%	0.0%	5
Aluminum Cans	0.4%	0.1%	130	Cosmetics	0.0%	0.0%	14
Aluminum Foil Or Containers	0.3%	0.2%	103	**Fines & Miscellaneous Materials**	**2.3%**	**0.8%**	**800**
Steel Food Cans	0.2%	0.1%	71	Personal Protective Equipment	0.5%	0.2%	169
Empty Aerosol Cans	0.1%	0.0%	28	Soil & Dirt	0.6%	0.7%	208
Other Ferrous	3.2%	1.2%	1,083	Non-distinct Fines	0.4%	0.1%	126
Other Aluminum	0.2%	0.2%	73	Misc. Organics	0.5%	0.3%	186
Oil Filters	0.0%	0.0%	5	Misc. Inorganics	0.3%	0.1%	111
Other Nonferrous	0.1%	0.1%	40				
Mixed Metals	2.7%	1.3%	914				
Sample Count	*114*			**Total Tons**	**100%**		**34,208**

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

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Commercial Sectors

During sampling, the field crew gather data to identify the commercial sector that had disposed of the garbage they sampled. Because commercial garbage trucks often collect waste from a mix of business types, only 59 of the 271 samples collected could be assigned to a specific commercial sector. Table 23**Error! Reference source not found.** shows the number of samples that could be assigned to specific commercial sectors. For the office & other services, we typically determined that the waste came from an office or service sector but could not identify the specific NAICS sector, so the NAICS sectors listed represent those most likely to have been included. Because so few samples came from educational services and other services, we combined them with offices.

Table 23. Commercial Sector Descriptions and Sample Counts

Commercial Sector	Number of Samples	NAICS Sectors and Codes
Manufacturing	4	Manufacturing (31–33)
Wholesale	11	Wholesale Trade (42)
Retail Trade & Grocery	13	Retail Trade (44–45)
Health Care	9	Health Care and Social Assistance (62)
Office & Other Services	6	Information (51) Finance and Insurance (52) Professional, Scientific, and Technical Services (54) Management of Companies and Enterprises (55) Educational Services (61) Other Services (except Public Administration) (81)
Construction	16	Construction (23)

During sampling, no loads arrived that could be attributed to the following sectors:

- Agriculture, Forestry, Fishing and Hunting (11)
- Mining, Quarrying, and Oil and Gas Extraction (21)
- Utilities (22)
- Transportation and Warehousing (48–49)
- Real Estate and Rental and Leasing (53)
- Administrative and Support and Waste Management and Remediation Services (56)
- Arts, Entertainment, and Recreation (71)
- Accommodation and Food Services (72)
- Public Administration (92)

Because these commercial sector analyses are based on a very small number of samples, they provide rough estimates only with a relatively wide margin of error. Because data are not available on the total tonnage of garbage disposed by these commercials sectors, compositions are shown without tons, using unweighted percentages only.

Manufacturing

Table 24. Detailed Composition Table: Manufacturing Sector

Material	Est. %	+ / -	Material	Est. %	+ / -
Curbside Recyclable	**20.6%**	**21.7%**	**Compostable Organics**	**23.5%**	**34.9%**
Compostable	**24.4%**	**36.0%**	Leaves & Grass	0.1%	0.2%
Other Recoverable	**7.3%**	**3.1%**	Prunings	0.0%	0.0%
Non-recoverable	**47.6%**	**23.7%**	Packaged Edible Vegetative Food Waste	0.0%	0.0%
			Edible Vegetative Food Waste	0.1%	0.1%
Paper	**24.1%**	**28.7%**	Packaged Edible Other Food Waste	22.7%	34.3%
Newspaper	0.1%	0.1%	Edible Food Waste Other	0.3%	0.4%
Cardboard & Kraft Paper	15.5%	20.1%	Inedible Vegetative Food Waste	0.1%	0.2%
Grocery Or Shopping Bags	0.0%	0.0%	Inedible Other Food Waste	0.1%	0.1%
Paper Packaging	0.5%	0.6%	Fats, Oils, & Grease	0.0%	0.0%
Paper Products	0.5%	0.3%	Other Compostable Organics	0.0%	0.0%
Aseptic Containers	0.3%	0.4%	**Other Organics**	**1.6%**	**1.1%**
Gable Top Containers	0.0%	0.0%	Textiles	1.5%	1.1%
Other Poly-coated Containers	0.0%	0.0%	Mixed Textiles	0.0%	0.0%
Non-coated or Soiled Paper Products	1.0%	0.4%	Tires	0.0%	0.0%
Non-coated Single-use Food Packaging	0.0%	0.0%	Diapers	0.0%	0.0%
Shredded Paper	0.0%	0.0%	Animal By-products	0.0%	0.0%
Waxed Cardboard	0.0%	0.0%	Rubber Products	0.0%	0.0%
Coated Single-use Food Packaging	0.1%	0.1%	**Furniture, Appliances, & Electronics**	**0.0%**	**0.0%**
Mixed Or Other Paper	6.1%	8.1%	Furniture	0.0%	0.0%
Plastic	**22.0%**	**19.7%**	Mattresses	0.0%	0.0%
PET Bottles & Jars	0.1%	0.1%	Small Appliances	0.0%	0.0%
HDPE Natural Bottles & Jars	0.3%	0.2%	CFL Lights	0.0%	0.0%
HDPE Colored Bottles & Jars	0.0%	0.0%	LED Lighting	0.0%	0.0%
PP Bottles & Jars	0.0%	0.0%	Rechargeable Batteries	0.0%	0.0%
Other Plastic Bottles & Jars	0.0%	0.0%	Dry Cell Batteries	0.0%	0.0%
PET Non-bottle Packaging	0.0%	0.0%	Wet Cell Batteries	0.0%	0.0%
HDPE Non-bottle Packaging	1.8%	1.9%	E-Cycle WA Accepted Electronics	0.0%	0.0%
PP Non-bottle Packaging	0.1%	0.1%	Non-E-Cycle WA Accepted Electronics	0.0%	0.0%
Other Non Bottle Packaging	0.3%	0.3%	**Construction Debris**	**8.5%**	**7.1%**
Other Single-use Food Service Packaging	0.1%	0.0%	Clean Dimensional Lumber	0.6%	0.8%
Small Durable Plastic Products	0.3%	0.5%	Clean Engineered Wood	1.2%	1.7%
PLA Single-use Food Service Utensils	0.0%	0.0%	Pallets & Crates	0.2%	0.3%
PLA Single-use Food Service Packaging	0.0%	0.0%	Other Untreated Wood	0.0%	0.0%
Compostable Plastic Bags	0.0%	0.0%	New Gypsum Scrap	0.0%	0.0%
EPS Non Food Grade	0.4%	0.6%	Demo Gypsum Scrap	0.0%	0.0%
Rigid Foam Insulation	0.0%	0.0%	Carpet	0.4%	0.6%
Takeout & Retail Bags	0.1%	0.1%	Felt Carpet Pad	0.0%	0.0%
Stretch Wrap	0.8%	0.7%	Rock, Concrete, & Other Aggregates	0.0%	0.0%
Other Clean Polyethylene Film	0.3%	0.2%	Asphaltic Roofing	0.0%	0.0%
Large Durable Plastic Products	0.4%	0.6%	Liquid Latex Paint	0.5%	0.8%
EPS Food Grade	0.0%	0.0%	New Painted Wood	1.9%	2.8%
Other Single-use Food Service Utensils	0.0%	0.0%	Old Painted Wood	0.0%	0.0%
Plastic Pouches	0.0%	0.0%	Creosote Treated Wood	0.0%	0.0%
Plastic Mailers	0.0%	0.0%	Other Treated Wood	0.0%	0.0%
Garbage Bags	1.0%	0.6%	Contaminated Wood	0.0%	0.0%
Other Film	15.6%	22.6%	Fiberglass Insulation	0.0%	0.0%
Plastic Other Materials	0.4%	0.5%	Ceramics	0.0%	0.0%
Glass	**0.1%**	**0.1%**	Other Construction Debris	3.7%	2.7%
Clear Beverage Glass	0.1%	0.1%	**Potentially Harmful Wastes**	**0.1%**	**0.1%**
Green Beverage Glass	0.0%	0.0%	Oil Based Paints	0.0%	0.0%
Brown Beverage Glass	0.0%	0.0%	Medications	0.0%	0.0%
Container Glass	0.0%	0.0%	Other Harmful Wastes	0.0%	0.0%
Mixed Cullet	0.0%	0.0%	Medical Waste	0.0%	0.0%
Other Glass	0.0%	0.0%	Non Caustic Chemicals	0.0%	0.0%
Metal	**20.1%**	**16.3%**	Vitamins & Supplements	0.0%	0.0%
Aluminum Cans	0.1%	0.0%	Cosmetics	0.1%	0.1%
Aluminum Foil Or Containers	0.0%	0.0%	**Fines & Miscellaneous Materials**	**0.1%**	**0.1%**
Steel Food Cans	0.0%	0.0%	Personal Protective Equipment	0.0%	0.0%
Empty Aerosol Cans	0.1%	0.1%	Soil & Dirt	0.0%	0.0%
Other Ferrous	0.5%	0.3%	Non-distinct Fines	0.0%	0.1%
Other Aluminum	0.0%	0.0%	Misc. Organics	0.0%	0.0%
Oil Filters	0.9%	1.1%	Misc. Inorganics	0.0%	0.0%
Other Nonferrous	0.0%	0.0%			
Mixed Metals	18.6%	12.5%			
Sample Count	*4*		**Total**	**100%**	

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

Wholesale Trade

Table 25. Detailed Composition Table: Wholesale Trade Sector

Material	Est. %	+ / -	Material	Est. %	+ / -
Curbside Recyclable	**27.8%**	**7.6%**	**Compostable Organics**	**8.3%**	**3.5%**
Compostable	**11.7%**	**4.2%**	Leaves & Grass	0.3%	0.3%
Other Recoverable	**34.8%**	**11.1%**	Prunings	0.0%	0.0%
Non-recoverable	**25.6%**	**8.7%**	Packaged Edible Vegetative Food Waste	0.4%	0.5%
			Edible Vegetative Food Waste	0.6%	0.2%
Paper	**27.1%**	**9.2%**	Packaged Edible Other Food Waste	1.2%	0.8%
Newspaper	0.0%	0.1%	Edible Food Waste Other	3.6%	2.5%
Cardboard & Kraft Paper	13.9%	8.3%	Inedible Vegetative Food Waste	1.8%	1.2%
Grocery Or Shopping Bags	0.5%	0.3%	Inedible Other Food Waste	0.3%	0.3%
Paper Packaging	1.1%	0.7%	Fats, Oils, & Grease	0.0%	0.0%
Paper Products	2.3%	1.0%	Other Compostable Organics	0.1%	0.1%
Aseptic Containers	0.1%	0.0%	**Other Organics**	**4.8%**	**1.9%**
Gable Top Containers	0.0%	0.0%	Textiles	2.8%	1.5%
Other Poly-coated Containers	0.0%	0.0%	Mixed Textiles	0.4%	0.4%
Non-coated or Soiled Paper Products	2.8%	1.3%	Tires	0.0%	0.0%
Non-coated Single-use Food Packaging	0.5%	0.2%	Diapers	0.2%	0.2%
Shredded Paper	0.1%	0.1%	Animal By-products	0.9%	1.0%
Waxed Cardboard	0.1%	0.1%	Rubber Products	0.5%	0.8%
Coated Single-use Food Packaging	0.5%	0.2%	**Furniture, Appliances, & Electronics**	**0.6%**	**0.7%**
Mixed Or Other Paper	5.2%	4.9%	Furniture	0.0%	0.0%
Plastic	**34.0%**	**10.1%**	Mattresses	0.0%	0.0%
PET Bottles & Jars	0.4%	0.1%	Small Appliances	0.4%	0.7%
HDPE Natural Bottles & Jars	0.1%	0.1%	CFL Lights	0.0%	0.0%
HDPE Colored Bottles & Jars	0.1%	0.1%	LED Lighting	0.0%	0.0%
PP Bottles & Jars	0.0%	0.0%	Rechargeable Batteries	0.0%	0.0%
Other Plastic Bottles & Jars	0.0%	0.0%	Dry Cell Batteries	0.0%	0.0%
PET Non-bottle Packaging	0.3%	0.2%	Wet Cell Batteries	0.0%	0.0%
HDPE Non-bottle Packaging	1.9%	1.5%	E-Cycle WA Accepted Electronics	0.0%	0.0%
PP Non-bottle Packaging	0.6%	0.4%	Non-E-Cycle WA Accepted Electronics	0.1%	0.2%
Other Non Bottle Packaging	0.6%	0.5%	**Construction Debris**	**19.4%**	**5.9%**
Other Single-use Food Service Packaging	0.3%	0.1%	Clean Dimensional Lumber	0.9%	0.5%
Small Durable Plastic Products	2.3%	3.0%	Clean Engineered Wood	1.3%	0.8%
PLA Single-use Food Service Utensils	0.0%	0.0%	Pallets & Crates	11.1%	6.4%
PLA Single-use Food Service Packaging	0.0%	0.0%	Other Untreated Wood	0.0%	0.0%
Compostable Plastic Bags	0.0%	0.0%	New Gypsum Scrap	0.0%	0.0%
EPS Non Food Grade	0.4%	0.4%	Demo Gypsum Scrap	0.0%	0.0%
Rigid Foam Insulation	0.0%	0.0%	Carpet	0.8%	1.1%
Takeout & Retail Bags	0.2%	0.1%	Felt Carpet Pad	0.0%	0.0%
Stretch Wrap	6.2%	5.0%	Rock, Concrete, & Other Aggregates	1.3%	2.0%
Other Clean Polyethylene Film	5.2%	4.1%	Asphaltic Roofing	0.0%	0.0%
Large Durable Plastic Products	3.1%	2.7%	Liquid Latex Paint	0.0%	0.0%
EPS Food Grade	0.1%	0.1%	New Painted Wood	0.5%	0.4%
Other Single-use Food Service Utensils	0.1%	0.0%	Old Painted Wood	0.0%	0.0%
Plastic Pouches	0.0%	0.0%	Creosote Treated Wood	0.0%	0.0%
Plastic Mailers	0.1%	0.1%	Other Treated Wood	0.0%	0.0%
Garbage Bags	2.0%	0.6%	Contaminated Wood	0.2%	0.3%
Other Film	9.3%	8.6%	Fiberglass Insulation	0.5%	0.5%
Plastic Other Materials	0.7%	0.7%	Ceramics	0.1%	0.1%
Glass	**1.8%**	**1.1%**	Other Construction Debris	2.7%	2.1%
Clear Beverage Glass	0.2%	0.1%	**Potentially Harmful Wastes**	**0.7%**	**0.7%**
Green Beverage Glass	0.1%	0.1%	Oil Based Paints	0.0%	0.0%
Brown Beverage Glass	0.7%	0.9%	Medications	0.0%	0.0%
Container Glass	0.1%	0.1%	Other Harmful Wastes	0.6%	0.7%
Mixed Cullet	0.0%	0.0%	Medical Waste	0.0%	0.0%
Other Glass	0.7%	0.6%	Non Caustic Chemicals	0.0%	0.0%
Metal	**2.9%**	**1.9%**	Vitamins & Supplements	0.0%	0.0%
Aluminum Cans	0.2%	0.1%	Cosmetics	0.1%	0.1%
Aluminum Foil Or Containers	0.2%	0.1%	**Fines & Miscellaneous Materials**	**0.6%**	**0.4%**
Steel Food Cans	0.1%	0.1%	Personal Protective Equipment	0.3%	0.2%
Empty Aerosol Cans	0.0%	0.1%	Soil & Dirt	0.0%	0.0%
Other Ferrous	1.7%	1.4%	Non-distinct Fines	0.2%	0.1%
Other Aluminum	0.0%	0.0%	Misc. Organics	0.0%	0.0%
Oil Filters	0.0%	0.0%	Misc. Inorganics	0.1%	0.1%
Other Nonferrous	0.0%	0.1%			
Mixed Metals	0.5%	0.4%			
Sample Count	*11*		**Total**	**100%**	

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

Table 26. Detailed Composition Table: Retail Trade & Grocery Sector

Material	Est. %	+ / -	Material	Est. %	+ / -
Curbside Recyclable	**21.7%**	**5.1%**	**Compostable Organics**	**30.6%**	**8.9%**
Compostable	**39.7%**	**9.4%**	Leaves & Grass	1.0%	0.7%
Other Recoverable	**12.2%**	**6.4%**	Prunings	0.9%	1.4%
Non-recoverable	**26.4%**	**6.3%**	Packaged Edible Vegetative Food Waste	2.0%	0.8%
			Edible Vegetative Food Waste	3.4%	2.8%
Paper	**31.1%**	**4.0%**	Packaged Edible Other Food Waste	7.5%	3.2%
Newspaper	0.6%	0.5%	Edible Food Waste Other	8.1%	3.7%
Cardboard & Kraft Paper	4.3%	1.8%	Inedible Vegetative Food Waste	4.4%	2.5%
Grocery Or Shopping Bags	0.6%	0.3%	Inedible Other Food Waste	0.8%	0.4%
Paper Packaging	1.6%	0.5%	Fats, Oils, & Grease	2.2%	3.1%
Paper Products	2.9%	1.3%	Other Compostable Organics	0.2%	0.1%
Aseptic Containers	0.1%	0.0%	**Other Organics**	**2.2%**	**1.5%**
Gable Top Containers	0.1%	0.1%	Textiles	1.2%	0.7%
Other Poly-coated Containers	0.1%	0.1%	Mixed Textiles	0.1%	0.2%
Non-coated or Soiled Paper Products	7.9%	2.3%	Tires	0.0%	0.0%
Non-coated Single-use Food Packaging	1.1%	0.9%	Diapers	0.6%	0.9%
Shredded Paper	0.0%	0.0%	Animal By-products	0.2%	0.1%
Waxed Cardboard	8.2%	3.8%	Rubber Products	0.0%	0.0%
Coated Single-use Food Packaging	0.9%	0.3%	**Furniture, Appliances, & Electronics**	**1.6%**	**2.3%**
Mixed Or Other Paper	2.8%	1.9%	Furniture	1.6%	2.3%
Plastic	**26.8%**	**6.6%**	Mattresses	0.0%	0.0%
PET Bottles & Jars	1.0%	0.4%	Small Appliances	0.0%	0.0%
HDPE Natural Bottles & Jars	0.2%	0.1%	CFL Lights	0.0%	0.0%
HDPE Colored Bottles & Jars	0.9%	1.3%	LED Lighting	0.0%	0.0%
PP Bottles & Jars	0.4%	0.4%	Rechargeable Batteries	0.0%	0.0%
Other Plastic Bottles & Jars	0.0%	0.0%	Dry Cell Batteries	0.0%	0.0%
PET Non-bottle Packaging	1.1%	0.5%	Wet Cell Batteries	0.0%	0.0%
HDPE Non-bottle Packaging	0.1%	0.1%	E-Cycle WA Accepted Electronics	0.0%	0.0%
PP Non-bottle Packaging	2.4%	1.0%	Non-E-Cycle WA Accepted Electronics	0.0%	0.0%
Other Non Bottle Packaging	0.6%	0.3%	**Construction Debris**	**3.1%**	**3.1%**
Other Single-use Food Service Packaging	1.4%	0.9%	Clean Dimensional Lumber	0.6%	0.6%
Small Durable Plastic Products	0.8%	0.7%	Clean Engineered Wood	0.5%	0.7%
PLA Single-use Food Service Utensils	0.1%	0.0%	Pallets & Crates	0.3%	0.2%
PLA Single-use Food Service Packaging	0.0%	0.0%	Other Untreated Wood	0.0%	0.0%
Compostable Plastic Bags	0.1%	0.1%	New Gypsum Scrap	0.3%	0.5%
EPS Non Food Grade	0.8%	0.5%	Demo Gypsum Scrap	0.0%	0.0%
Rigid Foam Insulation	0.0%	0.0%	Carpet	0.0%	0.0%
Takeout & Retail Bags	0.4%	0.3%	Felt Carpet Pad	0.0%	0.0%
Stretch Wrap	1.5%	1.4%	Rock, Concrete, & Other Aggregates	0.0%	0.0%
Other Clean Polyethylene Film	3.9%	4.5%	Asphaltic Roofing	0.0%	0.0%
Large Durable Plastic Products	0.9%	0.9%	Liquid Latex Paint	0.0%	0.0%
EPS Food Grade	0.2%	0.1%	New Painted Wood	0.3%	0.3%
Other Single-use Food Service Utensils	0.1%	0.1%	Old Painted Wood	0.0%	0.0%
Plastic Pouches	0.3%	0.4%	Creosote Treated Wood	0.0%	0.0%
Plastic Mailers	0.1%	0.1%	Other Treated Wood	0.4%	0.6%
Garbage Bags	3.1%	0.8%	Contaminated Wood	0.0%	0.0%
Other Film	6.0%	2.1%	Fiberglass Insulation	0.0%	0.0%
Plastic Other Materials	0.3%	0.2%	Ceramics	0.0%	0.1%
Glass	**1.4%**	**0.7%**	Other Construction Debris	0.8%	1.2%
Clear Beverage Glass	0.7%	0.4%	**Potentially Harmful Wastes**	**0.1%**	**0.0%**
Green Beverage Glass	0.1%	0.1%	Oil Based Paints	0.0%	0.0%
Brown Beverage Glass	0.2%	0.1%	Medications	0.0%	0.0%
Container Glass	0.3%	0.2%	Other Harmful Wastes	0.0%	0.0%
Mixed Cullet	0.0%	0.0%	Medical Waste	0.0%	0.0%
Other Glass	0.1%	0.2%	Non Caustic Chemicals	0.0%	0.0%
Metal	**1.3%**	**0.4%**	Vitamins & Supplements	0.0%	0.0%
Aluminum Cans	0.5%	0.2%	Cosmetics	0.0%	0.0%
Aluminum Foil Or Containers	0.2%	0.1%	**Fines & Miscellaneous Materials**	**1.9%**	**0.5%**
Steel Food Cans	0.2%	0.2%	Personal Protective Equipment	0.6%	0.3%
Empty Aerosol Cans	0.0%	0.0%	Soil & Dirt	0.0%	0.0%
Other Ferrous	0.2%	0.2%	Non-distinct Fines	0.6%	0.2%
Other Aluminum	0.0%	0.0%	Misc. Organics	0.2%	0.3%
Oil Filters	0.0%	0.0%	Misc. Inorganics	0.6%	0.4%
Other Nonferrous	0.0%	0.0%			
Mixed Metals	0.1%	0.1%			
Sample Count	*13*		**Total**	**100%**	

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

Health Care

Table 27. Detailed Composition Table: Health Care Sector

Material	Est. %	+ / -	Material	Est. %	+ / -
Curbside Recyclable	**10.9%**	**5.0%**	**Compostable Organics**	**11.9%**	**7.2%**
Compostable	**22.0%**	**10.7%**	Leaves & Grass	0.1%	0.2%
Other Recoverable	**9.3%**	**7.0%**	Prunings	0.0%	0.0%
Non-recoverable	**57.8%**	**16.6%**	Packaged Edible Vegetative Food Waste	0.7%	0.9%
			Edible Vegetative Food Waste	0.5%	0.4%
Paper	**18.0%**	**8.2%**	Packaged Edible Other Food Waste	2.7%	2.2%
Newspaper	0.1%	0.1%	Edible Food Waste Other	1.9%	0.9%
Cardboard & Kraft Paper	2.9%	1.6%	Inedible Vegetative Food Waste	5.5%	3.9%
Grocery Or Shopping Bags	0.3%	0.2%	Inedible Other Food Waste	0.4%	0.5%
Paper Packaging	0.8%	0.5%	Fats, Oils, & Grease	0.0%	0.0%
Paper Products	2.0%	1.6%	Other Compostable Organics	0.1%	0.1%
Aseptic Containers	0.3%	0.2%	**Other Organics**	**34.7%**	**18.3%**
Gable Top Containers	0.1%	0.0%	Textiles	0.9%	0.6%
Other Poly-coated Containers	0.1%	0.1%	Mixed Textiles	0.2%	0.2%
Non-coated or Soiled Paper Products	9.0%	4.5%	Tires	0.0%	0.0%
Non-coated Single-use Food Packaging	0.8%	0.3%	Diapers	32.4%	14.5%
Shredded Paper	0.0%	0.0%	Animal By-products	1.3%	1.4%
Waxed Cardboard	0.0%	0.0%	Rubber Products	0.0%	0.0%
Coated Single-use Food Packaging	0.9%	0.6%	**Furniture, Appliances, & Electronics**	**5.2%**	**6.8%**
Mixed Or Other Paper	0.8%	0.8%	Furniture	4.9%	6.8%
Plastic	**11.2%**	**3.7%**	Mattresses	0.0%	0.0%
PET Bottles & Jars	0.6%	0.3%	Small Appliances	0.0%	0.0%
HDPE Natural Bottles & Jars	0.2%	0.1%	CFL Lights	0.0%	0.0%
HDPE Colored Bottles & Jars	0.1%	0.1%	LED Lighting	0.0%	0.0%
PP Bottles & Jars	0.0%	0.1%	Rechargeable Batteries	0.0%	0.0%
Other Plastic Bottles & Jars	0.0%	0.0%	Dry Cell Batteries	0.0%	0.0%
PET Non-bottle Packaging	0.3%	0.1%	Wet Cell Batteries	0.0%	0.0%
HDPE Non-bottle Packaging	0.3%	0.4%	E-Cycle WA Accepted Electronics	0.0%	0.0%
PP Non-bottle Packaging	0.3%	0.2%	Non-E-Cycle WA Accepted Electronics	0.2%	0.4%
Other Non Bottle Packaging	0.2%	0.1%	**Construction Debris**	**3.1%**	**2.8%**
Other Single-use Food Service Packaging	0.4%	0.2%	Clean Dimensional Lumber	0.0%	0.0%
Small Durable Plastic Products	0.4%	0.3%	Clean Engineered Wood	0.1%	0.1%
PLA Single-use Food Service Utensils	0.0%	0.0%	Pallets & Crates	0.0%	0.0%
PLA Single-use Food Service Packaging	0.1%	0.1%	Other Untreated Wood	0.0%	0.0%
Compostable Plastic Bags	0.1%	0.1%	New Gypsum Scrap	0.0%	0.0%
EPS Non Food Grade	1.2%	1.1%	Demo Gypsum Scrap	0.0%	0.0%
Rigid Foam Insulation	0.0%	0.0%	Carpet	0.0%	0.0%
Takeout & Retail Bags	0.1%	0.1%	Felt Carpet Pad	0.0%	0.0%
Stretch Wrap	0.0%	0.0%	Rock, Concrete, & Other Aggregates	0.0%	0.0%
Other Clean Polyethylene Film	0.5%	0.6%	Asphaltic Roofing	0.0%	0.0%
Large Durable Plastic Products	0.0%	0.0%	Liquid Latex Paint	0.9%	1.4%
EPS Food Grade	0.2%	0.1%	New Painted Wood	0.3%	0.3%
Other Single-use Food Service Utensils	0.1%	0.1%	Old Painted Wood	0.2%	0.3%
Plastic Pouches	0.1%	0.1%	Creosote Treated Wood	1.5%	2.4%
Plastic Mailers	0.1%	0.0%	Other Treated Wood	0.0%	0.0%
Garbage Bags	3.6%	0.7%	Contaminated Wood	0.0%	0.0%
Other Film	2.1%	0.9%	Fiberglass Insulation	0.0%	0.0%
Plastic Other Materials	0.2%	0.2%	Ceramics	0.0%	0.0%
Glass	**0.8%**	**0.6%**	Other Construction Debris	0.0%	0.0%
Clear Beverage Glass	0.4%	0.4%	**Potentially Harmful Wastes**	**11.1%**	**10.4%**
Green Beverage Glass	0.0%	0.0%	Oil Based Paints	0.0%	0.0%
Brown Beverage Glass	0.3%	0.3%	Medications	0.0%	0.0%
Container Glass	0.1%	0.1%	Other Harmful Wastes	0.3%	0.4%
Mixed Cullet	0.0%	0.0%	Medical Waste	10.7%	10.2%
Other Glass	0.0%	0.0%	Non Caustic Chemicals	0.0%	0.0%
Metal	**1.2%**	**0.8%**	Vitamins & Supplements	0.0%	0.0%
Aluminum Cans	0.2%	0.1%	Cosmetics	0.1%	0.2%
Aluminum Foil Or Containers	0.1%	0.0%	**Fines & Miscellaneous Materials**	**2.8%**	**1.3%**
Steel Food Cans	0.1%	0.1%	Personal Protective Equipment	1.3%	0.7%
Empty Aerosol Cans	0.1%	0.2%	Soil & Dirt	0.0%	0.0%
Other Ferrous	0.3%	0.4%	Non-distinct Fines	0.3%	0.1%
Other Aluminum	0.0%	0.0%	Misc. Organics	0.7%	0.6%
Oil Filters	0.0%	0.0%	Misc. Inorganics	0.5%	0.5%
Other Nonferrous	0.0%	0.0%			
Mixed Metals	0.3%	0.5%			
Sample Count	*9*		**Total**	**100%**	

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

Offices and Other Services

Table 28. Detailed Composition Table: Offices & Other Services Sector

Material	Est. %	+ / -	Material	Est. %	+ / -
Curbside Recyclable	**33.9%**	**8.8%**	**Compostable Organics**	**19.1%**	**9.6%**
Compostable	**26.6%**	**13.1%**	Leaves & Grass	1.5%	2.2%
Other Recoverable	**21.4%**	**14.8%**	Prunings	0.0%	0.0%
Non-recoverable	**18.1%**	**8.2%**	Packaged Edible Vegetative Food Waste	0.9%	1.1%
			Edible Vegetative Food Waste	4.9%	6.8%
Paper	**35.7%**	**7.9%**	Packaged Edible Other Food Waste	6.0%	3.5%
Newspaper	0.2%	0.2%	Edible Food Waste Other	3.6%	3.3%
Cardboard & Kraft Paper	19.2%	12.7%	Inedible Vegetative Food Waste	2.0%	1.5%
Grocery Or Shopping Bags	0.5%	0.3%	Inedible Other Food Waste	0.3%	0.1%
Paper Packaging	1.0%	0.3%	Fats, Oils, & Grease	0.0%	0.0%
Paper Products	2.5%	1.8%	Other Compostable Organics	0.0%	0.0%
Aseptic Containers	0.0%	0.0%	**Other Organics**	**4.5%**	**3.0%**
Gable Top Containers	0.1%	0.1%	Textiles	2.2%	0.8%
Other Poly-coated Containers	0.0%	0.1%	Mixed Textiles	0.1%	0.1%
Non-coated or Soiled Paper Products	4.4%	2.6%	Tires	0.0%	0.0%
Non-coated Single-use Food Packaging	2.1%	2.8%	Diapers	1.0%	1.5%
Shredded Paper	0.4%	0.7%	Animal By-products	0.9%	1.3%
Waxed Cardboard	0.0%	0.0%	Rubber Products	0.4%	0.5%
Coated Single-use Food Packaging	1.1%	0.7%	**Furniture, Appliances, & Electronics**	**4.2%**	**4.6%**
Mixed Or Other Paper	4.1%	2.8%	Furniture	0.0%	0.0%
Plastic	**17.1%**	**4.9%**	Mattresses	3.3%	4.9%
PET Bottles & Jars	0.9%	0.6%	Small Appliances	0.1%	0.2%
HDPE Natural Bottles & Jars	0.2%	0.1%	CFL Lights	0.0%	0.0%
HDPE Colored Bottles & Jars	0.1%	0.1%	LED Lighting	0.0%	0.0%
PP Bottles & Jars	0.2%	0.1%	Rechargeable Batteries	0.0%	0.0%
Other Plastic Bottles & Jars	0.0%	0.0%	Dry Cell Batteries	0.0%	0.0%
PET Non-bottle Packaging	0.2%	0.2%	Wet Cell Batteries	0.0%	0.0%
HDPE Non-bottle Packaging	0.3%	0.3%	E-Cycle WA Accepted Electronics	0.7%	1.1%
PP Non-bottle Packaging	0.4%	0.4%	Non-E-Cycle WA Accepted Electronics	0.0%	0.1%
Other Non Bottle Packaging	0.3%	0.3%	**Construction Debris**	**6.8%**	**4.8%**
Other Single-use Food Service Packaging	0.4%	0.2%	Clean Dimensional Lumber	0.2%	0.3%
Small Durable Plastic Products	0.6%	0.4%	Clean Engineered Wood	2.8%	4.2%
PLA Single-use Food Service Utensils	0.4%	0.6%	Pallets & Crates	3.3%	3.5%
PLA Single-use Food Service Packaging	0.0%	0.0%	Other Untreated Wood	0.0%	0.0%
Compostable Plastic Bags	0.1%	0.1%	New Gypsum Scrap	0.0%	0.0%
EPS Non Food Grade	0.4%	0.4%	Demo Gypsum Scrap	0.0%	0.0%
Rigid Foam Insulation	0.0%	0.0%	Carpet	0.0%	0.0%
Takeout & Retail Bags	0.3%	0.2%	Felt Carpet Pad	0.0%	0.0%
Stretch Wrap	0.4%	0.5%	Rock, Concrete, & Other Aggregates	0.0%	0.0%
Other Clean Polyethylene Film	0.6%	0.4%	Asphaltic Roofing	0.0%	0.0%
Large Durable Plastic Products	5.9%	5.5%	Liquid Latex Paint	0.0%	0.0%
EPS Food Grade	0.1%	0.1%	New Painted Wood	0.0%	0.0%
Other Single-use Food Service Utensils	0.1%	0.1%	Old Painted Wood	0.0%	0.0%
Plastic Pouches	0.0%	0.0%	Creosote Treated Wood	0.0%	0.0%
Plastic Mailers	0.1%	0.2%	Other Treated Wood	0.0%	0.0%
Garbage Bags	2.1%	1.2%	Contaminated Wood	0.4%	0.6%
Other Film	2.2%	1.2%	Fiberglass Insulation	0.0%	0.0%
Plastic Other Materials	0.7%	0.9%	Ceramics	0.0%	0.0%
Glass	**2.1%**	**1.8%**	Other Construction Debris	0.0%	0.0%
Clear Beverage Glass	0.2%	0.2%	**Potentially Harmful Wastes**	**1.3%**	**1.4%**
Green Beverage Glass	0.1%	0.1%	Oil Based Paints	0.0%	0.0%
Brown Beverage Glass	1.0%	1.5%	Medications	0.0%	0.0%
Container Glass	0.2%	0.3%	Other Harmful Wastes	1.0%	1.4%
Mixed Cullet	0.0%	0.0%	Medical Waste	0.1%	0.1%
Other Glass	0.5%	0.8%	Non Caustic Chemicals	0.0%	0.0%
Metal	**6.7%**	**6.5%**	Vitamins & Supplements	0.0%	0.0%
Aluminum Cans	0.3%	0.1%	Cosmetics	0.2%	0.3%
Aluminum Foil Or Containers	0.1%	0.1%	**Fines & Miscellaneous Materials**	**2.5%**	**2.7%**
Steel Food Cans	0.1%	0.1%	Personal Protective Equipment	0.1%	0.1%
Empty Aerosol Cans	0.1%	0.1%	Soil & Dirt	1.3%	2.0%
Other Ferrous	4.6%	6.1%	Non-distinct Fines	0.7%	0.8%
Other Aluminum	0.0%	0.0%	Misc. Organics	0.3%	0.4%
Oil Filters	0.0%	0.0%	Misc. Inorganics	0.1%	0.0%
Other Nonferrous	0.0%	0.1%			
Mixed Metals	1.5%	0.7%			
Sample Count	*6*		**Total**	**100%**	

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

Construction

Table 29. Detailed Composition Table: Construction Sector

Material	Est. %	+ / -	Material	Est. %	+ / -
Curbside Recyclable	**21.2%**	**6.2%**	**Compostable Organics**	**11.4%**	**5.5%**
Compostable	**16.1%**	**6.4%**	Leaves & Grass	1.8%	1.5%
Other Recoverable	**34.1%**	**8.0%**	Prunings	0.0%	0.0%
Non-recoverable	**28.6%**	**8.7%**	Packaged Edible Vegetative Food Waste	0.5%	0.4%
			Edible Vegetative Food Waste	1.3%	0.5%
Paper	**20.3%**	**5.9%**	Packaged Edible Other Food Waste	0.8%	0.3%
Newspaper	0.1%	0.1%	Edible Food Waste Other	2.4%	1.3%
Cardboard & Kraft Paper	3.8%	1.6%	Inedible Vegetative Food Waste	3.9%	2.4%
Grocery Or Shopping Bags	0.4%	0.1%	Inedible Other Food Waste	0.5%	0.3%
Paper Packaging	3.4%	3.2%	Fats, Oils, & Grease	0.0%	0.0%
Paper Products	3.7%	3.8%	Other Compostable Organics	0.2%	0.2%
Aseptic Containers	0.1%	0.1%	**Other Organics**	**7.0%**	**2.8%**
Gable Top Containers	0.0%	0.0%	Textiles	3.6%	1.7%
Other Poly-coated Containers	0.0%	0.0%	Mixed Textiles	2.6%	2.0%
Non-coated or Soiled Paper Products	4.3%	1.8%	Tires	0.0%	0.0%
Non-coated Single-use Food Packaging	0.3%	0.1%	Diapers	0.4%	0.5%
Shredded Paper	0.0%	0.0%	Animal By-products	0.1%	0.1%
Waxed Cardboard	0.0%	0.1%	Rubber Products	0.3%	0.3%
Coated Single-use Food Packaging	0.4%	0.2%	**Furniture, Appliances, & Electronics**	**2.9%**	**2.1%**
Mixed Or Other Paper	3.7%	2.8%	Furniture	1.3%	1.7%
Plastic	**17.8%**	**5.3%**	Mattresses	0.0%	0.0%
PET Bottles & Jars	0.4%	0.1%	Small Appliances	1.4%	1.6%
HDPE Natural Bottles & Jars	0.4%	0.5%	CFL Lights	0.0%	0.1%
HDPE Colored Bottles & Jars	0.2%	0.1%	LED Lighting	0.0%	0.0%
PP Bottles & Jars	0.1%	0.1%	Rechargeable Batteries	0.0%	0.0%
Other Plastic Bottles & Jars	0.0%	0.0%	Dry Cell Batteries	0.0%	0.0%
PET Non-bottle Packaging	0.2%	0.1%	Wet Cell Batteries	0.0%	0.0%
HDPE Non-bottle Packaging	1.2%	0.7%	E-Cycle WA Accepted Electronics	0.1%	0.2%
PP Non-bottle Packaging	0.5%	0.5%	Non-E-Cycle WA Accepted Electronics	0.0%	0.0%
Other Non Bottle Packaging	0.5%	0.3%	**Construction Debris**	**24.4%**	**7.2%**
Other Single-use Food Service Packaging	0.2%	0.1%	Clean Dimensional Lumber	3.6%	1.8%
Small Durable Plastic Products	0.2%	0.1%	Clean Engineered Wood	8.7%	6.2%
PLA Single-use Food Service Utensils	0.0%	0.0%	Pallets & Crates	0.5%	0.5%
PLA Single-use Food Service Packaging	0.1%	0.0%	Other Untreated Wood	0.0%	0.0%
Compostable Plastic Bags	0.1%	0.1%	New Gypsum Scrap	0.0%	0.0%
EPS Non Food Grade	0.4%	0.3%	Demo Gypsum Scrap	0.6%	0.9%
Rigid Foam Insulation	0.0%	0.0%	Carpet	3.0%	3.5%
Takeout & Retail Bags	0.1%	0.0%	Felt Carpet Pad	0.0%	0.0%
Stretch Wrap	0.8%	0.5%	Rock, Concrete, & Other Aggregates	0.2%	0.4%
Other Clean Polyethylene Film	3.6%	4.4%	Asphaltic Roofing	0.0%	0.0%
Large Durable Plastic Products	3.0%	2.7%	Liquid Latex Paint	0.2%	0.2%
EPS Food Grade	0.1%	0.0%	New Painted Wood	2.9%	1.7%
Other Single-use Food Service Utensils	0.0%	0.0%	Old Painted Wood	0.8%	1.3%
Plastic Pouches	0.1%	0.1%	Creosote Treated Wood	0.0%	0.0%
Plastic Mailers	0.0%	0.0%	Other Treated Wood	0.4%	0.5%
Garbage Bags	1.3%	0.4%	Contaminated Wood	0.4%	0.3%
Other Film	2.8%	1.2%	Fiberglass Insulation	0.0%	0.0%
Plastic Other Materials	1.4%	0.9%	Ceramics	0.0%	0.1%
Glass	**1.0%**	**0.5%**	Other Construction Debris	3.0%	2.3%
Clear Beverage Glass	0.5%	0.3%	**Potentially Harmful Wastes**	**0.8%**	**0.7%**
Green Beverage Glass	0.2%	0.1%	Oil Based Paints	0.1%	0.1%
Brown Beverage Glass	0.1%	0.1%	Medications	0.0%	0.0%
Container Glass	0.2%	0.1%	Other Harmful Wastes	0.2%	0.3%
Mixed Cullet	0.0%	0.0%	Medical Waste	0.4%	0.5%
Other Glass	0.0%	0.1%	Non Caustic Chemicals	0.0%	0.0%
Metal	**10.4%**	**6.5%**	Vitamins & Supplements	0.0%	0.1%
Aluminum Cans	0.2%	0.1%	Cosmetics	0.1%	0.1%
Aluminum Foil Or Containers	0.2%	0.2%	**Fines & Miscellaneous Materials**	**4.0%**	**3.8%**
Steel Food Cans	0.2%	0.1%	Personal Protective Equipment	0.3%	0.2%
Empty Aerosol Cans	0.1%	0.1%	Soil & Dirt	2.8%	3.6%
Other Ferrous	3.9%	2.4%	Non-distinct Fines	0.3%	0.1%
Other Aluminum	0.1%	0.1%	Misc. Organics	0.5%	0.7%
Oil Filters	0.1%	0.1%	Misc. Inorganics	0.1%	0.1%
Other Nonferrous	0.3%	0.3%			
Mixed Metals	5.2%	6.2%			
Sample Count	*16*		**Total**	**100%**	

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

Season

Tonnages are not reported by season because season was not used as a weighting factor when determining the Citywide composition. Without weighting by season, summing tons by material type across seasons would not match the overall tons.

Spring

Table 30. Detailed Composition Table: Spring Sampling Season

Material	Est. %	+ / -	Material	Est. %	+ / -
Curbside Recyclable	**20.5%**	**1.6%**	**Compostable Organics**	**18.5%**	**2.1%**
Compostable	**26.4%**	**2.5%**	Leaves & Grass	1.4%	0.8%
Other Recoverable	**20.8%**	**2.7%**	Prunings	0.0%	0.0%
Non-recoverable	**32.2%**	**2.6%**	Packaged Edible Vegetative Food Waste	0.9%	0.2%
			Edible Vegetative Food Waste	1.3%	0.3%
Paper	**22.6%**	**1.8%**	Packaged Edible Other Food Waste	4.6%	1.3%
Newspaper	0.4%	0.1%	Edible Food Waste Other	4.6%	1.0%
Cardboard & Kraft Paper	4.4%	0.6%	Inedible Vegetative Food Waste	4.4%	0.9%
Grocery Or Shopping Bags	0.6%	0.1%	Inedible Other Food Waste	0.9%	0.3%
Paper Packaging	1.9%	0.6%	Fats, Oils, & Grease	0.2%	0.3%
Paper Products	3.0%	0.6%	Other Compostable Organics	0.2%	0.1%
Aseptic Containers	0.1%	0.0%	**Other Organics**	**8.8%**	**1.2%**
Gable Top Containers	0.1%	0.0%	Textiles	3.6%	0.7%
Other Poly-coated Containers	0.1%	0.0%	Mixed Textiles	1.0%	0.3%
Non-coated or Soiled Paper Products	6.8%	0.8%	Tires	0.1%	0.1%
Non-coated Single-use Food Packaging	0.7%	0.1%	Diapers	1.9%	0.7%
Shredded Paper	0.1%	0.1%	Animal By-products	1.3%	0.5%
Waxed Cardboard	0.3%	0.2%	Rubber Products	0.9%	0.4%
Coated Single-use Food Packaging	1.0%	0.2%	**Furniture, Appliances, & Electronics**	**3.9%**	**1.4%**
Mixed Or Other Paper	3.1%	0.9%	Furniture	1.8%	1.1%
Plastic	**18.4%**	**1.4%**	Mattresses	0.1%	0.2%
PET Bottles & Jars	0.8%	0.1%	Small Appliances	1.1%	0.5%
HDPE Natural Bottles & Jars	0.3%	0.1%	CFL Lights	0.0%	0.0%
HDPE Colored Bottles & Jars	0.3%	0.2%	LED Lighting	0.0%	0.0%
PP Bottles & Jars	0.0%	0.0%	Rechargeable Batteries	0.0%	0.0%
Other Plastic Bottles & Jars	0.0%	0.0%	Dry Cell Batteries	0.0%	0.0%
PET Non-bottle Packaging	0.5%	0.1%	Wet Cell Batteries	0.0%	0.0%
HDPE Non-bottle Packaging	0.6%	0.2%	E-Cycle WA Accepted Electronics	0.7%	0.6%
PP Non-bottle Packaging	0.8%	0.1%	Non-E-Cycle WA Accepted Electronics	0.2%	0.1%
Other Non Bottle Packaging	0.5%	0.1%	**Construction Debris**	**12.5%**	**2.4%**
Other Single-use Food Service Packaging	0.5%	0.1%	Clean Dimensional Lumber	1.1%	0.5%
Small Durable Plastic Products	1.1%	0.3%	Clean Engineered Wood	2.2%	1.1%
PLA Single-use Food Service Utensils	0.1%	0.0%	Pallets & Crates	1.6%	1.1%
PLA Single-use Food Service Packaging	0.2%	0.1%	Other Untreated Wood	0.0%	0.0%
Compostable Plastic Bags	0.1%	0.0%	New Gypsum Scrap	0.0%	0.0%
EPS Non Food Grade	0.5%	0.1%	Demo Gypsum Scrap	1.2%	0.8%
Rigid Foam Insulation	0.1%	0.1%	Carpet	0.7%	0.5%
Takeout & Retail Bags	0.4%	0.2%	Felt Carpet Pad	0.0%	0.0%
Stretch Wrap	0.6%	0.2%	Rock, Concrete, & Other Aggregates	0.0%	0.0%
Other Clean Polyethylene Film	1.2%	0.6%	Asphaltic Roofing	0.0%	0.0%
Large Durable Plastic Products	2.0%	0.7%	Liquid Latex Paint	0.2%	0.2%
EPS Food Grade	0.2%	0.1%	New Painted Wood	1.6%	0.7%
Other Single-use Food Service Utensils	0.1%	0.0%	Old Painted Wood	0.1%	0.1%
Plastic Pouches	0.1%	0.0%	Creosote Treated Wood	0.3%	0.4%
Plastic Mailers	0.1%	0.0%	Other Treated Wood	0.1%	0.1%
Garbage Bags	2.5%	0.3%	Contaminated Wood	0.7%	0.5%
Other Film	3.8%	0.5%	Fiberglass Insulation	0.2%	0.2%
Plastic Other Materials	1.2%	0.4%	Ceramics	0.2%	0.1%
Glass	**2.4%**	**0.8%**	Other Construction Debris	2.3%	1.0%
Clear Beverage Glass	0.6%	0.1%	**Potentially Harmful Wastes**	**3.7%**	**1.4%**
Green Beverage Glass	0.3%	0.1%	Oil Based Paints	0.0%	0.0%
Brown Beverage Glass	0.4%	0.2%	Medications	0.0%	0.0%
Container Glass	0.2%	0.1%	Other Harmful Wastes	0.3%	0.2%
Mixed Cullet	0.0%	0.0%	Medical Waste	2.6%	1.2%
Other Glass	0.9%	0.8%	Non Caustic Chemicals	0.0%	0.0%
Metal	**5.5%**	**1.4%**	Vitamins & Supplements	0.0%	0.0%
Aluminum Cans	0.4%	0.1%	Cosmetics	0.7%	0.7%
Aluminum Foil Or Containers	0.2%	0.0%	**Fines & Miscellaneous Materials**	**3.7%**	**1.3%**
Steel Food Cans	0.4%	0.1%	Personal Protective Equipment	0.7%	0.2%
Empty Aerosol Cans	0.1%	0.0%	Soil & Dirt	1.2%	1.1%
Other Ferrous	1.8%	0.5%	Non-distinct Fines	0.6%	0.2%
Other Aluminum	0.2%	0.2%	Misc. Organics	0.6%	0.3%
Oil Filters	0.0%	0.0%	Misc. Inorganics	0.6%	0.2%
Other Nonferrous	0.2%	0.2%			
Mixed Metals	2.1%	1.2%			
Sample Count	*91*		**Total**	**100%**	

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

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Summer

Table 31. Detailed Composition Table: Summer Sampling Season

Material	Est. %	+ / -	Material	Est. %	+ / -
Curbside Recyclable	**18.7%**	**2.6%**	**Compostable Organics**	**17.7%**	**4.3%**
Compostable	**25.7%**	**4.7%**	Leaves & Grass	0.3%	0.3%
Other Recoverable	**22.7%**	**4.5%**	Prunings	0.5%	0.5%
Non-recoverable	**32.9%**	**4.4%**	Packaged Edible Vegetative Food Waste	0.7%	0.5%
			Edible Vegetative Food Waste	0.9%	0.5%
Paper	**20.3%**	**2.3%**	Packaged Edible Other Food Waste	6.4%	3.9%
Newspaper	0.2%	0.1%	Edible Food Waste Other	5.1%	1.5%
Cardboard & Kraft Paper	4.6%	1.2%	Inedible Vegetative Food Waste	2.6%	0.9%
Grocery Or Shopping Bags	0.6%	0.2%	Inedible Other Food Waste	1.0%	0.5%
Paper Packaging	0.9%	0.2%	Fats, Oils, & Grease	0.1%	0.2%
Paper Products	2.1%	0.7%	Other Compostable Organics	0.1%	0.1%
Aseptic Containers	0.1%	0.0%	**Other Organics**	**8.4%**	**2.6%**
Gable Top Containers	0.1%	0.0%	Textiles	2.5%	0.8%
Other Poly-coated Containers	0.4%	0.4%	Mixed Textiles	2.6%	1.1%
Non-coated or Soiled Paper Products	6.6%	1.3%	Tires	0.0%	0.0%
Non-coated Single-use Food Packaging	1.1%	0.5%	Diapers	1.7%	2.0%
Shredded Paper	0.1%	0.1%	Animal By-products	1.0%	0.7%
Waxed Cardboard	0.6%	0.5%	Rubber Products	0.7%	0.4%
Coated Single-use Food Packaging	0.9%	0.3%	**Furniture, Appliances, & Electronics**	**3.6%**	**1.5%**
Mixed Or Other Paper	2.0%	0.7%	Furniture	1.0%	0.9%
Plastic	**16.1%**	**2.3%**	Mattresses	0.6%	0.7%
PET Bottles & Jars	0.9%	0.2%	Small Appliances	1.1%	0.7%
HDPE Natural Bottles & Jars	0.2%	0.1%	CFL Lights	0.0%	0.0%
HDPE Colored Bottles & Jars	0.1%	0.0%	LED Lighting	0.0%	0.0%
PP Bottles & Jars	0.0%	0.0%	Rechargeable Batteries	0.0%	0.0%
Other Plastic Bottles & Jars	0.0%	0.0%	Dry Cell Batteries	0.0%	0.0%
PET Non-bottle Packaging	0.3%	0.1%	Wet Cell Batteries	0.0%	0.0%
HDPE Non-bottle Packaging	0.4%	0.2%	E-Cycle WA Accepted Electronics	0.5%	0.9%
PP Non-bottle Packaging	0.6%	0.2%	Non-E-Cycle WA Accepted Electronics	0.4%	0.2%
Other Non Bottle Packaging	0.3%	0.1%	**Construction Debris**	**19.3%**	**4.8%**
Other Single-use Food Service Packaging	0.9%	0.3%	Clean Dimensional Lumber	2.7%	1.3%
Small Durable Plastic Products	0.8%	0.3%	Clean Engineered Wood	2.9%	1.4%
PLA Single-use Food Service Utensils	0.1%	0.0%	Pallets & Crates	1.0%	0.9%
PLA Single-use Food Service Packaging	0.1%	0.0%	Other Untreated Wood	0.0%	0.0%
Compostable Plastic Bags	0.0%	0.0%	New Gypsum Scrap	0.0%	0.0%
EPS Non Food Grade	0.4%	0.2%	Demo Gypsum Scrap	0.1%	0.1%
Rigid Foam Insulation	0.0%	0.0%	Carpet	2.7%	2.2%
Takeout & Retail Bags	0.3%	0.1%	Felt Carpet Pad	0.3%	0.4%
Stretch Wrap	0.5%	0.4%	Rock, Concrete, & Other Aggregates	0.3%	0.4%
Other Clean Polyethylene Film	0.7%	0.4%	Asphaltic Roofing	0.0%	0.0%
Large Durable Plastic Products	2.1%	0.7%	Liquid Latex Paint	0.1%	0.2%
EPS Food Grade	0.2%	0.2%	New Painted Wood	2.6%	1.5%
Other Single-use Food Service Utensils	0.1%	0.0%	Old Painted Wood	0.0%	0.0%
Plastic Pouches	0.1%	0.1%	Creosote Treated Wood	0.0%	0.0%
Plastic Mailers	0.1%	0.0%	Other Treated Wood	0.4%	0.5%
Garbage Bags	2.6%	0.4%	Contaminated Wood	1.5%	1.0%
Other Film	3.2%	0.8%	Fiberglass Insulation	0.2%	0.2%
Plastic Other Materials	1.3%	0.6%	Ceramics	0.1%	0.1%
Glass	**1.5%**	**0.4%**	Other Construction Debris	4.3%	3.9%
Clear Beverage Glass	0.5%	0.2%	**Potentially Harmful Wastes**	**2.1%**	**2.1%**
Green Beverage Glass	0.5%	0.3%	Oil Based Paints	0.0%	0.0%
Brown Beverage Glass	0.2%	0.1%	Medications	0.0%	0.0%
Container Glass	0.0%	0.0%	Other Harmful Wastes	0.0%	0.0%
Mixed Cullet	0.1%	0.1%	Medical Waste	1.9%	2.1%
Other Glass	0.2%	0.1%	Non Caustic Chemicals	0.0%	0.0%
Metal	**8.9%**	**2.6%**	Vitamins & Supplements	0.0%	0.0%
Aluminum Cans	0.3%	0.1%	Cosmetics	0.1%	0.1%
Aluminum Foil Or Containers	0.2%	0.1%	**Fines & Miscellaneous Materials**	**2.2%**	**1.0%**
Steel Food Cans	0.2%	0.1%	Personal Protective Equipment	0.3%	0.1%
Empty Aerosol Cans	0.1%	0.0%	Soil & Dirt	0.8%	0.9%
Other Ferrous	3.1%	1.5%	Non-distinct Fines	0.2%	0.1%
Other Aluminum	0.1%	0.1%	Misc. Organics	0.4%	0.2%
Oil Filters	0.0%	0.0%	Misc. Inorganics	0.4%	0.2%
Other Nonferrous	0.1%	0.1%			
Mixed Metals	4.8%	2.1%			
Sample Count	*45*		**Total**	**100%**	

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

Table 32. Detailed Composition Table: Fall Sampling Season

Material	Est. %	+ / -	Material	Est. %	+ / -
Curbside Recyclable	**22.1%**	**2.5%**	**Compostable Organics**	**17.4%**	**3.9%**
Compostable	**26.1%**	**4.5%**	Leaves & Grass	1.2%	0.7%
Other Recoverable	**24.0%**	**4.3%**	Prunings	0.6%	0.8%
Non-recoverable	**27.8%**	**3.6%**	Packaged Edible Vegetative Food Waste	0.8%	1.0%
			Edible Vegetative Food Waste	1.9%	0.9%
Paper	**22.3%**	**3.3%**	Packaged Edible Other Food Waste	2.7%	0.7%
Newspaper	0.1%	0.0%	Edible Food Waste Other	4.7%	1.4%
Cardboard & Kraft Paper	5.5%	1.5%	Inedible Vegetative Food Waste	4.4%	1.6%
Grocery Or Shopping Bags	0.9%	0.2%	Inedible Other Food Waste	0.8%	0.6%
Paper Packaging	1.5%	0.5%	Fats, Oils, & Grease	0.1%	0.0%
Paper Products	1.8%	0.5%	Other Compostable Organics	0.1%	0.1%
Aseptic Containers	0.1%	0.0%	**Other Organics**	**8.8%**	**2.1%**
Gable Top Containers	0.2%	0.1%	Textiles	3.8%	1.3%
Other Poly-coated Containers	0.1%	0.0%	Mixed Textiles	2.4%	1.0%
Non-coated or Soiled Paper Products	7.9%	1.8%	Tires	0.0%	0.0%
Non-coated Single-use Food Packaging	0.6%	0.1%	Diapers	0.5%	0.4%
Shredded Paper	0.0%	0.0%	Animal By-products	1.5%	0.6%
Waxed Cardboard	0.5%	0.4%	Rubber Products	0.5%	0.4%
Coated Single-use Food Packaging	1.0%	0.3%	**Furniture, Appliances, & Electronics**	**3.7%**	**1.5%**
Mixed Or Other Paper	2.2%	1.2%	Furniture	2.1%	1.2%
Plastic	**19.8%**	**2.9%**	Mattresses	0.0%	0.0%
PET Bottles & Jars	0.6%	0.1%	Small Appliances	1.2%	0.9%
HDPE Natural Bottles & Jars	0.5%	0.3%	CFL Lights	0.0%	0.0%
HDPE Colored Bottles & Jars	0.2%	0.1%	LED Lighting	0.0%	0.0%
PP Bottles & Jars	0.0%	0.0%	Rechargeable Batteries	0.0%	0.0%
Other Plastic Bottles & Jars	0.0%	0.0%	Dry Cell Batteries	0.0%	0.0%
PET Non-bottle Packaging	0.3%	0.1%	Wet Cell Batteries	0.0%	0.0%
HDPE Non-bottle Packaging	1.4%	0.6%	E-Cycle WA Accepted Electronics	0.2%	0.4%
PP Non-bottle Packaging	0.5%	0.2%	Non-E-Cycle WA Accepted Electronics	0.1%	0.2%
Other Non Bottle Packaging	0.4%	0.1%	**Construction Debris**	**13.8%**	**3.1%**
Other Single-use Food Service Packaging	0.6%	0.2%	Clean Dimensional Lumber	1.2%	0.5%
Small Durable Plastic Products	1.0%	0.4%	Clean Engineered Wood	2.5%	1.3%
PLA Single-use Food Service Utensils	0.0%	0.0%	Pallets & Crates	1.1%	0.9%
PLA Single-use Food Service Packaging	0.1%	0.0%	Other Untreated Wood	0.0%	0.0%
Compostable Plastic Bags	0.0%	0.0%	New Gypsum Scrap	0.1%	0.1%
EPS Non Food Grade	0.3%	0.2%	Demo Gypsum Scrap	0.4%	0.5%
Rigid Foam Insulation	0.0%	0.0%	Carpet	0.6%	0.6%
Takeout & Retail Bags	0.3%	0.1%	Felt Carpet Pad	0.0%	0.0%
Stretch Wrap	0.9%	1.2%	Rock, Concrete, & Other Aggregates	0.6%	0.6%
Other Clean Polyethylene Film	3.3%	2.0%	Asphaltic Roofing	0.0%	0.0%
Large Durable Plastic Products	2.7%	1.3%	Liquid Latex Paint	0.0%	0.1%
EPS Food Grade	0.1%	0.0%	New Painted Wood	2.8%	1.2%
Other Single-use Food Service Utensils	0.1%	0.0%	Old Painted Wood	0.5%	0.6%
Plastic Pouches	0.1%	0.0%	Creosote Treated Wood	0.0%	0.0%
Plastic Mailers	0.0%	0.0%	Other Treated Wood	0.9%	0.7%
Garbage Bags	2.6%	0.5%	Contaminated Wood	0.8%	0.5%
Other Film	3.2%	0.9%	Fiberglass Insulation	0.3%	0.3%
Plastic Other Materials	0.6%	0.3%	Ceramics	0.4%	0.3%
Glass	**1.6%**	**0.5%**	Other Construction Debris	1.6%	1.2%
Clear Beverage Glass	0.6%	0.2%	**Potentially Harmful Wastes**	**2.1%**	**1.0%**
Green Beverage Glass	0.3%	0.4%	Oil Based Paints	0.0%	0.0%
Brown Beverage Glass	0.2%	0.1%	Medications	0.0%	0.0%
Container Glass	0.1%	0.1%	Other Harmful Wastes	0.0%	0.0%
Mixed Cullet	0.0%	0.0%	Medical Waste	1.8%	0.9%
Other Glass	0.3%	0.2%	Non Caustic Chemicals	0.1%	0.1%
Metal	**8.8%**	**2.6%**	Vitamins & Supplements	0.0%	0.0%
Aluminum Cans	0.3%	0.1%	Cosmetics	0.2%	0.1%
Aluminum Foil Or Containers	0.3%	0.2%	**Fines & Miscellaneous Materials**	**1.8%**	**0.8%**
Steel Food Cans	0.4%	0.2%	Personal Protective Equipment	0.3%	0.1%
Empty Aerosol Cans	0.2%	0.2%	Soil & Dirt	0.5%	0.7%
Other Ferrous	4.1%	1.7%	Non-distinct Fines	0.2%	0.1%
Other Aluminum	0.1%	0.1%	Misc. Organics	0.5%	0.3%
Oil Filters	0.0%	0.0%	Misc. Inorganics	0.2%	0.0%
Other Nonferrous	0.1%	0.1%			
Mixed Metals	3.3%	1.8%			
Sample Count	*44*		**Total**	**100%**	

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

Winter

Table 33. Detailed Composition Table: Winter Sampling Season

Material	Est. %	+ / -	Material	Est. %	+ / -
Curbside Recyclable	**20.6%**	**2.2%**	**Compostable Organics**	**18.4%**	**2.6%**
Compostable	**24.5%**	**3.2%**	Leaves & Grass	1.5%	0.9%
Other Recoverable	**21.5%**	**3.4%**	Prunings	0.4%	0.3%
Non-recoverable	**33.4%**	**3.6%**	Packaged Edible Vegetative Food Waste	1.1%	0.3%
			Edible Vegetative Food Waste	1.8%	0.7%
Paper	**21.0%**	**2.5%**	Packaged Edible Other Food Waste	4.6%	1.0%
Newspaper	0.6%	0.3%	Edible Food Waste Other	4.3%	0.9%
Cardboard & Kraft Paper	6.4%	1.8%	Inedible Vegetative Food Waste	3.1%	0.7%
Grocery Or Shopping Bags	0.6%	0.1%	Inedible Other Food Waste	0.8%	0.3%
Paper Packaging	1.2%	0.2%	Fats, Oils, & Grease	0.6%	0.6%
Paper Products	2.1%	0.7%	Other Compostable Organics	0.3%	0.1%
Aseptic Containers	0.1%	0.0%	**Other Organics**	**10.5%**	**2.4%**
Gable Top Containers	0.1%	0.0%	Textiles	3.4%	0.7%
Other Poly-coated Containers	0.0%	0.0%	Mixed Textiles	1.2%	0.3%
Non-coated or Soiled Paper Products	4.9%	0.7%	Tires	0.4%	0.4%
Non-coated Single-use Food Packaging	0.9%	0.3%	Diapers	3.4%	2.2%
Shredded Paper	0.1%	0.1%	Animal By-products	1.7%	0.5%
Waxed Cardboard	1.1%	0.7%	Rubber Products	0.4%	0.2%
Coated Single-use Food Packaging	0.7%	0.1%	**Furniture, Appliances, & Electronics**	**2.3%**	**1.1%**
Mixed Or Other Paper	2.2%	0.7%	Furniture	0.9%	0.8%
Plastic	**18.6%**	**2.1%**	Mattresses	0.2%	0.4%
PET Bottles & Jars	0.5%	0.1%	Small Appliances	0.2%	0.3%
HDPE Natural Bottles & Jars	0.2%	0.1%	CFL Lights	0.0%	0.0%
HDPE Colored Bottles & Jars	0.1%	0.0%	LED Lighting	0.0%	0.0%
PP Bottles & Jars	0.2%	0.1%	Rechargeable Batteries	0.0%	0.0%
Other Plastic Bottles & Jars	0.0%	0.0%	Dry Cell Batteries	0.0%	0.0%
PET Non-bottle Packaging	0.3%	0.1%	Wet Cell Batteries	0.0%	0.0%
HDPE Non-bottle Packaging	0.5%	0.2%	E-Cycle WA Accepted Electronics	0.7%	0.7%
PP Non-bottle Packaging	0.5%	0.2%	Non-E-Cycle WA Accepted Electronics	0.3%	0.2%
Other Non Bottle Packaging	0.4%	0.1%	**Construction Debris**	**15.7%**	**2.9%**
Other Single-use Food Service Packaging	0.7%	0.2%	Clean Dimensional Lumber	1.2%	0.4%
Small Durable Plastic Products	0.8%	0.4%	Clean Engineered Wood	2.3%	1.2%
PLA Single-use Food Service Utensils	0.1%	0.0%	Pallets & Crates	2.6%	1.7%
PLA Single-use Food Service Packaging	0.1%	0.0%	Other Untreated Wood	0.1%	0.2%
Compostable Plastic Bags	0.1%	0.0%	New Gypsum Scrap	0.1%	0.1%
EPS Non Food Grade	0.4%	0.1%	Demo Gypsum Scrap	0.1%	0.2%
Rigid Foam Insulation	0.0%	0.0%	Carpet	1.7%	1.0%
Takeout & Retail Bags	0.2%	0.0%	Felt Carpet Pad	0.0%	0.0%
Stretch Wrap	0.8%	0.5%	Rock, Concrete, & Other Aggregates	1.0%	0.8%
Other Clean Polyethylene Film	1.0%	0.7%	Asphaltic Roofing	0.0%	0.0%
Large Durable Plastic Products	1.9%	0.6%	Liquid Latex Paint	0.5%	0.3%
EPS Food Grade	0.1%	0.0%	New Painted Wood	2.4%	1.1%
Other Single-use Food Service Utensils	0.1%	0.0%	Old Painted Wood	0.0%	0.0%
Plastic Pouches	0.1%	0.0%	Creosote Treated Wood	0.2%	0.2%
Plastic Mailers	0.0%	0.0%	Other Treated Wood	0.3%	0.3%
Garbage Bags	2.4%	0.3%	Contaminated Wood	1.3%	0.8%
Other Film	5.4%	1.7%	Fiberglass Insulation	0.3%	0.3%
Plastic Other Materials	1.5%	0.6%	Ceramics	0.1%	0.1%
Glass	**1.7%**	**0.4%**	Other Construction Debris	1.7%	0.8%
Clear Beverage Glass	0.6%	0.2%	**Potentially Harmful Wastes**	**2.0%**	**1.2%**
Green Beverage Glass	0.3%	0.2%	Oil Based Paints	0.0%	0.0%
Brown Beverage Glass	0.3%	0.1%	Medications	0.0%	0.0%
Container Glass	0.1%	0.1%	Other Harmful Wastes	0.2%	0.1%
Mixed Cullet	0.1%	0.1%	Medical Waste	1.7%	1.2%
Other Glass	0.3%	0.1%	Non Caustic Chemicals	0.0%	0.0%
Metal	**7.6%**	**1.5%**	Vitamins & Supplements	0.0%	0.0%
Aluminum Cans	0.3%	0.1%	Cosmetics	0.1%	0.0%
Aluminum Foil Or Containers	0.2%	0.1%	**Fines & Miscellaneous Materials**	**2.0%**	**0.6%**
Steel Food Cans	0.4%	0.2%	Personal Protective Equipment	0.4%	0.1%
Empty Aerosol Cans	0.1%	0.0%	Soil & Dirt	0.1%	0.2%
Other Ferrous	2.6%	0.7%	Non-distinct Fines	0.5%	0.1%
Other Aluminum	0.1%	0.2%	Misc. Organics	0.3%	0.2%
Oil Filters	0.0%	0.1%	Misc. Inorganics	0.7%	0.5%
Other Nonferrous	0.1%	0.0%			
Mixed Metals	3.7%	1.3%			
Sample Count	*91*		**Total**	**100%**	

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