

Seattle Public Utilities

2017-18
Self-Haul Waste Stream Composition Study
Final Report



prepared by
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In cooperation with
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1 Overview

Introduction and Background

Seattle Public Utilities (SPU) provides for the collection, transfer, and disposal of municipal solid waste (MSW) from within the City of Seattle. As part of this responsibility, SPU designs and implements programs that help the City meet its goal to achieve a 60% recycling rate by 2015, and 70% recycling rate by 2025. To better understand the types and quantities of MSW disposed and to assess the city's recycling potential, SPU has conducted composition studies every two years since 1988. The 1988 study included the city's entire waste stream, and each subsequent study has analyzed one or two of the city's three waste streams (residential, commercial, and self-haul) so that every stream is sampled at least once every four years. In 2017-18, the City limited the study to the examination of self-hauled waste. Traditionally the commercial stream and the self-haul stream studies are completed concurrently, however the City elected to begin the commercial study in 2016 while the North Recycling and Disposal Station (NRDS) was still closed and postponed the self-haul study until the NRDS station had been reopened for several months. This wait allowed the self-haul tonnage and traffic counts to stabilize at NRDS before the field work commenced. Table 1 shows the number of waste samples sorted from these three waste streams from 1988 through the current study in 2017-18.

Table 1. Samples per Study Period, by Substream

Year	Commercial	Residential	Self-Haul	Total
1988-89	121	212	217	550
1990	0	114	203	317
1992	251	0	197	448
1994-95	0	368	0	368
1996	348	0	199	547
1998-99	0	360	0	360
2000	347	0	200	547
2002	0	309	0	309
2004	270	0	216	486
2006	0	356	0	356
2008	271	0	216	487
2010	0	361	0	361
2012	259	0	226	476
2014	0	362	0	362
2016	292	0	0	292
2017-18	0	0	223	223

All of these studies share the following three objectives:

- Obtain information about the City's residential, commercial, and self-haul waste substreams in order to estimate the recycling potential for each;
- Understand differences among these three substreams so that targeted recycling programs can be designed, implemented, and monitored for each; and
- Establish a baseline for continued, long-term measurement of system performance.

This report, which consists of six sections, presents the results of the 2017/18 self-haul waste study. This section, Section 1, briefly introduces the project and the methodology, and Section 2 summarizes the study's findings. In Section 3, the 2017-18 self-haul findings are compared with those from the previous study periods. Detailed results of the 2017-18 self-haul waste composition study are presented in Section 4 and Section 5. Section 6 follows the main body of the report and it includes appendices detailing the material definitions, study methodology, comments on sampling events, waste composition calculations, year-to-year comparison calculations, and copies of field forms.

Seattle's Self-haul Waste Substream

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 targets the self-haul substream.¹

The **self-haul** substream is made up of waste that is: a) generated at residences as well as businesses and institutions; and, b) hauled by the household or business that generated the waste or a non-franchised hauler. All self-haul waste included in the study is disposed at one of two City-owned disposal stations: North or South Recycling and Disposal Stations (NRDS or SRDS). The self-haul stream includes many large institutions that haul their own waste including the University of Washington and the Seattle Housing Authority.

Study Methodology

The following table provides an overview of the 2017-18 study methodology. As shown, there were four major steps involved in conducting this waste composition study. The steps are presented according to the order in which they occurred during the study. Please see the Sampling Methodology appendix for a detailed description of the methodology.

¹ The residential and commercial substreams were not included in this study. For the most recent analysis of Seattle's residential waste stream, please see the [2014 Residential Waste Composition Study Final Report](#) prepared for the Seattle Public Utilities by Cascadia Consulting Group, Inc. For the most recent analysis of Seattle's commercial waste stream, please see the [2016 Commercial Waste Stream Composition Study](#) prepared for the Seattle Public Utilities by Cascadia Consulting Group, Inc.

Step 1: Develop Sampling Plan

- Self-haul samples were evenly allocated to each Recycling and Disposal Station, 108 to the North and 108 to the South.
- A sampling schedule included 12 days of sampling from August 1, 2017 to July 31, 2018. Sampling days were randomly selected to assure a representative distribution across the days of the week and weeks of the month.
- The allocation included 168 randomly selected loads and 48 loads from five targeted generator subtypes. The targeted generator subtypes were: construction contractors, charity/thrift stores, junk haulers, University of Washington, and Seattle Housing Authority

Step 2: Schedule and Collect Waste Samples

- The randomly selected loads were systematically selected for sampling using a pre-determined frequency based on expected transfer station traffic for each sampling day.
- Every vehicle from the targeted generator subtypes was selected for sampling until the daily sample target was met.
- In cases when a randomly selected load was from one of the generator subtypes selected, the sample was used to meet the overall and the generator subtype targets.

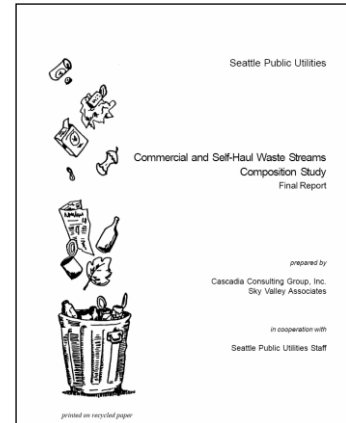
Step 3: Capture and Sort Samples

- The sampling crew supervisor worked with selected self-haul drivers to unload their waste onto a tarpaulin. Samples from large (greater than 250 pounds) self-haul loads were either sorted in their entirety or the sampling crew selected a 250-pound cross section of the load to sort. If the load was less than 250 pounds, then the next vehicle of the same generator group (residential or non-residential) was also selected so that the weight of the two samples together equaled at least 250 pounds.
- For this study, a total of 223 self-haul samples were sorted into 115 distinct component categories, such as *office paper* or *PET bottles*. Since the 2012 study, three component categories were added to the list of components. Please see Table 2 for an overview of how component categories have changed.



Step 4: Analyze Data and Prepare Report

- Following each sampling event, all sorting data were entered into a customized database and reviewed for data entry errors.
- At the conclusion of the study, the overall and subpopulation waste composition estimates were calculated by aggregating sampling data from the randomly selected vehicles using a *weighted average* procedure. SPU provided 2017-18 waste tonnage data estimates that were used to perform final calculations. The weighted average procedure is detailed in Waste Composition Calculations.
- Waste composition estimates were calculated for the targeted generator subtypes using the samples collected from the targeted subtypes using a *weighted average* procedure when tonnage data for the group was available. SPU provided 2017-18 waste tonnage data estimates that were used to perform final calculations.
- Once the data were analyzed, this accompanying report was prepared.



1.1.1 Changes in Waste Component Categories

Several changes were made to the 2012 list of components for the 2017-18 study. These changes were made to reflect changes in the waste stream, recycling industry, and disposal regulations; and to increase material specificity and worker safety.

A total of 115 components were included in this study, representing two additional components from the previous 2012 study, and there was a net increase of 23 components compared to the list of 92 that was used in the 2008 study. As detailed in Table 2, the increase since 2012 is due to one material type from the 2012 list that was separated into three material types. For a description of all the changes to the component list, reference Table 43 in Waste Component Categories.

Table 2. Changes to Waste Component Categories Since 2012

2012 Material Type	2017-18 Material Type
Other cleaners/chemicals	Pharmaceuticals and vitamins
	Personal care/cosmetics
	Other cleaners/chemicals

2 Summary of Year 2017-18 Sampling Results

In 2017-18, the waste samples were sorted into ten broad material categories: **Paper, Plastic, Glass, Metal, Compostable Organics, Other Organics, Furniture, Appliances & Electronics, Construction Debris, Potential Harmful Waste, And Fines & Miscellaneous Materials**. Each broad material category was then sorted into various components such as *newspaper* or *PET plastic bottles*. A total of 115 components were included in this study.

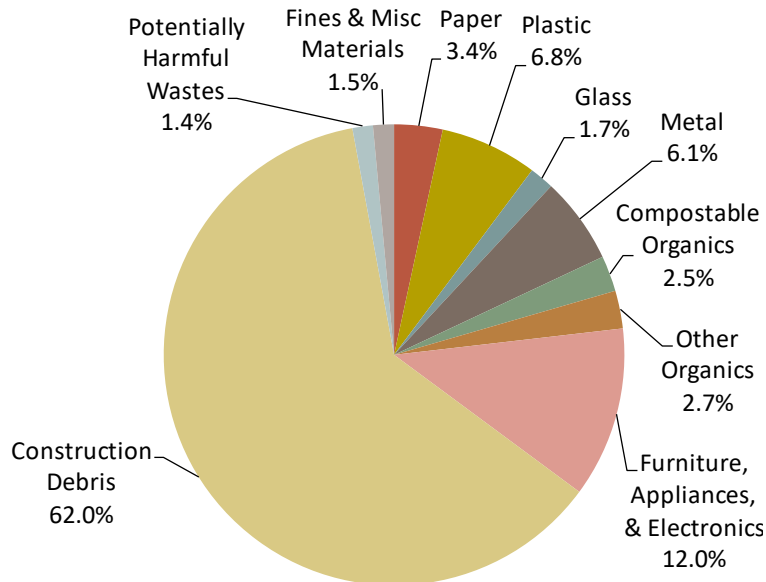
Composition results are presented in the following order in this report. First, a pie chart reflects the composition percentages of the ten broad material categories. A table that lists the top ten components by weight follows the pie charts. Lastly, a table depicting the full composition

results of all 115 components is presented.² Weighted averages were used to calculate composition estimates for the self-haul substream. Please see Waste Composition Calculations for more detail regarding these calculations.

Overall Self-haul Substream

Figure 1 summarizes the composition results for the overall self-haul substream. As shown, **Construction Debris** accounted for 62% of the self-hauled substream, followed by **Furniture, Appliances & Electronics** with 12%.

Figure 1. Self-haul Overview of Composition Estimates: Overall Self-haul (August 1, 2017 to July 31, 2018)



A total of 182 randomly selected self-haul loads were sampled in 2017-18. The self-haul substream disposed of 97,863 tons of waste during the 2017-18 study year, from August 1, 2017 through July 31, 2018. The composition estimates for this substream were applied to the 97,863 tons to estimate the amount of waste disposed for each component category. Table 3 lists the top ten components disposed by the self-haul substream. Together, these ten components accounted for nearly 60% of the entire self-haul tonnage. *Clean dimension lumber, new painted wood, and contaminated wood* are the three largest components of this substream. The composition percentages, by weight, of each component in the self-haul substream are listed in Table 4.

² All waste composition results were derived using a 90% confidence level. This means that there is a 90% certainty that the actual composition is within the calculated range. In charts throughout this report, the values graphed represent the mean component percentage, not the range.

**Table 3. Top Ten Components: Overall Self-haul
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	Cum. Percent	Est. Tons
Clean Dimension Lumber	9.7%	9.7%	9,525
New Painted Wood	9.1%	18.8%	8,883
Contaminated Wood	8.3%	27.1%	8,150
Furniture	7.6%	34.8%	7,480
Clean Engineered Wood	5.8%	40.6%	5,686
Carpet	5.2%	45.8%	5,100
Other Construction	4.1%	49.9%	4,007
Mixed Metals/Material	3.5%	53.3%	3,379
Mattresses	3.3%	56.7%	3,266
Other Treated Wood	3.3%	59.9%	3,194
Total	59.9%		58,669

**Table 4. Composition by Weight: Overall Self-haul
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	3.4%		3,325	Furniture, Appliances, and Electronics	12.0%		11,703
Newspaper	0.0%	0.0%	18	Furniture	7.6%	2.6%	7,480
Plain OCC/Kraft	2.0%	0.5%	1,956	Mattresses	3.3%	1.4%	3,266
Waxed OCC	0.0%	0.0%	0	Small Appliances	0.4%	0.3%	417
Grocery/Shopping Bags	0.0%	0.0%	32	Cell Phones	0.0%	0.0%	0
High-grade Paper	0.0%	0.0%	27	Audio/Visual Equipment	0.2%	0.1%	182
Mixed Low-grade Paper	0.6%	0.2%	561	CRT Monitors	0.0%	0.0%	0
Polycoated Containers	0.0%	0.0%	4	CRT Televisions	0.0%	0.0%	0
Compostable/Soiled	0.1%	0.1%	100	Other Electronics	0.4%	0.2%	360
Pot. Comp. Single-use Food Service	0.0%	0.0%	9	Construction Debris	62.0%		60,645
Non-Comp. Single-use Food Service	0.0%	0.0%	25	Clean Dimension Lumber	9.7%	2.6%	9,525
Mixed/Other Paper	0.6%	0.3%	591	Clean Engineered Wood	5.8%	1.8%	5,686
Plastic	6.8%		6,681	Pallets	2.6%	1.4%	2,587
#1 PET Bottles	0.1%	0.0%	52	Crates	0.1%	0.1%	87
#2 HDPE Natural Bottles	0.0%	0.0%	15	Other Untreated Wood	0.3%	0.2%	260
#2 HDPE Colored Bottles	0.0%	0.0%	14	New Painted Wood	9.1%	2.1%	8,883
Other Bottles	0.0%	0.0%	5	Old Painted Wood	2.3%	1.0%	2,270
Tubs	0.3%	0.1%	336	Creosote-treated Wood	0.9%	0.7%	888
Expanded Poly. Non-food	0.9%	1.1%	875	Other Treated Wood	3.3%	1.3%	3,194
Expanded Poly. Food-grade	0.0%	0.0%	12	Contaminated Wood	8.3%	1.9%	8,150
Rigid Poly. Foam Insulation	0.2%	0.3%	185	New Gypsum Scrap	1.0%	0.7%	962
Pot. Comp. Single-use Food Service	0.0%	0.0%	2	Demo Gypsum Scrap	2.7%	1.5%	2,669
Non-Comp. Single-use Food Service	0.0%	0.0%	15	Carpet	5.2%	2.0%	5,100
Other Rigid Packaging	0.1%	0.0%	54	Felt Carpet Pad	0.5%	0.4%	450
Shopping/Dry Cleaning Bags	0.0%	0.0%	12	Fiberglass Insulation	0.2%	0.2%	244
Stretch Wrap	0.1%	0.1%	97	Concrete	1.7%	1.4%	1,691
Clean Polyethylene Film	0.1%	0.0%	83	Asphalt Paving	0.0%	0.0%	0
Other Film	0.5%	0.2%	517	Other Aggregates	0.4%	0.4%	370
Plastic Pipe	0.1%	0.1%	132	Rock	0.0%	0.0%	39
Foam Carpet Padding	0.3%	0.2%	281	Asphalt Shingles	1.4%	0.8%	1,392
Durable Plastic Products	3.1%	0.8%	3,005	Other Asphaltic Roofing	0.0%	0.0%	4
Plastic/Other Materials	1.0%	0.7%	988	Ceramics	2.1%	1.0%	2,061
Glass	1.7%		1,677	Cement Fiber Board	0.1%	0.1%	125
Clear Bottles	0.1%	0.0%	58	Single-ply Roofing Membranes	0.0%	0.0%	1
Green Bottles	0.0%	0.0%	29	Ceiling Tiles	0.0%	0.0%	0
Brown Bottles	0.1%	0.1%	135	Other Construction	4.1%	1.6%	4,007
Container Glass	0.0%	0.0%	36	Potentially Harmful Wastes	1.4%		1,405
Fluorescent Tubes	0.0%	0.0%	3	Dried Latex Paint	0.0%	0.0%	0
CFLs	0.0%	0.0%	1	Liquid Latex Paint	0.6%	0.3%	558
Flat Glass	0.4%	0.3%	420	Solvent-based Adhesives	0.0%	0.0%	42
Automotive Glass	0.0%	0.0%	0	Water-based Adhesives	0.2%	0.2%	214
Other Glass	1.0%	0.9%	994	Oil-based Paint/Thinners	0.4%	0.4%	371
Metal	6.1%		5,946	Caustic Cleaners	0.0%	0.0%	2
Aluminum Beverage Cans	0.0%	0.0%	21	Pesticides/Herbicides	0.0%	0.0%	1
Aluminum Foil/Containers	0.0%	0.0%	18	Rechargeable Batteries	0.0%	0.0%	2
Other Aluminum	0.0%	0.0%	26	Other Dry-cell Batteries	0.0%	0.0%	2
Other Nonferrous	0.1%	0.1%	93	Wet-cell Batteries	0.1%	0.1%	75
Steel Food Cans	0.0%	0.0%	20	Gasoline/Kerosene	0.0%	0.0%	0
Empty Aerosol Cans	0.0%	0.0%	12	Motor Oil/Diesel Oil	0.1%	0.1%	65
Other Ferrous	2.4%	0.6%	2,378	Asbestos	0.0%	0.0%	0
Oil filters	0.0%	0.0%	0	Explosives	0.0%	0.0%	0
Mixed Metals/Material	3.5%	1.0%	3,379	Medical Wastes	0.0%	0.0%	0
Compostable Organics	2.5%		2,453	Other Cleaners/Chemicals	0.0%	0.0%	32
Leaves and Grass	0.7%	0.5%	637	Pharmaceuticals/Vitamins	0.0%	0.0%	7
Prunings	0.1%	0.0%	73	Personal Care/Cosmetics	0.0%	0.0%	18
Food	1.8%	1.6%	1,742	Other Potentially Harmful Waste	0.0%	0.0%	15
Fats, Oils, Grease	0.0%	0.0%	0	Fines and Misc Materials	1.5%		1,434
Other Organics	2.7%		2,595	Sand/Soil/Dirt	1.2%	0.9%	1,203
Textiles/Clothing	1.4%	0.7%	1,365	Non-distinct Fines	0.0%	0.0%	45
Mixed Textiles	0.9%	0.4%	882	Miscellaneous Organics	0.2%	0.1%	181
Disposable Diapers	0.1%	0.1%	87	Miscellaneous Inorganics	0.0%	0.0%	4
Animal By-products	0.0%	0.1%	44	Totals	100%		97,863
Rubber Products	0.2%	0.1%	204	Sample Count	182		
Tires	0.0%	0.0%	13				

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

Results by Self-haul Subpopulation

Waste composition estimates were calculated for the various subpopulations of the self-haul substream, including: transfer station, vehicle type, season, and generator type by transfer station.

The largest components (each accounting for more than 5% of the total tonnage) for each subpopulation are shown in Table 5. *Carpet, furniture, clean dimension lumber, clean engineered wood, new painted wood, and contaminated wood* were among the most prevalent materials in most self-haul subpopulations. When the data are reported by subpopulation, the sample size for each analysis is smaller, which means that the calculations are subject to a more substantial range of error than calculations for the overall self-haul stream.

Please see Self-haul Composition Results by Subpopulation for more detail regarding the self-haul substream.

**Table 5. Largest Waste Components: by Self-haul Subpopulation
(August 1, 2017 to July 31, 2018)**

Subpopulation	Metal	Organics	Appliances		CDL Wastes								
	Mixed Metals/ Materials	Textiles/ Clothing	Furniture	Mattresses	Pallets	Clean Dimen. Lumber	Clean Engin. Wood	New Painted Wood	Other Treated Wood	Contaminated Wood	Demo Gypsum Scrap	Carpet	Other Constr.
Transfer Station													
NRDS			6.6%			10.7%	5.6%	12.7%		9.5%			
SRDS			8.2%			9.2%	5.9%	6.9%		7.6%		5.9%	
Vehicle Type													
Car		5.7%		6.8%				10.0%		6.1%		11.6%	5.4%
Truck			7.8%			10.0%	6.0%	9.0%		8.4%		5.0%	
Season													
Spring						8.7%	6.2%	7.8%		12.3%		6.3%	
Summer	5.0%		13.0%			17.3%		10.4%					
Autumn			9.5%			7.2%	6.3%	12.6%		11.6%		5.7%	
Winter							5.9%	5.0%	10.4%	6.7%		8.3%	9.4%
Generator Type, by Site													
Residential, NRDS			6.1%			7.5%		14.5%		11.1%			
Residential, SRDS			9.8%			6.2%	5.9%	9.6%		6.7%		6.6%	
Non-residential, NRDS			6.5%	6.2%	9.6%	14.5%	6.8%			5.9%		5.4%	8.1%
Non-residential, SRDS						14.5%	6.1%			14.2%	7.5%	5.6%	
Overall Self-Haul			7.6%			9.7%	5.8%	9.1%		8.3%		5.2%	

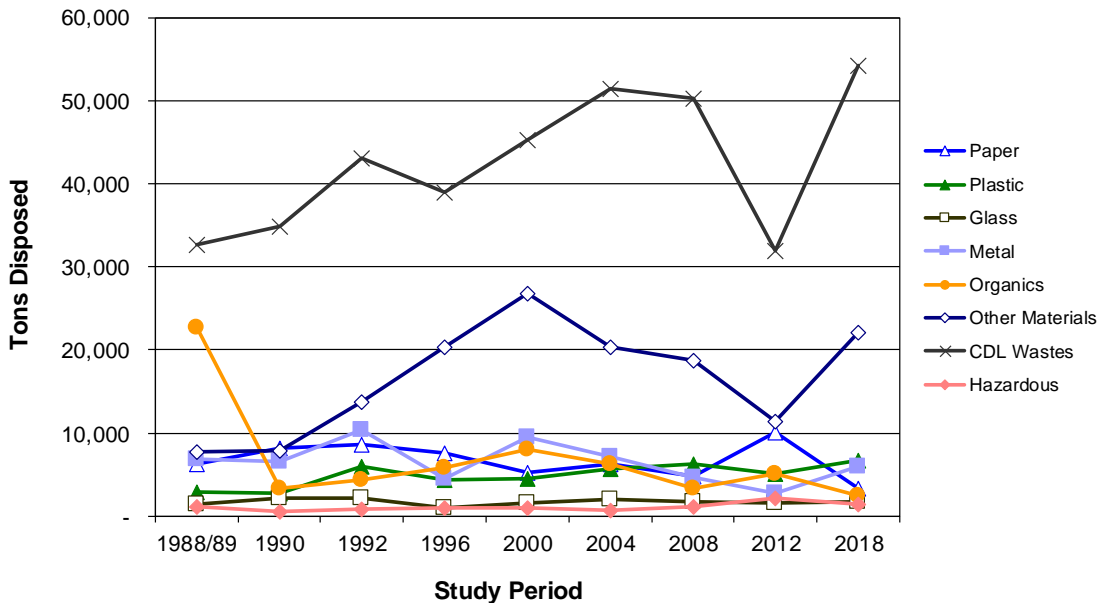
3 Self-haul Results Compared to Previous Studies

In this section, self-haul results from the 2017-18 study period are compared with the results of the 1988/89, 1990, 1992, 1996, 2000, 2004, 2008, and 2012 studies. Both composition percentages and the total amount of waste disposed of each broad material category were analyzed for the self-haul substream. All 2017-18 composition data in this section is based only on the randomly selected samples.³

Trends in Disposed Self-haul Waste

Changes in the quantity of disposed self-haul waste over time are depicted in Figure 2. **Construction Debris** show the largest increase in tonnage from the prior study period, up more than an estimated 22,300 tons. The increase in **Construction Debris** is likely tied to the increase in construction activity in the years since 2012; 2012 was near the bottom of the recession related construction reduction while the 2017-18 study coincided with one of the busiest construction periods in Seattle’s history. **Other Materials** saw the next largest increase, up an estimated 10,700 tons from 2012. **Paper** and **Organics** declined by an estimated 6,800 and 2,700 tons, respectively.

Figure 2. Changes in Self-haul Disposed Tons, 1988/89 to 2017-18



Changes in Self-haul Waste: 2012 to 2017-18

In Table 6, bolded broad material categories experienced significant differences in composition percentages between the 2012 and 2017-18 study periods. As shown, **Paper** and **Organics** displayed a significant change. **Paper** fell 11 percentage points, from an estimated 10,147 tons in 2012 to 3,325 in 2017-18, while organics dropped from 5,132 tons in 2012 to 2,453 in 2017-18.

³ The composition percentages used to perform statistical tests were calculated using unweighted averages. Please see Year-to-Year Comparison Calculations for more detail.

Table 6. Changes in Self-haul Waste: 2012 to 2017-18

	Percent		Change in Composition %	Disposed Tons	
	2012	2017/18		2012	2017/18
Paper	14.4%	3.4%	-11.0% ↓	10,147	3,325
Plastic	7.3%	6.8%	-0.5% ↓	5,155	6,681
Glass	2.3%	1.7%	-0.6% ↓	1,620	1,677
Metal	3.9%	6.1%	2.1% ↑	2,781	5,946
Organics	7.3%	2.5%	-4.8% ↓	5,132	2,453
Other Materials	16.2%	22.6%	6.3% ↑	11,438	22,094
CDL Wastes	45.4%	55.5%	10.1% ↑	31,993	54,283
Hazardous	3.1%	1.4%	-1.7% ↓	2,208	1,405
Total	100%	100%		70,474	97,863

* Bold type indicates statistically significant changes.

4 Self-haul Composition Results by Subpopulation

A total of 223 self-haul loads were sampled from August 1, 2017 to July 31, 2018. Many of these samples were from targeted loads and were not randomly selected. The composition data in this section is calculated based on the sampling data from the randomly selected loads. Descriptive data about samples from each subpopulation are summarized in Table 7. As shown, many of the analyses are based on a very small number of samples. Consequently, these calculations are subject to a relatively wide margin of error. The sampling plan was designed to provide statistically robust results for the overall self-haul substream. The composition results by subpopulation are provided as rough estimates only.

**Table 7. Description of Samples for each Self-haul Subpopulation
(August 1, 2017 to July 31, 2018)**

Subpopulation	Sample Count	(All weights in pounds)	
		Total Sample Weight	Average Sample Weight
Transfer Station			
NRDS	111	28,827.6	259.7
SRDS	112	29,071.3	259.6
Vehicle Type			
Passenger Vehicle	21	4,980.0	237.1
Truck	202	52,919.0	262.0
Season			
Spring	72	17,629.8	244.9
Summer	37	10,913.8	295.0
Autumn	70	18,905.1	270.1
Winter	44	10,450.3	237.5
Generator Type, by Site			
Residential, NRDS	73	18,430.1	252.5
Residential, SRDS	71	18,056.9	254.3
Non-Residential, NRDS	38	10,397.5	273.6
Non-Residential, SRDS	41	11,014.4	268.6
Overall	223	57,899.0	259.6

Seattle Public Utilities provided total disposal quantities (in tons) for the study period for the following waste populations: 1) total self-haul, 2) self-haul by vehicle type, 3) self-haul by season, and 4) self-haul by transfer station.

Table 8 illustrates the split between self-haul trips by residential and non-residential generators⁴. The vehicle trip counts collected during 2017 and 2018 sampling days were applied to the annual self-haul trips.⁵ As shown in the table, approximately 75% of 2017-18 self-haul trips were

⁴ The self-haul substream is waste that is: a) generated at residences as well as businesses and institutions; and b) hauled by the household or business that generated the waste or a non-franchised hauler. Self-haul residential and non-residential are defined by the hauling entity: self-haul non-residential is hauled by a commercial enterprise (like a landscaper or contractor), and self-haul residential is hauled by a resident from his or her home.

⁵ Data and statistics on daily incoming trips and tons at the City of Seattle's North and South Recycling & Disposal Stations can be found on the web at <http://www.seattle.gov/util/Documents/Reports/SolidWasteReports/index.htm>

residential, while the remaining 25% were from non-residential sources. About 64% of self-haul trips were delivered by residential self-haul trucks in during the study period. Non-residential self-haul trucks accounted for approximately 21% of self-haul trips. SPU does not ask customers at the transfer stations to identify as residential or non-residential and the 2017-18 study did not include a comprehensive vehicle survey that collected the net weights from a representative number of self-haul vehicles. Based on the sample data we can estimate the proportion of customers that are residential vs. non-residential but without the net weight data we cannot estimate the proportion of tons from residential vs. non-residential customers.

**Table 8. Self-haul Trips, by Residential and Non-residential Generators
(August 1, 2017 to July 31, 2018)**

Subpopulation	Trips	
	Count	Percent
Residential		
Passenger Vehicles	24,406	11.7%
Self-haul Trucks	132,880	63.6%
<i>Residential Subtotal</i>	<i>157,286</i>	<i>75.3%</i>
Non-residential		
Passenger Vehicles	8,016	3.8%
Self-haul Trucks	43,647	20.9%
<i>Non-residential Subtotal</i>	<i>51,663</i>	<i>24.7%</i>
Total	208,949	100.0%

In the following subsections, self-haul waste composition results are presented by transfer station, vehicle type, season, and generator type by site. Results are depicted in three ways: a pie chart reflects composition by the nine broad material categories; next, a table lists the top ten components, by weight; and finally, the full composition results are presented in a detailed table. Subsections 4.1.3, 4.1.6, 4.1.11, and 4.1.14 compare the composition results from the subpopulations presented in the preceding subsections.

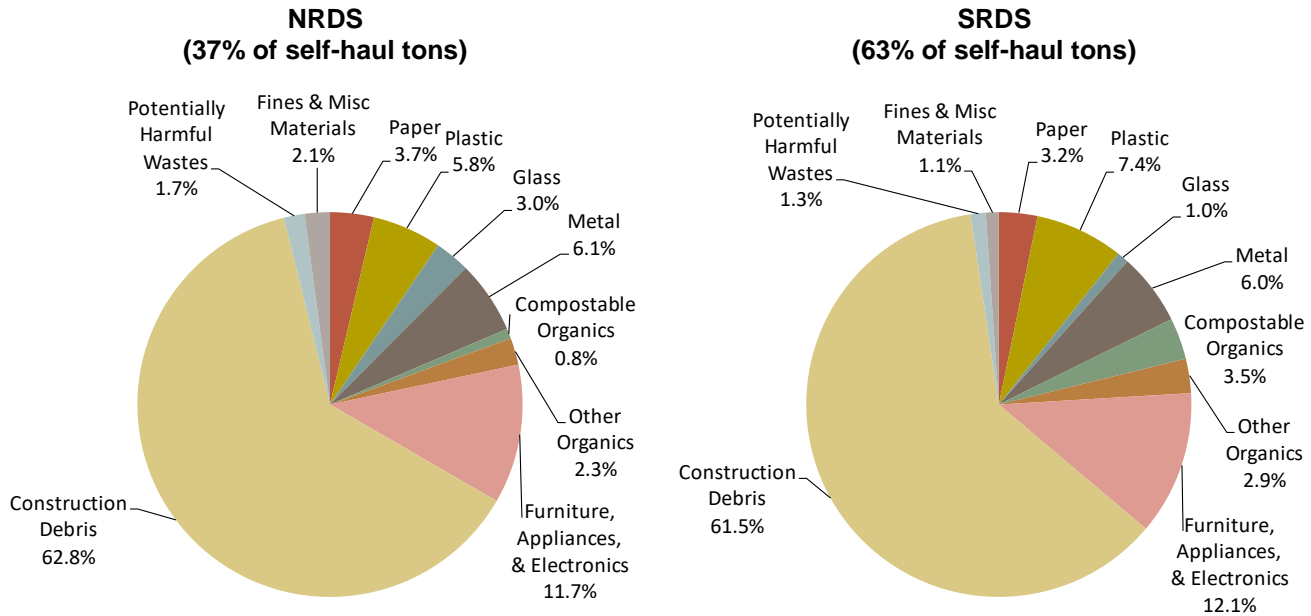
Material Designations

Throughout this report the **Material Classes** (e.g. **Paper, Plastic, Glass...**) are bolded and capitalized, while specific material types such as *carpet* and *furniture* are italicized.

Self-haul Composition by Transfer Station

This subsection examines the composition of wastes self-hauled to the North and South Recycling and Disposal Stations (NRDS and SRDS). Figure 3 summarizes the results on a broad material category level. **Construction Debris** composed the largest material category of the waste hauled to both of the transfer stations, followed by **Furniture, Appliances, & Electronics**. **Construction Debris** include components such as *clean dimension lumber, new painted wood,* and *carpet*. **Furniture, Appliances, & Electronics** includes *furniture, mattresses,* and *cell phones*. The following subsections examine self-hauled waste from each transfer station in more detail.

**Figure 3. Composition Summary: by Transfer Station
(August 1, 2017 to July 31, 2018)**



4.1.1 North Recycling and Disposal Station (NRDS)

A total of 90 samples were taken from loads that were delivered to the NRDS during the 2017-18 study year. Self-haul vehicles delivered 36,221 tons of waste to the NRDS from August 2017 to July 2018. The composition estimates for this subpopulation were applied to the 36,221 tons to estimate the amount of waste disposed for each component category. The top ten components listed in Table 9 made up more than 64% of the total materials from NRDS loads; *new painted wood, clean dimension lumber, contaminated wood, furniture, and clean engineered wood* each composed more than 5% of the total tonnage. Please see Table 11 for a detailed listing of the full composition results for waste sampled at the NRDS.

**Table 9. Top Ten Components: North Recycling and Disposal Station
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	Cum. Percent	Est. Tons
New Painted Wood	12.7%	12.7%	4,601
Clean Dimension Lumber	10.7%	23.4%	3,876
Contaminated Wood	9.5%	32.9%	3,454
Furniture	6.6%	39.6%	2,403
Clean Engineered Wood	5.6%	45.1%	2,020
Other Construction	4.8%	50.0%	1,748
Mattresses	4.4%	54.4%	1,600
Carpet	4.0%	58.4%	1,435
Mixed Metals/Material	3.0%	61.4%	1,099
Other Ferrous	2.9%	64.3%	1,059
Total	64.3%		23,294

4.1.2 South Recycling and Disposal Station (SRDS)

A total of 92 samples from the SRDS were examined during this study period. From July 2017 to August 2018, 61,642 tons of self-haul waste was disposed at the SRDS. The composition estimates for this subpopulation were applied to the 61,642 tons to estimate the amount of waste disposed for each component category. As shown in Table 10, *clean dimension lumber, furniture, contaminated wood, new painted wood, clean engineered wood, and carpet* each accounted for greater than 5%, by weight, of the self-haul waste disposed at the SRDS. The top ten components accounted for almost 60% of the total, by weight. Please see Table 12 for a full list of the composition results for the SRDS.

**Table 10. Top Ten Components: South Recycling and Disposal Station
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	Cum. Percent	Est. Tons
Clean Dimension Lumber	9.2%	9.2%	5,649
Furniture	8.2%	17.4%	5,077
Contaminated Wood	7.6%	25.0%	4,696
New Painted Wood	6.9%	32.0%	4,282
Clean Engineered Wood	5.9%	37.9%	3,666
Carpet	5.9%	43.9%	3,665
Other Treated Wood	4.1%	47.9%	2,503
Demo Gypsum Scrap	4.0%	51.9%	2,457
Mixed Metals/Material	3.7%	55.6%	2,280
Other Construction	3.7%	59.3%	2,260
Total	59.3%		36,534

4.1.3 Comparisons between Transfer Stations

Several of the top ten components for both the NRDS and the SRDS were types of **Construction Debris**, including *clean dimension lumber, contaminated wood, new painted wood, clean engineered wood, and carpet*. Another top ten component shared between the self-haul waste streams at the two transfer stations was *furniture*.

**Table 11. Composition by Weight: NRDS
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	3.7%		1,331	Furniture, Appliances, and Electronics	11.7%		4,234
Newspaper	0.0%	0.0%	6	Furniture	6.6%	3.6%	2,403
Plain OCC/Kraft	1.9%	0.6%	675	Mattresses	4.4%	2.5%	1,600
Waxed OCC	0.0%	0.0%	0	Small Appliances	0.2%	0.3%	71
Grocery/Shopping Bags	0.1%	0.0%	22	Cell Phones	0.0%	0.0%	0
High-grade Paper	0.0%	0.0%	8	Audio/Visual Equipment	0.1%	0.1%	31
Mixed Low-grade Paper	0.7%	0.4%	265	CRT Monitors	0.0%	0.0%	0
Polycoated Containers	0.0%	0.0%	1	CRT Televisions	0.0%	0.0%	0
Compostable/Soiled	0.1%	0.1%	30	Other Electronics	0.4%	0.3%	129
Pot. Comp. Single-use Food Service	0.0%	0.0%	3				
Non-Comp. Single-use Food Service	0.0%	0.0%	9	Construction Debris	62.8%		22,746
Mixed/Other Paper	0.9%	0.8%	313	Clean Dimension Lumber	10.7%	3.0%	3,876
				Clean Engineered Wood	5.6%	2.0%	2,020
Plastic	5.8%		2,105	Pallets	2.8%	1.7%	1,020
#1 PET Bottles	0.1%	0.0%	21	Crates	0.2%	0.3%	66
#2 HDPE Natural Bottles	0.0%	0.0%	5	Other Untreated Wood	0.6%	0.5%	206
#2 HDPE Colored Bottles	0.0%	0.0%	8	New Painted Wood	12.7%	4.2%	4,601
Other Bottles	0.0%	0.0%	2	Old Painted Wood	2.4%	1.6%	867
Tubs	0.4%	0.2%	127	Creosote-treated Wood	0.8%	0.6%	283
Expanded Poly. Non-food	0.2%	0.2%	87	Other Treated Wood	1.9%	1.4%	691
Expanded Poly. Food-grade	0.0%	0.0%	1	Contaminated Wood	9.5%	2.8%	3,454
Rigid Poly. Foam Insulation	0.0%	0.0%	0	New Gypsum Scrap	1.3%	1.0%	458
Pot. Comp. Single-use Food Service	0.0%	0.0%	1	Demo Gypsum Scrap	0.6%	0.4%	212
Non-Comp. Single-use Food Service	0.0%	0.0%	6	Carpet	4.0%	2.0%	1,435
Other Rigid Packaging	0.1%	0.1%	25	Felt Carpet Pad	0.1%	0.2%	49
Shopping/Dry Cleaning Bags	0.0%	0.0%	4	Fiberglass Insulation	0.2%	0.2%	71
Stretch Wrap	0.0%	0.0%	16	Concrete	1.7%	1.1%	603
Clean Polyethylene Film	0.1%	0.1%	36	Asphalt Paving	0.0%	0.0%	0
Other Film	0.5%	0.3%	182	Other Aggregates	0.0%	0.0%	13
Plastic Pipe	0.2%	0.2%	87	Rock	0.1%	0.1%	39
Foam Carpet Padding	0.2%	0.3%	76	Asphalt Shingles	1.9%	1.3%	690
Durable Plastic Products	2.9%	1.0%	1,059	Other Asphaltic Roofing	0.0%	0.0%	4
Plastic/Other Materials	1.0%	0.6%	363	Ceramics	0.6%	0.4%	217
				Cement Fiber Board	0.3%	0.4%	125
Glass	3.0%		1,070	Single-ply Roofing Membranes	0.0%	0.0%	1
Clear Bottles	0.1%	0.0%	23	Ceiling Tiles	0.0%	0.0%	0
Green Bottles	0.0%	0.0%	8	Other Construction	4.8%	2.0%	1,748
Brown Bottles	0.3%	0.3%	101				
Container Glass	0.1%	0.0%	21	Potentially Harmful Wastes	1.7%		625
Fluorescent Tubes	0.0%	0.0%	3	Dried Latex Paint	0.0%	0.0%	0
CFLs	0.0%	0.0%	1	Liquid Latex Paint	1.1%	0.8%	386
Flat Glass	0.8%	0.7%	307	Solvent-based Adhesives	0.0%	0.0%	8
Automotive Glass	0.0%	0.0%	0	Water-based Adhesives	0.1%	0.2%	52
Other Glass	1.7%	1.9%	606	Oil-based Paint/Thinners	0.1%	0.1%	20
				Caustic Cleaners	0.0%	0.0%	1
Metal	6.1%		2,219	Pesticides/Herbicides	0.0%	0.0%	1
Aluminum Beverage Cans	0.0%	0.0%	11	Rechargeable Batteries	0.0%	0.0%	2
Aluminum Foil/Containers	0.0%	0.0%	5	Other Dry-cell Batteries	0.0%	0.0%	2
Other Aluminum	0.0%	0.0%	6	Wet-cell Batteries	0.2%	0.3%	75
Other Nonferrous	0.1%	0.1%	34	Gasoline/Kerosene	0.0%	0.0%	0
Steel Food Cans	0.0%	0.0%	4	Motor Oil/Diesel Oil	0.0%	0.1%	12
Empty Aerosol Cans	0.0%	0.0%	2	Asbestos	0.0%	0.0%	0
Other Ferrous	2.9%	0.9%	1,059	Explosives	0.0%	0.0%	0
Oil filters	0.0%	0.0%	0	Medical Wastes	0.0%	0.0%	0
Mixed Metals/Material	3.0%	1.1%	1,099	Other Cleaners/Chemicals	0.1%	0.1%	32
				Pharmaceuticals/Vitamins	0.0%	0.0%	2
Compostable Organics	0.8%		304	Personal Care/Cosmetics	0.0%	0.0%	17
Leaves and Grass	0.1%	0.1%	34	Other Potentially Harmful Waste	0.0%	0.0%	15
Prunings	0.1%	0.0%	22				
Food	0.7%	0.4%	249	Fines and Misc Materials	2.1%		766
Fats, Oils, Grease	0.0%	0.0%	0	Sand/Soil/Dirt	1.7%	2.1%	620
				Non-distinct Fines	0.0%	0.0%	14
Other Organics	2.3%		819	Miscellaneous Organics	0.4%	0.3%	128
Textiles/Clothing	1.3%	0.9%	483	Miscellaneous Inorganics	0.0%	0.0%	4
Mixed Textiles	0.6%	0.4%	225				
Disposable Diapers	0.1%	0.1%	30	Totals	100%		36,221
Animal By-products	0.0%	0.0%	11	Sample Count	90		
Rubber Products	0.2%	0.1%	70				
Tires	0.0%	0.0%	0				

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

**Table 12. Composition by Weight: SRDS
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	3.2%		1,994	Furniture, Appliances, and Electronics	12.1%		7,469
Newspaper	0.0%	0.0%	12	Furniture	8.2%	3.5%	5,077
Plain OCC/Kraft	2.1%	0.7%	1,282	Mattresses	2.7%	1.7%	1,666
Waxed OCC	0.0%	0.0%	0	Small Appliances	0.6%	0.5%	345
Grocery/Shopping Bags	0.0%	0.0%	10	Cell Phones	0.0%	0.0%	0
High-grade Paper	0.0%	0.0%	20	Audio/Visual Equipment	0.2%	0.2%	151
Mixed Low-grade Paper	0.5%	0.3%	296	CRT Monitors	0.0%	0.0%	0
Polycoated Containers	0.0%	0.0%	3	CRT Televisions	0.0%	0.0%	0
Compostable/Soiled	0.1%	0.1%	70	Other Electronics	0.4%	0.2%	231
Pot. Comp. Single-use Food Service	0.0%	0.0%	6	Construction Debris	61.5%		37,899
Non-Comp. Single-use Food Service	0.0%	0.0%	17	Clean Dimension Lumber	9.2%	3.7%	5,649
Mixed/Other Paper	0.5%	0.2%	278	Clean Engineered Wood	5.9%	2.6%	3,666
Plastic	7.4%		4,575	Pallets	2.5%	1.9%	1,567
#1 PET Bottles	0.1%	0.0%	31	Crates	0.0%	0.1%	22
#2 HDPE Natural Bottles	0.0%	0.0%	10	Other Untreated Wood	0.1%	0.1%	54
#2 HDPE Colored Bottles	0.0%	0.0%	6	New Painted Wood	6.9%	2.3%	4,282
Other Bottles	0.0%	0.0%	3	Old Painted Wood	2.3%	1.3%	1,403
Tubs	0.3%	0.2%	209	Creosote-treated Wood	1.0%	1.1%	605
Expanded Poly. Non-food	1.3%	1.8%	787	Other Treated Wood	4.1%	1.9%	2,503
Expanded Poly. Food-grade	0.0%	0.0%	12	Contaminated Wood	7.6%	2.5%	4,696
Rigid Poly. Foam Insulation	0.3%	0.5%	185	New Gypsum Scrap	0.8%	1.0%	504
Pot. Comp. Single-use Food Service	0.0%	0.0%	0	Demo Gypsum Scrap	4.0%	2.4%	2,457
Non-Comp. Single-use Food Service	0.0%	0.0%	9	Carpet	5.9%	2.9%	3,665
Other Rigid Packaging	0.0%	0.0%	29	Felt Carpet Pad	0.7%	0.6%	401
Shopping/Dry Cleaning Bags	0.0%	0.0%	8	Fiberglass Insulation	0.3%	0.3%	173
Stretch Wrap	0.1%	0.2%	81	Concrete	1.8%	2.2%	1,088
Clean Polyethylene Film	0.1%	0.0%	47	Asphalt Paving	0.0%	0.0%	0
Other Film	0.5%	0.2%	335	Other Aggregates	0.6%	0.6%	357
Plastic Pipe	0.1%	0.1%	45	Rock	0.0%	0.0%	0
Foam Carpet Padding	0.3%	0.3%	205	Asphalt Shingles	1.1%	1.1%	702
Durable Plastic Products	3.2%	1.1%	1,947	Other Asphaltic Roofing	0.0%	0.0%	0
Plastic/Other Materials	1.0%	1.0%	625	Ceramics	3.0%	1.6%	1,844
Glass	1.0%		607	Cement Fiber Board	0.0%	0.0%	0
Clear Bottles	0.1%	0.0%	34	Single-ply Roofing Membranes	0.0%	0.0%	0
Green Bottles	0.0%	0.0%	20	Ceiling Tiles	0.0%	0.0%	0
Brown Bottles	0.1%	0.0%	34	Other Construction	3.7%	2.3%	2,260
Container Glass	0.0%	0.0%	16	Potentially Harmful Wastes	1.3%		780
Fluorescent Tubes	0.0%	0.0%	0	Dried Latex Paint	0.0%	0.0%	0
CFLs	0.0%	0.0%	1	Liquid Latex Paint	0.3%	0.3%	172
Flat Glass	0.2%	0.2%	113	Solvent-based Adhesives	0.1%	0.1%	34
Automotive Glass	0.0%	0.0%	0	Water-based Adhesives	0.3%	0.3%	162
Other Glass	0.6%	0.8%	388	Oil-based Paint/Thinners	0.6%	0.7%	352
Metal	6.0%		3,726	Caustic Cleaners	0.0%	0.0%	1
Aluminum Beverage Cans	0.0%	0.0%	10	Pesticides/Herbicides	0.0%	0.0%	0
Aluminum Foil/Containers	0.0%	0.0%	12	Rechargeable Batteries	0.0%	0.0%	0
Other Aluminum	0.0%	0.0%	20	Other Dry-cell Batteries	0.0%	0.0%	0
Other Nonferrous	0.1%	0.1%	59	Wet-cell Batteries	0.0%	0.0%	0
Steel Food Cans	0.0%	0.0%	16	Gasoline/Kerosene	0.0%	0.0%	0
Empty Aerosol Cans	0.0%	0.0%	9	Motor Oil/Diesel Oil	0.1%	0.1%	53
Other Ferrous	2.1%	0.9%	1,319	Asbestos	0.0%	0.0%	0
Oil filters	0.0%	0.0%	0	Explosives	0.0%	0.0%	0
Mixed Metals/Material	3.7%	1.5%	2,280	Medical Wastes	0.0%	0.0%	0
Compostable Organics	3.5%		2,148	Other Cleaners/Chemicals	0.0%	0.0%	0
Leaves and Grass	1.0%	0.9%	604	Pharmaceuticals/Vitamins	0.0%	0.0%	5
Prunings	0.1%	0.1%	51	Personal Care/Cosmetics	0.0%	0.0%	1
Food	2.4%	2.5%	1,494	Other Potentially Harmful Waste	0.0%	0.0%	0
Fats, Oils, Grease	0.0%	0.0%	0	Fines and Misc Materials	1.1%		668
Other Organics	2.9%		1,776	Sand/Soil/Dirt	0.9%	0.7%	583
Textiles/Clothing	1.4%	0.9%	882	Non-distinct Fines	0.1%	0.0%	31
Mixed Textiles	1.1%	0.6%	657	Miscellaneous Organics	0.1%	0.1%	53
Disposable Diapers	0.1%	0.1%	58	Miscellaneous Inorganics	0.0%	0.0%	0
Animal By-products	0.1%	0.1%	33	Totals	100%		61,642
Rubber Products	0.2%	0.2%	133	Sample Count	92		
Tires	0.0%	0.0%	13				

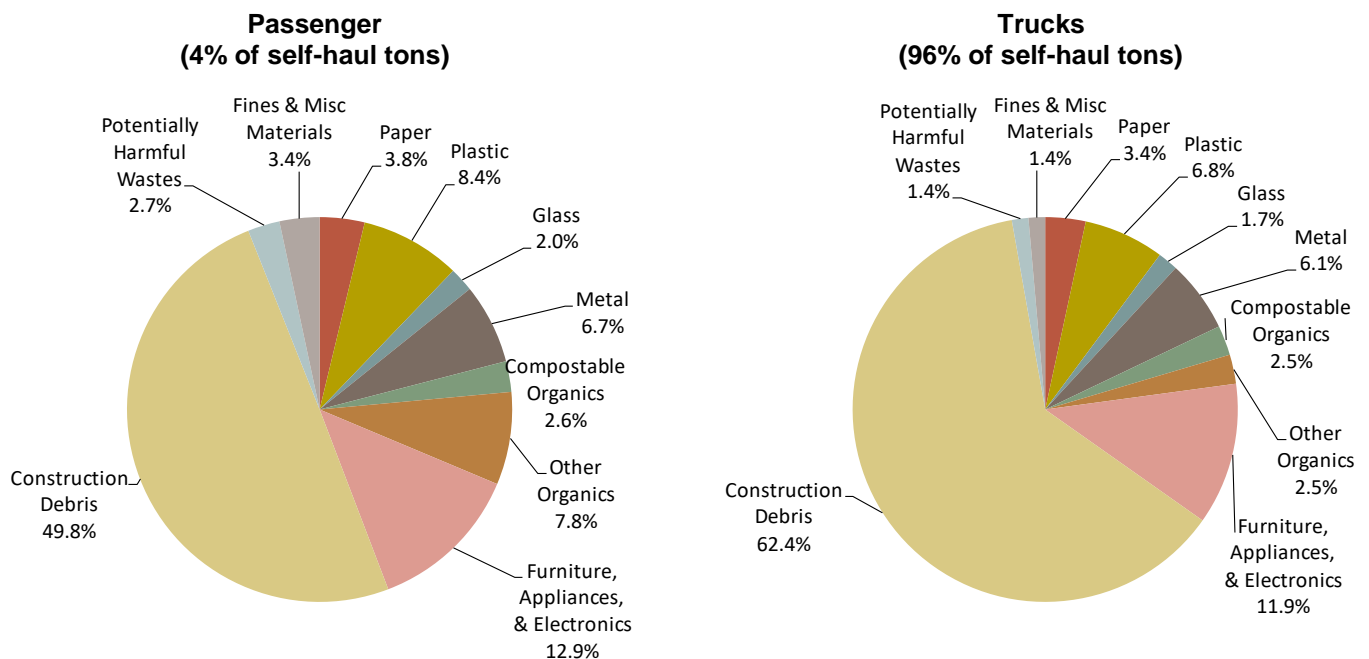
Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Self-haul Composition by Vehicle Type

Wastes are self-hauled to Seattle’s transfer stations in a variety of vehicles that can be categorized into two primary subpopulations: passenger vehicles and trucks. Passenger vehicles include cars, station wagons, and sport utility vehicles (all without trailers); all others (mostly pick-up trucks, vans, and vehicles with trailers) are classified as trucks.

Figure 4 provides an overview of waste disposed by both vehicle types. This figure illustrates that **Construction Debris** accounted for a relatively large percentage of the total tonnage both for passenger vehicles and trucks, about 50% and 62%, respectively. **Construction Debris** includes components such as *clean dimension lumber, contaminated wood, and carpet*. **Furniture, Appliances, & Electronics** were prevalent both in passenger vehicle and truck waste, composing approximately 13% and 12% of the total tonnage respectively.

Figure 4. Composition Summary: by Vehicle Type
(August 1, 2017 to July 31, 2018)



4.1.4 Passenger Vehicles

Twenty-one passenger vehicle samples were characterized during the 2017-18 study year. Passenger vehicles disposed 3,621 tons of self-haul waste during this time. The composition estimates for this subpopulation were applied to the 3,621 tons to estimate the amount of waste disposed for each component category. As shown in Table 13, the top ten components sum to more than 60% of the total tonnage. *Carpet* was the largest component, accounting for approximately 12% of the total. *New painted wood, mattresses, contaminated wood, and textiles/clothing* were other large components of waste disposed by passenger vehicles (each accounting for more than 5%, by weight). The full composition results for passenger vehicles are listed in Table 15.

**Table 13. Top Ten Components: Passenger Vehicles
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	Cum. Percent	Est. Tons
Carpet	11.6%	11.6%	421
New Painted Wood	10.0%	21.6%	363
Mattresses	6.8%	28.4%	246
Contaminated Wood	6.1%	34.6%	222
Textiles/Clothing	5.7%	40.2%	206
Other Construction	5.4%	45.6%	195
Furniture	4.8%	50.4%	173
Durable Plastic Products	3.6%	54.0%	129
Mixed Metals/Material	3.3%	57.3%	120
Other Ferrous	3.2%	60.5%	116
Total	60.5%		2,190

4.1.5 Trucks

A total of 161 self-haul truck loads were sampled during this study period. Trucks disposed 94,242 tons of self-haul waste during the 2017-18 study period. The composition estimates for this subpopulation were applied to the 94,242 tons to estimate the amount of waste disposed for each component category. As shown in Table 14, *clean dimension lumber*, *new painted wood*, and *contaminated wood* were the three largest materials, accounting for nearly 28% of material disposed. The top ten components accounted for approximately 60% of the total waste disposed by self-haul trucks in the 2017-18 study year. Please see Table 16 to view the full composition results for self-haul trucks.

**Table 14. Top Ten Components: Trucks
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	Cum. Percent	Est. Tons
Clean Dimension Lumber	10.0%	10.0%	9,423
New Painted Wood	9.0%	19.0%	8,520
Contaminated Wood	8.4%	27.5%	7,927
Furniture	7.8%	35.2%	7,307
Clean Engineered Wood	6.0%	41.2%	5,653
Carpet	5.0%	46.2%	4,679
Other Construction	4.0%	50.2%	3,812
Mixed Metals/Material	3.5%	53.7%	3,259
Other Treated Wood	3.3%	56.9%	3,078
Mattresses	3.2%	60.1%	3,020
Total	60.1%		56,678

4.1.6 Comparisons between Vehicle Types

New painted wood, *contaminated wood*, *furniture*, *carpet*, *other construction*, *mixed metals/material* and *mattresses* were top ten components shared between passenger vehicles and trucks. *Textiles/clothing*, *durable plastic products*, and *other ferrous* were among the top ten components for passenger vehicles, but not for trucks. On the other hand, *clean dimension lumber*, *clean engineered wood*, and *other treated wood* were top ten components for trucks, but not for passenger vehicles.

**Table 15. Composition by Weight: Passenger Vehicles
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	3.8%		136	Furniture, Appliances, and Electronics	12.9%		466
Newspaper	0.0%	0.1%	2	Furniture	4.8%	3.7%	173
Plain OCC/Kraft	1.0%	0.4%	36	Mattresses	6.8%	2.5%	246
Waxed OCC	0.0%	0.0%	0	Small Appliances	0.0%	0.1%	1
Grocery/Shopping Bags	0.0%	0.1%	2	Cell Phones	0.0%	0.0%	0
High-grade Paper	0.0%	0.0%	1	Audio/Visual Equipment	0.0%	0.0%	0
Mixed Low-grade Paper	1.7%	1.2%	60	CRT Monitors	0.0%	0.0%	0
Polycoated Containers	0.0%	0.0%	0	CRT Televisions	0.0%	0.0%	0
Compostable/Soiled	0.1%	0.1%	2	Other Electronics	1.3%	0.9%	46
Pot. Comp. Single-use Food Service	0.0%	0.0%	0	Construction Debris	49.8%		1,802
Non-Comp. Single-use Food Service	0.0%	0.0%	1	Clean Dimension Lumber	2.8%	2.2%	102
Mixed/Other Paper	0.9%	0.9%	33	Clean Engineered Wood	0.9%	0.6%	34
Plastic	8.4%		305	Pallets	2.0%	1.2%	74
#1 PET Bottles	0.1%	0.1%	4	Crates	0.0%	0.0%	0
#2 HDPE Natural Bottles	0.0%	0.0%	1	Other Untreated Wood	0.0%	0.0%	0
#2 HDPE Colored Bottles	0.1%	0.1%	4	New Painted Wood	10.0%	7.4%	363
Other Bottles	0.1%	0.1%	2	Old Painted Wood	1.9%	3.2%	68
Tubs	0.2%	0.3%	8	Creosote-treated Wood	0.0%	0.0%	0
Expanded Poly. Non-food	0.3%	0.4%	10	Other Treated Wood	3.2%	2.0%	116
Expanded Poly. Food-grade	0.0%	0.0%	0	Contaminated Wood	6.1%	5.1%	222
Rigid Poly. Foam Insulation	0.0%	0.0%	0	New Gypsum Scrap	0.0%	0.0%	0
Pot. Comp. Single-use Food Service	0.0%	0.0%	0	Demo Gypsum Scrap	0.7%	1.2%	27
Non-Comp. Single-use Food Service	0.1%	0.1%	3	Carpet	11.6%	12.4%	421
Other Rigid Packaging	0.1%	0.0%	2	Felt Carpet Pad	0.0%	0.0%	0
Shopping/Dry Cleaning Bags	0.0%	0.0%	0	Fiberglass Insulation	0.0%	0.1%	1
Stretch Wrap	0.0%	0.0%	0	Concrete	2.2%	2.3%	79
Clean Polyethylene Film	0.4%	0.4%	15	Asphalt Paving	0.0%	0.0%	0
Other Film	0.3%	0.2%	12	Other Aggregates	0.0%	0.0%	0
Plastic Pipe	0.1%	0.1%	4	Rock	0.2%	0.3%	8
Foam Carpet Padding	1.6%	0.7%	57	Asphalt Shingles	0.0%	0.0%	0
Durable Plastic Products	3.6%	2.3%	129	Other Asphaltic Roofing	0.0%	0.0%	0
Plastic/Other Materials	1.5%	1.0%	54	Ceramics	2.6%	3.0%	93
Glass	2.0%		74	Cement Fiber Board	0.0%	0.0%	0
Clear Bottles	0.0%	0.0%	1	Single-ply Roofing Membranes	0.0%	0.0%	0
Green Bottles	0.0%	0.1%	1	Ceiling Tiles	0.0%	0.0%	0
Brown Bottles	0.0%	0.0%	0	Other Construction	5.4%	6.5%	195
Container Glass	0.3%	0.4%	12	Potentially Harmful Wastes	2.7%		97
Fluorescent Tubes	0.0%	0.0%	0	Dried Latex Paint	0.0%	0.0%	0
CFLs	0.0%	0.0%	0	Liquid Latex Paint	2.1%	2.6%	75
Flat Glass	0.1%	0.2%	4	Solvent-based Adhesives	0.0%	0.0%	0
Automotive Glass	0.0%	0.0%	0	Water-based Adhesives	0.2%	0.3%	8
Other Glass	1.5%	1.3%	55	Oil-based Paint/Thinners	0.1%	0.1%	2
Metal	6.7%		244	Caustic Cleaners	0.0%	0.0%	1
Aluminum Beverage Cans	0.0%	0.0%	1	Pesticides/Herbicides	0.0%	0.1%	1
Aluminum Foil/Containers	0.0%	0.0%	0	Rechargeable Batteries	0.0%	0.0%	0
Other Aluminum	0.1%	0.1%	5	Other Dry-cell Batteries	0.0%	0.0%	1
Other Nonferrous	0.0%	0.0%	1	Wet-cell Batteries	0.0%	0.0%	0
Steel Food Cans	0.0%	0.0%	0	Gasoline/Kerosene	0.0%	0.0%	0
Empty Aerosol Cans	0.0%	0.0%	0	Motor Oil/Diesel Oil	0.0%	0.0%	0
Other Ferrous	3.2%	2.1%	116	Asbestos	0.0%	0.0%	0
Oil filters	0.0%	0.0%	0	Explosives	0.0%	0.0%	0
Mixed Metals/Material	3.3%	3.3%	120	Medical Wastes	0.0%	0.0%	0
Compostable Organics	2.6%		93	Other Cleaners/Chemicals	0.1%	0.1%	3
Leaves and Grass	1.2%	1.3%	44	Pharmaceuticals/Vitamins	0.0%	0.0%	0
Prunings	0.8%	0.7%	28	Personal Care/Cosmetics	0.1%	0.1%	4
Food	0.6%	0.6%	21	Other Potentially Harmful Waste	0.1%	0.1%	3
Fats, Oils, Grease	0.0%	0.0%	0	Fines and Misc Materials	3.4%		121
Other Organics	7.8%		282	Sand/Soil/Dirt	2.9%	3.0%	106
Textiles/Clothing	5.7%	3.5%	206	Non-distinct Fines	0.2%	0.2%	8
Mixed Textiles	0.9%	0.4%	33	Miscellaneous Organics	0.1%	0.1%	3
Disposable Diapers	0.1%	0.1%	2	Miscellaneous Inorganics	0.1%	0.2%	4
Animal By-products	0.3%	0.3%	11	Totals	100%		3,621
Rubber Products	0.8%	0.7%	30	Sample Count	21		
Tires	0.0%	0.0%	0				

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

**Table 16. Composition by Weight: Trucks
(August 1, 2017 to July 31, 2018)**

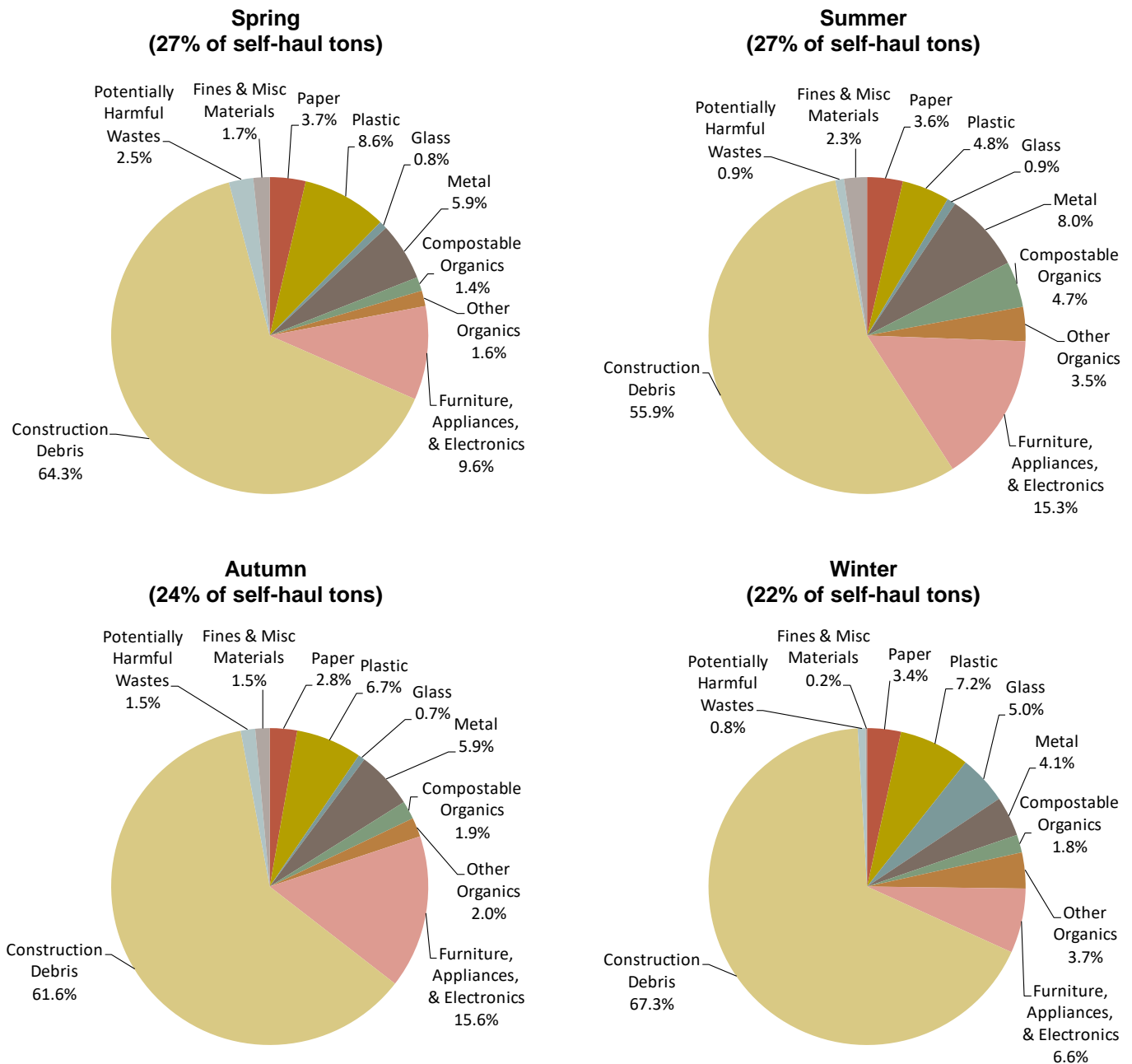
Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	3.4%		3,188	Furniture, Appliances, and Electronics	11.9%		11,237
Newspaper	0.0%	0.0%	16	Furniture	7.8%	2.7%	7,307
Plain OCC/Kraft	2.0%	0.5%	1,921	Mattresses	3.2%	1.5%	3,020
Waxed OCC	0.0%	0.0%	0	Small Appliances	0.4%	0.3%	415
Grocery/Shopping Bags	0.0%	0.0%	31	Cell Phones	0.0%	0.0%	0
High-grade Paper	0.0%	0.0%	26	Audio/Visual Equipment	0.2%	0.1%	182
Mixed Low-grade Paper	0.5%	0.2%	501	CRT Monitors	0.0%	0.0%	0
Polycoated Containers	0.0%	0.0%	4	CRT Televisions	0.0%	0.0%	0
Compostable/Soiled	0.1%	0.1%	98	Other Electronics	0.3%	0.2%	314
Pot. Comp. Single-use Food Service	0.0%	0.0%	9				
Non-Comp. Single-use Food Service	0.0%	0.0%	25	Construction Debris	62.4%		58,843
Mixed/Other Paper	0.6%	0.3%	558	Clean Dimension Lumber	10.0%	2.7%	9,423
				Clean Engineered Wood	6.0%	1.9%	5,653
Plastic	6.8%		6,375	Pallets	2.7%	1.4%	2,513
#1 PET Bottles	0.1%	0.0%	48	Crates	0.1%	0.1%	87
#2 HDPE Natural Bottles	0.0%	0.0%	14	Other Untreated Wood	0.3%	0.2%	260
#2 HDPE Colored Bottles	0.0%	0.0%	10	New Painted Wood	9.0%	2.2%	8,520
Other Bottles	0.0%	0.0%	3	Old Painted Wood	2.3%	1.0%	2,202
Tubs	0.3%	0.1%	327	Creosote-treated Wood	0.9%	0.8%	888
Expanded Poly. Non-food	0.9%	1.2%	865	Other Treated Wood	3.3%	1.3%	3,078
Expanded Poly. Food-grade	0.0%	0.0%	12	Contaminated Wood	8.4%	1.9%	7,927
Rigid Poly. Foam Insulation	0.2%	0.3%	185	New Gypsum Scrap	1.0%	0.7%	962
Pot. Comp. Single-use Food Service	0.0%	0.0%	2	Demo Gypsum Scrap	2.8%	1.6%	2,642
Non-Comp. Single-use Food Service	0.0%	0.0%	12	Carpet	5.0%	2.0%	4,679
Other Rigid Packaging	0.1%	0.0%	52	Felt Carpet Pad	0.5%	0.4%	450
Shopping/Dry Cleaning Bags	0.0%	0.0%	12	Fiberglass Insulation	0.3%	0.2%	243
Stretch Wrap	0.1%	0.1%	97	Concrete	1.7%	1.5%	1,612
Clean Polyethylene Film	0.1%	0.0%	68	Asphalt Paving	0.0%	0.0%	0
Other Film	0.5%	0.2%	505	Other Aggregates	0.4%	0.4%	370
Plastic Pipe	0.1%	0.1%	128	Rock	0.0%	0.0%	32
Foam Carpet Padding	0.2%	0.2%	224	Asphalt Shingles	1.5%	0.9%	1,392
Durable Plastic Products	3.1%	0.8%	2,877	Other Asphaltic Roofing	0.0%	0.0%	4
Plastic/Other Materials	1.0%	0.7%	934	Ceramics	2.1%	1.0%	1,968
				Cement Fiber Board	0.1%	0.2%	125
Glass	1.7%		1,603	Single-ply Roofing Membranes	0.0%	0.0%	1
Clear Bottles	0.1%	0.0%	57	Ceiling Tiles	0.0%	0.0%	0
Green Bottles	0.0%	0.0%	27	Other Construction	4.0%	1.6%	3,812
Brown Bottles	0.1%	0.1%	135				
Container Glass	0.0%	0.0%	24	Potentially Harmful Wastes	1.4%		1,308
Fluorescent Tubes	0.0%	0.0%	3	Dried Latex Paint	0.0%	0.0%	0
CFLs	0.0%	0.0%	1	Liquid Latex Paint	0.5%	0.3%	483
Flat Glass	0.4%	0.3%	416	Solvent-based Adhesives	0.0%	0.0%	41
Automotive Glass	0.0%	0.0%	0	Water-based Adhesives	0.2%	0.2%	206
Other Glass	1.0%	0.9%	939	Oil-based Paint/Thinners	0.4%	0.5%	369
				Caustic Cleaners	0.0%	0.0%	1
Metal	6.1%		5,702	Pesticides/Herbicides	0.0%	0.0%	0
Aluminum Beverage Cans	0.0%	0.0%	20	Rechargeable Batteries	0.0%	0.0%	2
Aluminum Foil/Containers	0.0%	0.0%	18	Other Dry-cell Batteries	0.0%	0.0%	2
Other Aluminum	0.0%	0.0%	21	Wet-cell Batteries	0.1%	0.1%	75
Other Nonferrous	0.1%	0.1%	91	Gasoline/Kerosene	0.0%	0.0%	0
Steel Food Cans	0.0%	0.0%	20	Motor Oil/Diesel Oil	0.1%	0.1%	65
Empty Aerosol Cans	0.0%	0.0%	12	Asbestos	0.0%	0.0%	0
Other Ferrous	2.4%	0.7%	2,262	Explosives	0.0%	0.0%	0
Oil filters	0.0%	0.0%	0	Medical Wastes	0.0%	0.0%	0
Mixed Metals/Material	3.5%	1.0%	3,259	Other Cleaners/Chemicals	0.0%	0.0%	29
				Pharmaceuticals/Vitamins	0.0%	0.0%	7
Compostable Organics	2.5%		2,359	Personal Care/Cosmetics	0.0%	0.0%	14
Leaves and Grass	0.6%	0.6%	593	Other Potentially Harmful Waste	0.0%	0.0%	12
Prunings	0.0%	0.0%	45				
Food	1.8%	1.6%	1,721	Fines and Misc Materials	1.4%		1,312
Fats, Oils, Grease	0.0%	0.0%	0	Sand/Soil/Dirt	1.2%	0.9%	1,097
				Non-distinct Fines	0.0%	0.0%	37
Other Organics	2.5%		2,313	Miscellaneous Organics	0.2%	0.1%	179
Textiles/Clothing	1.2%	0.7%	1,159	Miscellaneous Inorganics	0.0%	0.0%	0
Mixed Textiles	0.9%	0.4%	849				
Disposable Diapers	0.1%	0.1%	85	Totals	100%		94,242
Animal By-products	0.0%	0.1%	33	Sample Count	161		
Rubber Products	0.2%	0.1%	174				
Tires	0.0%	0.0%	13				

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

Self-haul Composition by Season

As shown in Figure 5, **Construction Debris** accounted for a substantial portion of the self-haul substream during every season of the 2017-18 study year. As a proportion of total disposal, **Construction Debris** disposal was most prevalent in the winter, at 67%. **Furniture, Appliances, & Electronics** was also a large proportion of the waste stream, from 7% in Winter to nearly 16% in Autumn.

Figure 5. Composition Summary: by Season



4.1.7 Spring

A total of 60 self-haul samples were taken during the spring months of March, April and May 2018. Self-haul vehicles disposed of 25,968 tons waste during this season. The composition estimates for this subpopulation were applied to the 25,968 tons to estimate the amount of waste disposed for each component category. As shown in Table 17, the top ten components summed to approximately 61% of the total spring tonnage. *Contaminated wood* was the largest single component, accounting for about 12% of the total, by weight. *Clean dimension lumber*, *new painted wood*, *carpet*, and *clean engineered wood* were each above 5% of composition. Table 21 lists the full composition results for the spring.

**Table 17. Top Ten Components: Spring
(March, April, May 2018)**

Material	Est. Percent	Cum. Percent	Est. Tons
Contaminated Wood	12.3%	12.3%	3,184
Clean Dimension Lumber	8.7%	21.0%	2,262
New Painted Wood	7.8%	28.8%	2,036
Carpet	6.3%	35.1%	1,625
Clean Engineered Wood	6.2%	41.3%	1,620
Mattresses	4.4%	45.7%	1,139
Pallets	4.1%	49.8%	1,059
Furniture	3.9%	53.6%	1,005
Durable Plastic Products	3.7%	57.3%	955
Demo Gypsum Scrap	3.6%	60.9%	932
Total	60.9%		15,817

4.1.8 Summer

During the summer months of July and August 2017 and June 2018, 29 self-haul loads were sampled. Self-haul vehicles disposed 26,816 tons of waste during that time. The composition estimates were applied to the 26,816 tons to estimate the amount of waste disposed for each component category. Table 18 contains a list of the top ten components, which summed to about 68% of the total summer tonnage. *Clean dimension lumber*, *furniture*, and *new painted wood* each accounted for more than 10% of the self-hauled waste disposed in the summer. Refer to Table 22 for the complete summer composition results.

**Table 18. Top Ten Components: Summer
(July and August 2017, June 2018)**

Material	Est. Percent	Cum. Percent	Est. Tons
Clean Dimension Lumber	17.3%	17.3%	4,637
Furniture	13.0%	30.3%	3,486
New Painted Wood	10.4%	40.7%	2,796
Mixed Metals/Material	5.0%	45.7%	1,341
Clean Engineered Wood	4.9%	50.6%	1,308
Food	4.3%	54.9%	1,157
Demo Gypsum Scrap	3.8%	58.7%	1,012
Concrete	3.4%	62.1%	914
Creosote-treated Wood	3.1%	65.2%	835
Asphalt Shingles	3.0%	68.2%	791
Total	68.2%		18,275

4.1.9 Autumn

A total of 57 self-haul loads were sampled during autumn months (September, October and November 2017). Self-haul loads during autumn amounted to 23,634 tons of waste. The composition estimates for this subpopulation were applied to the 23,634 tons to estimate the amount of waste disposed for each component category. As shown in Table 19, *new painted wood*, and *contaminated wood* each accounted for more than 10% of the waste disposed of during autumn. When combined, the top ten components accounted for approximately 67% of the total, by weight. Table 23 lists the detailed composition results for samples taken from September to November 2017.

**Table 19. Top Ten Components: Autumn
(September, October, November 2017)**

Material	Est. Percent	Cum. Percent	Est. Tons
New Painted Wood	12.6%	12.6%	2,983
Contaminated Wood	11.6%	24.2%	2,747
Furniture	9.5%	33.7%	2,237
Clean Dimension Lumber	7.2%	40.9%	1,696
Clean Engineered Wood	6.3%	47.2%	1,491
Carpet	5.7%	52.9%	1,347
Mattresses	4.5%	57.4%	1,074
Mixed Metals/Material	3.7%	61.1%	866
Old Painted Wood	3.4%	64.5%	801
Other Construction	2.9%	67.4%	679
Total	67.4%		15,921

4.1.10 Winter

For the winter season, December of 2017 and January and February of 2018, a total of 36 samples were taken from self-haul loads. Self-haul vehicles disposed 21,445 tons waste during the winter season. The composition estimates for this subpopulation were applied to the 21,445 tons to estimate the amount of waste disposed for each component category. Table 20 lists the top ten components of waste disposed during the winter, which summed to approximately 62% of the total, by weight. *Other treated wood*, with over 10%, was the largest material, followed by *other construction*, *carpet*, *contaminated wood*, and *clean engineered wood*. Please see Table 24 for a list of the detailed composition results.

**Table 20. Top Ten Components: Winter
(December 2017 and January and February 2018)**

Material	Est. Percent	Cum. Percent	Est. Tons
Other Treated Wood	10.4%	10.4%	2,230
Other Construction	9.4%	19.8%	2,026
Carpet	8.3%	28.2%	1,782
Contaminated Wood	6.7%	34.9%	1,438
Clean Engineered Wood	5.9%	40.8%	1,268
New Painted Wood	5.0%	45.8%	1,067
Old Painted Wood	4.4%	50.2%	953
Durable Plastic Products	4.4%	54.6%	938
Clean Dimension Lumber	4.3%	58.9%	931
Other Glass	3.5%	62.4%	759
Total	62.4%		13,391

4.1.11 Comparisons among Seasons

Clean dimension lumber, clean engineered wood, and new painted wood were top ten components across all four seasons. *Furniture* was a top ten component in all seasons except for winter, while *carpet* and *contaminated wood* were top ten components in all seasons except for summer. *Durable plastic products* were in the top 10 in spring and winter, *mattresses* in spring and autumn, and *demolition gypsum scrap* in spring and summer. *Other construction* was a top 10 material item in autumn and winter, while *mixed metals/materials* made the top ten in summer and autumn.

**Table 21. Composition by Weight: Spring
(March, April, May 2018)**

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	3.7%		950	Furniture, Appliances, and Electronics	9.6%		2,481
Newspaper	0.0%	0.0%	5	Furniture	3.9%	3.1%	1,005
Plain OCC/Kraft	2.1%	0.9%	543	Mattresses	4.4%	3.2%	1,139
Waxed OCC	0.0%	0.0%	0	Small Appliances	0.2%	0.4%	61
Grocery/Shopping Bags	0.0%	0.0%	6	Cell Phones	0.0%	0.0%	0
High-grade Paper	0.0%	0.0%	9	Audio/Visual Equipment	0.5%	0.5%	134
Mixed Low-grade Paper	0.9%	0.5%	243	CRT Monitors	0.0%	0.0%	0
Polycoated Containers	0.0%	0.0%	3	CRT Televisions	0.0%	0.0%	0
Compostable/Soiled	0.2%	0.2%	50	Other Electronics	0.5%	0.4%	142
Pot. Comp. Single-use Food Service	0.0%	0.0%	4				
Non-Comp. Single-use Food Service	0.1%	0.1%	13	Construction Debris	64.3%		16,694
Mixed/Other Paper	0.3%	0.2%	74	Clean Dimension Lumber	8.7%	4.0%	2,262
				Clean Engineered Wood	6.2%	4.3%	1,620
Plastic	8.6%		2,246	Pallets	4.1%	3.0%	1,059
#1 PET Bottles	0.0%	0.0%	11	Crates	0.2%	0.4%	60
#2 HDPE Natural Bottles	0.0%	0.0%	6	Other Untreated Wood	0.1%	0.2%	32
#2 HDPE Colored Bottles	0.0%	0.0%	2	New Painted Wood	7.8%	3.5%	2,036
Other Bottles	0.0%	0.0%	0	Old Painted Wood	2.0%	1.6%	516
Tubs	0.3%	0.2%	70	Creosote-treated Wood	0.0%	0.0%	0
Expanded Poly. Non-food	2.8%	4.3%	724	Other Treated Wood	2.3%	1.8%	608
Expanded Poly. Food-grade	0.0%	0.0%	1	Contaminated Wood	12.3%	4.7%	3,184
Rigid Poly. Foam Insulation	0.0%	0.0%	0	New Gypsum Scrap	3.3%	2.6%	849
Pot. Comp. Single-use Food Service	0.0%	0.0%	0	Demo Gypsum Scrap	3.6%	3.0%	932
Non-Comp. Single-use Food Service	0.0%	0.0%	4	Carpet	6.3%	3.3%	1,625
Other Rigid Packaging	0.0%	0.0%	10	Felt Carpet Pad	0.0%	0.0%	0
Shopping/Dry Cleaning Bags	0.0%	0.0%	4	Fiberglass Insulation	0.4%	0.6%	94
Stretch Wrap	0.1%	0.1%	22	Concrete	1.2%	0.9%	305
Clean Polyethylene Film	0.1%	0.0%	18	Asphalt Paving	0.0%	0.0%	0
Other Film	0.4%	0.2%	108	Other Aggregates	0.3%	0.5%	88
Plastic Pipe	0.0%	0.1%	12	Rock	0.0%	0.1%	10
Foam Carpet Padding	0.8%	0.8%	207	Asphalt Shingles	0.3%	0.4%	75
Durable Plastic Products	3.7%	1.4%	955	Other Asphaltic Roofing	0.0%	0.0%	4
Plastic/Other Materials	0.3%	0.3%	91	Ceramics	2.2%	1.9%	576
				Cement Fiber Board	0.2%	0.2%	44
Glass	0.8%		209	Single-ply Roofing Membranes	0.0%	0.0%	0
Clear Bottles	0.1%	0.1%	19	Ceiling Tiles	0.0%	0.0%	0
Green Bottles	0.0%	0.0%	3	Other Construction	2.8%	2.1%	715
Brown Bottles	0.0%	0.0%	8				
Container Glass	0.0%	0.0%	7	Potentially Harmful Wastes	2.5%		646
Fluorescent Tubes	0.0%	0.0%	0	Dried Latex Paint	0.0%	0.0%	0
CFLs	0.0%	0.0%	0	Liquid Latex Paint	0.5%	0.6%	126
Flat Glass	0.2%	0.2%	55	Solvent-based Adhesives	0.0%	0.0%	2
Automotive Glass	0.0%	0.0%	0	Water-based Adhesives	0.1%	0.1%	15
Other Glass	0.5%	0.5%	117	Oil-based Paint/Thinners	1.3%	1.7%	350
				Caustic Cleaners	0.0%	0.0%	0
Metal	5.9%		1,532	Pesticides/Herbicides	0.0%	0.0%	0
Aluminum Beverage Cans	0.0%	0.0%	9	Rechargeable Batteries	0.0%	0.0%	0
Aluminum Foil/Containers	0.0%	0.0%	8	Other Dry-cell Batteries	0.0%	0.0%	0
Other Aluminum	0.0%	0.0%	4	Wet-cell Batteries	0.3%	0.5%	75
Other Nonferrous	0.3%	0.3%	70	Gasoline/Kerosene	0.0%	0.0%	0
Steel Food Cans	0.0%	0.0%	5	Motor Oil/Diesel Oil	0.2%	0.3%	53
Empty Aerosol Cans	0.0%	0.0%	0	Asbestos	0.0%	0.0%	0
Other Ferrous	2.2%	1.0%	580	Explosives	0.0%	0.0%	0
Oil filters	0.0%	0.0%	0	Medical Wastes	0.0%	0.0%	0
Mixed Metals/Material	3.3%	2.4%	856	Other Cleaners/Chemicals	0.1%	0.1%	16
				Pharmaceuticals/Vitamins	0.0%	0.0%	0
Compostable Organics	1.4%		369	Personal Care/Cosmetics	0.0%	0.0%	3
Leaves and Grass	0.4%	0.5%	106	Other Potentially Harmful Waste	0.0%	0.0%	5
Prunings	0.1%	0.1%	15				
Food	1.0%	1.1%	247	Fines and Misc Materials	1.7%		431
Fats, Oils, Grease	0.0%	0.0%	0	Sand/Soil/Dirt	1.5%	1.5%	398
				Non-distinct Fines	0.1%	0.1%	27
Other Organics	1.6%		410	Miscellaneous Organics	0.0%	0.0%	6
Textiles/Clothing	0.3%	0.2%	87	Miscellaneous Inorganics	0.0%	0.0%	0
Mixed Textiles	0.8%	0.5%	216				
Disposable Diapers	0.2%	0.2%	41	Totals	100%		25,968
Animal By-products	0.0%	0.0%	13	Sample Count	60		
Rubber Products	0.2%	0.2%	53				
Tires	0.0%	0.0%	0				

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

**Table 22. Composition by Weight: Summer
(July and August 2017, June 2018)**

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	3.6%		976	Furniture, Appliances, and Electronics	15.3%		4,115
Newspaper	0.0%	0.0%	11	Furniture	13.0%	7.6%	3,486
Plain OCC/Kraft	2.1%	0.9%	553	Mattresses	1.7%	2.5%	466
Waxed OCC	0.0%	0.0%	0	Small Appliances	0.2%	0.3%	41
Grocery/Shopping Bags	0.0%	0.0%	9	Cell Phones	0.0%	0.0%	0
High-grade Paper	0.0%	0.0%	7	Audio/Visual Equipment	0.2%	0.3%	48
Mixed Low-grade Paper	0.5%	0.3%	121	CRT Monitors	0.0%	0.0%	0
Polycoated Containers	0.0%	0.0%	1	CRT Televisions	0.0%	0.0%	0
Compostable/Soiled	0.1%	0.1%	30	Other Electronics	0.3%	0.2%	74
Pot. Comp. Single-use Food Service	0.0%	0.0%	3	Construction Debris	55.9%		14,977
Non-Comp. Single-use Food Service	0.0%	0.0%	7	Clean Dimension Lumber	17.3%	7.9%	4,637
Mixed/Other Paper	0.9%	1.0%	234	Clean Engineered Wood	4.9%	3.5%	1,308
Plastic	4.8%		1,299	Pallets	1.0%	1.1%	271
#1 PET Bottles	0.1%	0.0%	22	Crates	0.1%	0.1%	27
#2 HDPE Natural Bottles	0.0%	0.0%	5	Other Untreated Wood	0.0%	0.0%	0
#2 HDPE Colored Bottles	0.0%	0.0%	6	New Painted Wood	10.4%	5.2%	2,796
Other Bottles	0.0%	0.0%	0	Old Painted Wood	0.0%	0.0%	0
Tubs	0.4%	0.3%	102	Creosote-treated Wood	3.1%	2.6%	835
Expanded Poly. Non-food	0.1%	0.1%	21	Other Treated Wood	0.4%	0.4%	95
Expanded Poly. Food-grade	0.0%	0.0%	0	Contaminated Wood	2.9%	1.8%	779
Rigid Poly. Foam Insulation	0.7%	1.1%	177	New Gypsum Scrap	0.1%	0.1%	16
Pot. Comp. Single-use Food Service	0.0%	0.0%	1	Demo Gypsum Scrap	3.8%	4.2%	1,012
Non-Comp. Single-use Food Service	0.0%	0.0%	7	Carpet	1.3%	1.5%	346
Other Rigid Packaging	0.1%	0.1%	30	Felt Carpet Pad	0.0%	0.0%	0
Shopping/Dry Cleaning Bags	0.0%	0.0%	3	Fiberglass Insulation	0.1%	0.2%	28
Stretch Wrap	0.0%	0.0%	4	Concrete	3.4%	4.9%	914
Clean Polyethylene Film	0.2%	0.1%	45	Asphalt Paving	0.0%	0.0%	0
Other Film	0.4%	0.4%	115	Other Aggregates	0.2%	0.3%	44
Plastic Pipe	0.3%	0.2%	71	Rock	0.0%	0.0%	8
Foam Carpet Padding	0.1%	0.0%	18	Asphalt Shingles	3.0%	2.7%	791
Durable Plastic Products	1.9%	1.2%	500	Other Asphaltic Roofing	0.0%	0.0%	0
Plastic/Other Materials	0.6%	0.6%	171	Ceramics	1.8%	2.0%	484
Glass	0.9%		238	Cement Fiber Board	0.0%	0.0%	0
Clear Bottles	0.1%	0.1%	21	Single-ply Roofing Membranes	0.0%	0.0%	0
Green Bottles	0.0%	0.0%	13	Ceiling Tiles	0.0%	0.0%	0
Brown Bottles	0.4%	0.3%	113	Other Construction	2.2%	1.4%	588
Container Glass	0.1%	0.1%	20	Potentially Harmful Wastes	0.9%		240
Fluorescent Tubes	0.0%	0.0%	0	Dried Latex Paint	0.0%	0.0%	0
CFLs	0.0%	0.0%	1	Liquid Latex Paint	0.3%	0.4%	70
Flat Glass	0.0%	0.0%	0	Solvent-based Adhesives	0.0%	0.0%	4
Automotive Glass	0.0%	0.0%	0	Water-based Adhesives	0.4%	0.4%	117
Other Glass	0.3%	0.2%	70	Oil-based Paint/Thinners	0.1%	0.1%	20
Metal	8.0%		2,155	Caustic Cleaners	0.0%	0.0%	1
Aluminum Beverage Cans	0.0%	0.0%	9	Pesticides/Herbicides	0.0%	0.0%	1
Aluminum Foil/Containers	0.0%	0.0%	4	Rechargeable Batteries	0.0%	0.0%	0
Other Aluminum	0.0%	0.0%	9	Other Dry-cell Batteries	0.0%	0.0%	1
Other Nonferrous	0.0%	0.0%	0	Wet-cell Batteries	0.0%	0.0%	0
Steel Food Cans	0.0%	0.0%	8	Gasoline/Kerosene	0.0%	0.0%	0
Empty Aerosol Cans	0.0%	0.1%	8	Motor Oil/Diesel Oil	0.0%	0.1%	12
Other Ferrous	2.9%	1.7%	776	Asbestos	0.0%	0.0%	0
Oil filters	0.0%	0.0%	0	Explosives	0.0%	0.0%	0
Mixed Metals/Material	5.0%	2.4%	1,341	Medical Wastes	0.0%	0.0%	0
Compostable Organics	4.7%		1,254	Other Cleaners/Chemicals	0.0%	0.0%	0
Leaves and Grass	0.3%	0.4%	81	Pharmaceuticals/Vitamins	0.0%	0.0%	5
Prunings	0.1%	0.0%	16	Personal Care/Cosmetics	0.0%	0.0%	7
Food	4.3%	5.5%	1,157	Other Potentially Harmful Waste	0.0%	0.0%	2
Fats, Oils, Grease	0.0%	0.0%	0	Fines and Misc Materials	2.3%		624
Other Organics	3.5%		937	Sand/Soil/Dirt	2.2%	2.8%	601
Textiles/Clothing	2.3%	1.6%	603	Non-distinct Fines	0.0%	0.0%	9
Mixed Textiles	0.9%	0.9%	247	Miscellaneous Organics	0.1%	0.1%	15
Disposable Diapers	0.1%	0.1%	25	Miscellaneous Inorganics	0.0%	0.0%	0
Animal By-products	0.1%	0.2%	31	Totals	100%		26,816
Rubber Products	0.1%	0.1%	17	Sample Count	29		
Tires	0.0%	0.1%	13				

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

**Table 23. Composition by Weight: Autumn
(September, October, November 2017)**

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	2.8%		659	Furniture, Appliances, and Electronics	15.6%		3,694
Newspaper	0.0%	0.0%	3	Furniture	9.5%	4.4%	2,237
Plain OCC/Kraft	1.8%	0.8%	426	Mattresses	4.5%	3.1%	1,074
Waxed OCC	0.0%	0.0%	0	Small Appliances	1.3%	1.2%	314
Grocery/Shopping Bags	0.0%	0.1%	10	Cell Phones	0.0%	0.0%	0
High-grade Paper	0.0%	0.0%	3	Audio/Visual Equipment	0.0%	0.0%	0
Mixed Low-grade Paper	0.3%	0.2%	61	CRT Monitors	0.0%	0.0%	0
Polycoated Containers	0.0%	0.0%	0	CRT Televisions	0.0%	0.0%	0
Compostable/Soiled	0.1%	0.1%	16	Other Electronics	0.3%	0.3%	69
Pot. Comp. Single-use Food Service	0.0%	0.0%	0	Construction Debris	61.6%		14,549
Non-Comp. Single-use Food Service	0.0%	0.0%	1	Clean Dimension Lumber	7.2%	3.0%	1,696
Mixed/Other Paper	0.6%	0.5%	139	Clean Engineered Wood	6.3%	2.8%	1,491
Plastic	6.7%		1,586	Pallets	2.8%	2.4%	671
#1 PET Bottles	0.0%	0.0%	7	Crates	0.0%	0.0%	0
#2 HDPE Natural Bottles	0.0%	0.0%	1	Other Untreated Wood	0.6%	0.7%	150
#2 HDPE Colored Bottles	0.0%	0.0%	3	New Painted Wood	12.6%	4.3%	2,983
Other Bottles	0.0%	0.0%	0	Old Painted Wood	3.4%	2.1%	801
Tubs	0.2%	0.2%	57	Creosote-treated Wood	0.2%	0.3%	53
Expanded Poly. Non-food	0.2%	0.2%	42	Other Treated Wood	1.1%	0.7%	262
Expanded Poly. Food-grade	0.0%	0.0%	0	Contaminated Wood	11.6%	4.0%	2,747
Rigid Poly. Foam Insulation	0.0%	0.0%	0	New Gypsum Scrap	0.4%	0.5%	91
Pot. Comp. Single-use Food Service	0.0%	0.0%	0	Demo Gypsum Scrap	1.7%	2.1%	413
Non-Comp. Single-use Food Service	0.0%	0.0%	3	Carpet	5.7%	2.8%	1,347
Other Rigid Packaging	0.0%	0.0%	7	Felt Carpet Pad	0.5%	0.5%	127
Shopping/Dry Cleaning Bags	0.0%	0.0%	1	Fiberglass Insulation	0.2%	0.2%	39
Stretch Wrap	0.3%	0.4%	71	Concrete	1.4%	1.5%	340
Clean Polyethylene Film	0.1%	0.1%	16	Asphalt Paving	0.0%	0.0%	0
Other Film	0.7%	0.5%	162	Other Aggregates	0.0%	0.0%	6
Plastic Pipe	0.2%	0.2%	39	Rock	0.1%	0.2%	22
Foam Carpet Padding	0.1%	0.1%	30	Asphalt Shingles	1.2%	1.1%	286
Durable Plastic Products	2.6%	1.1%	611	Other Asphaltic Roofing	0.0%	0.0%	0
Plastic/Other Materials	2.3%	2.6%	536	Ceramics	1.5%	1.1%	343
Glass	0.7%		161	Cement Fiber Board	0.0%	0.0%	0
Clear Bottles	0.0%	0.0%	3	Single-ply Roofing Membranes	0.0%	0.0%	1
Green Bottles	0.0%	0.0%	0	Ceiling Tiles	0.0%	0.0%	0
Brown Bottles	0.0%	0.0%	2	Other Construction	2.9%	1.5%	679
Container Glass	0.0%	0.0%	3	Potentially Harmful Wastes	1.5%		349
Fluorescent Tubes	0.0%	0.0%	3	Dried Latex Paint	0.0%	0.0%	0
CFLs	0.0%	0.0%	1	Liquid Latex Paint	1.0%	1.0%	236
Flat Glass	0.4%	0.5%	101	Solvent-based Adhesives	0.0%	0.0%	0
Automotive Glass	0.0%	0.0%	0	Water-based Adhesives	0.3%	0.5%	82
Other Glass	0.2%	0.2%	48	Oil-based Paint/Thinners	0.0%	0.0%	0
Metal	5.9%		1,387	Caustic Cleaners	0.0%	0.0%	1
Aluminum Beverage Cans	0.0%	0.0%	2	Pesticides/Herbicides	0.0%	0.0%	0
Aluminum Foil/Containers	0.0%	0.0%	5	Rechargeable Batteries	0.0%	0.0%	0
Other Aluminum	0.0%	0.0%	5	Other Dry-cell Batteries	0.0%	0.0%	1
Other Nonferrous	0.0%	0.0%	3	Wet-cell Batteries	0.0%	0.0%	0
Steel Food Cans	0.0%	0.0%	5	Gasoline/Kerosene	0.0%	0.0%	0
Empty Aerosol Cans	0.0%	0.0%	2	Motor Oil/Diesel Oil	0.0%	0.0%	0
Other Ferrous	2.1%	0.8%	500	Asbestos	0.0%	0.0%	0
Oil filters	0.0%	0.0%	0	Explosives	0.0%	0.0%	0
Mixed Metals/Material	3.7%	1.6%	866	Medical Wastes	0.0%	0.0%	0
Compostable Organics	1.9%		440	Other Cleaners/Chemicals	0.1%	0.1%	13
Leaves and Grass	0.7%	0.8%	165	Pharmaceuticals/Vitamins	0.0%	0.0%	2
Prunings	0.2%	0.2%	36	Personal Care/Cosmetics	0.0%	0.0%	6
Food	1.0%	0.9%	239	Other Potentially Harmful Waste	0.0%	0.1%	7
Fats, Oils, Grease	0.0%	0.0%	0	Fines and Misc Materials	1.5%		346
Other Organics	2.0%		462	Sand/Soil/Dirt	0.7%	0.8%	175
Textiles/Clothing	0.7%	0.6%	174	Non-distinct Fines	0.0%	0.0%	6
Mixed Textiles	0.7%	0.5%	168	Miscellaneous Organics	0.7%	0.5%	161
Disposable Diapers	0.1%	0.1%	15	Miscellaneous Inorganics	0.0%	0.0%	4
Animal By-products	0.0%	0.0%	0	Totals	100%		23,634
Rubber Products	0.4%	0.5%	105	Sample Count	57		
Tires	0.0%	0.0%	0				

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

**Table 24. Composition by Weight: Winter
(December 2017 and January and February 2018)**

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	3.4%		740	Furniture, Appliances, and Electronics	6.6%		1,413
Newspaper	0.0%	0.0%	0	Furniture	3.5%	3.5%	752
Plain OCC/Kraft	2.0%	1.4%	434	Mattresses	2.7%	2.3%	586
Waxed OCC	0.0%	0.0%	0	Small Appliances	0.0%	0.0%	0
Grocery/Shopping Bags	0.0%	0.0%	8	Cell Phones	0.0%	0.0%	0
High-grade Paper	0.0%	0.0%	8	Audio/Visual Equipment	0.0%	0.0%	0
Mixed Low-grade Paper	0.6%	0.8%	136	CRT Monitors	0.0%	0.0%	0
Polycoated Containers	0.0%	0.0%	0	CRT Televisions	0.0%	0.0%	0
Compostable/Soiled	0.0%	0.0%	3	Other Electronics	0.4%	0.5%	75
Pot. Comp. Single-use Food Service	0.0%	0.0%	2	Construction Debris	67.3%		14,424
Non-Comp. Single-use Food Service	0.0%	0.0%	4	Clean Dimension Lumber	4.3%	2.3%	931
Mixed/Other Paper	0.7%	0.5%	144	Clean Engineered Wood	5.9%	3.6%	1,268
Plastic	7.2%		1,549	Pallets	2.7%	4.2%	586
#1 PET Bottles	0.1%	0.1%	12	Crates	0.0%	0.0%	0
#2 HDPE Natural Bottles	0.0%	0.0%	3	Other Untreated Wood	0.4%	0.5%	78
#2 HDPE Colored Bottles	0.0%	0.0%	3	New Painted Wood	5.0%	3.4%	1,067
Other Bottles	0.0%	0.0%	4	Old Painted Wood	4.4%	3.5%	953
Tubs	0.5%	0.5%	106	Creosote-treated Wood	0.0%	0.0%	0
Expanded Poly. Non-food	0.4%	0.4%	88	Other Treated Wood	10.4%	5.4%	2,230
Expanded Poly. Food-grade	0.1%	0.1%	11	Contaminated Wood	6.7%	3.9%	1,438
Rigid Poly. Foam Insulation	0.0%	0.1%	8	New Gypsum Scrap	0.0%	0.0%	6
Pot. Comp. Single-use Food Service	0.0%	0.0%	0	Demo Gypsum Scrap	1.5%	1.4%	313
Non-Comp. Single-use Food Service	0.0%	0.0%	1	Carpet	8.3%	7.3%	1,782
Other Rigid Packaging	0.0%	0.0%	6	Felt Carpet Pad	1.5%	1.7%	323
Shopping/Dry Cleaning Bags	0.0%	0.0%	3	Fiberglass Insulation	0.4%	0.4%	83
Stretch Wrap	0.0%	0.0%	1	Concrete	0.6%	0.8%	133
Clean Polyethylene Film	0.0%	0.0%	5	Asphalt Paving	0.0%	0.0%	0
Other Film	0.6%	0.5%	132	Other Aggregates	1.1%	1.6%	231
Plastic Pipe	0.0%	0.1%	10	Rock	0.0%	0.0%	0
Foam Carpet Padding	0.1%	0.0%	26	Asphalt Shingles	1.1%	1.4%	241
Durable Plastic Products	4.4%	2.5%	938	Other Asphaltic Roofing	0.0%	0.0%	0
Plastic/Other Materials	0.9%	0.9%	191	Ceramics	3.1%	2.8%	657
Glass	5.0%		1,069	Cement Fiber Board	0.4%	0.6%	81
Clear Bottles	0.1%	0.1%	14	Single-ply Roofing Membranes	0.0%	0.0%	0
Green Bottles	0.1%	0.1%	13	Ceiling Tiles	0.0%	0.0%	0
Brown Bottles	0.1%	0.1%	13	Other Construction	9.4%	6.4%	2,026
Container Glass	0.0%	0.0%	7	Potentially Harmful Wastes	0.8%		170
Fluorescent Tubes	0.0%	0.0%	0	Dried Latex Paint	0.0%	0.0%	0
CFLs	0.0%	0.0%	0	Liquid Latex Paint	0.6%	0.8%	125
Flat Glass	1.2%	1.3%	264	Solvent-based Adhesives	0.2%	0.2%	36
Automotive Glass	0.0%	0.0%	0	Water-based Adhesives	0.0%	0.0%	0
Other Glass	3.5%	3.8%	759	Oil-based Paint/Thinners	0.0%	0.0%	1
Metal	4.1%		871	Caustic Cleaners	0.0%	0.0%	0
Aluminum Beverage Cans	0.0%	0.0%	1	Pesticides/Herbicides	0.0%	0.0%	0
Aluminum Foil/Containers	0.0%	0.0%	1	Rechargeable Batteries	0.0%	0.0%	2
Other Aluminum	0.0%	0.0%	9	Other Dry-cell Batteries	0.0%	0.0%	0
Other Nonferrous	0.1%	0.1%	20	Wet-cell Batteries	0.0%	0.0%	0
Steel Food Cans	0.0%	0.0%	1	Gasoline/Kerosene	0.0%	0.0%	0
Empty Aerosol Cans	0.0%	0.0%	1	Motor Oil/Diesel Oil	0.0%	0.0%	0
Other Ferrous	2.4%	1.2%	522	Asbestos	0.0%	0.0%	0
Oil filters	0.0%	0.0%	0	Explosives	0.0%	0.0%	0
Mixed Metals/Material	1.5%	0.9%	316	Medical Wastes	0.0%	0.0%	0
Compostable Organics	1.8%		390	Other Cleaners/Chemicals	0.0%	0.0%	3
Leaves and Grass	1.3%	2.2%	284	Pharmaceuticals/Vitamins	0.0%	0.0%	0
Prunings	0.0%	0.0%	6	Personal Care/Cosmetics	0.0%	0.0%	2
Food	0.5%	0.7%	99	Other Potentially Harmful Waste	0.0%	0.0%	0
Fats, Oils, Grease	0.0%	0.0%	0	Fines and Misc Materials	0.2%		32
Other Organics	3.7%		786	Sand/Soil/Dirt	0.1%	0.1%	29
Textiles/Clothing	2.3%	2.1%	501	Non-distinct Fines	0.0%	0.0%	3
Mixed Textiles	1.2%	1.0%	250	Miscellaneous Organics	0.0%	0.0%	0
Disposable Diapers	0.0%	0.0%	6	Miscellaneous Inorganics	0.0%	0.0%	0
Animal By-products	0.0%	0.0%	0	Totals	100%		21,445
Rubber Products	0.1%	0.2%	29	Sample Count	36		
Tires	0.0%	0.0%	0				

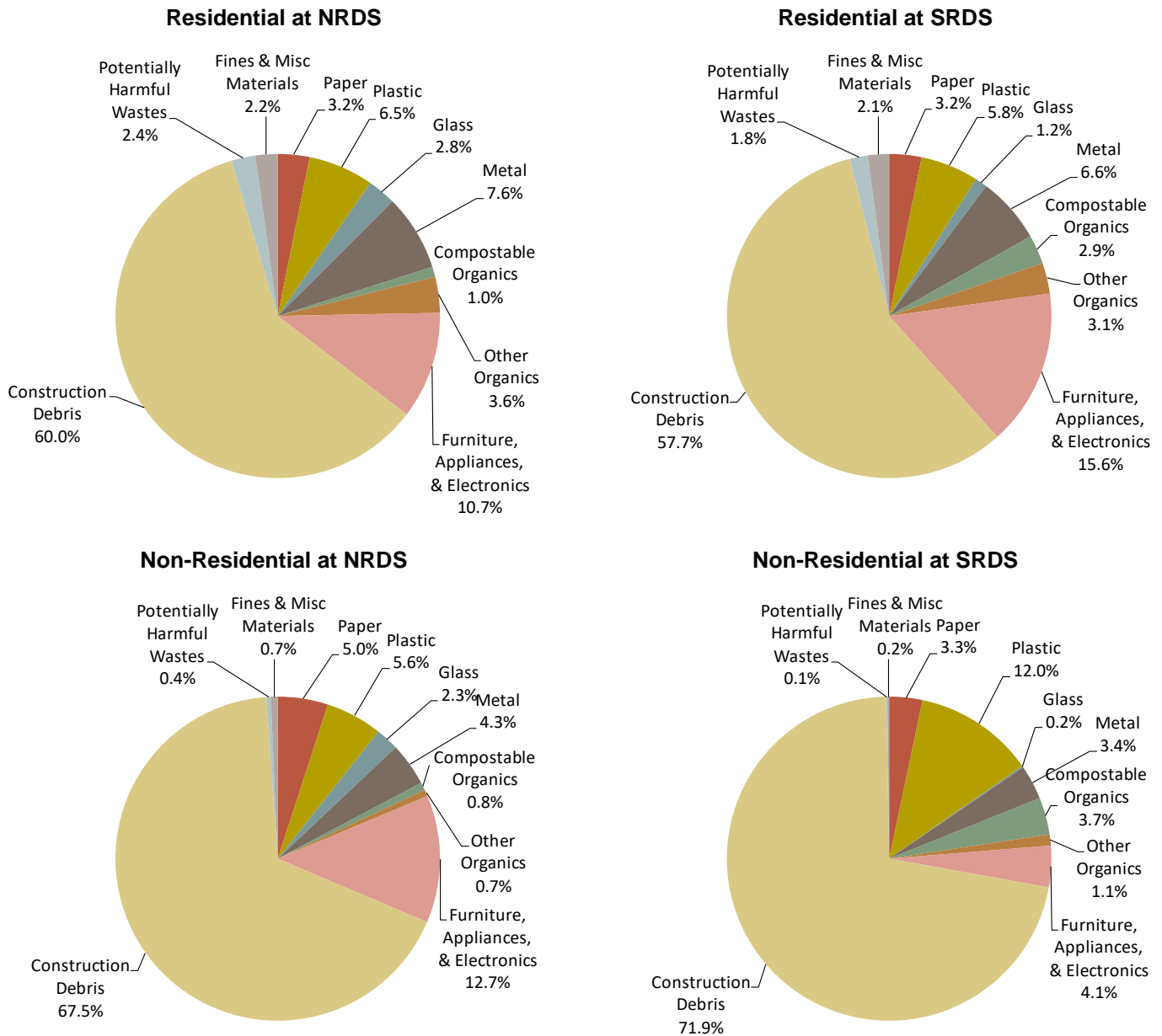
Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Self-haul Composition by Generator Type, by Site

This subsection provides a brief overview of the wastes self-hauled by residential and non-residential generators to the NRDS and SRDS.

As shown in Figure 6, **Construction Debris** accounted for over 57% of the total for residential and non-residential waste at both the NRDS and the SRDS. **Construction Debris** includes components such as *clean dimension lumber, new painted wood, and demo gypsum scrap*.

Figure 6. Composition Summary: by Generator Type, by Site
(August 1, 2017 to July 31, 2018)



4.1.12 Residential Generators, by Site

4.1.12.1 North Recycling and Disposal Station (NRDS)

A total of 70 samples were taken from residential loads at the NRDS. As shown in Table 25, the top ten components from these loads summed to more than 63% of the total, and *new painted wood* and *contaminated wood* were the two most prevalent components, at 15% and 11%, respectively. Table 29 lists detailed composition results for the residential waste disposed at the NRDS.

**Table 25. Top Ten Components: Residential at NRDS
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	Cum. Percent
New Painted Wood	14.5%	14.5%
Contaminated Wood	11.1%	25.6%
Clean Dimension Lumber	7.5%	33.1%
Furniture	6.1%	39.1%
Clean Engineered Wood	4.5%	43.7%
Carpet	4.2%	47.9%
Other Construction	4.2%	52.1%
Mixed Metals/Material	3.8%	55.9%
Other Ferrous	3.7%	59.6%
Mattresses	3.7%	63.2%
Total	63.2%	

4.1.12.2 South Recycling and Disposal Station (SRDS)

A total of 67 samples were taken from residential loads at the SRDS. As Table 26 details, the top ten components in the loads were 62% of the total materials in the loads, by weight. *Furniture* and *new painted wood* were the top two components, each with about 10%. Table 30 lists detailed composition results for the residential waste disposed at the SRDS.

**Table 26. Top Ten Components: Residential at SRDS
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	Cum. Percent
Furniture	9.8%	9.8%
New Painted Wood	9.6%	19.4%
Contaminated Wood	6.7%	26.1%
Carpet	6.6%	32.7%
Clean Dimension Lumber	6.2%	38.9%
Clean Engineered Wood	5.9%	44.8%
Other Treated Wood	4.5%	49.3%
Mattresses	4.3%	53.6%
Ceramics	4.1%	57.7%
Mixed Metals/Material	3.9%	61.6%
Total	61.6%	

4.1.13 Non-Residential Generators, by Site

4.1.13.1 North Recycling and Disposal Station (NRDS)

A total of 20 samples were taken from non-residential loads at the NRDS. Table 27 lists the top ten components in the loads, which sum to about 71% of the total. *Clean dimension lumber* accounted for approximately 15% of the total, by weight. Table 31 lists detailed composition results for the non-residential waste disposed at the NRDS.

**Table 27. Top Ten Components: Non-residential at NRDS
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	Cum. Percent
Clean Dimension Lumber	14.5%	14.5%
Pallets	9.6%	24.1%
Other Construction	8.1%	32.2%
Clean Engineered Wood	6.8%	39.0%
Furniture	6.5%	45.5%
Mattresses	6.2%	51.7%
Contaminated Wood	5.9%	57.6%
Carpet	5.4%	63.1%
New Painted Wood	4.8%	67.9%
Asphalt Shingles	3.5%	71.4%
Total	71.4%	

4.1.13.2 South Recycling and Disposal Station (SRDS)

A total of 25 samples were taken from non-residential loads at the SRDS. As shown in Table 28, the top ten components accounted for a combined total of 68% of the tonnage. *Clean dimension lumber* was the single largest component of this waste, with 15%. Table 32 lists detailed composition results for the non-residential waste disposed at the SRDS.

**Table 28. Top Ten Components: Non-residential at SRDS
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	Cum. Percent
Clean Dimension Lumber	14.5%	14.5%
Contaminated Wood	14.2%	28.7%
Demo Gypsum Scrap	7.5%	36.2%
Clean Engineered Wood	6.1%	42.3%
Carpet	5.6%	47.9%
Expanded Poly. Non-food	4.5%	52.4%
Concrete	4.2%	56.6%
Pallets	4.2%	60.8%
Food	3.7%	64.5%
Old Painted Wood	3.5%	68.0%
Total	68.0%	

4.1.14 Comparisons among Generator Types and Sites

Four material categories, *contaminated wood*, *clean dimension lumber*, *clean engineered wood* and *carpet*, were top ten components for both residential and non-residential generators at both sites.

**Table 29. Composition by Weight: Residential at NRDS
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	+ / -	Material	Est. Percent	+ / -
Paper	3.2%		Furniture, Appliances, and Electronics	10.7%	
Newspaper	0.0%	0.0%	Furniture	6.1%	3.4%
Plain OCC/Kraft	1.4%	0.6%	Mattresses	3.7%	2.2%
Waxed OCC	0.0%	0.0%	Small Appliances	0.3%	0.4%
Grocery/Shopping Bags	0.1%	0.1%	Cell Phones	0.0%	0.0%
High-grade Paper	0.0%	0.0%	Audio/Visual Equipment	0.1%	0.1%
Mixed Low-grade Paper	1.0%	0.6%	CRT Monitors	0.0%	0.0%
Polycoated Containers	0.0%	0.0%	CRT Televisions	0.0%	0.0%
Compostable/Soiled	0.1%	0.0%	Other Electronics	0.6%	0.4%
Pot. Comp. Single-use Food Service	0.0%	0.0%			
Non-Comp. Single-use Food Service	0.0%	0.0%	Construction Debris	60.0%	
Mixed/Other Paper	0.5%	0.3%	Clean Dimension Lumber	7.5%	2.3%
Plastic	6.5%		Clean Engineered Wood	4.5%	1.8%
#1 PET Bottles	0.1%	0.1%	Pallets	0.5%	0.7%
#2 HDPE Natural Bottles	0.0%	0.0%	Crates	0.2%	0.3%
#2 HDPE Colored Bottles	0.0%	0.0%	Other Untreated Wood	0.8%	0.8%
Other Bottles	0.0%	0.0%	New Painted Wood	14.5%	4.5%
Tubs	0.4%	0.2%	Old Painted Wood	3.5%	2.2%
Expanded Poly. Non-food	0.3%	0.2%	Creosote-treated Wood	0.1%	0.2%
Expanded Poly. Food-grade	0.0%	0.0%	Other Treated Wood	1.8%	1.2%
Rigid Poly. Foam Insulation	0.0%	0.0%	Contaminated Wood	11.1%	3.8%
Pot. Comp. Single-use Food Service	0.0%	0.0%	New Gypsum Scrap	1.1%	1.2%
Non-Comp. Single-use Food Service	0.0%	0.0%	Demo Gypsum Scrap	0.8%	0.6%
Other Rigid Packaging	0.1%	0.1%	Carpet	4.2%	2.0%
Shopping/Dry Cleaning Bags	0.0%	0.0%	Felt Carpet Pad	0.2%	0.4%
Stretch Wrap	0.0%	0.0%	Fiberglass Insulation	0.1%	0.1%
Clean Polyethylene Film	0.1%	0.1%	Concrete	2.5%	1.9%
Other Film	0.4%	0.2%	Asphalt Paving	0.0%	0.0%
Plastic Pipe	0.2%	0.3%	Other Aggregates	0.1%	0.1%
Foam Carpet Padding	0.3%	0.3%	Rock	0.2%	0.2%
Durable Plastic Products	3.5%	1.1%	Asphalt Shingles	1.1%	1.1%
Plastic/Other Materials	1.1%	0.6%	Other Asphaltic Roofing	0.0%	0.0%
			Ceramics	0.7%	0.7%
			Cement Fiber Board	0.4%	0.4%
Glass	2.8%		Single-ply Roofing Membranes	0.0%	0.0%
Clear Bottles	0.0%	0.0%	Ceiling Tiles	0.0%	0.0%
Green Bottles	0.0%	0.0%	Other Construction	4.2%	2.7%
Brown Bottles	0.0%	0.0%			
Container Glass	0.1%	0.1%	Potentially Harmful Wastes	2.4%	
Fluorescent Tubes	0.0%	0.0%	Dried Latex Paint	0.0%	0.0%
CFLs	0.0%	0.0%	Liquid Latex Paint	1.7%	1.3%
Flat Glass	0.5%	0.4%	Solvent-based Adhesives	0.0%	0.0%
Automotive Glass	0.0%	0.0%	Water-based Adhesives	0.1%	0.1%
Other Glass	2.1%	2.0%	Oil-based Paint/Thinners	0.0%	0.0%
			Caustic Cleaners	0.0%	0.0%
Metal	7.6%		Pesticides/Herbicides	0.0%	0.0%
Aluminum Beverage Cans	0.0%	0.0%	Rechargeable Batteries	0.0%	0.0%
Aluminum Foil/Containers	0.0%	0.0%	Other Dry-cell Batteries	0.0%	0.0%
Other Aluminum	0.0%	0.0%	Wet-cell Batteries	0.3%	0.4%
Other Nonferrous	0.0%	0.0%	Gasoline/Kerosene	0.0%	0.0%
Steel Food Cans	0.0%	0.0%	Motor Oil/Diesel Oil	0.0%	0.0%
Empty Aerosol Cans	0.0%	0.0%	Asbestos	0.0%	0.0%
Other Ferrous	3.7%	1.5%	Explosives	0.0%	0.0%
Oil filters	0.0%	0.0%	Medical Wastes	0.0%	0.0%
Mixed Metals/Material	3.8%	1.6%	Other Cleaners/Chemicals	0.1%	0.1%
			Pharmaceuticals/Vitamins	0.0%	0.0%
			Personal Care/Cosmetics	0.1%	0.1%
			Other Potentially Harmful Waste	0.1%	0.1%
Compostable Organics	1.0%				
Leaves and Grass	0.1%	0.2%	Fines and Misc Materials	2.2%	
Prunings	0.2%	0.2%	Sand/Soil/Dirt	1.7%	1.8%
Food	0.7%	0.5%	Non-distinct Fines	0.1%	0.1%
Fats, Oils, Grease	0.0%	0.0%	Miscellaneous Organics	0.4%	0.4%
			Miscellaneous Inorganics	0.0%	0.1%
Other Organics	3.6%				
Textiles/Clothing	1.9%	1.3%	Totals	100%	
Mixed Textiles	1.0%	0.5%	Sample Count	70	
Disposable Diapers	0.1%	0.1%			
Animal By-products	0.2%	0.2%			
Rubber Products	0.5%	0.3%			
Tires	0.0%	0.0%			

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

**Table 30. Composition by Weight: Residential at SRDS
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	+ / -	Material	Est. Percent	+ / -
Paper	3.2%		Furniture, Appliances, and Electronics	15.6%	
Newspaper	0.0%	0.0%	Furniture	9.8%	4.2%
Plain OCC/Kraft	1.9%	0.7%	Mattresses	4.3%	2.7%
Waxed OCC	0.0%	0.0%	Small Appliances	0.9%	0.9%
Grocery/Shopping Bags	0.0%	0.0%	Cell Phones	0.0%	0.0%
High-grade Paper	0.0%	0.0%	Audio/Visual Equipment	0.1%	0.1%
Mixed Low-grade Paper	0.5%	0.4%	CRT Monitors	0.0%	0.0%
Polycoated Containers	0.0%	0.0%	CRT Televisions	0.0%	0.0%
Compostable/Soiled	0.1%	0.1%	Other Electronics	0.5%	0.4%
Pot. Comp. Single-use Food Service	0.0%	0.0%			
Non-Comp. Single-use Food Service	0.0%	0.0%	Construction Debris	57.7%	
Mixed/Other Paper	0.6%	0.4%	Clean Dimension Lumber	6.2%	3.0%
			Clean Engineered Wood	5.9%	3.2%
Plastic	5.8%		Pallets	2.5%	2.0%
#1 PET Bottles	0.0%	0.0%	Crates	0.0%	0.0%
#2 HDPE Natural Bottles	0.0%	0.0%	Other Untreated Wood	0.1%	0.1%
#2 HDPE Colored Bottles	0.0%	0.0%	New Painted Wood	9.6%	3.2%
Other Bottles	0.0%	0.0%	Old Painted Wood	1.9%	1.3%
Tubs	0.4%	0.2%	Creosote-treated Wood	0.9%	1.1%
Expanded Poly. Non-food	0.2%	0.2%	Other Treated Wood	4.5%	2.3%
Expanded Poly. Food-grade	0.0%	0.0%	Contaminated Wood	6.7%	2.7%
Rigid Poly. Foam Insulation	0.0%	0.0%	New Gypsum Scrap	0.1%	0.2%
Pot. Comp. Single-use Food Service	0.0%	0.0%	Demo Gypsum Scrap	2.2%	1.9%
Non-Comp. Single-use Food Service	0.0%	0.0%	Carpet	6.6%	3.4%
Other Rigid Packaging	0.1%	0.0%	Felt Carpet Pad	0.5%	0.5%
Shopping/Dry Cleaning Bags	0.0%	0.0%	Fiberglass Insulation	0.1%	0.1%
Stretch Wrap	0.1%	0.1%	Concrete	0.3%	0.4%
Clean Polyethylene Film	0.1%	0.0%	Asphalt Paving	0.0%	0.0%
Other Film	0.6%	0.4%	Other Aggregates	0.7%	0.7%
Plastic Pipe	0.1%	0.1%	Rock	0.0%	0.0%
Foam Carpet Padding	0.2%	0.2%	Asphalt Shingles	1.2%	1.1%
Durable Plastic Products	3.6%	1.2%	Other Asphaltic Roofing	0.0%	0.0%
Plastic/Other Materials	0.4%	0.3%	Ceramics	4.1%	2.2%
			Cement Fiber Board	0.0%	0.0%
Glass	1.2%		Single-ply Roofing Membranes	0.0%	0.0%
Clear Bottles	0.0%	0.0%	Ceiling Tiles	0.0%	0.0%
Green Bottles	0.0%	0.0%	Other Construction	3.6%	2.5%
Brown Bottles	0.0%	0.0%			
Container Glass	0.0%	0.0%	Potentially Harmful Wastes	1.8%	
Fluorescent Tubes	0.0%	0.0%	Dried Latex Paint	0.0%	0.0%
CFLs	0.0%	0.0%	Liquid Latex Paint	0.4%	0.4%
Flat Glass	0.3%	0.3%	Solvent-based Adhesives	0.0%	0.0%
Automotive Glass	0.0%	0.0%	Water-based Adhesives	0.4%	0.4%
Other Glass	0.8%	0.9%	Oil-based Paint/Thinners	0.8%	1.0%
			Caustic Cleaners	0.0%	0.0%
Metal	6.6%		Pesticides/Herbicides	0.0%	0.0%
Aluminum Beverage Cans	0.0%	0.0%	Rechargeable Batteries	0.0%	0.0%
Aluminum Foil/Containers	0.0%	0.0%	Other Dry-cell Batteries	0.0%	0.0%
Other Aluminum	0.1%	0.1%	Wet-cell Batteries	0.0%	0.0%
Other Nonferrous	0.1%	0.2%	Gasoline/Kerosene	0.0%	0.0%
Steel Food Cans	0.0%	0.0%	Motor Oil/Diesel Oil	0.1%	0.2%
Empty Aerosol Cans	0.0%	0.0%	Asbestos	0.0%	0.0%
Other Ferrous	2.5%	0.9%	Explosives	0.0%	0.0%
Oil filters	0.0%	0.0%	Medical Wastes	0.0%	0.0%
Mixed Metals/Material	3.9%	1.4%	Other Cleaners/Chemicals	0.0%	0.0%
			Pharmaceuticals/Vitamins	0.0%	0.0%
Compostable Organics	2.9%		Personal Care/Cosmetics	0.0%	0.0%
Leaves and Grass	1.4%	1.1%	Other Potentially Harmful Waste	0.0%	0.0%
Prunings	0.2%	0.2%			
Food	1.3%	1.0%	Fines and Misc Materials	2.1%	
Fats, Oils, Grease	0.0%	0.0%	Sand/Soil/Dirt	1.9%	1.7%
			Non-distinct Fines	0.1%	0.0%
Other Organics	3.1%		Miscellaneous Organics	0.1%	0.2%
Textiles/Clothing	1.6%	1.0%	Miscellaneous Inorganics	0.0%	0.0%
Mixed Textiles	0.9%	0.5%			
Disposable Diapers	0.1%	0.1%	Totals	100%	
Animal By-products	0.1%	0.1%	Sample Count	67	
Rubber Products	0.3%	0.3%			
Tires	0.0%	0.0%			

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

**Table 31. Composition by Weight: Non-Residential at NRDS
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	+ / -	Material	Est. Percent	+ / -
Paper	5.0%		Furniture, Appliances, and Electronics	12.7%	
Newspaper	0.0%	0.0%	Furniture	6.5%	6.3%
Plain OCC/Kraft	2.5%	1.4%	Mattresses	6.2%	5.7%
Waxed OCC	0.0%	0.0%	Small Appliances	0.0%	0.0%
Grocery/Shopping Bags	0.0%	0.0%	Cell Phones	0.0%	0.0%
High-grade Paper	0.0%	0.0%	Audio/Visual Equipment	0.0%	0.0%
Mixed Low-grade Paper	0.7%	0.6%	CRT Monitors	0.0%	0.0%
Polycoated Containers	0.0%	0.0%	CRT Televisions	0.0%	0.0%
Compostable/Soiled	0.1%	0.1%	Other Electronics	0.0%	0.0%
Pot. Comp. Single-use Food Service	0.0%	0.0%			
Non-Comp. Single-use Food Service	0.0%	0.0%	Construction Debris	67.5%	
Mixed/Other Paper	1.6%	1.9%	Clean Dimension Lumber	14.5%	6.6%
			Clean Engineered Wood	6.8%	3.9%
Plastic	5.6%		Pallets	9.6%	6.9%
#1 PET Bottles	0.1%	0.0%	Crates	0.0%	0.1%
#2 HDPE Natural Bottles	0.0%	0.0%	Other Untreated Wood	0.2%	0.4%
#2 HDPE Colored Bottles	0.0%	0.0%	New Painted Wood	4.8%	3.1%
Other Bottles	0.0%	0.0%	Old Painted Wood	0.2%	0.3%
Tubs	0.2%	0.2%	Creosote-treated Wood	1.5%	1.3%
Expanded Poly. Non-food	0.0%	0.0%	Other Treated Wood	2.4%	3.7%
Expanded Poly. Food-grade	0.0%	0.0%	Contaminated Wood	5.9%	3.6%
Rigid Poly. Foam Insulation	0.0%	0.0%	New Gypsum Scrap	1.9%	2.0%
Pot. Comp. Single-use Food Service	0.0%	0.0%	Demo Gypsum Scrap	0.2%	0.2%
Non-Comp. Single-use Food Service	0.0%	0.0%	Carpet	5.4%	6.6%
Other Rigid Packaging	0.0%	0.0%	Felt Carpet Pad	0.0%	0.0%
Shopping/Dry Cleaning Bags	0.0%	0.0%	Fiberglass Insulation	0.4%	0.4%
Stretch Wrap	0.1%	0.1%	Concrete	1.1%	1.5%
Clean Polyethylene Film	0.1%	0.1%	Asphalt Paving	0.0%	0.0%
Other Film	0.7%	0.6%	Other Aggregates	0.0%	0.0%
Plastic Pipe	0.2%	0.2%	Rock	0.0%	0.0%
Foam Carpet Padding	0.1%	0.1%	Asphalt Shingles	3.5%	3.0%
Durable Plastic Products	3.1%	2.6%	Other Asphaltic Roofing	0.0%	0.0%
Plastic/Other Materials	1.0%	1.3%	Ceramics	0.9%	0.8%
			Cement Fiber Board	0.0%	0.0%
Glass	2.3%		Single-ply Roofing Membranes	0.0%	0.0%
Clear Bottles	0.1%	0.1%	Ceiling Tiles	0.0%	0.0%
Green Bottles	0.0%	0.0%	Other Construction	8.1%	4.7%
Brown Bottles	0.6%	0.7%			
Container Glass	0.0%	0.1%	Potentially Harmful Wastes	0.4%	
Fluorescent Tubes	0.1%	0.1%	Dried Latex Paint	0.0%	0.0%
CFLs	0.0%	0.0%	Liquid Latex Paint	0.0%	0.0%
Flat Glass	1.5%	2.1%	Solvent-based Adhesives	0.0%	0.0%
Automotive Glass	0.0%	0.0%	Water-based Adhesives	0.3%	0.4%
Other Glass	0.0%	0.0%	Oil-based Paint/Thinners	0.1%	0.2%
			Caustic Cleaners	0.0%	0.0%
Metal	4.3%		Pesticides/Herbicides	0.0%	0.0%
Aluminum Beverage Cans	0.1%	0.1%	Rechargeable Batteries	0.0%	0.0%
Aluminum Foil/Containers	0.0%	0.0%	Other Dry-cell Batteries	0.0%	0.0%
Other Aluminum	0.0%	0.0%	Wet-cell Batteries	0.0%	0.0%
Other Nonferrous	0.2%	0.3%	Gasoline/Kerosene	0.0%	0.0%
Steel Food Cans	0.0%	0.0%	Motor Oil/Diesel Oil	0.0%	0.0%
Empty Aerosol Cans	0.0%	0.0%	Asbestos	0.0%	0.0%
Other Ferrous	2.7%	2.2%	Explosives	0.0%	0.0%
Oil filters	0.0%	0.0%	Medical Wastes	0.0%	0.0%
Mixed Metals/Material	1.3%	1.5%	Other Cleaners/Chemicals	0.0%	0.0%
			Pharmaceuticals/Vitamins	0.0%	0.0%
Compostable Organics	0.8%		Personal Care/Cosmetics	0.0%	0.0%
Leaves and Grass	0.0%	0.0%	Other Potentially Harmful Waste	0.0%	0.0%
Prunings	0.0%	0.0%			
Food	0.8%	0.7%	Fines and Misc Materials	0.7%	
Fats, Oils, Grease	0.0%	0.0%	Sand/Soil/Dirt	0.1%	0.2%
			Non-distinct Fines	0.1%	0.1%
Other Organics	0.7%		Miscellaneous Organics	0.5%	0.8%
Textiles/Clothing	0.4%	0.3%	Miscellaneous Inorganics	0.0%	0.0%
Mixed Textiles	0.1%	0.1%			
Disposable Diapers	0.1%	0.1%	Totals	100%	
Animal By-products	0.0%	0.0%	Sample Count	20	
Rubber Products	0.0%	0.0%			
Tires	0.0%	0.0%			

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

**Table 32. Composition by Weight: Non-Residential at SRDS
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	+ / -	Material	Est. Percent	+ / -
Paper	3.3%		Furniture, Appliances, and Electronics	4.1%	
Newspaper	0.0%	0.0%	Furniture	2.9%	3.5%
Plain OCC/Kraft	2.6%	1.5%	Mattresses	0.0%	0.0%
Waxed OCC	0.0%	0.0%	Small Appliances	0.0%	0.0%
Grocery/Shopping Bags	0.0%	0.0%	Cell Phones	0.0%	0.0%
High-grade Paper	0.0%	0.0%	Audio/Visual Equipment	0.7%	0.7%
Mixed Low-grade Paper	0.3%	0.2%	CRT Monitors	0.0%	0.0%
Polycoated Containers	0.0%	0.0%	CRT Televisions	0.0%	0.0%
Compostable/Soiled	0.1%	0.1%	Other Electronics	0.5%	0.6%
Pot. Comp. Single-use Food Service	0.0%	0.0%			
Non-Comp. Single-use Food Service	0.0%	0.0%	Construction Debris	71.9%	
Mixed/Other Paper	0.3%	0.3%	Clean Dimension Lumber	14.5%	8.3%
			Clean Engineered Wood	6.1%	4.2%
Plastic	12.0%		Pallets	4.2%	4.5%
#1 PET Bottles	0.0%	0.0%	Crates	0.1%	0.1%
#2 HDPE Natural Bottles	0.0%	0.0%	Other Untreated Wood	0.1%	0.2%
#2 HDPE Colored Bottles	0.0%	0.0%	New Painted Wood	1.7%	1.7%
Other Bottles	0.0%	0.0%	Old Painted Wood	3.5%	3.2%
Tubs	0.1%	0.1%	Creosote-treated Wood	0.2%	0.4%
Expanded Poly. Non-food	4.5%	7.1%	Other Treated Wood	2.3%	2.4%
Expanded Poly. Food-grade	0.0%	0.0%	Contaminated Wood	14.2%	7.3%
Rigid Poly. Foam Insulation	0.8%	1.2%	New Gypsum Scrap	2.9%	3.7%
Pot. Comp. Single-use Food Service	0.0%	0.0%	Demo Gypsum Scrap	7.5%	5.8%
Non-Comp. Single-use Food Service	0.0%	0.0%	Carpet	5.6%	5.2%
Other Rigid Packaging	0.0%	0.0%	Felt Carpet Pad	0.9%	1.4%
Shopping/Dry Cleaning Bags	0.0%	0.0%	Fiberglass Insulation	0.8%	1.0%
Stretch Wrap	0.5%	0.7%	Concrete	4.2%	5.4%
Clean Polyethylene Film	0.1%	0.1%	Asphalt Paving	0.0%	0.0%
Other Film	0.5%	0.2%	Other Aggregates	0.0%	0.0%
Plastic Pipe	0.0%	0.0%	Rock	0.0%	0.0%
Foam Carpet Padding	0.9%	1.2%	Asphalt Shingles	0.1%	0.2%
Durable Plastic Products	1.4%	1.5%	Other Asphaltic Roofing	0.0%	0.0%
Plastic/Other Materials	3.2%	4.5%	Ceramics	0.5%	0.6%
			Cement Fiber Board	0.0%	0.0%
Glass	0.2%		Single-ply Roofing Membranes	0.0%	0.0%
Clear Bottles	0.1%	0.1%	Ceiling Tiles	0.0%	0.0%
Green Bottles	0.0%	0.0%	Other Construction	2.5%	2.4%
Brown Bottles	0.0%	0.1%			
Container Glass	0.0%	0.0%	Potentially Harmful Wastes	0.1%	
Fluorescent Tubes	0.0%	0.0%	Dried Latex Paint	0.0%	0.0%
CFLs	0.0%	0.0%	Liquid Latex Paint	0.0%	0.1%
Flat Glass	0.0%	0.0%	Solvent-based Adhesives	0.1%	0.1%
Automotive Glass	0.0%	0.0%	Water-based Adhesives	0.0%	0.0%
Other Glass	0.0%	0.0%	Oil-based Paint/Thinners	0.0%	0.0%
			Caustic Cleaners	0.0%	0.0%
Metal	3.4%		Pesticides/Herbicides	0.0%	0.0%
Aluminum Beverage Cans	0.0%	0.0%	Rechargeable Batteries	0.0%	0.0%
Aluminum Foil/Containers	0.0%	0.0%	Other Dry-cell Batteries	0.0%	0.0%
Other Aluminum	0.0%	0.1%	Wet-cell Batteries	0.0%	0.0%
Other Nonferrous	0.1%	0.1%	Gasoline/Kerosene	0.0%	0.0%
Steel Food Cans	0.0%	0.0%	Motor Oil/Diesel Oil	0.0%	0.0%
Empty Aerosol Cans	0.0%	0.0%	Asbestos	0.0%	0.0%
Other Ferrous	0.6%	0.5%	Explosives	0.0%	0.0%
Oil filters	0.0%	0.0%	Medical Wastes	0.0%	0.0%
Mixed Metals/Material	2.7%	3.6%	Other Cleaners/Chemicals	0.0%	0.0%
			Pharmaceuticals/Vitamins	0.0%	0.0%
Compostable Organics	3.7%		Personal Care/Cosmetics	0.0%	0.0%
Leaves and Grass	0.0%	0.0%	Other Potentially Harmful Waste	0.0%	0.0%
Prunings	0.0%	0.0%			
Food	3.7%	5.9%	Fines and Misc Materials	0.2%	
Fats, Oils, Grease	0.0%	0.0%	Sand/Soil/Dirt	0.0%	0.0%
			Non-distinct Fines	0.1%	0.1%
Other Organics	1.1%		Miscellaneous Organics	0.1%	0.1%
Textiles/Clothing	0.0%	0.0%	Miscellaneous Inorganics	0.0%	0.0%
Mixed Textiles	1.0%	1.0%			
Disposable Diapers	0.0%	0.1%	Totals	100%	
Animal By-products	0.0%	0.0%	Sample Count	25	
Rubber Products	0.0%	0.0%			
Tires	0.0%	0.0%			

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

5 Self-haul Composition by Generator Subtype

The 2017-18 study also collected samples of waste from five additional self-haul load subtypes representing targeted industry groups or organizations. Some of these loads were selected through the normal random selection process; however, to achieve the sample goals, some of these loads were targeted for sampling—ignoring the random selection process. The five targeted generator subtypes were:

- Construction contractors
- Charities/thrift stores (Goodwill, Salvation Army etc.)
- Junk Haulers (property cleanup companies such as 1-800-Junk-Be-Gone, Got Junk, etc.)
- Seattle Housing Authority
- University of Washington

Generator Subtype Findings

The following subsection details the waste composition findings for five targeted generator subtypes.

5.1.1 Construction Contractors

While it was not possible to estimate tons of self-hauled from Construction Contractors, the study captured 42 samples from this generator subtype. Figure 7 shows the composition of waste disposed. Logically, **Construction Debris** accounts for the largest share of material, with 83%.

Figure 7. Composition Summary: Construction Contractors

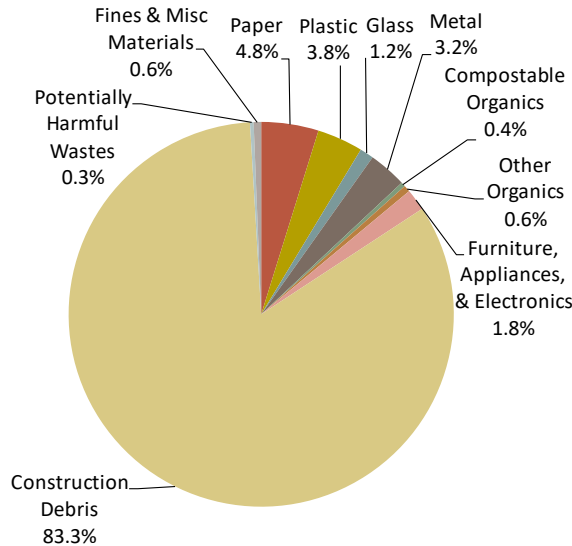


Table 33 lists the top ten components of waste disposed from Construction Contractors self-haulers. The top ten materials account for about 72% of the total, by weight. *Clean dimension lumber* is the single largest material with 20%, followed by *contaminated wood* with 9% and *carpet* with 8%. Please see Table 34 for a list of the detailed composition results.

**Table 33. Top Ten Components: Construction Contractors
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	Cum. Percent
Clean Dimension Lumber	20.1%	20.1%
Contaminated Wood	9.2%	29.3%
Carpet	7.8%	37.1%
Other Construction	7.4%	44.5%
Clean Engineered Wood	7.0%	51.5%
Demo Gypsum Scrap	5.6%	57.1%
New Painted Wood	4.9%	62.0%
Concrete	3.8%	65.9%
New Gypsum Scrap	3.1%	69.0%
Plain OCC/Kraft	2.6%	71.5%
Total	71.5%	

**Table 34. Composition by Weight: Construction Contractors
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	+ / -		Est. Percent	+ / -
Paper	4.8%		Furniture, Appliances, and Electronics	1.8%	
Newspaper	0.0%	0.0%	Furniture	1.7%	2.8%
Plain OCC/Kraft	2.6%	0.9%	Mattresses	0.0%	0.0%
Waxed OCC	0.0%	0.0%	Small Appliances	0.1%	0.1%
Grocery/Shopping Bags	0.0%	0.0%	Cell Phones	0.0%	0.0%
High-grade Paper	0.0%	0.0%	Audio/Visual Equipment	0.0%	0.0%
Mixed Low-grade Paper	0.5%	0.4%	CRT Monitors	0.0%	0.0%
Polycoated Containers	0.0%	0.0%	CRT Televisions	0.0%	0.0%
Compostable/Soiled	0.1%	0.1%	Other Electronics	0.0%	0.0%
Pot. Comp. Single-use Food Service	0.0%	0.0%			
Non-Comp. Single-use Food Service	0.0%	0.0%	Construction Debris	83.3%	
Mixed/Other Paper	1.5%	1.2%	Clean Dimension Lumber	20.1%	6.2%
			Clean Engineered Wood	7.0%	2.8%
Plastic	3.8%		Pallets	2.4%	1.6%
#1 PET Bottles	0.1%	0.0%	Crates	0.8%	1.2%
#2 HDPE Natural Bottles	0.0%	0.0%	Other Untreated Wood	0.1%	0.1%
#2 HDPE Colored Bottles	0.0%	0.0%	New Painted Wood	4.9%	2.2%
Other Bottles	0.0%	0.0%	Old Painted Wood	2.4%	2.0%
Tubs	0.2%	0.2%	Creosote-treated Wood	1.5%	1.0%
Expanded Poly. Non-food	0.2%	0.1%	Other Treated Wood	1.8%	1.9%
Expanded Poly. Food-grade	0.0%	0.0%	Contaminated Wood	9.2%	4.9%
Rigid Poly. Foam Insulation	0.5%	0.7%	New Gypsum Scrap	3.1%	2.4%
Pot. Comp. Single-use Food Service	0.0%	0.0%	Demo Gypsum Scrap	5.6%	3.6%
Non-Comp. Single-use Food Service	0.0%	0.0%	Carpet	7.8%	5.2%
Other Rigid Packaging	0.0%	0.0%	Felt Carpet Pad	0.5%	0.9%
Shopping/Dry Cleaning Bags	0.0%	0.0%	Fiberglass Insulation	0.6%	0.6%
Stretch Wrap	0.1%	0.1%	Concrete	3.8%	3.4%
Clean Polyethylene Film	0.1%	0.1%	Asphalt Paving	0.0%	0.0%
Other Film	0.7%	0.3%	Other Aggregates	0.5%	0.9%
Plastic Pipe	0.1%	0.1%	Rock	0.5%	0.8%
Foam Carpet Padding	0.6%	0.7%	Asphalt Shingles	2.5%	1.8%
Durable Plastic Products	1.0%	0.7%	Other Asphaltic Roofing	0.0%	0.1%
Plastic/Other Materials	0.4%	0.3%	Ceramics	0.8%	0.6%
			Cement Fiber Board	0.0%	0.0%
Glass	1.2%		Single-ply Roofing Membranes	0.0%	0.0%
Clear Bottles	0.0%	0.0%	Ceiling Tiles	0.0%	0.0%
Green Bottles	0.0%	0.0%	Other Construction	7.4%	3.5%
Brown Bottles	0.4%	0.4%			
Container Glass	0.0%	0.0%	Potentially Harmful Wastes	0.3%	
Fluorescent Tubes	0.0%	0.0%	Dried Latex Paint	0.0%	0.0%
CFLs	0.0%	0.0%	Liquid Latex Paint	0.0%	0.0%
Flat Glass	0.7%	1.1%	Solvent-based Adhesives	0.1%	0.1%
Automotive Glass	0.0%	0.0%	Water-based Adhesives	0.1%	0.2%
Other Glass	0.0%	0.0%	Oil-based Paint/Thinners	0.1%	0.1%
			Caustic Cleaners	0.0%	0.0%
Metal	3.2%		Pesticides/Herbicides	0.0%	0.0%
Aluminum Beverage Cans	0.0%	0.0%	Rechargeable Batteries	0.0%	0.0%
Aluminum Foil/Containers	0.0%	0.0%	Other Dry-cell Batteries	0.0%	0.0%
Other Aluminum	0.1%	0.1%	Wet-cell Batteries	0.0%	0.0%
Other Nonferrous	0.1%	0.1%	Gasoline/Kerosene	0.0%	0.0%
Steel Food Cans	0.0%	0.0%	Motor Oil/Diesel Oil	0.0%	0.0%
Empty Aerosol Cans	0.0%	0.0%	Asbestos	0.0%	0.0%
Other Ferrous	2.2%	1.3%	Explosives	0.0%	0.0%
Oil filters	0.0%	0.0%	Medical Wastes	0.0%	0.0%
Mixed Metals/Material	0.7%	0.4%	Other Cleaners/Chemicals	0.0%	0.0%
			Pharmaceuticals/Vitamins	0.0%	0.0%
Compostable Organics	0.4%		Personal Care/Cosmetics	0.0%	0.0%
Leaves and Grass	0.0%	0.0%	Other Potentially Harmful Waste	0.0%	0.0%
Prunings	0.1%	0.1%			
Food	0.3%	0.2%	Fines and Misc Materials	0.6%	
Fats, Oils, Grease	0.0%	0.0%	Sand/Soil/Dirt	0.2%	0.3%
			Non-distinct Fines	0.1%	0.0%
Other Organics	0.6%		Miscellaneous Organics	0.3%	0.4%
Textiles/Clothing	0.2%	0.1%	Miscellaneous Inorganics	0.0%	0.0%
Mixed Textiles	0.1%	0.1%			
Disposable Diapers	0.1%	0.1%	Totals	100%	
Animal By-products	0.0%	0.0%	Sample Count	42	
Rubber Products	0.3%	0.4%			
Tires	0.0%	0.0%			

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

5.1.2 Charities and Thrift Stores

Charities and Thrift Stores self-hauled 8,235 tons of waste to the Seattle transfer stations during the study year. The study captured seven samples of waste from this generator subtype. Figure 8 shows the composition of waste disposed. As shown, **Other Organics** (25%) is the largest component, followed by **Construction Debris** (22%), and **Plastic** (16%).

Figure 8. Composition Summary: Charities and Thrift Stores

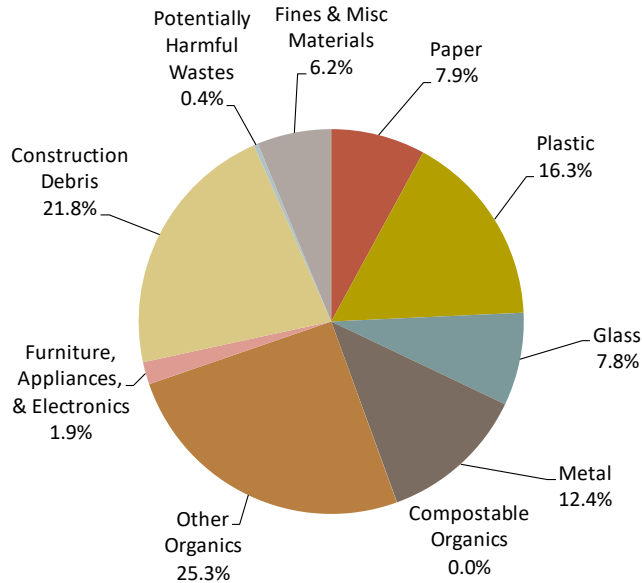


Table 35 lists the top ten components of waste disposed from Charities and Thrift Stores, which sum to approximately 75% of the total, by weight. *Mixed textiles* was the single largest material with 13%, followed by *durable plastic products* at 12% and *textiles/clothing* at 11%. Please see Table 36 for a list of the detailed composition results.

Table 35. Top Ten Components: Charities and Thrift Stores (August 1, 2017 to July 31, 2018)

Material	Est. Percent	Cum. Percent	Est. Tons
Mixed Textiles	13.2%	13.2%	1,091
Durable Plastic Products	11.6%	24.8%	953
Textiles/Clothing	10.7%	35.5%	882
Mixed Metals/Material	7.5%	43.0%	619
Ceramics	7.3%	50.3%	598
Contaminated Wood	6.6%	56.9%	542
Other Glass	5.1%	62.0%	420
Mixed Low-grade Paper	5.1%	67.0%	417
Miscellaneous Organics	4.1%	71.2%	341
Other Ferrous	4.1%	75.3%	338
Total	75.3%		6,200

**Table 36. Composition by Weight: Charities and Thrift Stores
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	7.9%		652	Furniture, Appliances, and Electronics	1.9%		155
Newspaper	0.0%	0.1%	4	Furniture	0.0%	0.0%	0
Plain OCC/Kraft	0.5%	0.3%	42	Mattresses	0.0%	0.0%	0
Waxed OCC	0.0%	0.0%	0	Small Appliances	0.0%	0.0%	0
Grocery/Shopping Bags	0.4%	0.5%	31	Cell Phones	0.0%	0.0%	0
High-grade Paper	0.1%	0.0%	10	Audio/Visual Equipment	1.3%	1.2%	104
Mixed Low-grade Paper	5.1%	3.9%	417	CRT Monitors	0.0%	0.0%	0
Polycoated Containers	0.0%	0.0%	3	CRT Televisions	0.0%	0.0%	0
Compostable/Soiled	0.0%	0.0%	1	Other Electronics	0.6%	0.8%	51
Pot. Comp. Single-use Food Service	0.0%	0.0%	0	Construction Debris	21.8%		1,796
Non-Comp. Single-use Food Service	0.0%	0.0%	1	Clean Dimension Lumber	0.4%	0.7%	35
Mixed/Other Paper	1.8%	0.3%	145	Clean Engineered Wood	0.0%	0.1%	3
Plastic	16.3%		1,346	Pallets	0.1%	0.2%	7
#1 PET Bottles	0.0%	0.0%	3	Crates	0.0%	0.0%	0
#2 HDPE Natural Bottles	0.0%	0.0%	0	Other Untreated Wood	0.4%	0.2%	35
#2 HDPE Colored Bottles	0.0%	0.0%	0	New Painted Wood	3.1%	2.1%	259
Other Bottles	0.0%	0.0%	0	Old Painted Wood	0.0%	0.0%	0
Tubs	0.1%	0.0%	6	Creosote-treated Wood	0.0%	0.0%	0
Expanded Poly. Non-food	0.1%	0.0%	12	Other Treated Wood	3.1%	4.5%	252
Expanded Poly. Food-grade	0.0%	0.0%	0	Contaminated Wood	6.6%	3.7%	542
Rigid Poly. Foam Insulation	0.0%	0.0%	0	New Gypsum Scrap	0.0%	0.0%	0
Pot. Comp. Single-use Food Service	0.0%	0.0%	0	Demo Gypsum Scrap	0.0%	0.0%	0
Non-Comp. Single-use Food Service	0.0%	0.0%	3	Carpet	0.2%	0.3%	19
Other Rigid Packaging	0.5%	0.3%	44	Felt Carpet Pad	0.0%	0.0%	0
Shopping/Dry Cleaning Bags	0.0%	0.0%	1	Fiberglass Insulation	0.0%	0.0%	0
Stretch Wrap	0.1%	0.1%	5	Concrete	0.0%	0.0%	0
Clean Polyethylene Film	0.1%	0.0%	6	Asphalt Paving	0.0%	0.0%	0
Other Film	0.2%	0.1%	13	Other Aggregates	0.6%	1.0%	46
Plastic Pipe	0.0%	0.0%	0	Rock	0.0%	0.0%	0
Foam Carpet Padding	0.0%	0.0%	0	Asphalt Shingles	0.0%	0.0%	0
Durable Plastic Products	11.6%	3.1%	953	Other Asphaltic Roofing	0.0%	0.0%	0
Plastic/Other Materials	3.7%	1.9%	301	Ceramics	7.3%	1.0%	598
Glass	7.8%		643	Cement Fiber Board	0.0%	0.0%	0
Clear Bottles	0.1%	0.0%	9	Single-ply Roofing Membranes	0.0%	0.0%	0
Green Bottles	0.0%	0.0%	0	Ceiling Tiles	0.0%	0.0%	0
Brown Bottles	0.0%	0.0%	0	Other Construction	0.0%	0.0%	0
Container Glass	0.6%	0.7%	47	Potentially Harmful Wastes	0.4%		30
Fluorescent Tubes	0.0%	0.0%	0	Dried Latex Paint	0.0%	0.0%	0
CFLs	0.0%	0.0%	0	Liquid Latex Paint	0.0%	0.0%	0
Flat Glass	2.0%	0.0%	168	Solvent-based Adhesives	0.0%	0.0%	0
Automotive Glass	0.0%	0.0%	0	Water-based Adhesives	0.0%	0.0%	0
Other Glass	5.1%	3.6%	420	Oil-based Paint/Thinners	0.0%	0.0%	0
Metal	12.4%		1,018	Caustic Cleaners	0.0%	0.0%	0
Aluminum Beverage Cans	0.0%	0.0%	0	Pesticides/Herbicides	0.0%	0.0%	0
Aluminum Foil/Containers	0.0%	0.0%	0	Rechargeable Batteries	0.0%	0.0%	0
Other Aluminum	0.3%	0.0%	24	Other Dry-cell Batteries	0.0%	0.0%	0
Other Nonferrous	0.1%	0.0%	8	Wet-cell Batteries	0.0%	0.0%	0
Steel Food Cans	0.4%	0.0%	29	Gasoline/Kerosene	0.0%	0.0%	0
Empty Aerosol Cans	0.0%	0.0%	0	Motor Oil/Diesel Oil	0.0%	0.0%	0
Other Ferrous	4.1%	0.6%	338	Asbestos	0.0%	0.0%	0
Oil filters	0.0%	0.0%	0	Explosives	0.0%	0.0%	0
Mixed Metals/Material	7.5%	6.5%	619	Medical Wastes	0.0%	0.0%	0
Compostable Organics	0.0%		2	Other Cleaners/Chemicals	0.0%	0.0%	0
Leaves and Grass	0.0%	0.0%	0	Pharmaceuticals/Vitamins	0.0%	0.0%	0
Prunings	0.0%	0.0%	2	Personal Care/Cosmetics	0.0%	0.0%	0
Food	0.0%	0.0%	0	Other Potentially Harmful Waste	0.4%	0.5%	30
Fats, Oils, Grease	0.0%	0.0%	0	Fines and Misc Materials	6.2%		512
Other Organics	25.3%		2,079	Sand/Soil/Dirt	0.0%	0.0%	0
Textiles/Clothing	10.7%	0.9%	882	Non-distinct Fines	2.1%	0.1%	171
Mixed Textiles	13.2%	6.5%	1,091	Miscellaneous Organics	4.1%	0.1%	341
Disposable Diapers	0.0%	0.0%	0	Miscellaneous Inorganics	0.0%	0.0%	0
Animal By-products	0.0%	0.0%	0	Totals	100%		8,235
Rubber Products	1.3%	1.0%	106	Sample Count	7		
Tires	0.0%	0.0%	0				

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

5.1.3 Junk Haulers

While it was not possible to estimate tons of waste self-hauled by Junk Haulers, the study captured 19 samples from this generator subtype. Figure 9 shows the composition of waste disposed. As shown, **Construction Debris** accounts for 44% of the material, by weight. The next largest proportion of the waste is comprised of **Furniture, Appliances & Electronics** with 35%.

Figure 9. Composition Summary: Junk Haulers

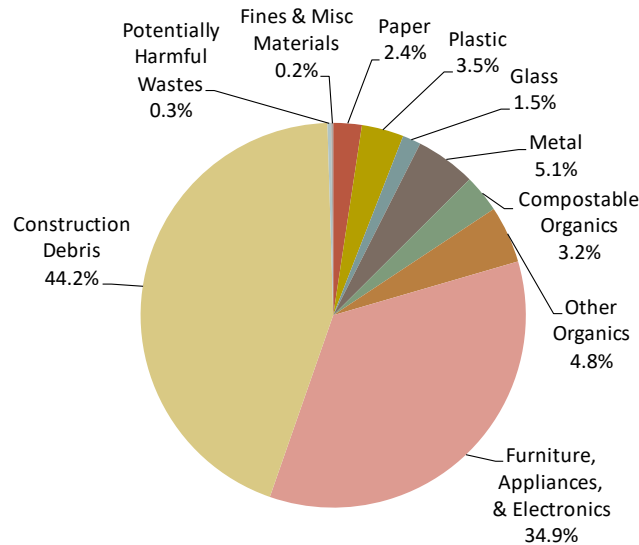


Table 37 lists the top ten components of waste disposed from Junk Haulers. The top ten materials account for about 76% of the total, by weight. *Furniture* was the single largest material with 17%, followed by *mattresses* with 16%. Please see Table 38 for a list of the detailed composition results.

**Table 37. Top Ten Components: Junk Haulers
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	Cum. Percent
Furniture	17.0%	17.0%
Mattresses	15.6%	32.6%
Concrete	13.8%	46.5%
Contaminated Wood	6.9%	53.4%
Pallets	5.1%	58.5%
New Painted Wood	4.5%	63.0%
Textiles/Clothing	3.5%	66.5%
Crates	3.5%	70.0%
Other Ferrous	2.8%	72.8%
Prunings	2.7%	75.5%
Total	75.5%	

**Table 38. Composition by Weight: Junk Haulers
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	+ / -		Est. Percent	+ / -
Paper	2.4%		Furniture, Appliances, and Electronics	34.9%	
Newspaper	0.1%	0.1%	Furniture	17.0%	9.1%
Plain OCC/Kraft	1.3%	0.7%	Mattresses	15.6%	6.8%
Waxed OCC	0.0%	0.0%	Small Appliances	1.3%	2.1%
Grocery/Shopping Bags	0.1%	0.1%	Cell Phones	0.0%	0.0%
High-grade Paper	0.0%	0.0%	Audio/Visual Equipment	0.2%	0.3%
Mixed Low-grade Paper	0.6%	0.4%	CRT Monitors	0.0%	0.0%
Polycoated Containers	0.0%	0.0%	CRT Televisions	0.0%	0.0%
Compostable/Soiled	0.0%	0.0%	Other Electronics	0.7%	0.8%
Pot. Comp. Single-use Food Service	0.0%	0.0%			
Non-Comp. Single-use Food Service	0.0%	0.0%	Construction Debris	44.2%	
Mixed/Other Paper	0.2%	0.2%	Clean Dimension Lumber	2.6%	2.2%
			Clean Engineered Wood	1.2%	1.7%
Plastic	3.5%		Pallets	5.1%	4.1%
#1 PET Bottles	0.0%	0.0%	Crates	3.5%	4.9%
#2 HDPE Natural Bottles	0.0%	0.0%	Other Untreated Wood	0.5%	0.5%
#2 HDPE Colored Bottles	0.0%	0.0%	New Painted Wood	4.5%	3.4%
Other Bottles	0.0%	0.0%	Old Painted Wood	0.1%	0.2%
Tubs	0.1%	0.2%	Creosote-treated Wood	0.0%	0.0%
Expanded Poly. Non-food	0.0%	0.0%	Other Treated Wood	1.0%	1.0%
Expanded Poly. Food-grade	0.0%	0.0%	Contaminated Wood	6.9%	3.8%
Rigid Poly. Foam Insulation	0.0%	0.0%	New Gypsum Scrap	0.0%	0.0%
Pot. Comp. Single-use Food Service	0.0%	0.0%	Demo Gypsum Scrap	0.2%	0.4%
Non-Comp. Single-use Food Service	0.0%	0.0%	Carpet	1.8%	2.7%
Other Rigid Packaging	0.0%	0.0%	Felt Carpet Pad	0.0%	0.0%
Shopping/Dry Cleaning Bags	0.0%	0.0%	Fiberglass Insulation	0.2%	0.3%
Stretch Wrap	0.1%	0.1%	Concrete	13.8%	13.9%
Clean Polyethylene Film	0.1%	0.1%	Asphalt Paving	0.0%	0.0%
Other Film	0.1%	0.1%	Other Aggregates	0.0%	0.0%
Plastic Pipe	0.2%	0.3%	Rock	0.0%	0.0%
Foam Carpet Padding	0.0%	0.1%	Asphalt Shingles	0.0%	0.0%
Durable Plastic Products	1.9%	1.3%	Other Asphaltic Roofing	0.0%	0.0%
Plastic/Other Materials	0.8%	0.7%	Ceramics	1.1%	1.0%
			Cement Fiber Board	0.0%	0.0%
Glass	1.5%		Single-ply Roofing Membranes	0.0%	0.0%
Clear Bottles	0.1%	0.1%	Ceiling Tiles	0.0%	0.0%
Green Bottles	0.0%	0.0%	Other Construction	1.6%	1.7%
Brown Bottles	0.0%	0.0%			
Container Glass	0.0%	0.0%	Potentially Harmful Wastes	0.3%	
Fluorescent Tubes	0.0%	0.0%	Dried Latex Paint	0.0%	0.0%
CFLs	0.0%	0.0%	Liquid Latex Paint	0.0%	0.0%
Flat Glass	0.2%	0.3%	Solvent-based Adhesives	0.0%	0.0%
Automotive Glass	0.0%	0.0%	Water-based Adhesives	0.0%	0.0%
Other Glass	1.3%	1.8%	Oil-based Paint/Thinners	0.0%	0.0%
			Caustic Cleaners	0.0%	0.0%
Metal	5.1%		Pesticides/Herbicides	0.0%	0.0%
Aluminum Beverage Cans	0.0%	0.0%	Rechargeable Batteries	0.0%	0.0%
Aluminum Foil/Containers	0.0%	0.0%	Other Dry-cell Batteries	0.0%	0.0%
Other Aluminum	0.0%	0.0%	Wet-cell Batteries	0.0%	0.0%
Other Nonferrous	0.1%	0.1%	Gasoline/Kerosene	0.0%	0.0%
Steel Food Cans	0.0%	0.0%	Motor Oil/Diesel Oil	0.0%	0.0%
Empty Aerosol Cans	0.0%	0.0%	Asbestos	0.0%	0.0%
Other Ferrous	2.8%	3.1%	Explosives	0.0%	0.0%
Oil filters	0.0%	0.0%	Medical Wastes	0.0%	0.0%
Mixed Metals/Material	2.1%	1.6%	Other Cleaners/Chemicals	0.0%	0.0%
			Pharmaceuticals/Vitamins	0.0%	0.0%
Compostable Organics	3.2%		Personal Care/Cosmetics	0.3%	0.4%
Leaves and Grass	0.0%	0.0%	Other Potentially Harmful Waste	0.0%	0.0%
Prunings	2.7%	4.5%			
Food	0.4%	0.6%	Fines and Misc Materials	0.2%	
Fats, Oils, Grease	0.0%	0.0%	Sand/Soil/Dirt	0.0%	0.0%
			Non-distinct Fines	0.1%	0.1%
Other Organics	4.8%		Miscellaneous Organics	0.1%	0.2%
Textiles/Clothing	3.5%	2.9%	Miscellaneous Inorganics	0.0%	0.0%
Mixed Textiles	1.2%	0.7%			
Disposable Diapers	0.0%	0.0%	Totals	100%	
Animal By-products	0.0%	0.0%	Sample Count	19	
Rubber Products	0.1%	0.1%			
Tires	0.0%	0.0%			

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

5.1.4 Seattle Housing Authority

The Seattle Housing Authority self-hauled 5,793 tons of waste to the Seattle transfer stations during the study year. The study captured seven samples of waste from this generator subtype. Figure 10 shows the composition of waste disposed. As shown, **Compostable Organics** with 30% and **Other Organics** at 22% were the two largest portions of the waste stream.

Figure 10. Composition Summary: Seattle Housing Authority

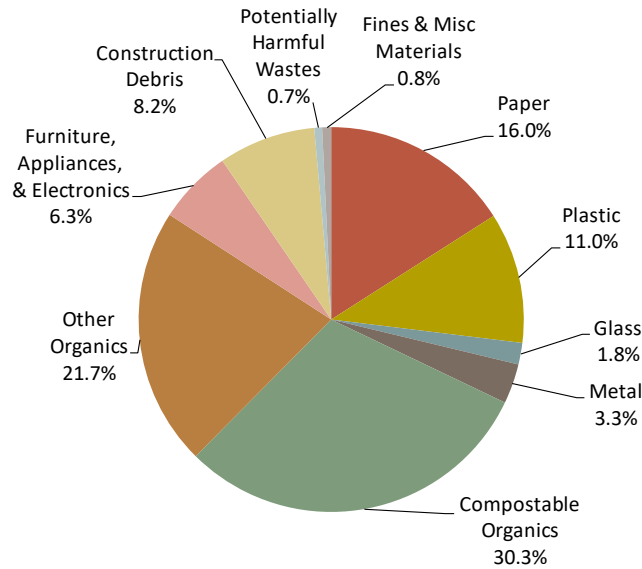


Table 39 lists the top ten components of waste disposed from the Seattle Housing Authority. Together, these ten materials account for about 75% of the total, by weight. *Food* was the single largest material with 30%, followed by *disposable diapers* with 12%. Please see Table 40 for a list of the detailed composition results.

Table 39. Top Ten Components: Seattle Housing Authority (August 1, 2017 to July 31, 2018)

Material	Est. Percent	Cum. Percent	Est. Tons
Food	29.6%	29.6%	1,716
Disposable Diapers	12.2%	41.9%	709
Textiles/Clothing	5.5%	47.3%	316
Compostable/Soiled	5.0%	52.4%	292
Other Film	4.8%	57.1%	276
Contaminated Wood	4.2%	61.4%	246
Furniture	4.2%	65.5%	241
Mixed Low-grade Paper	3.8%	69.3%	220
Animal By-products	2.9%	72.3%	170
Plain OCC/Kraft	2.7%	74.9%	156
Total	74.9%		4,341

**Table 40. Composition by Weight: Seattle Housing Authority
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	16.0%		924	Furniture, Appliances, and Electronics	6.3%		364
Newspaper	1.1%	0.7%	67	Furniture	4.2%	4.8%	241
Plain OCC/Kraft	2.7%	0.5%	156	Mattresses	0.0%	0.0%	0
Waxed OCC	0.0%	0.0%	0	Small Appliances	0.0%	0.0%	0
Grocery/Shopping Bags	0.5%	0.4%	30	Cell Phones	0.0%	0.0%	0
\	0.8%	1.1%	45	Audio/Visual Equipment	0.4%	0.0%	22
Mixed Low-grade Paper	3.8%	0.5%	220	CRT Monitors	0.0%	0.0%	0
Polycoated Containers	0.1%	0.0%	7	CRT Televisions	0.0%	0.0%	0
Compostable/Soiled	5.0%	1.2%	292	Other Electronics	1.8%	2.0%	102
Pot. Comp. Single-use Food Service	0.2%	0.2%	12				
Non-Comp. Single-use Food Service	0.9%	0.3%	51	Construction Debris	8.2%		472
Mixed/Other Paper	0.8%	0.0%	44	Clean Dimension Lumber	0.1%	0.2%	8
				Clean Engineered Wood	0.0%	0.0%	1
Plastic	11.0%		637	Pallets	0.0%	0.0%	0
#1 PET Bottles	1.2%	0.3%	69	Crates	0.0%	0.0%	0
#2 HDPE Natural Bottles	0.4%	0.1%	25	Other Untreated Wood	0.3%	0.4%	20
#2 HDPE Colored Bottles	0.4%	0.3%	20	New Painted Wood	0.3%	0.4%	17
Other Bottles	0.1%	0.1%	7	Old Painted Wood	0.0%	0.0%	0
Tubs	0.5%	0.3%	29	Creosote-treated Wood	0.0%	0.0%	0
Expanded Poly. Non-food	0.3%	0.1%	16	Other Treated Wood	0.0%	0.0%	0
Expanded Poly. Food-grade	0.2%	0.1%	13	Contaminated Wood	4.2%	5.5%	246
Rigid Poly. Foam Insulation	0.0%	0.0%	0	New Gypsum Scrap	0.0%	0.0%	0
Pot. Comp. Single-use Food Service	0.0%	0.0%	2	Demo Gypsum Scrap	2.6%	4.4%	150
Non-Comp. Single-use Food Service	0.2%	0.1%	11	Carpet	0.4%	0.6%	23
Other Rigid Packaging	0.7%	0.1%	42	Felt Carpet Pad	0.0%	0.0%	0
Shopping/Dry Cleaning Bags	0.5%	0.1%	31	Fiberglass Insulation	0.0%	0.0%	0
Stretch Wrap	0.0%	0.0%	0	Concrete	0.0%	0.0%	0
Clean Polyethylene Film	0.2%	0.1%	11	Asphalt Paving	0.0%	0.0%	0
Other Film	4.8%	0.5%	276	Other Aggregates	0.0%	0.0%	0
Plastic Pipe	0.0%	0.0%	0	Rock	0.0%	0.0%	0
Foam Carpet Padding	0.0%	0.0%	0	Asphalt Shingles	0.0%	0.0%	0
Durable Plastic Products	1.1%	0.6%	62	Other Asphaltic Roofing	0.0%	0.0%	0
Plastic/Other Materials	0.4%	0.2%	23	Ceramics	0.1%	0.1%	7
				Cement Fiber Board	0.0%	0.0%	0
Glass	1.8%		105	Single-ply Roofing Membranes	0.0%	0.0%	0
Clear Bottles	0.5%	0.1%	31	Ceiling Tiles	0.0%	0.0%	0
Green Bottles	0.4%	0.6%	26	Other Construction	0.0%	0.0%	0
Brown Bottles	0.3%	0.2%	15				
Container Glass	0.5%	0.2%	30	Potentially Harmful Wastes	0.7%		38
Fluorescent Tubes	0.0%	0.0%	0	Dried Latex Paint	0.0%	0.0%	0
CFLs	0.0%	0.0%	0	Liquid Latex Paint	0.0%	0.0%	0
Flat Glass	0.0%	0.0%	0	Solvent-based Adhesives	0.0%	0.0%	0
Automotive Glass	0.0%	0.0%	0	Water-based Adhesives	0.0%	0.0%	0
Other Glass	0.0%	0.0%	1	Oil-based Paint/Thinners	0.0%	0.0%	0
				Caustic Cleaners	0.2%	0.4%	13
Metal	3.3%		194	Pesticides/Herbicides	0.0%	0.0%	2
Aluminum Beverage Cans	0.3%	0.1%	15	Rechargeable Batteries	0.0%	0.0%	0
Aluminum Foil/Containers	0.2%	0.1%	11	Other Dry-cell Batteries	0.0%	0.0%	3
Other Aluminum	0.1%	0.0%	7	Wet-cell Batteries	0.0%	0.0%	0
Other Nonferrous	0.0%	0.0%	1	Gasoline/Kerosene	0.0%	0.0%	0
Steel Food Cans	0.4%	0.1%	23	Motor Oil/Diesel Oil	0.0%	0.0%	0
Empty Aerosol Cans	0.0%	0.0%	2	Asbestos	0.0%	0.0%	0
Other Ferrous	0.2%	0.1%	11	Explosives	0.0%	0.0%	1
Oil filters	0.0%	0.0%	0	Medical Wastes	0.2%	0.4%	13
Mixed Metals/Material	2.1%	2.2%	124	Other Cleaners/Chemicals	0.0%	0.0%	0
				Pharmaceuticals/Vitamins	0.1%	0.0%	3
Compostable Organics	30.3%		1,756	Personal Care/Cosmetics	0.1%	0.0%	3
Leaves and Grass	0.7%	0.9%	40	Other Potentially Harmful Waste	0.0%	0.0%	0
Prunings	0.0%	0.0%	0				
Food	29.6%	1.7%	1,716	Fines and Misc Materials	0.8%		44
Fats, Oils, Grease	0.0%	0.0%	0	Sand/Soil/Dirt	0.0%	0.0%	0
				Non-distinct Fines	0.4%	0.1%	24
Other Organics	21.7%		1,259	Miscellaneous Organics	0.3%	0.1%	19
Textiles/Clothing	5.5%	2.1%	316	Miscellaneous Inorganics	0.0%	0.0%	0
Mixed Textiles	1.0%	0.1%	58				
Disposable Diapers	12.2%	1.0%	709	Totals	100%		5,793
Animal By-products	2.9%	0.1%	170	Sample Count		7	
Rubber Products	0.1%	0.0%	6				
Tires	0.0%	0.0%	0				

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

5.1.5 University of Washington

The University of Washington self-hauled 2,328 tons of waste to the Seattle transfer stations during the study year. The study captured five samples of waste from this generator subtype. Figure 11 shows the composition of waste disposed. As shown, **Compostable Organics** and **Paper** were the two largest portions of the waste stream, each comprising 23%.

Figure 11. Composition Summary: University of Washington

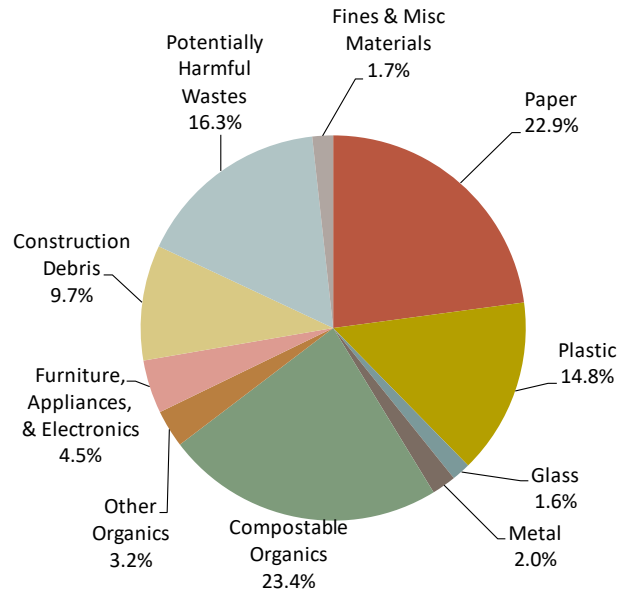


Table 41 lists the top ten components of waste disposed from the University of Washington, which summed to approximately 81% of the total, by weight. *Food* was the single largest material with 23%, followed by *medical wastes* with 16%. Please see Table 42 for a list of the detailed composition results.

Table 41. Top Ten Components: University of Washington (August 1, 2017 to July 31, 2018)

Material	Est. Percent	Cum. Percent	Est. Tons
Food	23.0%	23.0%	536
Medical Wastes	16.1%	39.1%	374
Compostable/Soiled	11.6%	50.7%	269
Other Film	9.2%	59.9%	215
New Painted Wood	7.4%	67.3%	172
Mixed Low-grade Paper	4.4%	71.7%	103
Small Appliances	3.5%	75.2%	82
Plain OCC/Kraft	2.2%	77.4%	51
Disposable Diapers	1.9%	79.3%	45
Mixed/Other Paper	1.8%	81.1%	41
Total	81.1%		1,888

**Table 42. Composition by Weight: University of Washington
(August 1, 2017 to July 31, 2018)**

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	22.9%		533	Furniture, Appliances, and Electronics	4.5%		104
Newspaper	0.2%	0.2%	5	Furniture	0.0%	0.0%	0
Plain OCC/Kraft	2.2%	0.1%	51	Mattresses	0.0%	0.0%	0
Waxed OCC	0.0%	0.0%	0	Small Appliances	3.5%	0.0%	82
Grocery/Shopping Bags	0.3%	0.1%	7	Cell Phones	0.0%	0.0%	0
High-grade Paper	0.5%	0.3%	12	Audio/Visual Equipment	0.0%	0.0%	0
Mixed Low-grade Paper	4.4%	0.4%	103	CRT Monitors	0.0%	0.0%	0
Polycoated Containers	0.2%	0.1%	5	CRT Televisions	0.0%	0.0%	0
Compostable/Soiled	11.6%	0.5%	269	Other Electronics	1.0%	1.3%	23
Pot. Comp. Single-use Food Service	1.0%	0.1%	23	Construction Debris	9.7%		225
Non-Comp. Single-use Food Service	0.7%	0.1%	17	Clean Dimension Lumber	1.3%	0.2%	31
Mixed/Other Paper	1.8%	0.3%	41	Clean Engineered Wood	0.0%	0.0%	0
Plastic	14.8%		344	Pallets	0.0%	0.0%	0
#1 PET Bottles	0.7%	0.0%	17	Crates	0.0%	0.0%	0
#2 HDPE Natural Bottles	0.2%	0.3%	5	Other Untreated Wood	0.0%	0.0%	1
#2 HDPE Colored Bottles	0.3%	0.1%	6	New Painted Wood	7.4%	0.0%	172
Other Bottles	0.1%	0.1%	3	Old Painted Wood	0.0%	0.0%	0
Tubs	1.1%	0.1%	26	Creosote-treated Wood	0.0%	0.0%	0
Expanded Poly. Non-food	0.1%	0.0%	3	Other Treated Wood	0.0%	0.0%	0
Expanded Poly. Food-grade	0.0%	0.0%	1	Contaminated Wood	0.0%	0.0%	1
Rigid Poly. Foam Insulation	0.0%	0.0%	0	New Gypsum Scrap	0.0%	0.0%	0
Pot. Comp. Single-use Food Service	0.4%	0.1%	9	Demo Gypsum Scrap	0.0%	0.0%	0
Non-Comp. Single-use Food Service	0.4%	0.0%	8	Carpet	0.0%	0.0%	0
Other Rigid Packaging	0.6%	0.2%	15	Felt Carpet Pad	0.0%	0.0%	0
Shopping/Dry Cleaning Bags	0.2%	0.0%	5	Fiberglass Insulation	0.0%	0.0%	0
Stretch Wrap	0.0%	0.0%	0	Concrete	0.9%	0.0%	21
Clean Polyethylene Film	0.4%	0.3%	10	Asphalt Paving	0.0%	0.0%	0
Other Film	9.2%	0.0%	215	Other Aggregates	0.0%	0.0%	0
Plastic Pipe	0.1%	0.0%	1	Rock	0.0%	0.0%	0
Foam Carpet Padding	0.0%	0.0%	0	Asphalt Shingles	0.0%	0.0%	0
Durable Plastic Products	0.5%	0.0%	11	Other Asphaltic Roofing	0.0%	0.0%	0
Plastic/Other Materials	0.4%	0.1%	8	Ceramics	0.0%	0.0%	0
Glass	1.6%		37	Cement Fiber Board	0.0%	0.0%	0
Clear Bottles	0.9%	0.9%	22	Single-ply Roofing Membranes	0.0%	0.0%	0
Green Bottles	0.0%	0.0%	0	Ceiling Tiles	0.0%	0.0%	0
Brown Bottles	0.3%	0.0%	8	Other Construction	0.0%	0.0%	0
Container Glass	0.3%	0.1%	6	Potentially Harmful Wastes	16.3%		379
Fluorescent Tubes	0.0%	0.0%	0	Dried Latex Paint	0.0%	0.0%	0
CFLs	0.0%	0.0%	0	Liquid Latex Paint	0.0%	0.0%	0
Flat Glass	0.0%	0.0%	0	Solvent-based Adhesives	0.0%	0.0%	0
Automotive Glass	0.0%	0.0%	0	Water-based Adhesives	0.0%	0.0%	0
Other Glass	0.0%	0.0%	1	Oil-based Paint/Thinners	0.0%	0.0%	0
Metal	2.0%		48	Caustic Cleaners	0.0%	0.0%	0
Aluminum Beverage Cans	0.2%	0.0%	5	Pesticides/Herbicides	0.0%	0.0%	0
Aluminum Foil/Containers	0.1%	0.1%	3	Rechargeable Batteries	0.0%	0.0%	0
Other Aluminum	0.0%	0.0%	0	Other Dry-cell Batteries	0.0%	0.0%	0
Other Nonferrous	0.0%	0.0%	0	Wet-cell Batteries	0.0%	0.0%	0
Steel Food Cans	0.0%	0.0%	1	Gasoline/Kerosene	0.0%	0.0%	0
Empty Aerosol Cans	0.1%	0.0%	1	Motor Oil/Diesel Oil	0.0%	0.0%	0
Other Ferrous	0.5%	0.2%	12	Asbestos	0.0%	0.0%	0
Oil filters	0.0%	0.0%	0	Explosives	0.0%	0.0%	0
Mixed Metals/Material	1.1%	0.5%	26	Medical Wastes	16.1%	4.2%	374
Compostable Organics	23.4%		545	Other Cleaners/Chemicals	0.0%	0.0%	0
Leaves and Grass	0.1%	0.0%	2	Pharmaceuticals/Vitamins	0.0%	0.0%	0
Prunings	0.2%	0.4%	6	Personal Care/Cosmetics	0.2%	0.2%	4
Food	23.0%	2.2%	536	Other Potentially Harmful Waste	0.1%	0.0%	1
Fats, Oils, Grease	0.0%	0.0%	0	Fines and Misc Materials	1.7%		41
Other Organics	3.2%		74	Sand/Soil/Dirt	0.0%	0.0%	0
Textiles/Clothing	0.7%	0.0%	17	Non-distinct Fines	1.0%	0.2%	23
Mixed Textiles	0.1%	0.1%	3	Miscellaneous Organics	0.8%	0.1%	18
Disposable Diapers	1.9%	0.7%	45	Miscellaneous Inorganics	0.0%	0.0%	0
Animal By-products	0.1%	0.2%	3	Totals	100%		2,328
Rubber Products	0.2%	0.2%	5	Sample Count	5		
Tires	0.0%	0.0%	0				

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

Appendix A. Waste Component Categories

Waste samples were sorted by hand into 115 waste components, which are grouped into ten broad categories.

Medical wastes were excluded from sorting. A list of component categories and definitions follows.

Waste Components

PAPER

1. *NEWSPAPER*: Printed ground wood newsprint. Includes advertising “slicks” (glossy paper), if found mixed with newspaper; otherwise, ad slicks are included with mixed low grade.
2. *PLAIN OCC/KRAFT PAPER*: Old unwaxed/uncoated corrugated container boxes and Kraft paper.
3. *WAXED OCC*: Old waxed/coated corrugated container boxes and Kraft paper.
4. *GROCERY/SHOPPING BAGS*: Paper grocery and shopping bags. Includes all brown paper bags and bags with non-paper handles.
5. *HIGH-GRADE PAPER*: White and lightly colored bond, rag, or stationary grade paper. This includes white or lightly colored sulfite/sulfate bond, copy papers, notebook paper, envelopes, continuous-feed sulfite/sulfate computer printouts and forms of all types, excluding carbonless paper.
6. *MIXED LOW-GRADE PAPER*: Mixed paper acceptable in Seattle's residential curbside program. This includes junk mail; magazines; colored papers; bleached Kraft; boxboard; mailing tubes; carbonless copy paper; ground wood computer printouts; paperback books; telephone directories; spiral notebooks; and frozen/refrigerator packaging. Excludes juice concentrate cans.
7. *POLYCOATED CONTAINERS*: Polycoated milk, ice cream, and aseptic juice containers, including those with plastic spouts attached.
8. *COMPOSTABLE/SOILED PAPER*: Paper towels, waxed paper, tissues, and other papers that were soiled with food during use (e.g., pizza box inserts).
9. *POTENTIALLY COMPOSTABLE SINGLE-USE FOOD SERVICE PAPER*: 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.
10. *NON-COMPOSTABLE SINGLE-USE FOOD SERVICE PAPER*: Paper plates, bowls, and cups not labeled “compostable” and that appear to have a plastic lining or coating.

11. *MIXED/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.

PLASTIC

12. *PET BOTTLES*: Blow-molded polyethylene terephthalate (#1) bottles and jars excluding toxic product containers.
13. *HDPE NATURAL BOTTLES*: Blow-molded high-density translucent polyethylene (#2) bottles and jars excluding toxic product containers. Examples include milk, juice, beverage, oil, vinegar, and distilled water.
14. *HDPE COLORED BOTTLES*: Blow-molded high-density colored polyethylene (#2) bottles and jars excluding toxic product containers. Examples include liquid detergent bottles and some hair care bottles.
15. *OTHER PLASTIC BOTTLES*: Blow-molded #3-#7 plastic bottles and jars and unknown bottles. Excludes toxic product containers.
16. *TUBS*: #1-#7 tubs such as yogurt, cottage cheese, prescription vials, and margarine. Excludes toxic product containers.
17. *EXPANDED POLYSTYRENE 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.
18. *EXPANDED POLYSTYRENE FOOD-GRADE*: "Styrofoam" products used to contain food such as "clamshells," cups, plates, and bowls.
19. *RIGID POLYSTYRENE FOAM INSULATION*: rigid panels of expanded polystyrene used to insulate walls and roofs. Excludes non-polystyrene rigid foam insulation.
20. *POTENTIALLY COMPOSTABLE SINGLE-USE FOOD SERVICE PLASTICS*: Includes clamshells, cups, cup lids, and salad trays labeled "compostable." Excludes clamshells, cups plates and bowls and other food service items made of Styrofoam.
21. *NON-COMPOSTABLE SINGLE-USE FOOD SERVICE PLASTICS*: Includes forks and spoons, clamshells, cups, cup lids, and salad trays not labeled "compostable." Excludes clamshells, cups plates and bowls and other food service items made of Styrofoam.
22. *OTHER RIGID PACKAGING*: #1-#7 and unmarked rigid plastic packaging (excluding expanded polystyrene -- Styrofoam), such as cookie tray inserts, plastic spools, plastic frozen food trays, plastic toothpaste tubes, and disposable plant pots. Also includes toxic product containers, such as for motor oil or antifreeze.
23. *CLEAN SHOPPING/DRY CLEANER BAGS*: Labeled grocery and merchandise, dry cleaner, and newspaper polyethylene film bags that were not contaminated with food, liquid or grit during use.
24. *STRETCH WRAP*: Polyethylene pallet wrap or stretch wrap.

25. *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, and mattress packaging.
26. *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 category also includes contaminated plastic sheeting, photographic negatives, shower curtains, any bags used to contain food or liquid (e.g., produce), contaminated trash bags, used garbage bags, and shopping bags used as garbage bags.
27. *PLASTIC PIPE*: pipes and fittings made of PVC (polyvinyl chloride), ABS (acrylonitrile butadiene styrene), or other rigid plastics.
28. *FOAM CARPET PADDING*: foam material used under carpet to provide insulation and padding. Most commonly made of urethane foam. Can be solid-colored or have a marbled appearance.
29. *DURABLE PLASTIC PRODUCTS*: Finished plastic products made entirely of plastic such as toys, toothbrushes, vinyl hose, plastic lawn furniture, and foam mattresses. Includes fiberglass resin products and materials, and durable plastic pots.
30. *PLASTIC/OTHER MATERIALS*: Items that are predominately plastic with other materials attached such as disposable razors, pens, lighters, toys, and 3-ring binders.

GLASS

31. *CLEAR BEVERAGE*: Bottles that are clear in color, including pop, liquor, wine, juice, beer, and vinegar bottles.
32. *GREEN BEVERAGE*: Bottles that are green in color, including green pop, liquor, wine, beer, and lemon juice bottles.
33. *BROWN BEVERAGE*: Bottles that are brown in color, including brown pop, beer, liquor, juice, and extract bottles.
34. *CONTAINER GLASS*: Glass containers of all colors, holding solid materials such as mayonnaise, non-dairy creamer, and facial cream.
35. *FLUORESCENT TUBES*: Fluorescent light tubes.
36. *COMPACT FLUORESCENT LIGHTS (CFL)*: small, fluorescent bulbs similar in appearance to incandescent bulbs. These bulbs typically have a spiral or tubular design.
37. *FLAT GLASS*: Clear or tinted glass that is flat. Examples include glass window panes, doors and table tops, safety glass, and architectural glass. Excludes windshields, laminated glass, or any curved glass.
38. *AUTOMOTIVE GLASS*: Windshield and side window auto glass.

39. *OTHER GLASS*: Mirrors, light bulbs (except fluorescent tubes), glassware, and blue glass bottles.

METAL

40. *ALUMINUM CANS*: Aluminum beverage cans (UBC) and bi-metal cans made mostly of aluminum.
41. *ALUMINUM FOIL/CONTAINERS*: Aluminum food containers, trays, and foil.
42. *OTHER ALUMINUM*: Aluminum products and scrap such as window frames, cookware.
43. *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.
44. *STEEL FOOD CANS*: Steel food containers, including bi-metal cans made mostly of steel.
45. *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.)
46. *OTHER FERROUS*: Ferrous and alloyed ferrous scrap metals to which a magnet adheres and which are not significantly contaminated with other metals or materials.
47. *OIL FILTERS*: Metal oil filters used in cars and other automobiles.
48. *MIXED METALS/MATERIALS*: 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. White goods are banned from Seattle's disposal. However, segments of large appliances are occasionally found; they are included in this category.

COMPOSTABLE ORGANICS

49. *LEAVES AND GRASS*: Non-woody plant materials from a yard or garden area, including grass clippings, leaves, weeds, and garden wastes.
50. *PRUNINGS*: Cut prunings, 6" or less in diameter, from bushes, shrubs, and trees.
51. *FOOD*: Food wastes and scraps, including bone, rinds, etc. Excludes the weight of food containers, except when container weight is not appreciable compared to the food inside. Biodegradable packaging peanuts (made from corn starch) are also included in this category. Excludes fats, oils, and grease.
52. *FATS, OILS, AND GREASE*: fatty by-products of food preparation. Includes cooking oil, butter, lard, and gravy. Can be in liquid or solid form.

OTHER ORGANICS

53. *TEXTILES*: Rag stock fabric materials including natural and synthetic textiles such as cotton, wool, silk, woven nylon, rayon, and polyester.

54. *MIXED TEXTILES*: Non-rag stock grade textiles such as upholstered items, non-leather shoes and handbags, heavy linens, and draperies.
55. *DISPOSABLE 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.
56. *ANIMAL BY-PRODUCTS*: Animal carcasses not resulting from food storage or preparation, animal wastes, and kitty litter.
57. *RUBBER PRODUCTS*: Finished products and scrap materials made of natural and synthetic rubber, such as bath mats, inner tubes, rubber hoses, rubber carpet padding, and foam rubber.
58. *TIRES*: Vehicle tires of all types. Tubes are put into the rubber category.

FURNITURE, APPLIANCES, & ELECTRONICS

59. *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).
60. *MATTRESSES*: Mattresses and box springs.
61. *SMALL APPLIANCES*: Small electric appliances such as toasters, microwave ovens, power tools, curling irons, and light fixtures.
62. *CELL PHONES*: Personal digital assistants (PDA) and cell phones.
63. *AUDIO/VISUAL EQUIPMENT*: Examples include stereos, radios, tape decks, VCRs, camcorders, and digital cameras.
64. *COMPUTER MONITORS*: Computer monitors containing a cathode ray tube (CRT).
65. *TELEVISIONS*: Television sets containing a cathode ray tube (CRT).
66. *OTHER ELECTRONICS*: Computer items not containing CRTs such as processors, mice and mouse pads, keyboards, disk drives, laptops, and other video display without cathode ray tubes (CRT).

CONSTRUCTION DEBRIS

67. *CLEAN DIMENSION 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.
68. *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).

69. *PALLETS*: Untreated wood pallets, whole and broken.
70. *CRATES*: Untreated crates, pieces of crates, and other packaging lumber/panelboard.
71. *OTHER UNTREATED WOOD*: Compostable prunings or stumps 6" or greater in diameter.
72. *NEW PAINTED WOOD*: Lumber and wood products from new construction that have been painted so as to render them difficult to compost.
73. *OLD PAINTED WOOD*: Painted wood from demolition jobs. May be flaky and oxidized. Includes lead-based painted wood
74. *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).
75. *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.
76. *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.
77. *NEW GYPSUM SCRAP*: Calcium sulfate dehydrate sandwiched between heavy layers of Kraft-type paper. Also known as drywall. This category 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.
78. *DEMO GYPSUM SCRAP*: Used or demolition gypsum wallboard scrap that has been painted or treated.
79. *CARPET*: General category of flooring applications and non-rag stock textiles consisting of various natural or synthetic fibers bonded to some type of backing material.
80. *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.
81. *FIBERGLASS INSULATION*: Fiberglass building and mechanical insulation, batt or rigid.
82. *CONCRETE*: A hard material made from sand, gravel, aggregate, cement mix, and water. This category includes concrete containing steel mesh and/or reinforcement bars, or "rebar". Examples include pieces of building foundations, concrete paving, and cinder blocks.
83. *ASPHALT PAVING*: a black or brown, tar-like material mixed with aggregate used as a paving material. This category includes asphalt paving containing steel mesh and/or reinforcement bars, or "rebar."

84. *OTHER AGGREGATES*: Aggregates other than concrete and asphalt paving such as bricks, masonry tile, and clay roofing tiles.
85. *ROCK*: Rock gravel larger than 2" in diameter.
86. *ASPHALT SHINGLES*: 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.
87. *OTHER ASPHALTIC ROOFING*: Other 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.
88. *CERAMICS*: Finished ceramic or porcelain products such as toilets, sinks, and some dishware.
89. *CEMENT FIBER BOARD*: a composite building material containing cement and wood fiber. Includes Hardiplank, Hardiboard, tile backer board, and other similar products.
90. *DRIED LATEX PAINTS*: Water-based paints and similar products that have dried. Excludes empty paint containers and paint that is outweighed by that of the container.
91. *SINGLE-PLY ROOFING MEMBRANES*: Plastic roofing membranes typically installed in gray, white, or black sheets. This category includes thermoplastic membranes, such as PVC or thermoplastic olefin (TPO), or thermoset roofing membranes, such as Ethylene Propylene Diene Monomer (EPDM) or "rubber" roofs.
92. *CEILING TILES*: Fiber or composite acoustic ceiling tiles.
93. *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.

POTENTIALLY HARMFUL WASTES

94. *LIQUID LATEX PAINTS*: Water-based paints and similar products in liquid form. Excludes empty paint containers and paint that is outweighed by that of the container.
95. *SOLVENT-BASED ADHESIVES/GLUES*: Oil/resin/volatile solvent-based glues and adhesives, including epoxy, rubber cement, two-part glues and sealers, and auto body fillers.
96. *WATER-BASED ADHESIVES/GLUES*: Water-based glues, caulking compounds, grouts, and Spackle.
97. *OIL-BASED PAINT/SOLVENT*: Solvent-based paints, varnishes, and similar products. Various solvents, including chlorinated and flammable solvents, paint strippers, solvents

contaminated with other products such as paints, degreasers and some other cleaners if the primary ingredient is (or was) a solvent, or alcohol such as methanol and isopropanol.

98. *CAUSTIC CLEANERS*: Caustic acids and bases whose primary purpose is to clean surfaces, unclog drains, or perform other actions.
99. *PESTICIDES/HERBICIDES*: Variety of poisons with the purpose of discouraging or killing insects, weeds, or microorganisms. Fungicides and wood preservatives, such as pentachlorophenol, are also included.
100. *RECHARGEABLE BATTERIES*: Rechargeable batteries, such as those found in cordless power tools, cell phones, laptops, digital cameras, toothbrushes, and remote control toys.
101. *OTHER 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.
102. *WET-CELL BATTERIES*: Wet-cell batteries of various sizes and types as commonly used in automobiles.
103. *GASOLINE/KEROSENE*: Gasoline, diesel fuel, and fuel oils.
104. *MOTOR OIL/DIESEL OIL*: Lubricating oils, primarily used in vehicles but including other types with similar characteristics.
105. *ASBESTOS*: Asbestos and asbestos-containing wastes (if this is the primary hazard associated with these wastes).
106. *EXPLOSIVES*: Gunpowder, unspent ammunition, picric acid, and other potentially explosive chemicals.
107. *MEDICAL WASTES*: 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.
108. *OTHER CLEANERS/CHEMICALS*: Non-caustic cleaners, and other household chemicals.
109. *PHARMACEUTICALS AND VITAMINS*: Both prescription and over-the-counter medications and supplements in all forms, including pills, liquid medications, 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. (This component category was new to the 2017-18 study period.)
110. *PERSONAL CARE/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. (This component category was new to the 2017-18 study period.)

111. *OTHER POTENTIALLY HARMFUL WASTES*: Other chemicals or potentially harmful wastes that do not fit into the above categories, including *unidentifiable materials*.

FINES AND MISCELLANEOUS MATERIALS

112. *SAND/SOIL/DIRT*: Sand, soil, dirt, and gravel smaller than 2" in diameter.
113. *NONDISTINCT FINES*: Mixed MSW fines smaller than 2" in diameter.
114. *MISCELLANEOUS ORGANICS*: Combustible materials including wax; bar soap; 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.
115. *MISCELLANEOUS INORGANICS*: Other inorganic, non-combustible materials not classified elsewhere.

Changes to Waste Component Categories

The material types used to categorize Seattle's waste stream have been refined over the years. Table 43 tracks these changes. (An "X" signifies that the component remains the same from the previous study period; an outline border reflects how components were split apart or grouped together.)

Table 43. Changes to Waste Component Categories, 1988 to present

1988/89	1990	1992	1994	1996	1998/99	2000	2002	2004	2006	2008	2010	2012	2017/18							
PAPER																				
Newspaper	x	x	x	x	x	x	x	x	x	x	x	x	x							
Corrugated Paper	x	x	x	x	x	x	x	x	x	x	x	Plain OCC/ Kraft Paper	x							
												Grocery/ Shopping Bags	x							
Office Paper	x	x	x	x	x	x	x	High-grade Paper	x	x	x	x	x							
Computer Paper	x	x	x	x	x	x	x													
Mixed Scrap Paper	x	x	Mixed Scrap Paper	x	x	x	x	Mixed Low-grade Paper	Mixed Low-grade Paper	x	x	Mixed Low-grade Paper	x							
			Phone Books	x	x	x	x													
Other Paper	x	x	Milk/Juice Polycoats	x	x	x	x	Polycoated Paper	Mixed Low-grade Paper	x	x	Polycoated Paper	x							
			Frozen Food Polycoats	x	x	x	x													
			Compostable/ Soiled Paper	Compostable/ Soiled Paper	Compostable/ Soiled Paper	Compostable/ Soiled Paper	x	x	x	x	x	x	Compostable/ Soiled Paper	x	x	x				
																	Single-use Food Service Paper	Potentially Compostable Single-use Food Service	x	x
																		Other Single- use Food Service Paper	Non- Compostable Single-Use Food Service	x
			Paper/ Other Materials	Paper/ Other Materials	Paper/ Other Materials	Paper/ Other Materials	x	x	x	x	Mixed/Other Paper	x	x	x	x	x				
																	Other Paper	x	x	x

Table 43. Changes to Waste Component Categories, 1988 to present (continued)

1988/89	1990	1992	1994	1996	1998/99	2000	2002	2004	2006	2008	2010	2012	2017/18	
PLASTIC														
PET Bottles	x	x	x	PET Pop & Liquor	x	x	x	x	#1 PET Bottles	#1 PET Bottles	x	x	x	
				Other PET Bottles	x	x	x	x	Moved to "Other Plastic Bottles"					
HDPE Bottles	x	x	HDPE Milk & Juice	x	x	x	x	#2 HDPE Natural Bottles	x	x	x	x	x	
								#2 HDPE Colored	x	x	x	x	x	
			Other HDPE Bottles	x	x	x	x	Moved to "Other Plastic Bottles"	Moved to "Other Rigid Packaging"	x	x	x	x	
Plastic Packaging	Other Plastic Bottles	x	x	x	x	x	x	x	x	x	x	Other Plastic Bottles	x	
	Plastic Packaging	x	Other Rigid Containers	Jars & Tubs	x	x	x	x	x	Tubs #1-#7	x	x	x	
Plastic Packaging	x	x	Other Rigid Packaging	x	x	x	x	x	x	Single-use Food Service Plastics	Potentially Compostable Single-use Food Service	x	x	
											Non-Compostable Single-use Food Service	x	x	
										Other Rigid Packaging #1-#7	x	x	x	
Plastic Packaging	x	x	Grocery/Bread Bags	x	x	x	x	Clean Shopping/ Dry Cleaner Bags	x	x	x	x	x	
				Other Film	Garbage Bags	x	x	x	Other Clean PE Film	x	x	x	Other Clean PE Film	x
			Other Film		Other Film	x	x	x	Other Film	x	x	x	Stretch Wrap	x
					Other Film	x	x	x	Other Film	x	x	x	x	x

Table 43. Changes to Waste Component Categories, 1988 to present (continued)

1988/89	1990	1992	1994	1996	1998/99	2000	2002	2004	2006	2008	2010	2012	2017/18					
Expanded Polystyrene	x	x	x	x	x	x	x	x	x	Expanded Poly. Food-grade	x	x	x					
										Expanded Polystyrene Non-food Grade	Rigid Poly. Foam Insulation	x	x					
											Expanded Poly. Non-food Grade	x	x					
Other Plastic Products	x	x	Plastic Products	x	x	x	x	x	x	x	Plastic Pipe	x	x					
											Foam Carpet Padding	x	x					
			Durable Plastic Products								x	x						
			Plastic/ Other Materials	x	x	x	x	x	x	x	x	x	x					
GLASS																		
Non-refillable Pop	x	x	Clear Beverage	x	x	x	x	x	x	x	x	x	x					
Refillable Pop	x	x	Green Beverage	x	x	x	x	x	x	x	x	x	x					
Non-refillable Beer	x	x	Brown Beverage	x	x	x	x	x	x	x	x	x	x					
Refillable Beer	x	x	<i>(After 1994, characterized according to color)</i>															
Container Glass	x	x	x	x	x	x	x	x	x	x	x	x	x					
Non-recyclable Glass	x	x	x	Fluorescent Tubes	x	x	x	x	x	x	CFLs	x	x					
											Fluorescent Tubes	x	x					
				Other Glass						x	x	x	x	x	Flat Glass	x	Flat Glass	x
																	Automotive Glass	x
Other Glass	x	x	x	x	x	Other Glass	x	x	x									

Table 43. Changes to Waste Component Categories, 1988 to present (continued)

1988/89	1990	1992	1994	1996	1998/99	2000	2002	2004	2006	2008	2010	2012	2017/18
METAL													
Aluminum Cans	x	x	x	x	x	x	x	x	x	x	x	x	x
Aluminum Foil/ Containers	x	x	x	x	x	x	x	x	x	x	x	x	x
Nonferrous	x	x	Nonferrous	Other Nonferrous	x	x	x	x	x	x	x	x	x
			Other Aluminum	Other Aluminum	x	x	x	x	x	x	x	x	x
				Empty Aerosol Cans	x	x	x	x	x	x	x	x	x
Tinned Cans	x	x	x	x	x	x	x	x	x	x	x	Steel Food Cans	x
Bi-metal Cans	x	x	<i>(After 1994, characterized according to predominant metal)</i>										
Ferrous	x	x	x	x	x	x	x	x	x	x	x	Other Ferrous	x
Mixed Metals/ Materials	x	x	x	x	x	x	x	x	x	x	x	x	x
<i>(Before 1998/99, was not characterized)</i>					Metal Oil Filters	x	x	x	x	x	x	x	x
White Goods	x	x	<i>(After 1994, banned from disposal. Parts show up in "Mixed Metals")</i>										
COMPOSTABLE ORGANICS													
Leaves and Grass	x	x	x	x	x	x	x	x	x	x	x	x	x
Prunings	x	x	x	x	x	x	x	x	x	x	x	x	x
Food	x	x	x	x	x	x	x	x	x	x	Fats, Oils, & Grease	x	x
											Food	x	x

Table 43. Changes to Waste Component Categories, 1988 to present (continued)

1988/89	1990	1992	1994	1996	1998/99	2000	2002	2004	2006	2008	2010	2012	2017/18
<i>(COMPOSTABLE and OTHER ORGANICS Combined as ORGANICS prior to 2012)</i>												OTHER ORGANICS	
Textiles	x	x	Textiles	Textiles/ Clothing	x	x	x	<i>Moved to "Organics"</i>	Textiles	x	x	x	x
			Carpet/ Upholstery	x	x	x	x		Mixed Textiles	x	x	x	x
Disposable Diapers	x	x	x	x	x	x	Disposable Diapers		x	x	x	x	
<i>(Discarded from samples prior to 1994)</i>			Animal By-Products	x	x	x	x		Animal By-products	x	x	x	x
Rubber Products	x	x	<i>moved to "Other Materials"</i>	x	x	x	x		Rubber Products	x	x	x	x
Tires	x	x	<i>moved to "Other Materials"</i>	x	x	x	x		Tires	x	x	x	x
FURNITURE, APPLIANCES, AND ELECTRONICS													
<i>(Prior to 1994, split among various materials; Mixed Metal, Textiles, Other Plastics, etc.)</i>			Furniture	x	x	x	x	<i>Moved to "Furniture, Appliances, & Electronics"</i>	Furniture	x	x	x	x
<i>(Prior to 1994, split among various materials; Mixed Metal, Textiles, Other Plastics, etc.)</i>			Mattresses	x	x	x	x		Mattresses	x	x	x	x
<i>(Prior to 1994, split among various materials; Mixed Metal, Textiles, Other Plastics, etc.)</i>			Small Appliances	x	x	x	x		Small Appliances	x	x	x	x

Table 43. Changes to Waste Component Categories, 1988 to present (continued)

1988/89	1990	1992	1994	1996	1998/99	2000	2002	2004	2006	2008	2010	2012	2017/18	
<i>(Prior to 1994, split among various materials; Mixed Metal, Textiles, Other Plastics, etc.)</i>			A/V Equipment	x	x	x	x	Moved to "Furniture, Appliances, & Electronics"	Audio/Visual Equipment	x	Cell Phones	x	x	
									Audio/Visual Equipment		x	x		
						Televisions & Computer Monitors	Television Sets		Computer Monitors	x	x	x	x	
							Computer Monitors		Televisions	x	x	x	x	
						Other Computer Equipment	x		Other Computer Equipment	x	Other Electronics	x	x	
CONSTRUCTION DEBRIS														
Wood	x	Untreated Wood	Untreated Wood	Dimension Lumber	x	x	x	x	x	Clean Dimension Lumber	x	x	x	
										Clean Engineered Wood	x	x	x	
			Crates/ Pallets	Other Untreated Wood	x	x	x	x	x	x	x	x	x	x
				Pallets	x	x	x	x	x	x	x	x	x	
Wood	x	Treated Wood	x	Treated Wood	x	x	x	x	x	New Painted Wood	x	x	x	
										Old Painted Wood	x	x	x	
										Creosote-treated Wood	x	x	x	
										Other Treated Wood	x	x	x	
				Contaminated Wood	x	x	x	x	x	x	x	x		

Table 43. Changes to Waste Component Categories, 1988 to present (continued)

1988/89	1990	1992	1994	1996	1998/99	2000	2002	2004	2006	2008	2010	2012	2017/18
Gypsum Drywall	x	x	x	New Gypsum Scrap	x	x	x	x	x	x	x	x	x
				Demo Gypsum Scrap	x	x	x	x	x	x	x	x	x
Fiberglass Insulation	x	x	x	Moved to "Construction Debris"	x	x	x	x	x	x	x	x	x
Rock/ Concrete/ Brick	x	x	x	Moved to "Construction Debris"	x	x	x	x	x	x	x	Concrete	x
												Asphalt Paving	x
												Other Aggregates	x
												Rock	x
Ceramics, Porcelain, China	x	x	x	x	x	x	x	Moved to "Construction Debris"	Ceramics	x	x	x	x
Other Construction Debris	x	x	x	Asphaltic Roofing	x	x	x	x	x	Asphalt Shingles	x	x	x
										Other Asphaltic Roofing	x	x	x
				Other Construction Debris	Other Construction Debris	Cement Fiber Board	x	x					
						Other Construction Debris	Dried Latex Paint	x					
							Single-ply Roofing Membranes	x					
							Ceiling Tiles	x					
							Other Construction Debris	x					

Table 43. Changes to Waste Component Categories, 1988 to present (continued)

1988/89	1990	1992	1994	1996	1998/99	2000	2002	2004	2006	2008	2010	2012	2017/18
POTENTIALLY HARMFUL WASTE													
Latex Paints	x	x	x	x	x	x	x	x	x	x	Liquid Latex Paint	x	x
											Dried Latex Paint	<i>Moved to "Construction Debris"</i>	x
Adhesives/ Glues	x	x	x	Hazardous Glue/Adhesives	x	x	x	Solvent-based Adhesives/ Glues	x	x	x	x	x
				Non-hazardous Glue/Adhesives	x	x	x	Water-based Adhesives/ Glues	x	x	x	x	x
Oil-based Paints/ Solvents	x	x	x	x	x	x	x	x	x	x	x	x	x
Cleaners	x	x	x	x	x	x	x	Caustic Cleaners	x	x	x	x	x
Pesticides/ Herbicides	x	x	x	x	x	x	x	x	x	x	x	x	x
Batteries	x	x	Dry-cell Batteries	x	x	x	x	x	x	x	x	x	x
			Wet-cell Batteries	x	x	x	x	x	x	x	x	x	x
Gasoline/ Kerosene	x	x	x	x	x	x	x	x	x	x	x	x	x
Motor Oil/ Diesel Oil	x	x	x	x	x	x	x	x	x	x	x	x	x
Asbestos	x	x	x	x	x	x	x	x	x	x	x	x	x
Explosives	x	x	x	x	x	x	x	x	x	x	x	x	x

Table 43. Changes to Waste Component Categories, 1988 to present (continued)

1988/89	1990	1992	1994	1996	1998/99	2000	2002	2004	2006	2008	2010	2012	2017/18	
Other Chemicals	x	x	x	Other Hazardous Chemicals	x	x	x	Medical Waste	x	x	x	x	x	
								Other Cleaners/ Chemicals	x	x	x	x	Other Cleaners/ Chemicals	x
				Other Non-hazardous Chemicals	x	x	x	Other Potentially Harmful Wastes	x	x	x	x	x	x
FINES AND MISCELLANEOUS MATERIALS														
Sand, Dirt, Non-distinct Fines	x	x	Sand/Soil/ Dirt	<i>Moved to "Construction Debris"</i>	x	x	x	<i>Moved to "Fines & Miscellaneous Materials"</i>	Sand/Soil/ Dirt	x	x	x	x	
			Non-distinct Fines	x	x	x	x	<i>Moved to "Fines & Miscellaneous Materials"</i>	Non-distinct Fines	x	x	x	x	
Ash	x	x	x	x	x	x	x	<i>Moved to "Fines & Miscellaneous Materials"</i>	Misc. Organics	x	x	x	x	
Leather	x	x	x	x	x	x								
<i>(Prior to 1994, mostly in "Sand, Dirt, Non-distinct Fines; also in various "Mixed" and "Other" categories)</i>			Misc. Organics	x	x	x	x							
<i>(Prior to 1994, mostly in "Sand, Dirt, Non-distinct Fines; also in various "Mixed" and "Other" categories)</i>			Misc. Inorganics	x	x	x	x	<i>Moved to "Fines & Miscellaneous Materials"</i>	Misc. Inorganics	x	x	x	x	

Appendix B. Sampling Methodology

Overview

The objective of the 2017-18 Seattle Waste Composition Study is to provide statistically significant data on the composition of self-haul wastes in the City of Seattle. Self-haul wastes were last sampled in 2012. The current project follows the same basic methodology as the 2012 study. However, the component categories and definitions have been revised and are included in Waste Component Categories.

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 targets the self-haul substream, one of three main substreams in Seattle.⁶

The self-haul substream comprises waste that is: a) generated at residences as well as businesses and institutions; and, b) hauled by the household or business that generated the waste or a non-franchised hauler. The self-haul substream is composed of four subpopulations as shown in Figure 12. Subpopulations are defined according to generator type and disposal station. All self-haul waste included in the study is disposed at one of two City-owned facilities: North Recycling and Disposal Station (NRDS) or South Recycling and Disposal Station (SRDS).

Generator types are defined as follows.

- *Self-haul Non-residential*: Waste that is hauled to NRDS or SRDS by a commercial enterprise (landscaper, contractor, etc.), including waste from residential dwellings.
- *Self-haul Residential*: Waste that is hauled to the NRDS or SRDS by a resident from the resident’s home.

Figure 12. Self-haul Subpopulations, by Generator Type and Service Area

		Generator Type	
		Non-residential	Residential
Disposal Station	NRDS	Non-residential NRDS	Residential NRDS
	SRDS	Non-residential SRDS	Residential SRDS

⁶ The residential and commercial substreams were not included in this study. For the most recent analysis of Seattle’s residential waste stream, please see the [2014 Residential Waste Composition Study Final Report](#) prepared for the Seattle Public Utilities by Cascadia Consulting Group, Inc. For the most recent analysis of Seattle’s commercial waste stream, please see the [2016 Commercial and Self-haul Waste Streams Composition Study](#) prepared for the Seattle Public Utilities by Cascadia Consulting Group, Inc.

For this study, we will also target samples of waste from five additional self-haul load subtypes representing targeted industry groups/organizations. These five load subtypes are:

- Construction contractors
- Charities/thrift stores (Goodwill, Salvation Army etc.)
- Junk Haulers (property cleanup companies such as 1-800-Junk-Be-Gone, Got Junk, etc.)
- Seattle Housing Authority
- University of Washington

Details on how Cascadia will obtain samples from each of the targeted load subtypes are provided in the Load Selection subsection.

Sample Allocation

For this study, a total of 216 self-haul samples will be characterized. Since the proportion of self-haul tonnage transported to the North and South Stations is nearly equal (51% and 49%, respectively), half of the self-haul samples will be allocated to each facility: 108 at NRDS and 108 at SRDS. This study will not stratify samples by generator type, since data from the study will also be used to determine the relative mix of residential and commercial loads arriving at each recycling and disposal station.

Sampling Calendar

At least 216 self-haul samples will be sorted during this study. Due to the expense of moving the sampling crew from site to site, sorting will occur at only one facility per sampling day. Since the field crew can sort approximately 18 self-haul loads per day, 12 days of sampling will be required to meet the study's sampling goals. In order to capture any seasonal variation, the sampling events will be distributed across the 12-month study period. Sampling will occur every other month for two consecutive days each selected month, for a total of 12 days of sampling.

Working around major holidays and the sorting crew's availability, sampling dates within each month were selected using a random number generator, and refined so that the distribution across weeks of the month and days of the week will be roughly even. Whenever possible, the sampling dates for the self-haul waste sorts will be scheduled contiguously. The sampling calendar was designed using the following steps.

1. Starting in September 2017, every other month was selected to identify six sampling events.
2. The week of the month was randomly selected using the Randbetween() function in Excel.
3. Three weekend sampling days were allocated based on 2016 tonnage data and randomly selected among the six selected sampling months (November, May, and July).
4. For remaining months (September, January, March), a starting day of Tuesday, Wednesday or Thursday was randomly selected. Monday and Friday were not eligible start days for these months since Monday and Fridays are the only weekdays possible with the weekend days.
5. Based on selected weeks of the month and weekdays, the calendar was used to find the starting date for each month (e.g., January will start on the 1st Thursday or 1/4/18).

6. Finally, a random selection method was used to select NRDS or SRDS for the first day of each sampling event. The second day was the alternate station.

The sampling calendar is shown in Table 44. The resulting allocation of waste sampling days is shown in Table 45.

Table 44. Sampling Calendar

Date	Facility	No. of Samples	Day of the Week	Week of the Month
9/6/17	South	18	Wednesday	1
9/7/17	North	18	Thursday	1
11/17/17	North	18	Friday	3
11/18/17	South	18	Saturday	3
1/4/18	North	18	Thursday	1
1/5/18	South	18	Friday	1
3/13/18	North	18	Tuesday	2
3/14/18	South	18	Wednesday	2
5/18/18	South	18	Friday	3
5/19/18	North	18	Saturday	3
7/22/18	South	18	Sunday	4
7/23/18	North	18	Monday	4

Table 45. Distribution of Sampling Days

Week of the Month	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Total
1				1	2	1		4
2			1	1				2
3						2	2	4
4	1	1						2
Total	1	1	1	2	2	3	2	12

Hauler and Transfer Station Participation

Staff at the City's two transfer stations will receive the sampling schedule for the year and will be informed prior to each sampling event. We will rely on the help of transfer station staff to help select special loads as described below.

Load Selection

Self-haul loads will be systematically selected at each facility. Systematic selection consists of taking every " n^{th} " vehicle that enters the facility after a randomly selected start time. The sampling intervals (n) will be determined by dividing the day's expected number of arriving vehicles by the number of samples needed on that day. This method of selecting vehicles will provide a representative number of samples for the non-residential and residential generators of

self-haul waste. The expected traffic count will be based on either the average weekday or weekend vehicle count from the same month in 2016.

In addition to the above method for randomly selecting vehicles, we will also request the help of transfer station staff to select one load from each of the below targeted generator subtypes each day for a total of 12 loads per subtype over the course of the study.

- Construction contractors
- Charities/thrift stores (Goodwill, Salvation Army etc.)
- Junk Haulers (property cleanup companies such as 1-800-Junk-Be-Gone, Got Junk, etc.)
- Seattle Housing Authority
- University of Washington

Cascadia will work with transfer station staff to ensure that all station greeters are aware of specific sampling goals for these loads. Station greeters will be provided with sample placards for each of the generator subtypes. During each sampling day, the station greeters will select one these loads by providing a sample placard to, typically, the first load of each of these five generator subtypes that they see. The greeter will then communicate with the crew that they have selected a load for sampling.

Field Procedures

The Field Supervisor will coordinate vehicle selection, sample extraction, sorting, and disposal of sorted waste with the transfer station manager.

When a vehicle selected for sampling arrives, the Field Supervisor will obtain the origin, generator, and residence type for loads originating from residential generators. For loads originating from commercial generators, the Field Supervisor will ask drivers to identify the type of business the sample load is from. Drivers will also be asked whether they have accounts at the transfer station. Table 46 lists Standard Industry Codes (SIC) by business type, which the Field Supervisor will use to categorize loads. Information collected from each driver, including SICs, will be recorded on the load's corresponding tally sheet.

Table 46. SIC Codes, by Business Type

Business Type	SIC Codes
Construction, Demolition, and Landclearing	15-17
Education	82
Health Care	80
Hotel/Motel	70
Manufacturing	20, 22-26, 28-36, 38-39, 372, 373, 376
Office	01-02, 08-09, 10, 14, 27, 48, 49, 60-67, 73, 81
Other Non-residential	--
Other Services	7, 55, 72, 75, 76, 78-79, 84, 86, 89
Restaurant	58
Retail	52-54, 56-57, 59
Transportation	40-47, 371, 374, 375, 379
Wholesale	50, 51
Mixed Commercial Generators	--

Large (greater than 250 pounds) loads will be entirely sorted, or a 250 pound sample will be randomly selected using a superimposed 8-cell grid and a pre-assigned random number that identifies the cell from which to extract a sample. The randomly selected cell number appears on the vehicle selection sheet. If the load is less than 250 pounds, then the next vehicle of the same generator group (residential or commercial) will also be selected. A sample will be captured from this vehicle and combined with the first load, so that the weight of the two samples equals at least 250 pounds.

The Field Supervisor will give the drivers of non-passenger vehicles a net weight card to use to record the load weight once the vehicle scales out. For passenger vehicles (which transfer station staff do not weigh), the total weight of the sample will be equal to the weight of the load if the full load is sorted. Otherwise, the Field Supervisor will estimate what percentage of the load was sorted and will estimate the weight of the load.

Once a sample of waste is selected, it will be placed on a tarp for sorting. Each sample will be sorted by hand into the defined component categories. (See Waste Component Categories for component definitions.). Each sample will be sorted to the greatest reasonable detail. The weights of all materials will be recorded on tally sheets; an example tally sheet is shown in Field Forms.

Appendix C. Comments on Monthly Sampling Events

For the 2017-18 study, sampling was planned every other month for two consecutive days each selected month, for a total of 12 days of sampling. This appendix summarizes sampling activities for each selected month.

September 2017

The September 2017 sampling occurred on 9/6 and 9/7. Table 47 compares the number of samples that were actually sorted to the number originally planned by date. The goal for each day was 18 samples. The sampling goal was achieved both days, however, two of the samples from 9/7 were excluded from the analysis due to missing or incorrect sample information.

Table 47. Summary of Planned vs. Actual Samples Completed by Date, September 2017

Date	Station	Target # of Samples	Actual # of Samples	Difference
9/6/17	South	18	18	0
9/7/17	North	18	16	0
Total		36	34	-2

In addition to the overall sampling target, the sampling plan targets sampling at least one vehicle from each of the following target self-haul generator categories:

- Construction contractors
- Charities/Thrift stores
- Junk Haulers
- Seattle Housing Authority
- University of Washington

On the first day of sampling (9/6), these generator-specific sampling targets were met for all categories except for University of Washington. We were told by the South Station staff that University of Washington does not haul to the South Station so the goal was adjusted for future sampling events. On the second day (9/7), only the targets for construction contractors and junk haulers were achieved. It appears that charities/thrift store loads did not arrive while the crew was on site. Seattle Housing Authority loads may not typically come to North Station. University of Washington loads are hauled to North Station, but they enter through the automated commercial door, and the crew was not alerted when one arrived. The targeted generator category sample count data is summarized in Table 48.

For future sampling events, we adjusted these targets and resolved the barrier to sampling University of Washington loads at the North Station.

Table 48. Summary of Planned vs. Actual Samples Completed by Generator Category, September 2017

Generator Category	Target # of Samples	Actual # of Samples	Difference
Construction contractors	2	4	+2
Charities/Thrift stores	2	1	-1
Junk Haulers	2	2	0
Seattle Housing Authority	1	1	0
University of Washington	1	0	-1
Totals	8	8	0

November 2017

The November 2017 sampling occurred on 11/17 and 11/18. Table 49 compares the number of samples that were actually sorted to the number originally planned by date. The goal for each day was 18 samples. The goal was achieved both days.

Table 49. Summary of Planned vs. Actual Samples Completed by Date, November 2017

Date	Station	Target # of Samples	Actual # of Samples	Difference
11/17/17	South	18	18	0
11/18/17	North	18	18	0
Total		36	36	0

In addition to general self-haul loads, the sampling plan included sampling goals for the targeted generator categories. On the first day of sampling (11/17), the generator-specific sampling targets were met for all categories except for charities/thrift stores. On the second day (11/18), the targets were met. The targeted generator category sample count data is summarized in Table 50.

Table 50. Summary of Planned vs. Actual Samples Completed by Generator Category, November 2017

Generator Category	Target # of Samples	Actual # of Samples	Difference
Construction contractors	2	2	0
Charities/Thrift stores	2	1	-1
Junk Haulers	2	2	0
Seattle Housing Authority	1	1	0
University of Washington	1	1	0
Totals	8	7	-1

As shown in Table 51, the total samples completed by station match the target. By generator subtype, we are meeting the targets for construction contractors, junk haulers, and Seattle Housing Authority, but not for charities/thrift stores (down by two samples) or University of Washington (down by one sample).

Table 51. Summary of Overall Sampling Progress, Through November 2017

	Target Number	Actual Samples	Difference
Samples by Generator Category			
Construction Contractors	4	6	+2
Charities/Thrift stores	4	2	-2
Junk Haulers	4	4	0
Seattle Housing Authority	2	2	0
University of Washington	2	1	-1
Samples by Station			
South	36	36	0
North	36	34	-2
Total by Station	72	70	-2

January 2018

Sampling took place over four days in January 2018, two planned days and two make-up days. The two additional days were necessary to catch up on the missing targeted generator samples. Table 52 compares the number of samples that were actually sorted with the number originally planned for sorting on 1/4, 1/5, 1/25 and 1/26. There was no sampling goal for 1/4 and 1/5 and the goal for 1/25 and 1/26 was 18 samples each day. The sample goals were achieved each day.

Table 52. Summary of Planned vs. Actual Samples Completed by Date, January 2018

Date	Station	Target # of Samples	Actual # of Samples	Difference
1/4/18	North	0	4	+4
1/5/18	South	0	4	+4
1/25/18	North	18	18	0
1/26/18	South	18	18	0
Total		36	44	+8

In addition to general self-haul loads, the sampling plan included sampling goals for the targeted generator categories. We collected samples from targeted generator categories across all four January sampling days (1/4, 1/5, 1/25, and 1/26). On the NRDS sampling days, Cascadia met or exceeded these generator-specific sampling targets for all categories except charities/thrift stores. On the SRDS sampling days, the targets were met or exceeded. The targeted generator category sample count data is summarized in Table 53.

Table 53. Summary of Actual Samples Completed by Generator Category, January 2018

Generator Category	Target # of Samples	Actual # of Samples	Difference
Construction contractors	2	6	+4
Charities/Thrift stores	2	1	-1
Junk Haulers	2	3	+1
Seattle Housing Authority	1	1	0
University of Washington	1	2	+1
Totals	8	13	+5

As shown in Table 54, the total samples completed by station exceed the target by at least two samples. By generator subtype, we are meeting or exceeding the targets for all groups other than charities/thrift stores (down by three samples).

**Table 54. Summary of Overall Sampling Progress,
Through January 2018**

	Target Number	Actual Samples	Difference
Samples by Generator Category			
Construction Contractors	6	12	+6
Charities/Thrift stores	6	3	-3
Junk Haulers	6	7	+1
Seattle Housing Authority	3	3	0
University of Washington	3	3	0
Samples by Station			
South	54	58	+4
North	54	56	+2
Total	108	114	+6

March 2018

The March 2018 sampling took place over two days, 3/13 and 3/14. Table 55 compares the number of samples that were actually sorted with the number originally planned for sorting on March 13 and 14. The goal for each day was 18 samples, and that goal was achieved both days.

**Table 55. Summary of Planned vs. Actual Samples Completed by Date,
March 2018**

Date	Station	Target # of Samples	Actual # of Samples	Difference
3/14/18	North	18	18	0
3/15/18	South	18	18	0
Total		36	36	0

In addition to general self-haul loads, the sampling plan included sampling goals for the targeted generator categories. We collected samples from targeted generator categories on both March sampling days. On the NRDS sampling days, Cascadia met or exceeded these generator-specific sampling targets for all categories except charities/thrift stores. On the SRDS sampling days, the targets were met or exceeded. The targeted generator category sample count data is summarized in Table 56.

Table 56. Summary of Actual Samples Completed by Generator Category, March 2018

Generator Category	Target # of Samples	Actual # of Samples	Difference
Construction contractors	2	8	+6
Charities/Thrift stores	2	2	0
Junk Haulers	2	4	+2
Seattle Housing Authority	1	2	+1
University of Washington	1	1	0
Totals	8	17	+9

As shown in Table 57, the total samples completed by station exceed the target by at least two samples. By generator subtype, we are meeting or exceeding the targets for all groups other than charities/thrift stores (down by three samples).

Table 57. Summary of Overall Sampling Progress, Through March 2018

	Target Number	Actual Samples	Difference
Samples by Generator Category			
Construction Contractors	8	20	+12
Charities/Thrift stores	8	5	-3
Junk Haulers	8	11	+3
Seattle Housing Authority	4	5	+1
University of Washington	4	4	0
Samples by Station			
South	72	76	+4
North	72	74	+2
Total	144	150	+6

May 2018

The May 2018 sampling occurred on 5/18 and 5/19. Table 58 compares the number of samples that were actually sorted with the number originally planned for sorting on May 18 and 19. The goal for each day was 18 samples, and that goal was achieved both days.

Table 58. Summary of Planned vs. Actual Samples Completed by Date, May 2018

Date	Station	Target # of Samples	Actual # of Samples	Difference
5/18/18	South	18	18	0
5/19/18	North	18	18	0
Total		36	36	0

In addition to general self-haul loads, the sampling plan included sampling goals for the targeted generator categories. We collected samples from targeted generator categories on both May sampling days. On the SRDS sampling day, Cascadia met or exceeded these generator-specific sampling targets for all categories. On the NRDS sampling day, the targets were exceeded for construction contractors and junk haulers. We did not see any loads from charities/thrift stores, Seattle Housing Authority, or University of Washington, possibly because it was a Saturday. The targeted generator category sample count data is summarized in Table 59.

Table 59. Summary of Actual Samples Completed by Generator Category, May 2018

Generator Category	Target # of Samples	Actual # of Samples	Difference
Construction contractors	2	8	+6
Charities/Thrift stores	2	1	-1
Junk Haulers	2	4	+2
Seattle Housing Authority	1	1	0
University of Washington	1	0	-1
Totals	8	14	+6

As shown in Table 60, the total samples completed by station exceed the target by at least two samples. By generator subtype, we are meeting or exceeding the targets for all groups except for charities/thrift stores (down by four samples) and University of Washington (down by one sample).

**Table 60. Summary of Overall Sampling Progress,
Through May 2018**

	Target Number	Actual Samples	Difference
Samples by Generator Category			
Construction Contractors	10	28	+18
Charities/Thrift stores	10	6	-4
Junk Haulers	10	15	+5
Seattle Housing Authority	5	6	+1
University of Washington	5	4	-1
Samples by Station			
South	90	94	+4
North	90	92	+2
Total	180	186	+6

July 2018

The July 2018 sampling took place over two days. Table 61 compares the number of samples that were actually sorted with the number originally planned for sorting on July 22 and 23. The goal for each day was 18 samples. That goal was achieved on the SRDS sampling day and exceeded by one sample on the NRDS sampling day.

**Table 61. Summary of Planned vs. Actual Samples Completed by Date,
July 2018**

Date	Station	Target # of Samples	Actual # of Samples	Difference
7/22/2018	South	18	18	0
7/23/2018	North	18	19	1
Total		36	37	1

In addition to general self-haul loads, the sampling plan included sampling goals for the targeted generator categories. We collected samples from targeted generator categories on both July sampling days. At the NRDS, the targets were exceeded or met for all targeted generators except charities/thrift stores. At the SRDS, the targets were exceeded or met for all targeted generators. The targeted generator category sample count data is summarized in Table 62.

Table 62. Summary of Actual Samples Completed Generator Category, July 2018

Generator Category	Target # of Samples	Actual # of Samples	Difference
Construction contractors	2	14	+12
Charities/Thrift stores	2	1	-1
Junk Haulers	2	4	+2
Seattle Housing Authority	1	1	0
University of Washington	1	1	0
Totals	8	21	+13

As shown in Table 63, the total samples completed by station exceed the target by three samples at the NRDS and four samples at the SRDS. By generator subtype, we have met or exceeded the targets for all groups except for charities/thrift stores (down by five samples) and University of Washington (down by one sample).

Table 63. Summary of Overall Sampling Progress, Through July 2018

	Target Number	Actual Samples	Difference
Samples by Generator Category			
Construction Contractors	12	42	+30
Charities/Thrift stores	12	7	-5
Junk Haulers	12	19	+7
Seattle Housing Authority	6	7	+1
University of Washington	6	5	-1
Samples by Station			
South	108	112	+4
North	108	111	+3
Total	116	223	+7

Appendix D. Waste Composition Calculations

Composition Calculations

The composition estimates represent the **ratio of the components' weight to the total waste** for each noted substream. They are derived by summing each component's weight across all of 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:

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

where:

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

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).

Weighted Averages

The overall self-haul waste composition estimates were calculated by performing a weighted average across the relevant substreams. For the self-haul substream, the overall estimate was calculated by performing a weighted average based on the tonnage hauled each season to each site, by vehicle type.

Seattle provided the estimate of tonnage disposed by the self-haul substream for the study period August 1, 2017 to July 31, 2018. 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:

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

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:

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

The weighting percentages that were used to perform the composition calculations are listed below.

Table 64 to Table 72 pertain to the self-haul substream and its respective subpopulations. Weighting percentages were not used to perform composition calculations on self-haul sampling data by generator type.

Seattle Public Schools waste is collected by Waste Management, but included in SPU reports as self-haul. This waste is included in commercial substream sampling, so the tons will be subtracted from the self-haul substream totals.

Table 64. Weighting Percentages: Overall Self Haul

Site	Tons	Percent
Vehicle Type	Disposed	of
Season		Total
NRDS		
Passenger Car		
Spring	543	0.55%
Summer	617	0.63%
Autumn	481	0.49%
Winter	403	0.41%
Truck		
Spring	9,405	9.61%
Summer	9,356	9.56%
Autumn	8,075	8.25%
Winter	7,342	7.50%
SRDS		
Passenger Car		
Spring	432	0.44%
Summer	490	0.50%
Autumn	365	0.37%
Winter	291	0.30%
Truck		
Spring	15,589	15.93%
Summer	16,353	16.71%
Autumn	14,713	15.03%
Winter	13,410	13.70%
Overall	97,863	100%

Table 65. Weighting Percentages: Self-haul at the NRDS

Vehicle Type Season	Tons Disposed	Percent of Total
Passenger Car		
Spring	543	1.50%
Summer	617	1.70%
Autumn	481	1.33%
Winter	403	1.11%
Truck		
Spring	9,405	25.97%
Summer	9,356	25.83%
Autumn	8,075	22.29%
Winter	7,342	20.27%
Overall	36,221	100%

Table 66. Weighting Percentages: Self-haul at the SRDS

Vehicle Type Season	Tons Disposed	Percent of Total
Passenger Car		
Spring	432	0.70%
Summer	490	0.79%
Autumn	365	0.59%
Winter	291	0.47%
Truck		
Spring	15,589	25.29%
Summer	16,353	26.53%
Autumn	14,713	23.87%
Winter	13,410	21.76%
Overall	61,642	100%

Table 67. Weighting Percentages: Self-haul Passenger Vehicles

Site Season	Tons Disposed	Percent of Total
NRDS		
Spring	543	14.99%
Summer	617	17.05%
Autumn	481	13.28%
Winter	403	11.12%
SRDS		
Spring	432	11.92%
Summer	490	13.53%
Autumn	365	10.09%
Winter	291	8.03%
Overall	3,621	100%

Table 68. Weighting Percentages: Self-haul Trucks

Site Season	Tons Disposed	Percent of Total
NRDS		
Spring	9,405	9.98%
Summer	9,356	9.93%
Autumn	8,075	8.57%
Winter	7,342	7.79%
SRDS		
Spring	15,589	16.54%
Summer	16,353	17.35%
Autumn	14,713	15.61%
Winter	13,410	14.23%
Overall	94,242	100%

Table 69. Weighting Percentages: Self-haul in Spring

Site Vehicle Type	Tons Disposed	Percent of Total
NRDS		
Passenger Car	543	2.09%
Truck	9,405	36.22%
SRDS		
Passenger Car	432	1.66%
Truck	15,589	60.03%
Overall	25,968	100%

Table 70. Weighting Percentages: Self-haul in Summer

Site Vehicle Type	Tons Disposed	Percent of Total
NRDS		
Passenger Car	617	2.30%
Truck	9,356	34.89%
SRDS		
Passenger Car	490	1.83%
Truck	16,353	60.98%
Overall	26,816	100%

Table 71. Weighting Percentages: Self-haul in Autumn

Site Vehicle Type	Tons Disposed	Percent of Total
NRDS		
Passenger Car	481	2.03%
Truck	8,075	34.17%
SRDS		
Passenger Car	365	1.55%
Truck	14,713	62.25%
Overall	23,634	100%

Table 72. Weighting Percentages: Self-haul in Winter

Site Vehicle Type	Tons Disposed	Percent of Total
NRDS		
Passenger Car	403	1.88%
Truck	7,342	34.23%
SRDS		
Passenger Car	291	1.36%
Truck	13,410	62.53%
Overall	21,445	100%

Comparison Calculations

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** is calculated:

$$S_{pool}^2 = \frac{[(n1 - 1) \cdot (n1 \cdot \hat{V}_{rj1})] + [(n2 - 1) \cdot (n2 \cdot \hat{V}_{rj2})]}{n1 + n2 - 2}$$

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

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

The **p-value** of the t-statistic is calculated based on (n1+n2 -2) degrees of freedom.

Appendix E. Year-to-Year Comparison Calculations

This section outlines the technical issues involved with the year-to-year comparison calculations. The calculation formulae are outlined in Waste Composition Calculations.

Background

In an ongoing effort to monitor the types and amounts of materials disposed locally, Seattle has performed several waste composition studies. This study analyzed the composition variations in the percentage of each broad material category disposed within the self-haul substream.

In order to control for population changes and other factors that may influence the total amount of waste disposed from year to year, the tests described in this appendix measure waste proportions, and not actual tonnage. For example, if newspaper accounts for 5% of a particular substream's disposed waste each year, and that substream disposed a total of 1,000 tons of waste in one year and 2,000 tons of waste in the next, while the amount of newspaper increased from 50 to 100 tons, the percentage remained the same. Therefore, the tests would indicate that there had been no change.

The purpose of conducting these comparison tests is to identify statistically significant changes in the percentage of broad material categories of waste disposed in each substream over time. One specific example is stated as follows:

Hypothesis: "There is no statistically significant difference, between the 2012 and 2017-18 study periods, in the percentage of paper disposed in the self-haul substream."

Statistics are then employed to look for evidence disproving the hypothesis. A "significant" result means that there is enough evidence to disprove the hypothesis, and it can be concluded that there is a true difference across study periods. "Insignificant" results indicate that either a) there is no true difference, or b) even though there may be a difference, there is not enough evidence to prove it.

The purpose of these tests is to identify changes across years. However, the study did not attempt to investigate *why* or *how* these changes occurred. The changes may be due to a variety of factors.

Statistical Considerations

The analyses are based on the component percentages, by weight, for each selected substream. As described in Waste Composition Calculations, these percentages are calculated by dividing the sum of the selected component weights by the sum of the corresponding sample weights. T-tests (modified for ratio estimation) were used to examine the year-to-year variation.

5.1.6 Normality

The distribution of some of the broad waste categories (particularly the hazardous materials) is skewed and may not follow a normal distribution. Although t-tests assume a normal distribution, they are very robust to departures from this assumption, particularly with large sample sizes. In addition, the broad waste categories are sums of several individual waste components, which improve our ability to meet the assumptions of normality.

5.1.7 Dependence

There may be dependence between waste components (if a person disposes of component A, they always dispose of component B at the same time).

There is certainly a degree of dependence between the calculated percentages. (Since the percentages sum to 100, if the percentage of component A increases, the percentage of some other component must decrease). This type of dependence is somewhat controlled by choosing only a portion of the waste categories for the analyses.

5.1.8 Multiple T-Tests

In all statistical tests, there is a chance of incorrectly concluding that a result is significant. The year-to-year comparison required conducting several t-tests, (one for each waste category within each set of substreams) **each** of which carries that risk. However, we were willing to accept only a 10% chance, **overall**, of making an incorrect conclusion. Therefore, each test was adjusted by setting the significance threshold to $\frac{0.10}{w}$ (w = the number of t-tests).

The adjustment can be explained as follows:

For each test, we set a $1 - \frac{0.10}{w}$ chance of not making a mistake, which results in a $\left(1 - \frac{0.10}{w}\right)^w$ chance of not making a mistake during all w tests.

Since one minus the chance of not making a mistake equals the chance of making a mistake, by making this adjustment, we have set the overall risk of making a wrong conclusion during any one of the tests at $\left(1 - \left(1 - \frac{0.10}{w}\right)^w\right) = 0.10$.

The chance of a “false positive” for this study is restricted to 10% overall, or 1.25% for each test (10% divided by the eight tests within each substream equals 1.25%).

For more detail regarding 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).

Interpreting the Calculation Results

Table 73 shows the calculation results for the self-haul substream. The comparisons are shown for all eight tests; an asterisk indicates the statistically significant differences.

For the purposes of this study, only those calculation results with a p-value of less than 1.25% are considered to be statistically significant. As described above, the threshold for determining statistically significant results (the “alpha-level”) is conservative, accounting for the fact that so many individual tests were calculated.

The t-statistic is calculated from the data; according to statistical theory, the larger the absolute value of the t-statistic, the less likely 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.

For example, in Table 73 the proportion of **Paper** in the disposed self-haul substream decreased from 6.4% to 3.4% across the study periods. The t-statistic is relatively large (2.7703) and the probability (p-value) of observing that t-statistic if there had been no true difference between years is approximately 0.1%. This value is less than the study’s pre-determined threshold for statistically significant results (alpha-level of 1.25%); thus the decrease in **Paper** is considered to be a true difference. In contrast, the p-value corresponding to the increase in **Construction Debris** is very large. The chance of observing the 51.9% to 55.4% increase when the actual proportion had not changed is approximately 32.2% - much too high to be considered a true difference.

As illustrated in Table 73, **Paper** and **Organics** showed a significant change across study periods.

Table 73. Changes in Self-Haul Waste Composition: 2012 to 2017-18

	Mean Ratio <i>(Material Wt/Total Wt)</i>		t-Statistic	p-Value <i>(Cut-off for statistically valid difference = 0.0125)</i>
	2012	2017/18		
Paper	6.4%	3.4%	2.7703	0.0059 *
Plastic	6.2%	6.9%	0.6536	0.5137
Glass	1.6%	1.8%	0.2386	0.8115
Metal	5.6%	6.3%	0.6323	0.5276
Organics	5.2%	2.0%	2.5434	0.0113 *
Other Materials	21.6%	22.5%	0.3432	0.7316
CDL Wastes	51.9%	55.4%	0.9909	0.3223
Hazardous	1.4%	1.6%	0.2571	0.7972
<i>Number of Samples</i>	226	182		

Appendix F. Field Forms

The 2017-18 field forms are included in the following order:

- Self-haul vehicle selection sheet
- Sample tally sheet

Vehicle Selection Sheet

SEATTLE WASTE COMPOSITION STUDY Vehicle Selection Form

Site: SRDS

Date: Monday, December 11, 2017

Cross off one number for each vehicle entering the station (**both trucks and passenger vehicles**).

When you reach the number circled, this vehicle should be asked to go to the sorting area to dump its load for sampling.

Continue for each block on the next line until the required number of vehicles is sampled.

SELF-HAUL GARBAGE ONLY

1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22
23	24	25	26	27	28	29	30	31	32	33
34	35	36	37	38	39	40	41	42	43	44
45	46	47	48	49	50	51	52	53	54	55
56	57	58	59	60	61	62	63	64	65	66
67	68	69	70	71	72	73	74	75	76	77
78	79	80	81	82	83	84	85	86	87	88
89	90	91	92	93	94	95	96	97	98	99
100	101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120	121
122	123	124	125	126	127	128	129	130	131	132
133	134	135	136	137	138	139	140	141	142	143
144	145	146	147	148	149	150	151	152	153	154
155	156	157	158	159	160	161	162	163	164	165
166	167	168	169	170	171	172	173	174	175	176
177	178	179	180	181	182	183	184	185	186	187
188	189	190	191	192	193	194	195	196	197	198

NEED 18 VEHICLES - PLS. SAMPLE EVERY 7TH VEHICLE

Sample Tally Sheet (Front)

Tally Sheet - Page 1

2017 Seattle Waste Composition Study

PAPER	New spaper				
	Plain OCC/Kraft				
	Waxed OCC/Kraft				
	Grocery/Shopping Bags				
	High Grade				
	Mixed Low -grade				
	Polycoated Containers				
	Compostable/Soiled				
	Pot. Comp. Single-use Food Service				
	Non-Comp. Single-use Food Service				
	Mixed/Other Paper				

PLASTIC	#1 PET Bottles				
	#2 HDPE Natural Bottles				
	#2 HDPE Colored Bottles				
	Other Bottles				
	Tubs				
	Expanded Poly. Nonfood				
	Expanded Poly. Food grade				
	Rigid Poly. Foam Insulation				
	Pot. Comp. Single-use Food Service				
	Non-Comp. Single-use Food Service				
	Other Rigid Packaging				
	Clean Shopping/Dry Cleaning Bags				
	Stretch Wrap				
	Other Clean PE Film				
	Other Film				
	Plastic Pipe				
	Foam Carpet Padding				
	Durable Plastic Products				
Plastic/Other Materials					

METAL	Alum. Cans				
	Alum. Foil/Containers				
	Other Aluminum				
	Other Nonferrous				
	Steel Food Cans				
	Empty Aerosol Cans				
	Other Ferrous				
	Oil filters			Filter Count:	
	Mixed Metals/Material				

GLASS	Clear Bottles				
	Green Bottles				
	Brown Bottles				
	Container Glass				
	Fluorescent Tubes				
	CFLs				
	Flat Glass				
	Automotive Glass				
	Other Glass				

VEHICLE TYPE

A - Auto (Car or SUV)
 P - Pickup Trucks
 V - Van
 T - Other Truck
 RL - Rear Loader
 FL - Front Loader
 SL - Side Loader
 ROD - Loose Roll-Off
 ROC - Compactor Roll-Off

GENERATOR TYPE

Percent SF _____
 Percent MF _____
 Percent COM _____
 100%

If COM, what type of bus.?

A - Manufacturing
 B - Wholesale
 C - Retail
 D - Restaurant
 E - Hotel/Motel
 F - Office
 G - Health Care
 H - Education
 I - Transportation
 J - Other Services
 K - Mixed Businesses
 L - CDL
 M - Other Non-residential
 N - Homeowner Box

SELF-HAUL VEHICLES

	ACCOUNT?	YES	NO
Vehicle 1	LICENSE PLATE:		
	ORIGIN ADDRESS:		
	PERCENT SORTED: or NET WEIGHT:		
Vehicle 2	LICENSE PLATE:		
	ORIGIN ADDRESS:		
	PERCENT SORTED: or NET WEIGHT:		
Vehicle 3	LICENSE PLATE:		
	ORIGIN ADDRESS:		
	PERCENT SORTED: or NET WEIGHT:		

COMPANY NAME:

Sample Tally Sheet (Back)

ORGANICS	Leaves & Grass					
	Prunings					
	Food					
	Fats/Oils/Grease					
	Textiles/Clothing					
	Mixed Textiles					
	Disposable Diapers					
	Animal By-products					
	Rubber Products					
	Tires					
CONSTRUCTION DEBRIS	Clean Dimension Lumber					
	Clean Engineered Wood					
	Pallets					
	Crates					
	Other Untreated Wood					
	New Painted Wood					
	Old Painted Wood					
	Creosote-Treated Wood					
	Other Treated Wood					
	Contaminated Wood					
	New Gypsum Scrap					
	Demo Gypsum Scrap					
	Carpet					
	Felt Carpet Pad					
	Fiberglass Insulation					
	Concrete					
	Asphalt Pavings					
	Other Aggregates					
	Rock					
	Asphalt Shingles					
Other Asphaltic Roofing						
Ceramics						
Cement Fiber Board						
Dried Latex Paints						
Single-Ply Roofing Membranes						
Ceiling Tiles						
Other Construction Debris						
FURNITURE, APPLIANCES, AND ELECTRONICS	Furniture					
	Mattresses					
	Small Appliances					
	Cell Phones					
	Audio/Visual Equipment					
	CRT Computer Monitors					
	CRT Televisions					
	Other Electronics					
	POTENTIALLY HARMFUL WASTE	Liquid Latex Paint				
		Solvent-based Adhesives				
Water-based Adhesives						
Oil-based Paint/Thinners						
Caustic Cleaners						
Pesticides/Herbicides						
Rechargeable Batteries						
Other Dry-cell Batteries						
Wet-cell Batteries						
Gasoline/Kerosene						
Motor Oil/Diesel Oil						
Asbestos						
Explosives						
Medical Wastes						
Other Cleaners/Chemicals						
Pharmaceuticals & Vitamins						
Personal care/cosmetics						
Other Potentially Harmful						
MISC.	Sand/Soil/Dirt					
	Non-distinct Fines					
	Misc. Organics					
	Misc. Inorganics					
CAPTURE DATE		SAMPLE NUMBER				
FACILITY		TIME				

Tally Sheet - Page 2

Revised 12/24/16