CITY OF MOUNTAIN VIEW

Zero Waste Plan
Materials Characterization Study

May 2019

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Introduction

The City of Mountain View maintains state-of-the-art policies and programs designed to achieve the City's goal of 90 percent diversion by 2030.

These include:

- Environmental Preferable Purchasing
- Polystyrene (Foam) Foodware Restrictions (Ordinance)
- Reusable Bag Requirements (Ordinance)
- Recycling and Organics Collection Service
- Outreach and Technical Assistance
- Mixed Waste Processing (to recover recyclable material from the trash)
- Mandatory Construction and Demolition Debris Diversion Requirements and Reporting
- Mixed Construction Debris Processing (to recover recyclable material)

In 2021, the contracts for collection and processing will expire and the City has the option of negotiating new contacts or soliciting proposals for new services. The City is evaluating its current programs and identifying potential new policies and programs which will be incorporated into a Zero Waste Plan.

Materials characterization studies (also known as waste composition studies) are conducted to find out how much recyclable (e.g., paper, glass) or compostable (e.g., food, yard trimmings) materials are discarded into the trash and sometimes into the incorrect recycling or compost cart. The data is collected by taking samples of waste and sorting it into material types such as newspaper, aluminum cans, glass jars, plastic bottles and weighing each type.

This study characterizes the waste that has been discarded by the generator (resident, business or construction site). Before going to landfill, this discarded waste is processed at the Sunnyvale Material Recovery and Transfer (SMaRT®) Station to remove recyclable material prior to landfilling. On average, 30% of all discarded material is recovered.

The focus of this materials characterization study was:

- Single family recycling, organics and trash
- Commercial trash
- Construction & demolition (C&D) debris

The current programs for single family, commercial and C&D are mature and the City is using this characterization study to help evaluate their effectiveness.

The City is in the process of rolling out organics collection at all multifamily buildings. Thus, the composition of multifamily trash is expected to change once the program has

been fully implemented. Therefore, data from a 2010 characterization study will be used for multifamily program planning.

A characterization of the residuals left-over after processing of the trash to recover recyclable materials at the Sunnyvale Material Recovery and Transfer (SMaRT) Station was completed in 2017. This information will also be used for program planning.

This report presents a statistical analysis of the 2018 characterization study results for the City and compares the results of this study with the key findings of the 2010 characterization study.

Methodology

The materials characterization study was performed October 1-12, 2018 at the SMaRT Station.

The field crew sorted randomly-selected samples from single-family residential customers (including recycling, organics and trash carts) and commercial front-load trash loads, and visually characterized mixed C&D loads delivered to the SMaRT Station by Recology Mountain View.

Single-family residential recycling, organics, trash – Recology collected recycling, organics and trash carts from single family households and brought the trios together to the SMaRT Station. The field crew hand sorted the entire contents of each cart.

Commercial trash – Samples were taken from commercial front-load route trucks brought to the SMaRT Station by Recology for hand sorting by the field crew.

C&D debris – Entire loads of C&D roll-off boxes brought to the station by Recology were profiled using visual characterization.

The field crew characterized a total of 421 samples, 372 by hand sorting and 49 samples using visual characterization. All samples were selected randomly from the generator groups considered for this study. A detailed description of the study design is included in Appendix A Study Design.

Sample Count By Sector October 1-12, 2018

Sector	Sorting Method	Average Sample Size	Average Per Day	Total
Single-family 3 carts each*	Hand sort	20-96 gallons	12 each cart 36 carts total	333 carts
Commercial trash front-load	Hand sort	0.5 yard/100 pounds	4	39
C&D debris roll-off	Visual characterization	Entire load	4	49
		Total	44	421

*Not all single-family set-outs included all three carts.

Field staff sorted samples into a 100 material types described in detail in Appendix B Material Type Definitions.

To help identify additional diversion opportunities, each of these 100 types was classified into one of seven recoverability groups:

Recoverability Index

Index Category	Description	Examples
Recyclable	Acceptable in the City's current recycling collection programs	
Potentially Recyclable	Could feasibly be recycled with program changes	Durable plastic items Scrap metal
Compostable	Acceptable in the City's current organics collection programs	
Potentially Compostable	Could feasibly be composted with program changes	Compostable plastics
Potentially Reusable	Could be diverted through reuse programs	Pallets Recoverable food Household goods
Problem Materials	Not currently marketable and must currently be disposed	Composite materials Residuals
Dispose Elsewhere	Not appropriate for trash disposal	Pharmaceuticals Electronics Hazardous materials

Each material type was assigned to one of these recoverability groups based on the definitions listed above. Material types are color coded in the findings section to indicate where each material type was allocated.

Material Types by Recoverability Group

	Recyclable	Potentially Recyclable	Compostable	Potentially Compostable	Potentially Reusable	Problem Materials	Dispose Elsewhere
Paper	Uncoated Corrugated Cardboard - Clean, Flattened Uncoated Corrugated Cardboard - Clean, Unflattened Kraft Bags/Kraft Paper Newspaper Office Paper Catalogs, Directories and Magazines Clean Paper, Other Aseptic Packaging Gable Top Cartons	Poly-Lined Paperboard, Other	Coated Corrugated Cardboard Pizzeria Boxes Paper Towels/Tissues Paper Takeout Containers, Poly-Lined Paper Cups, Poly-Lined Paper Cups, Eco-cups Compostable Paper			Remainder/Composite Non-Compostable Paper	
Plastic	PETE Bottles (#1) HDPE Containers (One Gallon Or Less) (#2) HDPE Containers (Greater Than One Gallon) (#2)	PETE Food Containers and Packaging (#1) PETE Non-Food Packaging (#1) Expanded Polystyrene, Food Packaging (#6) Expanded Polystyrene, Other (#6) Miscellaneous Food Service Containers (#3, #4, #5, #7) Miscellaneous Containers (#3, #4, #5, #7) Flexible Pouches Film, Bags Film, Non-Bag Commercial And Industrial Packaging Durable Plastic Items, Bulky Rigid (#2, #5) Durable Plastic Items, Other	Bags, Compostable	Compostable Plastics, Other		Remainder/Composite Plastics	
Glass	Glass Bottles & Containers, Clear Glass Bottles & Containers, Brown Glass Bottles & Containers, Green Glass Bottles & Containers, Red or Blue					Non-Composite Glass Remainder/Composite Glass	
Metal	Aluminum Cans Tin/Steel Cans	Non-Ferrous Metal, Other Appliances, Small Ferrous Metal, Other				Remainder/Composite Metal	
Organics			Leaves And Grass Woody Prunings And Trimmings Branches, Logs and Stumps Food Scraps, Edible Food Scraps, Inedible Compostable Organics, Other		Recoverable Food	Diapers Sanitary Products Dog and Cat Feces and Litter Remainder/Composite Non-Compostable Organic	
C&D	Dimensional Lumber, Untreated Engineered Wood, Untreated Pallets and Crates Inerts/Concrete, Rock, Soil and Fines	Asphalt Composition Shingles Gypsum, Unpainted C&D Glass Carpeting, Non-compostable				Roofing Materials, Other Gypsum, Painted Fiberglass Insulation Remainder/Composite C&D	Dimensional Lumber, Treated Engineered Wood, Treated
Hazardous		Paint, Latex Non-Empty Aerosol Cans (Propane, Butane, Pesticides) Vehicle And Equipment Fluids Oil and Fuel Filters Batteries, Lead-Acid Computer-Related Electronics, Small Computer-Related Electronics, Large Televisions and Monitors Consumer Electronics, Other				Blue Wrap Cold Packs	Paint, Oil Pesticides, Other Fluorescent Lamps, Mercury Cleaning Products Medical Waste, Untreated Medical Waste, Untreated, Sharps Medical Waste Pharmaceuticals, Treated Remainder/Composite Hazardous
Other		Textiles and Leather Furniture Mattresses and Box Springs Tires, All Kinds			Reusables, Other	Rubber, Other Residuals	

Findings

This section describes the results of the materials characterization study for:

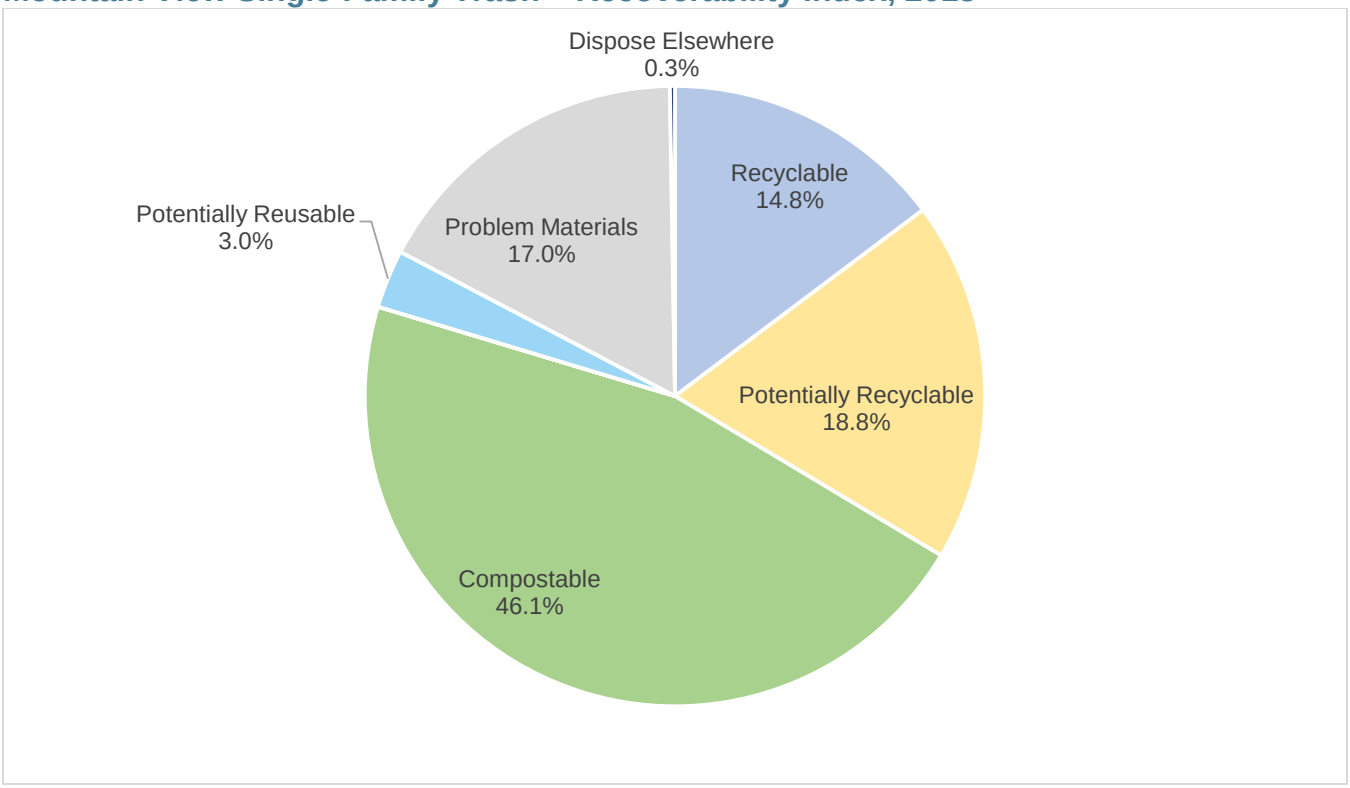
- Single family recycling, organics and trash
- Commercial trash
- Construction & demolition (C&D) debris

The recoverability index is included to show what portions of the materials could have been recycled or composted through the City's existing programs or could be targeted for new policies and programs.

Single-Family Trash

Over 60% of the materials in the single-family trash are recyclable (14.8%) or compostable (46.1%) and could have been placed in the blue cart or the green cart.

Mountain View Single-Family Trash – Recoverability Index, 2018



Mountain View Single-Family Trash – Top Ten Materials, 2018

Material Type	Estimated Percent	Estimated Tons
Food Scraps, Edible	17.7%	1,431
Food Scraps, Inedible	13.9%	1,122
Compostable Paper	7.7%	621
Dog and Cat Feces and Litter	6.2%	503
Diapers	5.1%	415
Paper Towels & Tissues	4.6%	373
Clean Paper, Other	3.7%	297
Film, Non-Bag Commercial & Industrial Packaging	3.2%	254
Textiles and Leather	2.6%	211
Miscellaneous Containers (#3, #4, #5, #7)	2.2%	174
Total Top Ten	66.9%	5,403

The top ten most prevalent materials include:
Edible Food Scraps – 17.7% (approximately 1,431 tons)
Inedible Food Scraps – 13.9% (approximately 1,122 tons)
Compostable Paper – 7.7% (approximately 621 tons)
Paper Towels & Tissues – 4.6% (approximately 373 tons)
Clean Paper – 3.7% (approximately 297 tons)

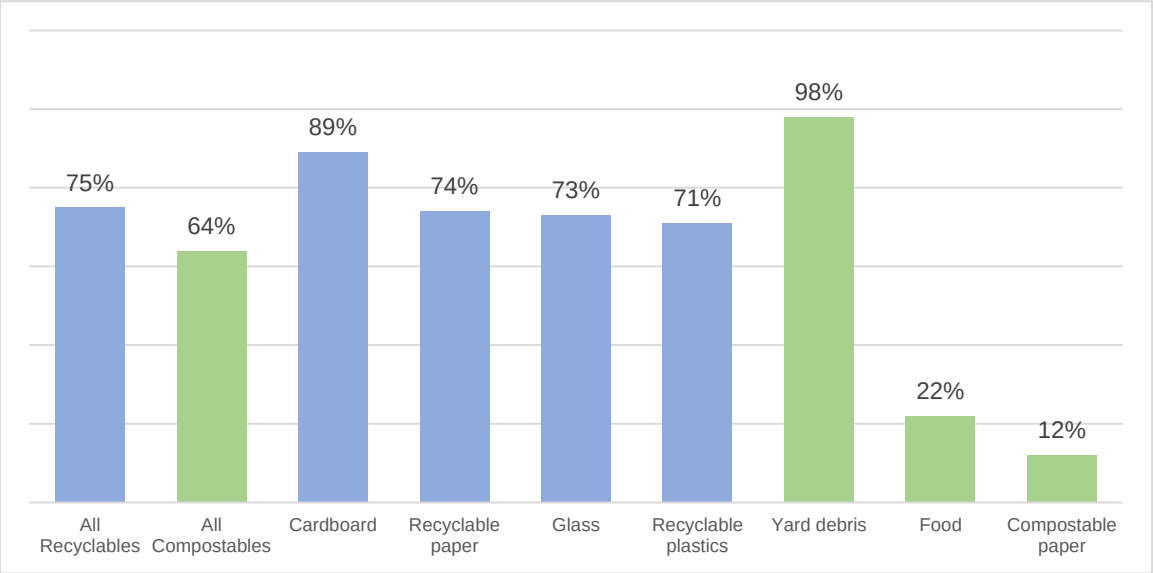
Organics load sorted into Inedible Food Scraps, Edible Food Scraps, Paper Towels & Tissues, Compostable Paper and Compostable Plastic Bags

Single-Family Capture Rates

All three carts were sorted for the single-family sector to establish a "capture rate." A capture rate indicates what proportion of a material type is being placed in the correct container. Capture rates for the single-family residential sector were able to be included in the materials characterization study because each of the trash, recycling and organics carts was sorted. This was only done for the single-family residential sector due to cost considerations.

Overall, single-family residents in Mountain View are doing a good job of sorting correctly. Single-family generators are "capturing" 75% of recyclable materials and 64% of compostable materials. Some materials types, such as food and compostable paper have much lower capture rates and represent an opportunity for program enhancements. Over 59% percent of the materials remaining in the trash are recyclable (13.4%) or compostable (46.1%) and could have been included the recycling or organics collection service.

Mountain View Single-Family Material Capture Rates, 2018



The following table provides the detailed material composition by material class and material type for single-family recycling, organics and trash. Top ten materials are highlighted in green.

Mountain View Single-Family Materials Characterization Study, 2018

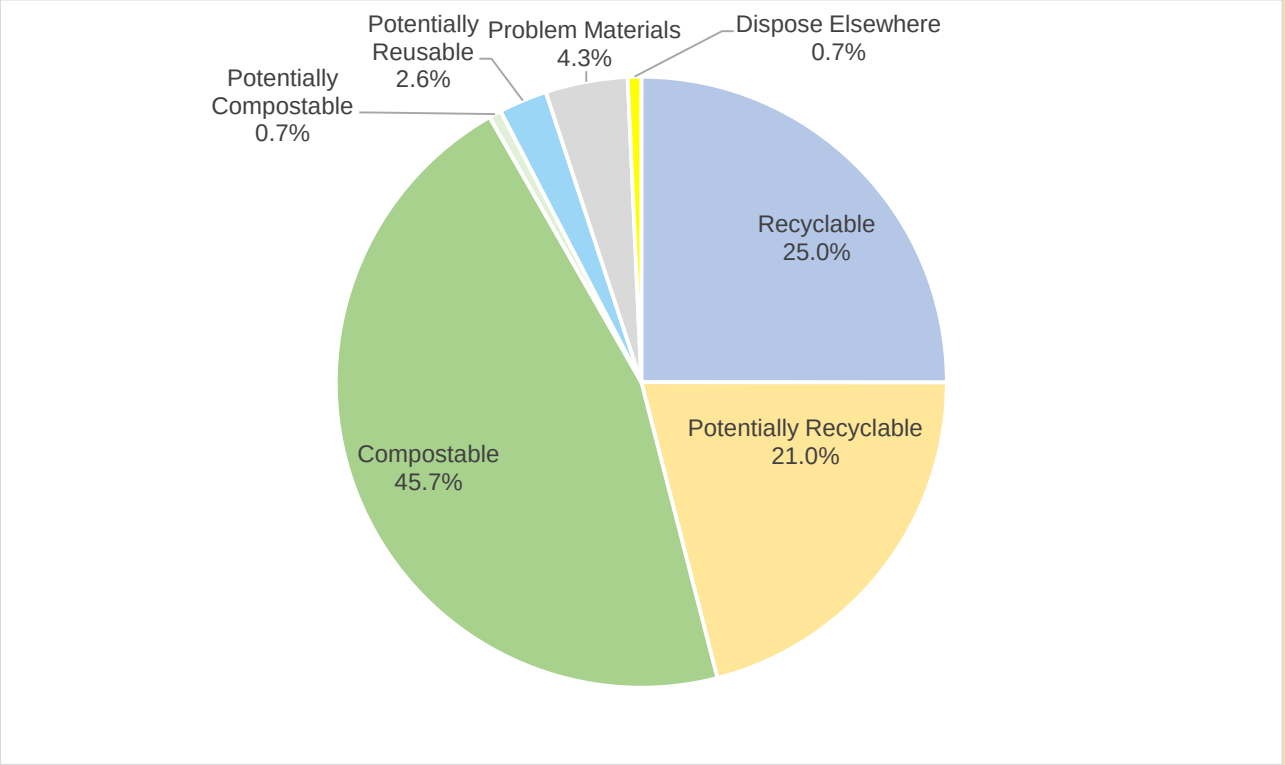
MATERIAL CLASS	SINGLE-FAMILY Material Type	RECYCLING CART Est. %	+/-	Est. Tons	ORGANICS CART Est.%	+/-	Est. Tons	TRASH CART Est. %	+/-	Est. Tons
PAPER	Uncoated Corrugated Cardboard - Flattened	15.4%	0.4%	607	0.2%	-	15	0.7%	0.1%	57
	Uncoated Corrugated Cardboard - Unflattened	0.8%	0.5%	30	-	-	-	0.1%	0.3%	6
	Kraft Bags/Kraft Paper	2.0%	1.9%	77	0.0%	-	1	0.7%	0.7%	54
	Newspaper	8.3%	1.8%	327	-	-	-	1.2%	0.3%	95
	Office Paper	6.6%	2.7%	261	-	-	-	0.8%	0.1%	61
	Catalogs, Directories and Magazines	12.1%	1.5%	475	-	-	-	0.2%	1.4%	13
	Clean Paper, Other	10.2%	0.0%	402	-	-	-	3.7%	0.0%	297
	Coated Corrugated Cardboard	0.0%	0.2%	1	-	-	-	0.0%	0.1%	1
	Pizzeria Boxes	0.3%	0.3%	12	0.1%	0.0%	4	0.1%	1.3%	9
	Paper Towels/Tissues	0.4%	0.2%	18	0.0%	-	1	4.6%	0.1%	373
	Aseptic Packaging	0.3%	0.2%	12	-	-	-	0.1%	0.3%	11
	Gable Top Cartons	0.7%	0.1%	27	-	-	-	0.5%	0.1%	38
	Paper Takeout Containers, Poly-Lined	0.1%	0.0%	3	0.0%	-	1	0.2%	0.1%	14
	Paper Cups, Poly-Lined	0.0%	-	1	-	-	-	0.1%	-	10
	Paper Cups, Eco-cups	-	-	-	-	-	-	-	-	-
	Poly-Lined Paperboard, Other	0.0%	0.5%	1	-	-	-	0.3%	2.1%	25
	Compostable Paper	1.1%	0.2%	43	2.1%	-	145	7.7%	0.4%	621
	Remainder/Composite Non-Compostable Paper	0.3%	0.4%	13	-	-	-	0.5%	0.2%	43
Total		**58.8%**		**2,311**	**2.4%**		**165**	**21.4%**		**1,727**
PLASTIC	PETE Bottles (#1)	1.8%	0.5%	69	0.0%	-	0	0.5%	0.0%	44
	PETE Food Containers and Packaging (#1)	2.1%	0.1%	84	-	-	-	1.3%	0.1%	101
	PETE Non-Food Packaging (#1)	0.1%	0.4%	6	-	-	-	0.0%	0.0%	3
	HDPE Containers (One Gallon Or Less) (#2)	1.7%	0.2%	67	0.0%	-	1	0.2%	0.1%	14
	HDPE Containers (Greater Than One Gallon) (#2)	0.2%	0.0%	9	-	-	-	0.0%	0.1%	1
	Expanded Polystyrene, Food Packaging (#6)	0.0%	0.1%	1	-	-	-	0.2%	0.6%	18
	Expanded Polystyrene, Other (#6)	0.1%	0.5%	6	-	-	-	0.2%	1.2%	17
	Miscellaneous Food Service Containers (#3, #4, #5, #7)	1.8%	0.4%	69	-	-	-	1.8%	0.3%	148
	Miscellaneous Containers (#3, #4, #5, #7)	0.9%	0.1%	36	-	-	-	2.2%	0.5%	174
	Flexible Pouches	0.1%	0.2%	5	-	-	-	1.0%	0.9%	83
	Film, Bags	0.5%	0.2%	18	-	-	-	1.6%	0.6%	126
	Film, Non-Bag Commercial And Industrial Packaging	0.5%	0.3%	18	0.0%	-	1	3.2%	0.6%	254
	Durable Plastic Items, Bulky Rigid (#2, #5)	0.5%	0.1%	18	-	-	-	0.9%	0.0%	73
	Durable Plastic Items, Other	0.2%	-	8	-	-	-	1.0%	0.0%	82
	Bags, Compostable	-	-	-	0.0%	-	0	0.0%	0.4%	0
	Compostable Plastics, Other	-	-	-	-	-	-	0.0%	0.7%	0
	Remainder/Composite Plastics	0.2%	2.0%	10	0.1%	0.3%	10	0.7%	0.3%	53
Total		**10.8%**		**425**	**0.2%**		**12**	**14.7%**		**1,191**
GLASS	Glass Bottles & Containers, Clear	9.4%	1.4%	371	0.2%	-	13	1.7%	0.7%	135
	Glass Bottles & Containers, Brown	4.3%	1.8%	170	-	-	-	0.4%	0.1%	30
	Glass Bottles & Containers, Green	8.9%	0.4%	349	-	-	-	1.5%	-	125
	Glass Bottles & Containers, Red or Blue	0.3%	0.2%	12	-	-	-	0.4%	-	36
	Non-Composite Glass, Other	0.1%	0.0%	4	-	-	-	0.1%	0.1%	7
	Remainder/Composite Glass	0.0%	0.2%	0	-	-	-	-	0.3%	-
Total		**23.1%**		**907**	**0.2%**		**13**	**4.1%**		**333**
METAL	Aluminum Cans	1.0%	0.1%	40	0.0%	-	0	0.3%	0.9%	24
	Non-Ferrous Metal, Other	0.1%	0.3%	5	-	-	-	0.4%	0.0%	33
	Tin/Steel Cans	1.4%	0.0%	57	-	-	-	0.5%	0.3%	39
	Appliances, Small	0.0%	1.2%	1	-	-	-	0.1%	1.5%	4
	Ferrous Metal, Other	0.9%	0.5%	36	0.0%	-	0	1.2%	-	100
	Remainder/Composite Metal	0.3%	0.1%	11	-	-	-	0.0%	-	0
Total		**3.8%**		**149**	**0.0%**		**0**	**2.5%**		**200**
ORGANICS	Leaves And Grass	0.0%	-	1	83.2%	0.9%	5,828	0.3%	0.8%	26
	Woody Prunings And Trimmings	-	-	-	1.1%	0.7%	81	1.3%	2.6%	104
	Branches, Logs and Stumps	-	-	-	0.7%	1.6%	48	-	1.0%	-
	Food Scraps, Edible	0.3%	0.2%	13	5.9%	1.4%	413	17.7%	2.9%	1,431

MATERIAL CLASS	Material Type	SINGLE-FAMILY RECYCLING CART Est. %	+/-	Est. Tons	ORGANICS CART Est.%	+/-	Est. Tons	TRASH CART Est. %	+/-	Est. Tons
	Food Scraps, Inedible	0.3%	0.1%	10	4.4%	1.9%	306	13.9%	0.1%	1,122
	Recoverable Food	0.1%	-	2	1.1%	0.3%	80	1.8%	0.1%	149
	Diapers	-	-	-	0.2%	-	13	5.1%	-	415
	Sanitary Products	-	-	-	-	-	-	1.5%	-	122
	Dog and Cat Feces and Litter	-	-	-	0.0%	0.2%	0	6.2%	-	503
	Compostable Organics, Other	-	-	-	0.1%	0.8%	10	0.1%	-	10
	Remainder/Composite Non-Compostable Organic	-	-	-	0.6%	-	40	0.0%	-	3
Total		**0.7%**		**27**	**97.3%**		**6,818**	**48.1%**		**3,885**
C&D	Dimensional Lumber, Untreated	-	-	-	-	-	-	-	-	-
	Dimensional Lumber, Treated	-	-	-	-	-	-	-	-	-
	Engineered Wood, Untreated	-	-	-	-	-	-	-	-	-
	Engineered Wood, Treated	-	-	-	-	-	-	-	-	-
	Pallets and Crates	-	-	-	-	-	-	-	-	-
	Asphalt Composition Shingles	-	-	-	-	-	-	-	-	-
	Roofing Materials, Other	-	-	-	-	-	-	-	-	-
	Inerts/Concrete, Rock, Soil and Fines	0.1%	-	4	-	-	-	1.3%	0.1%	107
	Gypsum, Unpainted	-	-	-	-	-	-	-	-	-
	Gypsum, Painted	-	-	-	-	-	-	-	-	-
	C&D Glass	-	-	-	-	-	-	0.0%	-	3
	Fiberglass Insulation	-	-	-	-	-	-	-	-	-
	Carpeting, Non-compostable	0.8%	-	32	-	-	-	0.8%	-	63
	Remainder/Composite C&D	-	-	-	-	-	-	0.0%	-	3
Total		0.9%		36	-		-	2.2%	-	176
HAZARDOUS	Paint, Latex	-	-	-	-	-	-	-	0.0%	-
	Paint, Oil	-	-	-	-	-	-	-	-	-
	Non-Empty Aerosol Cans (Propane, Butane, Pesticides)	-	-	-	-	-	-	-	-	-
	Pesticides, Other	-	-	-	-	-	-	-	-	-
	Fluorescent Lamps, Mercury	0.0%	-	0	-	-	-	0.0%	1.5%	4
	Cleaning Products	-	-	-	-	-	-	-	-	-
	Medical Waste, Untreated	0.0%	-	0	-	-	-	0.1%	-	6
	Medical Waste, Untreated, Sharps	-	-	-	-	-	-	0.0%	-	0
	Medical Waste, Treated	-	-	-	-	-	-	-	-	-
	Blue Wrap	-	-	-	-	-	-	-	-	-
	Pharmaceuticals	-	-	-	-	-	-	0.1%	-	9
	Cold Packs	0.5%	-	19	-	-	-	1.5%	-	120
	Vehicle And Equipment Fluids	-	-	-	-	-	-	-	-	-
	Oil & Fuel Filters	-	-	-	-	-	-	-	0.2%	-
	Batteries, Lead-Acid	-	-	-	-	-	-	-	1.2%	-
	Batteries, Other	0.1%	0.6%	3	-	-	-	0.1%	-	4
	Computer-Related Electronics, Small	0.4%	-	15	-	-	-	-	-	-
	Computer-Related Electronics, Large	-	-	-	-	-	-	-	-	-
	Televisions and Monitors	-	-	-	-	-	-	-	-	-
	Consumer Electronics, Other	0.0%	-	0	-	-	-	0.0%	0.8%	2
	Remainder/Composite Hazardous	-	-	-	-	-	-	0.1%	0.6%	12
Total		1.0%		38	-		-	2.0%		158
OTHER	Textiles and Leather	0.3%	-	12	-	-	-	2.6%	-	211
	Furniture	-	-	-	-	-	-	-	-	-
	Mattresses and Box Springs	-	-	-	-	-	-	-	-	-
	Tires, All Kinds	-	-	-	-	-	-	-	-	-
	Rubber, Other	0.0%	0.3%	0	-	-	-	0.0%	-	2
	Reusables, Other	0.3%	0.2%	14	-	-	-	1.2%	-	97
	Residuals	0.3%	-	12	0.0%	-	0	1.2%	-	95
Total		1.0%		38	0.0%	-	0	5.0%		405
Grand Total		**100%**		**3,931**	**100%**		**7,008**	**100%**		**8,076**

Commercial Trash

Similar to single-family, over 70% of the materials in the commercial trash are recyclable (25.0%) or compostable (45.7%) and could have been included the recycling or organics collection service. Commercial businesses in Mountain View also generate 21.0% of potentially recyclable materials that are not included in the City's recycling programs, such as ferrous metals and durable plastic items.

Mountain View Commercial Trash – Recoverability Index, 2018



Mountain View Commercial Trash – Top Ten Materials, 2018

Material Type	Estimated Percent	Estimated Tons
Food Scraps, Edible	15.6%	4,337
Compostable Paper	10.4%	2,892
Food Scraps, Inedible	8.9%	2,483
Ferrous Metal, Other	6.1%	1,689
Paper Towels &Tissues	5.3%	1,467
Uncoated Corrugated Cardboard - Flattened	4.3%	1,184
Engineered Wood, Untreated	3.2%	884
Film, Non-Bag Commercial and Industrial Packaging	3.1%	867
Leaves & Grass	3.0%	819
Durable Plastic Items, Other	2.6%	715
Total Top Ten	62.4%	17,336

The top ten most prevalent materials include:

Edible Food Scraps – 15.6% (approximately 4,337 tons)
Compostable Paper – 10.4% (approximately 2,892 tons)
Inedible Food Scraps – 8.9% (approximately 2,483 tons)
Ferrous Metal – 6.1% (approximately 1,689 tons)
Paper Towels & Tissues – 5.3% (approximately 1,467 tons)

The following table provides the detailed material composition by material class and material type for commercial trash. Top ten materials are highlighted in green.

Mountain View Commercial Materials Characterization Study, 2018

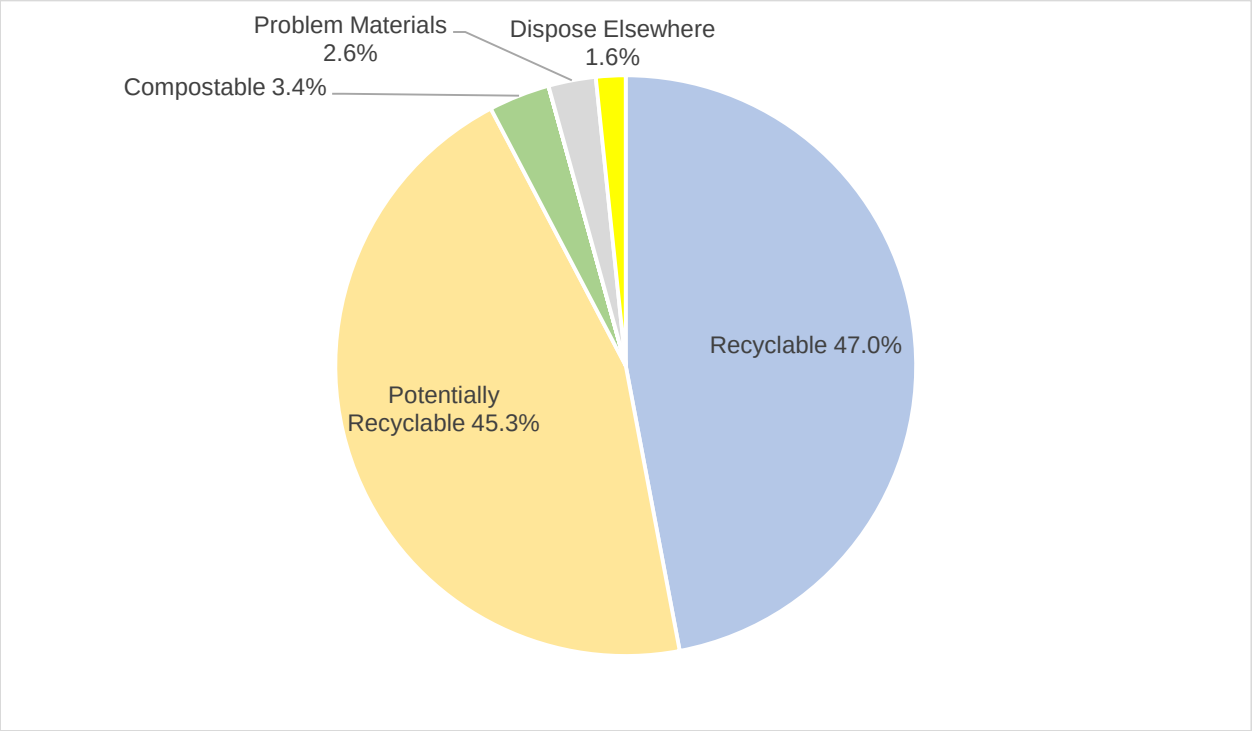
MATERIAL	COMMERCIAL Material Type	TRASH Est. %	+/-	Est. Tons
PAPER	Uncoated Corrugated Cardboard - Flattened	4.3%	1.3%	1,184
	Uncoated Corrugated Cardboard - Unflattened	0.1%	0.1%	20
	Kraft Bags/Kraft Paper	0.5%	0.2%	136
	Newspaper	1.1%	0.9%	318
	Office Paper	1.8%	0.6%	501
	Catalogs, Directories and Magazines	0.7%	0.4%	188
	Clean Paper, Other	2.3%	0.6%	630
	Coated Corrugated Cardboard	0.8%	0.5%	227
	Pizzeria Boxes	0.3%	0.3%	81
	Paper Towels/Tissues	5.3%	1.5%	1,467
	Aseptic Packaging	0.1%	0.1%	32
	Gable Top Cartons	0.2%	0.1%	44
	Paper Takeout Containers, Poly-Lined	0.0%	0.0%	4
	Paper Cups, Poly-Lined	0.4%	0.2%	113
	Paper Cups, Eco-cups	0.5%	0.5%	145
	Poly-Lined Paperboard, Other	0.3%	0.4%	82
	Compostable Paper	10.4%	3.4%	2,892
	Remainder/Composite Non-Compostable Paper	0.4%	0.2%	97
Total		**29.4%**		**8,161**
PLASTIC	PETE Bottles (#1)	1.3%	0.7%	357
	PETE Food Containers and Packaging (#1)	0.5%	0.2%	152
	PETE Non-Food Packaging (#1)	0.0%	0.1%	13
	HDPE Containers (One Gallon Or Less) (#2)	1.1%	0.4%	293
	HDPE Containers (Greater Than One Gallon) (#2)	0.5%	0.3%	136
	Expanded Polystyrene, Food Packaging (#6)	0.0%	0.0%	8
	Expanded Polystyrene, Other (#6)	0.6%	0.3%	154
	Miscellaneous Food Service Containers (#3, #4, #5, #7)	0.8%	0.3%	212
	Miscellaneous Containers (#3, #4, #5, #7)	0.8%	0.8%	236
	Flexible Pouches	0.3%	0.1%	84
	Film, Bags	2.5%	0.9%	686
	Film, Non-Bag Commercial And Industrial Packaging	3.1%	0.9%	867
	Durable Plastic Items, Bulky Rigid (#2, #5)	0.3%	0.3%	87
	Durable Plastic Items, Other	2.6%	1.5%	715
	Bags, Compostable	0.0%	0.0%	2
	Compostable Plastics, Other	0.7%	0.8%	183
	Remainder/Composite Plastics	1.2%	0.6%	320
Total		**16.2%**		**4,505**
GLASS	Glass Bottles & Containers, Clear	1.0%	0.4%	283
	Glass Bottles & Containers, Brown	0.4%	0.2%	118
	Glass Bottles & Containers, Green	0.2%	0.1%	60
	Glass Bottles & Containers, Red or Blue	-	-	-
	Non-Composite Glass, Other	-	-	-
	Remainder/Composite Glass	0.0%	0.0%	5
Total		**1.7%**		**466**
METAL	Aluminum Cans	0.4%	0.1%	98
	Non-Ferrous Metal, Other	0.7%	0.3%	199
	Tin/Steel Cans	0.6%	0.3%	153
	Appliances, Small	0.2%	0.3%	46
	Ferrous Metal, Other	6.1%	3.8%	1,689
	Remainder/Composite Metal	0.0%	0.0%	2
Total		**7.9%**		**2,187**
ORGANICS	Leaves And Grass	3.0%	1.3%	819
	Woody Prunings And Trimmings	0.3%	0.4%	82
	Branches, Logs and Stumps	-	-	-
	Food Scraps, Edible	15.6%	4.2%	4,337

MATERIAL	COMMERCIAL Material Type	TRASH Est. %	+/-	Est. Tons
	Food Scraps, Inedible	8.9%	2.5%	2,483
	Recoverable Food	2.6%	2.3%	710
	Diapers	2.3%	1.3%	629
	Sanitary Products	0.2%	0.2%	58
	Dog and Cat Feces and Litter	0.1%	0.1%	25
	Compostable Organics, Other	0.2%	0.3%	46
	Remainder/Composite Non-Compostable Organic	0.1%	0.1%	17
Total		**33.2%**		**9,205**
C&D	Dimensional Lumber, Untreated	1.8%	1.2%	489
	Dimensional Lumber, Treated	-	-	-
	Engineered Wood, Untreated	3.2%	4.3%	884
	Engineered Wood, Treated	0.4%	0.6%	109
	Pallets and Crates	2.4%	2.3%	661
	Asphalt Composition Shingles	-	-	-
	Roofing Materials, Other	-	-	-
	Inerts/Concrete, Rock, Soil and Fines	1.3%	1.8%	361
	Gypsum, Unpainted	-	-	-
	Gypsum, Painted	0.0%	0.0%	3
	C&D Glass	0.3%	0.4%	73
	Fiberglass Insulation	-	-	-
	Carpeting, Non-compostable	0.1%	0.2%	31
	Remainder/Composite C&D	-	-	-
Total		**9.4%**		**2,610**
HAZARDOUS	Paint, Latex	-	-	-
	Paint, Oil	0.0%	0.0%	6
	Non-Empty Aerosol Cans (Propane, Butane, Pesticides)	0.2%	0.2%	43
	Pesticides, Other	-	-	-
	Fluorescent Lamps, Mercury	-	-	-
	Cleaning Products	-	-	-
	Medical Waste, Untreated	0.3%	0.2%	81
	Medical Waste, Untreated, Sharps	0.0%	0.0%	1
	Medical Waste, Treated	-	-	-
	Blue Wrap	-	-	-
	Pharmaceuticals	-	-	-
	Cold Packs	-	-	-
	Vehicle And Equipment Fluids	-	-	-
	Oil & Fuel Filters	-	-	-
	Batteries, Lead-Acid	-	-	-
	Batteries, Other	0.0%	0.0%	1
	Computer-Related Electronics, Small	0.0%	0.0%	7
	Computer-Related Electronics, Large	-	-	-
	Televisions and Monitors	-	-	-
	Consumer Electronics, Other	0.0%	0.1%	10
	Remainder/Composite Hazardous	-	-	-
Total		**0.5%**		**148**
OTHER	Textiles and Leather	1.4%	0.9%	402
	Furniture	0.1%	0.2%	31
	Mattresses and Box Springs	-	-	-
	Tires, All Kinds	-	-	-
	Rubber, Other	0.1%	0.1%	25
	Reusables, Other	-	-	-
	Residuals	0.1%	0.1%	27
Total		1.7%		484
Grand Total				**27,767**

C&D Debris

Recology brings mixed loads of C&D debris to the SMaRT Station where some materials, such as large pieces of scrap metal, big stumps, wood and cardboard are salvaged by a manual floor sort team. C&D debris loads are dumped on the floor of the transfer station and large pieces are salvaged. The majority of the material (92.3%) is recyclable or potentially recyclable if it were separated at the source or sent to a specialized C&D recycling facility for more intensive processing.

Mountain View C&D Debris – Recoverability Index, 2018



Mountain View C&D Debris – Top Ten Materials, 2018

Material Type	Estimated Percent	Estimated Tons
Gypsum, Unpainted	27.3%	3,511
Dimensional Lumber, Untreated	24.3%	3,125
Ferrous Metal, Other	8.3%	1,064
Engineered Wood, Untreated	8.2%	1,058
Uncoated Corrugated Cardboard - Flattened	5.2%	665
Pallets and Crates	4.7%	603
Durable Plastic Items, Other	3.9%	507
Inerts/Concrete, Rock, Soil and Fines	2.7%	351
Film, Non-Bag Commercial and Industrial Packaging	2.4%	310
Leaves and Grass	2.4%	305
Total Top Ten	89.4%	11,500

The top ten most prevalent materials include:

Unpainted Gypsum – 27.3% (approximately 3,511 tons)
Untreated Dimensional Lumber – 24.4% (approximately 3,125 tons)
Ferrous Metal – 8.3% (approximately 1,064 tons)
Untreated Engineered Wood – 8.2% (approximately 1,058 tons)
Uncoated Corrugated Cardboard – 5.2% (approximately 665 tons)

The following table provides the detailed material composition by material class and material type for C&D debris. Top ten materials are highlighted in green.

Mountain View C&D Debris Materials Characterization Study, 2018

MATERIAL CLASS	C&D Debris Material Type	MIXED C&D DEBRIS Est. %	+/-	Est. Tons
PAPER	Uncoated Corrugated Cardboard - Flattened	5.2%	1.3%	665
	Uncoated Corrugated Cardboard - Unflattened	1.0%	0.7%	132
	Kraft Bags/Kraft Paper	0.1%	0.2%	13
	Newspaper	-	-	-
	Office Paper	0.1%	0.2%	18
	Catalogs, Directories and Magazines	-	-	-
	Clean Paper, Other	0.4%	0.3%	47
	Coated Corrugated Cardboard	-	-	-
	Pizzeria Boxes	-	-	-
	Paper Towels/Tissues	-	-	-
	Aseptic Packaging	-	-	-
	Gable Top Cartons	-	-	-
	Paper Takeout Containers, Poly-Lined	-	-	-
	Paper Cups, Poly-Lined	-	-	-
	Paper Cups, Eco-cups	-	-	-
	Poly-Lined Paperboard, Other	-	-	-
	Compostable Paper	0.5%	0.4%	65
	Remainder/Composite Non-Compostable Paper	0.4%	0.6%	49
Total		**7.7%**		**988**
PLASTIC	PETE Bottles (#1)	-	-	-
	PETE Food Containers and Packaging (#1)	-	-	-
	PETE Non-Food Packaging (#1)	-	-	-
	HDPE Containers (One Gallon Or Less) (#2)	-	-	-
	HDPE Containers (Greater Than One Gallon) (#2)	0.3%	0.3%	40
	Expanded Polystyrene, Food Packaging (#6)	-	-	-
	Expanded Polystyrene, Other (#6)	0.5%	0.3%	67
	Miscellaneous Food Service Containers (#3, #4, #5,	-	-	-
	Miscellaneous Containers (#3, #4, #5, #7)	-	-	-
	Flexible Pouches	-	-	-
	Film, Bags	-	-	-
	Film, Non-Bag Commercial And Industrial Packaging	2.4%	0.9%	310
	Durable Plastic Items, Bulky Rigid (#2, #5)	0.4%	0.4%	52
	Durable Plastic Items, Other	3.9%	1.0%	507
	Bags, Compostable	-	-	-
	Compostable Plastics, Other	-	-	-
	Remainder/Composite Plastics	0.0%	0.0%	1
Total		**7.6%**		**977**
GLASS	Glass Bottles & Containers, Clear	-	-	-
	Glass Bottles & Containers, Brown	-	-	-
	Glass Bottles & Containers, Green	-	-	-
	Glass Bottles & Containers, Red or Blue	-	-	-
	Non-Composite Glass, Other	-	-	-
	Remainder/Composite Glass	-	-	-
Total		**-**		**-**
METAL	Aluminum Cans	-	-	-
	Non-Ferrous Metal, Other	0.8%	0.8%	98
	Tin/Steel Cans	-	-	-
	Appliances, Small	-	-	-
	Ferrous Metal, Other	8.3%	2.0%	1,064
	Remainder/Composite Metal	0.1%	0.2%	14
Total		**9.1%**		**1,177**
ORGANICS	Leaves And Grass	2.4%	-	305
	Woody Prunings And Trimmings	0.4%	-	48
	Branches, Logs and Stumps	0.2%	-	20
	Food Scraps, Edible	-	-	-
	Food Scraps, Inedible	-	-	-

MATERIAL CLASS	C&D Debris Material Type	MIXED C&D DEBRIS Est. %	+/-	Est. Tons
	Recoverable Food	-	-	-
	Diapers	-	-	-
	Sanitary Products	-	-	-
	Dog and Cat Feces and Litter	-	-	-
	Compostable Organics, Other	-	-	-
	Remainder/Composite Non-Compostable Organic	-	-	-
Total		**2.9%**		**374**
C&D	Dimensional Lumber, Untreated	24.3%	-	3,125
	Dimensional Lumber, Treated	-	-	-
	Engineered Wood, Untreated	8.2%	-	1,058
	Engineered Wood, Treated	1.6%	-	212
	Pallets And Crates	4.7%	-	603
	Asphalt Composition Shingles	0.4%	-	58
	Roofing Materials, Other	0.4%	-	49
	Inerts/Concrete, Rock, Soil and Fines	2.7%	-	351
	Gypsum, Unpainted	27.3%	-	3,511
	Gypsum, Painted	0.1%	-	15
	C&D Glass	0.0%	-	1
	Fiberglass Insulation	1.4%	-	185
	Carpeting, Non-compostable	0.6%	-	82
	Remainder/Composite C&D	0.2%	-	27
Total		**72.1%**		**9,276**
HAZARDOUS	Paint, Latex	-	-	-
	Paint, Oil	-	-	-
	Non-Empty Aerosol Cans (Propane, Butane,	-	-	-
	Pesticides, Other	-	-	-
	Fluorescent Lamps, Mercury	-	-	-
	Cleaning Products	-	-	-
	Medical Waste, Untreated	-	-	-
	Medical Waste, Untreated, Sharps	-	-	-
	Medical Waste, Treated	-	-	-
	Blue Wrap	-	-	-
	Pharmaceuticals	-	-	-
	Cold Packs	-	-	-
	Vehicle And Equipment Fluids	-	-	-
	Oil & Fuel Filters	-	-	-
	Batteries, Lead-Acid	-	-	-
	Batteries, Other	-	-	-
	Computer-Related Electronics, Small	-	-	-
	Computer-Related Electronics, Large	-	-	-
	Televisions and Monitors	-	-	-
	Consumer Electronics, Other	-	-	-
	Remainder/Composite Hazardous	-	-	-
Total		**-**		**-**
OTHER	Textiles and Leather	0.3%	-	37
	Furniture	0.3%	-	38
	Mattresses and Box Springs	0.0%	-	2
	Tires, All Kinds	-	-	-
	Rubber, Other	-	-	-
	Reusables, Other	-	-	-
	Residuals	-	-	-
Total		0.6%		78
Grand Total		**100.0%**		**12,869**

Comparison to 2010 Study

The City conducted a materials characterization study in 2010 using a similar methodology to the 2018 study with a few differences.

The 2010 study analyzed multifamily trash and SMaRT Station residuals in addition to the sectors analyzed in the 2018 study. The 2018 study also analyzed the single-family recycling and organics in order to determine a capture rate by material type.

Since the 2010 study was conducted jointly with the City of Sunnyvale, fewer samples were specific to Mountain View (compared to the 2018 study).

Sample Count and Method for 2010 and 2018

Sector	Sorting Method	2010 Study Samples	2018 Study Samples
Single-family trash	Hand sort	13	119
Single-family recycling	Hand sort	NA	121
Single-family organics	Hand sort	NA	93
Multifamily trash	Hand sort	15	N/A
Commercial trash	Hand sort	21	39
C&D debris roll-off	Visual characterization	44	49
SMaRT Station residuals	Hand sort	30	N/A
	Total	123	421

There have been significant changes in the City's programs since 2010. The City:

- Banned all but reusable checkout bags at retail stores and required a fee for those bags.
- Banned the use of polystyrene foam foodware containers.
- Entered into a new service agreement with Recology and rolled out organics collection (including food scraps) to all single-family and commercial customers.

Overall, single-family trash tons discarded by residents have been reduced by 22% and commercial front-load tons have been reduced by 20%. C&D debris tons have significantly increased by 207% (along with increased building and commercial activity).

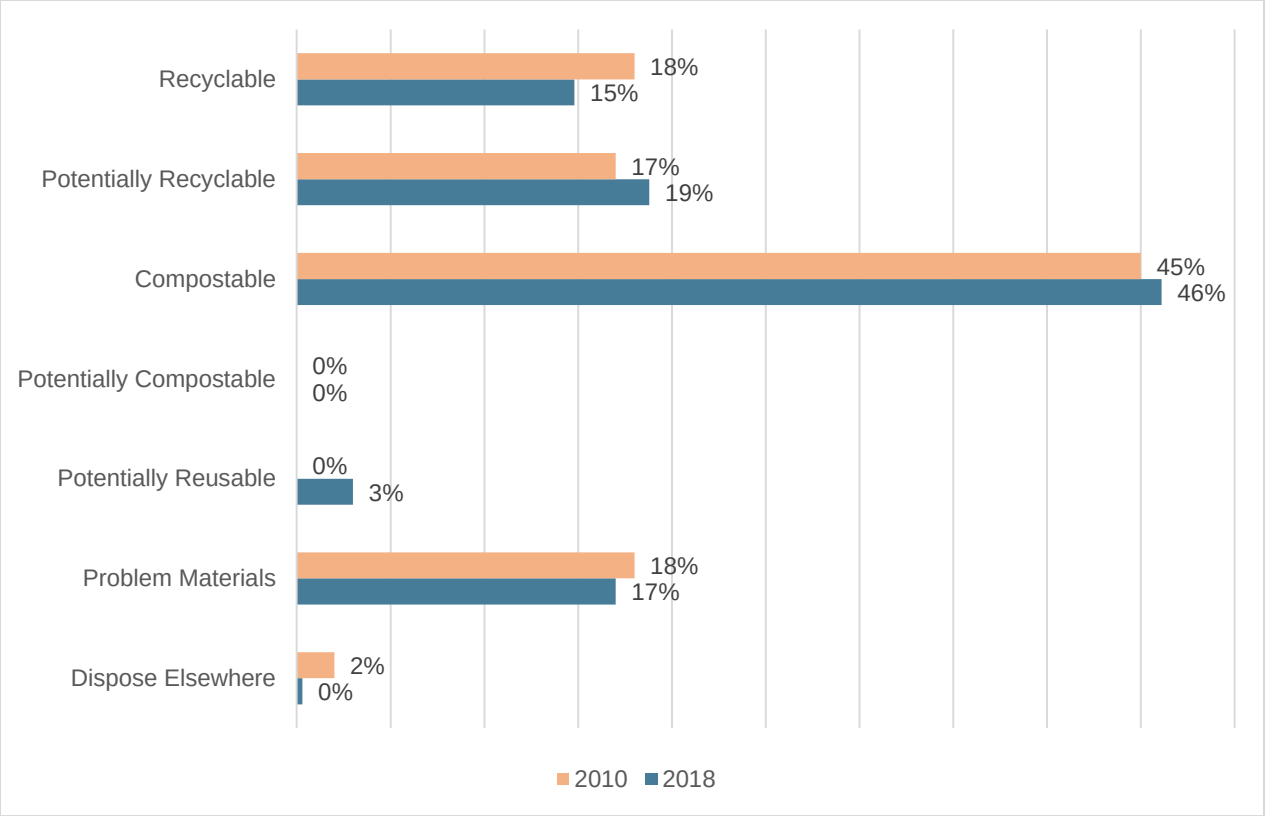
Trash Tons by Sector 2010 and 2018

Sector	2010	2018	% Difference
Single-family trash	10,326	8,076	Decreased by 22%
Commercial front-load trash	20,713	16,591	Decreased by 20%
C&D debris roll-off	4,194	12,869	Increased by 207%

Single-Family

While the total amount of single-family trash in 2018 has gone down, the composition of the remaining materials is similar to 2010.

Mountain View Single-Family Recoverability 2010 and 2018

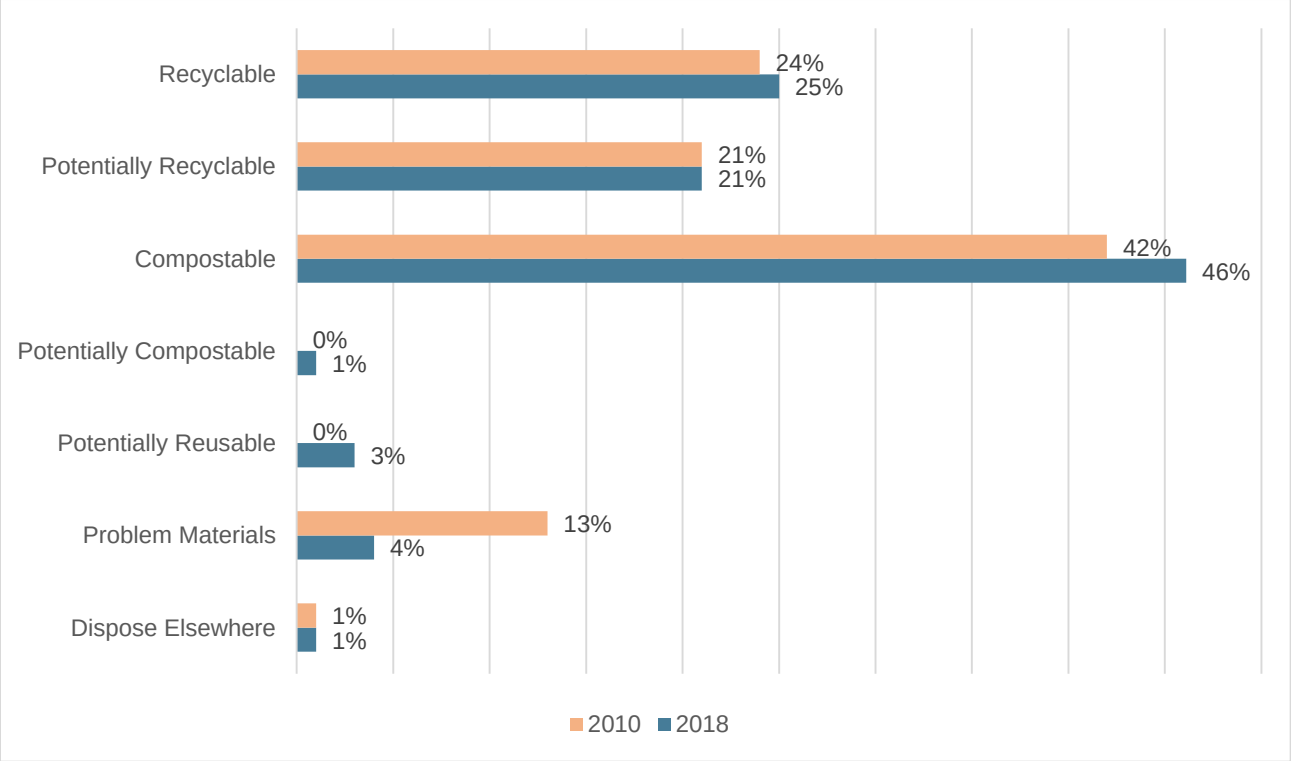


Commercial

Similar to single-family, the composition of the commercial front-load trash has not changed significantly even though total tons discarded have decreased since 2010.

Somewhat more of the “remainder/composite” materials (including remainder/composite paper, remainder/composite metal and remainder/composite C&D) were found in 2010 compared to 2018. These are considered “Problem Materials.”

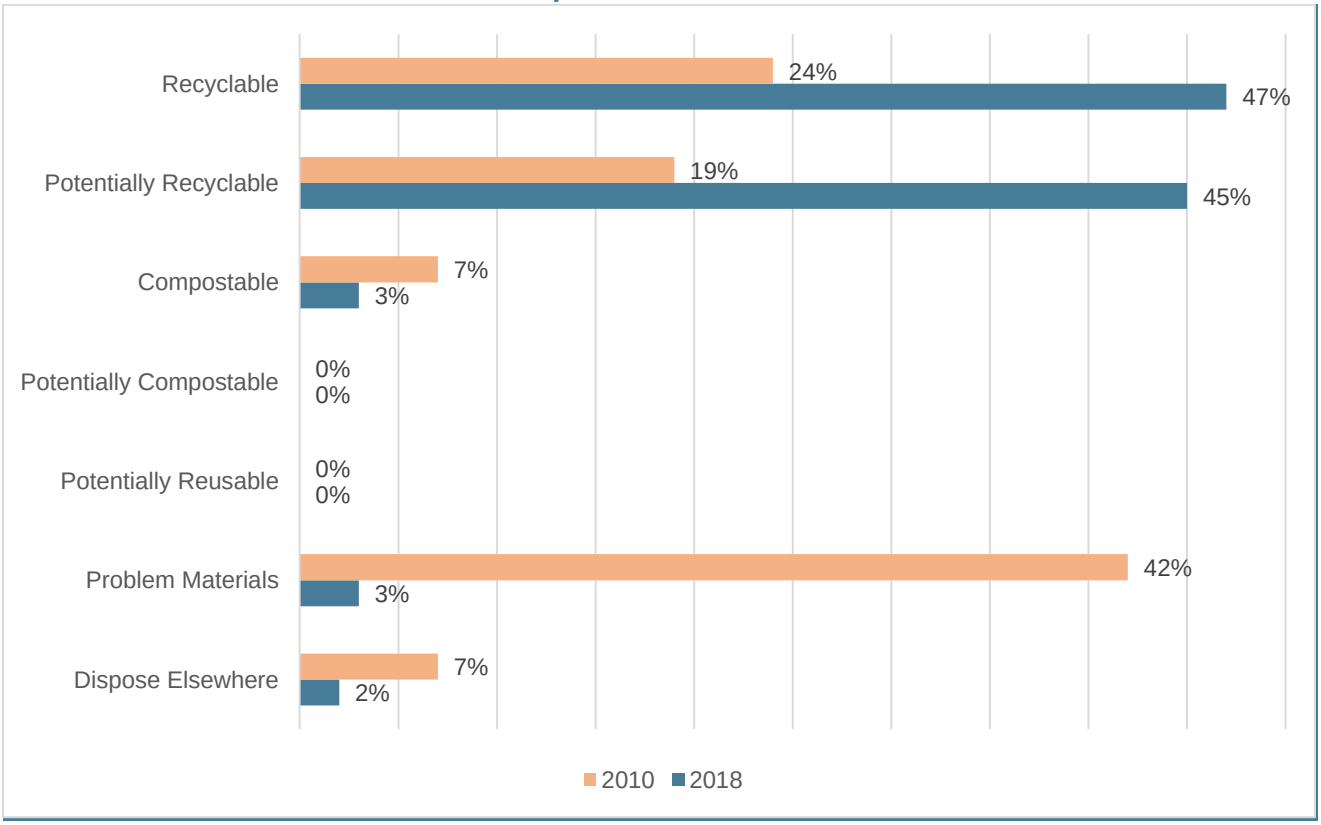
Mountain View Commercial Recoverability 2010 and 2018



C&D Debris

There were some significant changes in the composition of the C&D debris roll-off tons in 2018 compared to 2010. There was significantly more “Recyclable Materials,” such as untreated dimensional lumber (24.3% in 2018 compared to 5.3% in 2010) and “Potentially Recyclable Materials,” such as unpainted gypsum (27.3% in 2018 compared to 6.3% in 2010). Remainder/composite C&D was much higher in 2010 than in 2018 (28.2% in 2010 compared to 0.2% in 2018) along with painted gypsum (11.3% in 2010 compared to 0.12% in 2018). These are considered “Problem Materials.”

Mountain View C&D Debris Recoverability 2010 and 2018



Appendix A
Study Design

This section presents the study plan as it was written prior to collecting and characterizing material samples.

Compare Relevant Studies and Assess Waste Characterization Needs

The consultant team will assess Mountain View's material characterization needs in two steps – compare and contrast relevant recent studies and seek new models to improve the proposed methodology. To date the studies being reviewed are:

1. City of Mountain View Waste Characterization Report 2010, Cascadia Consulting Group
2. Cal Recycle Disposal-Facility-Based Characterization of Solid Waste in California 2014, Cascadia Consulting Group
3. Palo Alto Waste Characterization Study 2017, Abbe & Associates and Cascadia Consulting Group
4. Alameda County 2017-18 Waste Characterization Study, SCS Engineers

Sampling Schedule

The study dates are Monday, October 1 through Friday, October 5 and Monday, October 8 through Friday, October 12. At least 400 samples will be sorted as per Table 1. Each load will be collected by Recology staff and delivered to the SMaRT Station.

Sample Count by Sectors, 10/1/2018 – 10/12/2018

Sectors	Sample Size	Average Per Day	Total
Single-Family, 3 carts each	20-96 Gallons	12 X 3	360
Commercial Trash Front-Load	0.5 yd/200 Lbs.	4	40
C&D (Visual Characterization)	0.5 yd/200 Lbs.	4	40
	Total	20	440

Single-Family - All three carts will be collected from randomly selected single unit households based on the City's 2018 Curbside Collection Calendar (below).

The City will prepare a study announcement (Attachment A) explaining the Study purpose and process. It will be shown to cart owners who may have security issues and/or curious passersby.

2018 CURBSIDE COLLECTION

Collection Day & Recycling Week

- Garbage and compost carts are collected *weekly.*
- Recycling carts are collected *every other week.*
- To find your collection day and recycling week: locate your neighborhood on the map and note collection day and color (blue or grey). Match color to the calendar for recycling week. *Example: On Church Street between Hope and Castro, garbage and compost collection is every Tuesday and recycling collection is every other Tuesday on blue weeks, beginning on January 9.*
- Also find collection day schedules and set up service reminders at **MountainView.gov/MySchedule**

HOLIDAYS

Collection occurs on all holidays except Thanksgiving (November 22), Christmas (December 25) and New Year's Day (January 1).

If your collection day falls on or after the holiday, collection will occur one day later that week. For example, for a Thursday holiday, Thursday collection will take place on Friday and Friday collection will take place on Saturday.

October 2018

M	T	W	T	F
1	2	3	4	5
8	9	10	11	12
15	16	17	18	19
22	23	24	25	26
29	30	31		

Commercial Trash – Front-load routes vary greatly by time and pick-up frequency. The Google and Intuit routes need to be well understood especially in regards to their impact on the entire discard stream.

Construction & Demolition - Recology currently runs three C&D debris box routes per day, averaging five trips - all taken to the SMaRT Station.

Daily Collection Lists

During the last week in September, the consultant team Field Manager will send multiple copies of the Daily Collection Lists – in summary and detail form to the Recology Route Supervisor. These include:

Single-Family Set-outs - ten sheets of addresses organized by date, trash route, street and address – i.e., Monday, 10/01/18, Route 24A, 675 Sierra Vista Ave and a set of brightly colored two-inch Sample Identification stickers – five per set-out.

Commercial Trash - ten sheets of vehicles organized by date, route, and vehicle identification and trip number and placards for each truck trip.

Data Collection Lists, Placards and Forms

Samples of the study lists, forms and placards are Attachment B.

Residential Daily Collection List	Daily address list used to collect samples. Organized by date, route, street and address. Includes cart types, sizes and counts for each address plus fields to note absent setouts and other relevant comments.
Commercial Daily Collection List	Daily list of vehicles to be sampled. Organized by date, vehicle and route.
Sample Placards	Pre-printed paper signs with date, route, unique sample number and origin address or vehicle with fields for driver info and time of collection. The collection team will place the placards in and/or on every sample so that the field manager can easily identify and maintain custody over individual samples.
Tally Forms	Used to record net weights of each hand-sorted sample by material category and type. The sheet will carry identifying information for each sample.
Visual Characterization Sheets	Used to record the volumetric percentage estimates for each visually characterized C&D sample. The sheet will carry identifying information for each sample including date, unique sample number, route, contractor and origin address.

Single-Family Trash, Recycling and Organics – Sample Collection

Routes and Cart Options

The five weekly Mountain View single-family curbside collection routes are broken in two – A (blue) and B (gray). Trash and Organics setouts are picked-up weekly, while the split cart Recyclables – Paper and Containers, are picked-up every other week, hence the two designations/colors. Based on the City's 2018 Curbside Collection Calendar, A (blue) routes will be sampled the first week and B (gray) routes the second. The goal is to sample and sort 120+ setouts; at least 12 per day.

Trash cart size is initially determined by household size. Recycling cart size selections are up to the householder. Most Organics carts are 96 gallons. A small number of households have 20-gallon inserts in a 32-gallon cart; these are being phased out.

Assigned Garbage Cart Sizes	
Cart Size	Household Size
20-gallon	1 adult or 2 seniors
32-gallon	2 adults or 2 adults and 1 child
64-gallon	2 adults and 2 children or 3 adults
96-gallon	2 adults and 3+ children or 4 adults

Single Family Cart Sizes	
Garbage	20-, 32-, 64- and 96-gallon
Recycling	64- and 96-gallon
Organics	24-, 64- and 96-gallon

Sample Collection Procedures

Each Single-Family Daily List will carry 16 randomly pre-selected addresses to insure that at least 12 of the setouts that arrive at the SMaRT Station are viable and sortable. Reasons for non-viability include unsafe contents or absent setouts - those missing all three carts types. (The addresses with no setouts will still be included in the participation data.) If one or two carts are missing a set-out is still considered eligible since that is representative of the sample.

Starting Friday, September 28, a Recology flatbed truck – which can carry 18 carts, should be set up each afternoon with the first set of empty carts to be swapped out the next study day. The cart inventory should reflect the carts being collected. Assuming three setouts per trip (9+ carts to be swapped and the remaining substitutes), there will be five or six trips. The collection time will vary depending on distance and traffic congestion.

The first day, a field crewmember will go out with the Recology team to assist with the collection of two loads of carts. They will meet at 935 Terra Bella Ave yard at 6:45 a.m. to head out at 7 a.m.

The Recology Collection Team will have multiple City study announcements in hand (Attachment A) and be prepared to discuss study as needed.

The carts will be collected at each stop using the following procedures:

1. Double-check address and confirm/correct cart types, sizes and counts on the list.

2. Collect all carts and place the appropriate brightly colored Sample Identification stickers on each. Replace with substitute carts of same size.
3. Collect cardboard set-outs adjacent to the carts and affix appropriate stickers.

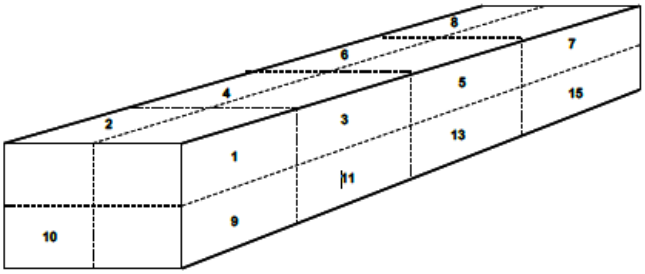
Commercial Front-Load Trash Route Vehicle - Sample Collection

Routes and Vehicles

There are 16 Commercial Front-Load routes per week. Monday has four routes, while Tuesday – Friday has three routes per day. Two to three trips per route; possibly 48 trips. Some are dedicated to certain generators – i.e., Google and their neighbors. Collection starts at 4 a.m.

Collection Procedures

Each Commercial Daily List will carry six randomly pre-selected trips to insure that at least four that arrive at the SMaRT Station are viable and sortable. The goal is 40 samples, four per day; additional samples are acceptable as well. The sample collection and preparation procedures are as follows:



1. The Recology Route Supervisor will direct selected vehicle drivers to take certain loads to the study staging area at the SMaRT Station.
2. The consultant team Field Manager or Crew Leader will verify the vehicle descriptors, collect the placard from the windshield, and interview the driver for additional information.
3. As directed by SMaRT staff, the vehicle driver will dump the selected load in an elongated pile.
4. On the placard, a randomly-generated number (1-16) will be listed and referenced to the grid image at right to determine which cell to extract the sample. (Instead of the numbered cells, alternative identifiers are Back, Front, Middle Front, Middle Back, Left, Right, Top and Bottom.)
5. The SMaRT loader driver will extract the sample from the selected cell under direction of Field Manager, and deposit the sample in the sorting area.
6. After the pile is photographed with placard, loader driver will pull the sample and spread it out as directed.
7. Once the sorting and data recording is completed, the loader driver with remove the sample.

Construction & Demolition Loads at SMaRT Station - Visual Characterizations

At the SMaRT Station all C&D loads are floor-sorted and marketable materials, including wood, metal, plastic, cardboard and inert debris, are recovered for recycling.

The study goal is 40 C&D loads total, averaging three per day. Since the schedule varies daily, each day three loads will be pre-selected at random from the Recology schedule by the consultant team Field Manager. (On the first or any day the Field Manager may choose to pass on one or both loads and make those loads up later in the study.)

1. Before the collection days starts, the Recology Route Supervisor will brief drivers about the study and direct those with selected loads to go to the study staging area at the end of the assigned trip.
2. On arrival at the facility gate the driver will place the placard in the windshield.
3. On arrival at the scale, the Weighmaster will generate a duplicate scale tag – including customer, bin capacity and truck full weight - assuming that information is on the tag, and hand it to the driver while reinforcing the study directions.
4. At the Staging Area, the Field Manager will verify the vehicle's descriptors, collect the placard and duplicate scale tag, and interview the driver for additional information including customer and pick-up address and estimation on how full.
5. The driver will drop the load as directed by SMaRT Station Tip Floor Manager and consultant team Estimator, leaving walk around space for the Estimator.
6. Estimator will photograph the load with placard visible.
7. The Estimator, walking entirely around the pile, will begin by checking off on the sampling form the major material classes.
8. The Estimator will then visually estimate composition by volume for each major material class starting with the largest present by volume. The totals will be calculated to ensure that they add to 100 percent.
9. The SMaRT station sorting crew will sort the load as usual.

Sample Characterization

Sorting Protocol

At the pre-study meetings and at the onset of each study week, the Field Manager will brief the sorting crew on facility-specific health and safety requirements, personal protective equipment (PPE) and contingency protocols as well as the study protocols.

The SMaRT Station Study Area will have two sections – a large staging area for carts and samples awaiting characterization and two adjacent sorting areas with a communal area for

weighing materials. Each needs to be approximately 20 feet wide by 20 feet long with wide cart aisles. The sorting of trash and recyclables require somewhat different configurations. Therefore the two setups will be similar but not identical - tarps, tables, bins, buckets, baskets and smaller containers plus tools. Sorting the organics is generally a simpler process – first weighing and noting the full cart size and weight, dumping it out and weighting the smaller components to determine the largest component.

The standard cart sorting process is as follows:

1. The consultant team Crew Lead will simultaneously manage the cart and sample traffic.
2. The Recology Collection Team will deliver six sets of carts at a time, each with marching id stickers attached siblings.
3. The Lead will confer with the collection crew on status of the Daily List and inventory the carts types and counts and placards to insure they are accurate.
4. The Lead will flip the lids and check the contents for unsafe materials or conditions.
5. Assuming that most carts will arrive in the morning, some will be parked as is in the staging area with their identification stickers all facing in the proper direction. When ready the Lead will direct crewmembers to dump the paired or trios of carts on specific tarps.
6. Each sample will be sorted into the material categories in designated bins, baskets and buckets. Individual crewmembers will specialize in groups of materials, such as Papers or Plastics.
7. The Lead will monitor the homogeneity of materials as they accumulate in each basket, redirecting any that are improperly classified.
8. At the digital scale, each material will be placed in one of a variety of clean scale baskets, each of which has its tare - aka empty weight, recorded on the side an on the Tare Sheet.
9. The Lead will visually inspect the purity of each material as it is weighed and record each weight on the Material Weight Tally Sheet and add relevant notes.

Data Analysis

The data will be collected and documented, using rigorous quality assurance/quality control protocols and the standard statistical procedures used for studies across the country, including past Mountain View characterization studies. The study database is designed to allow for detailed comparison to previous studies and at the same time tie data to current and possible new programs

Conduct Data Quality Control and Assurance

The quality assurance/quality control process includes:

Interviewing collectors and drivers to confirm load specifications, such as origin and sector as well as count.

1. Assigning a unique sample identification number to each sample, maintaining a chain of custody for sample data as it moves from vehicle selection through data entry.
2. Using the Vehicle Selection Form to track the numbers and sectors for each sampled load.
3. Verifying that the field crew accurately completes data forms for each sample and reviews them every evening during the study for accuracy.
4. Encoding the composition analysis formulae so that statistical protocols are consistently applied to different data sets.
5. Extensive data entry checks and random proofing to ensure error-free results.

The data will be entered into a custom characterization database at the conclusion of each sampling event and provide the City with a final accounting of all samples sorted.

Determine Annual Quantities

A complete analysis requires determining the amount of materials from each generator sector. We will rely on the City and Recology to provide annual and/or monthly tonnage estimates for single-family, commercial, and C&D tonnages.

Draft and Final Report

The findings and recommendations will be assembled into a clear, concise, and highly visual report that the City can use with confidence for short- and long-term planning. The final report and accompanying information are expected to include the following elements:

1. Narrative description of the project, including introduction, background, and a summary of study methodology.
2. Definitions of the categories used to characterize samples
3. Characterization findings, in table and chart form:
    a. Overall composition and quantities.
    b. Composition and quantity for each material stream
    c. Estimates of confidence intervals at the 90% confidence level for each identified material categories.
4. Comparisons to the 2010 characterization data
5. Single-Family participation rate
6. Single-Family capture rates
7. Quantities of “problem materials”

8. Detailed methodologies.
9. Examples of each form and list used in the study

The draft version of the report will be submitted to City staff for review. City comments will be incorporated and a final report will be prepared.

Attachment A – City Study Announcement

CITY OF MOUNTAIN VIEW

WHAT ARE WE DOING? **Waste Characterization Study 2018**

About every 10 years, we study our community's wastes to improve recycling, compost, waste reduction and outreach programs for residents and businesses. The "Waste Characterization Study" determines the *composition* of discarded materials, and whether they can be diverted to conserve natural resources and reduce greenhouse gas emissions. See the back side of this flyer for the 2010 study results.

For this year's study, the City has authorized consultants Abbe & Associates to **randomly** select and sample trash, recycling and compost containers at about **200** residential and business properties in October. Each container will be assigned a **unique identifying number (not address location).** Recology will pick up the randomly-selected containers and replace with the same size so there is no change in service level.

Unfortunately, we cannot provide advance notice to residents as that would skew the data and negate random selection. We are simply looking at contents. The authority for removal of containers and contents is found under Mountain View City Code Section 16.19 on the back side of this flyer.

Recology will deliver the containers to the SMaRT Station where the consultants will sort and weigh the contents into a multitude of categories (e.g. clean paper, plastic bottles, metal cans, food scraps, and non-recyclable, non-compostable trash). Afterwards, the materials will be processed as usual for diversion or landfill.

The data collected during the study is the first step in updating the Zero Waste Plan to improve City environmental programs and services. The Zero Waste Plan will be presented to the City Council at a public hearing in 2019, and will be used again later when the City Council considers new collection, processing and landfill agreements (expiring in 2021).

QUESTIONS? Contact Cynthia Palacio at (650) 903-6033 or cynthia.palacio@mountainview.gov.

Waste Disposed by Residents and Businesses 2010

Figure 1: Composition of Disposed Waste

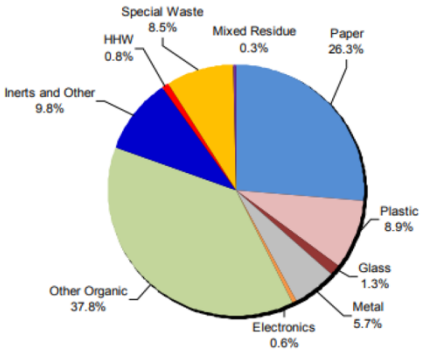
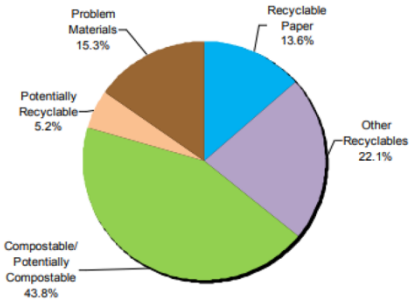


Figure 2: Recoverability Grouping



Visit www.mountainview.gov/ZeroWaste and www.mountainview.gov/WhatGoesWhere

Mountain View City Code Sec. 16.19. - Property interest in matter removed.

a. All garbage and waste, upon being removed by the authorized disposal service operator, from the premises where produced and accumulated, shall become and be the property of the city.

b. Recyclable material, upon being placed at the curb or other collection station, shall become and be the property of the city or its authorized disposal service operator . . . .

Attachment B – Data Collection Lists and Placards

Mt. View WCS Material Sheet, Oct 2018 - Single Family Day/Date **MO 10/01**

Scale Master/Recorder Set-Out ID

1. PAPER

	Pounds R	Pounds T
Uncoated Corrugated Cardboard - Clean, Flattened		
Uncoated Corrugated Cardboard - Clean, Unflattened		
Kraft Paper - Grocery Bags or Paper		
Newspaper		
Office Paper		
Catalogs, Directories and Magazines		
Phonebooks		
Other Clean Paper		
Coated Corrugated Cardboard		
Pizzeria Boxes		
Paper Towels/Tissues		
Aseptic Packaging		
Gable Top Cartons		
Paper Takeout Containers, Poly-Lined		
Paper Cups, Poly-Lined or Eco-Cups		
Other Poly-Lined Paperboard		
Compostable Paper		
Remainder/Composite Non-Compostable Paper		

2. PLASTIC

Note CRV Count and Weight		
PETE Bottles, (#1) R: T:		
PETE Food Containers and Packaging (#1)		
PETE Non-Food Packaging		
HDPE Containers (One Gallon Or Less) (#2)		
HDPE Containers (Greater Than One Gallon)		
Expanded Polystyrene, Food Packaging (#6)		
Expanded Polystyrene, Other (#6)		
Miscellaneous Food Service Containers (#3, #4, #5, #7)		
Miscellaneous Containers (#3, #4, #5 #7)		
Flexible Pouches		
Film, Non-Bag Commercial And Industrial Packaging		
Durable Plastic Items, Bulky Rigid (#2, #5)		
Durable Plastic Items - Other		
Remainder/Composite Plastics		

3. GLASS

Note CRV Count and Weight		
Glass Bottles & Containers, Clear R: T:		
Glass Bottles & Containers, Blue or Red R: T:		
Glass Bottles & Containers, Brown R: T:		
Glass Bottles & Containers, Green R: T:		
Glass Bottles & Containers, Other R: T:		
Non-Composite Glass, Other		
Remainder/Composite Glass		

4. METAL

Note CRV Count and Weight	Pounds R	Pounds T
Aluminum Cans R: T:		
Non-Ferrous Metal, Other		
Tin/Steel Cans		
Appliances, Small		
Appliances, Major		
Ferrous Metal, Other		
Remainder/Composite Metal		

5. ORGANICS

Leaves And Grass		
Woody Prunings And Trimmings		
Branches, Logs And Stumps		
Agricultural Crop Residues		
Food Scraps, Edible		
Food Scraps, Inedible		
Recoverable Food		
Other Compostable Organics		
Diapers		
Sanitary Products		
Dog and Cat Feces and Litter		
Manures, Other Animal		
Carpet, Compostable		
Compostable Organics, Other		
Remainder/Composite Non-Compostable Organic		

6. C & D

Dimensional Lumber, Untreated		
Dimensional Lumber, Treated		
Engineered Wood, Untreated		
Engineered Wood, Treated		
Pallets And Crates		
Asphalt Paving		
Asphalt Composition Shingles		
Other Asphalt Roofing Material		
Concrete		
Gypsum, Unpainted		
Gypsum, Painted		
C&D Glass		
Fiberglass Insulation		
Carpet, Non-compostable		
Remainder/Composite C & D		

Mt. View WCS Material Sheet, Oct 2018 - Single Family

Day/Date **MO 10/01**

Scale Master/Recorder

Set-Out ID

Counts

7. HAZARDOUS

	R	T
Paint, Latex		
Paint, Oil		
Non-Empty Aerosol Cans - Propane, Butane, Pesticides		
Pesticides, Other		
Fluorescent Lamps, Mercury *		
Mercury Products - Thermometers, Thermostats		
Cleaning Products		
Medical Waste, Untreated *		
Medical Waste, Untreated, Sharps *		
Medical Waste, Treated *		
Pharmaceuticals *		
Cold Packs		
Blue Wrap		
Motor Oil		
Vehicle And Equipment Fluids		
Oil and Fuel Filters		
Batteries, Lead-Acid		
Batteries, Lithium Ion		
Batteries, Household - Size:		
Computer-Related Electronics, Small		
Computer-Related Electronics, Large		
Televisions And Monitors		
Consumer Electronics, Other		
Other Hazardous		
Remainder/Composite Hazardous Waste		

8. OTHER

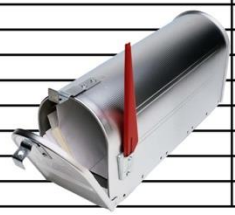
Bags, Compostable Produce, - Brown. Green. Clear	
Bags, Grocery, Disposable Paper	
Bags, Grocery, Disposable Plastic	
Bags, Grocery, Other Merchandise	
Bags, Grocery, Reusable	
Textiles and Leather	
Furniture	
Mattresses & Box Springs	
Tires, All kinds	
Rubber, Other:	
Cooking Oil *	

* Targeted Materials

Types, Materials, Counts and Pounds

9. REUSABLES *

	R	T



ORGANICS CART

Leaves And Grass		
Woody Prunings And Trimmings		
Branches, Logs And Stumps		
Agricultural Crop Residues		
Food Scraps, Edible		
Food Scraps, Inedible		
Recoverable Food		
Other Compostable Organics		
Diapers		
Sanitary Products		
Dog and Cat Feces and Litter		
Manures, Other Animal		
Carpet, Compostable		
Compostable Organics, Other		
Remainder/Composite Non-Compostable Organic		

OFFICE USE		

Mt. View WCS Material Sheet, Oct 2018 - Front Loader

Day/Date **MO 10/01**

Scale Master/Recorder

Set-Out ID

Pounds

1. PAPER

	R	T
Uncoated Corrugated Cardboard - Clean, Flattened		
Uncoated Corrugated Cardboard - Clean, Unflattened		
Kraft Paper - Grocery Bags or Paper		
Newspaper		
Office Paper		
Catalogs, Directories and Magazines		
Phonebooks		
Other Clean Paper		
Coated Corrugated Cardboard		
Pizzeria Boxes		
Paper Towels/Tissues		
Aseptic Packaging		
Gable Top Cartons		
Paper Takeout Containers, Poly-Lined		
Paper Cups, Poly-Lined or Eco-Cups		
Other Poly-Lined Paperboard		
Compostable Paper		
Remainder/Composite Non-Compostable Paper		

2. PLASTIC

Note CRV Count and Weight		
PETE Bottles, (#1) R: T:		
PETE Food Containers and Packaging (#1)		
PETE Non-Food Packaging		
HDPE Containers (One Gallon Or Less) (#2)		
HDPE Containers (Greater Than One Gallon)		
Expanded Polystyrene, Food Packaging (#6)		
Expanded Polystyrene, Other (#6)		
Miscellaneous Food Service Containers (#3, #4, #5, #7)		
Miscellaneous Containers (#3, #4, #5 #7)		
Flexible Pouches		
Film, Non-Bag Commercial And Industrial Packaging		
Durable Plastic Items, Bulky Rigid (#2, #5)		
Durable Plastic Items - Other		
Remainder/Composite Plastics		

3. GLASS

Note CRV Count and Weight		
Glass Bottles & Containers, Clear R: T:		
Glass Bottles & Containers, Blue or Red R: T:		
Glass Bottles & Containers, Brown R: T:		
Glass Bottles & Containers, Green R: T:		
Glass Bottles & Containers, Other R: T:		
Non-Composite Glass, Other		
Remainder/Composite Glass		

4. METAL

Pounds

Note CRV Count and Weight	R	T
Aluminum Cans R: T:		
Non-Ferrous Metal, Other		
Tin/Steel Cans		
Appliances, Small		
Appliances, Major		
Ferrous Metal, Other		
Remainder/Composite Metal		

5. ORGANICS

Leaves And Grass		
Woody Prunings And Trimmings		
Branches, Logs And Stumps		
Agricultural Crop Residues		
Food Scraps, Edible		
Food Scraps, Inedible		
Recoverable Food		
Other Compostable Organics		
Diapers		
Sanitary Products		
Dog and Cat Feces and Litter		
Manures, Other Animal		
Carpet, Compostable		
Compostable Organics, Other		
Remainder/Composite Non-Compostable Organic		

6. C & D

Dimensional Lumber, Untreated		
Dimensional Lumber, Treated		
Engineered Wood, Untreated		
Engineered Wood, Treated		
Pallets And Crates		
Asphalt Paving		
Asphalt Composition Shingles		
Other Asphalt Roofing Material		
Concrete		
Gypsum, Unpainted		
Gypsum, Painted		
C&D Glass		
Fiberglass Insulation		
Carpet, Non-compostable		
Remainder/Composite C & D		

Mt. View WCS Material Sheet, Oct 2018 - Front Loader

Day/Date **MO 10/01**

Scale Master/Recorder

Set-Out ID

Counts

7. HAZARDOUS

	R	T
Paint, Latex		
Paint, Oil		
Non-Empty Aerosol Cans - Propane, Butane, Pesticides		
Pesticides, Other		
Fluorescent Lamps, Mercury *		
Mercury Products - Thermometers, Thermostats		
Cleaning Products		
Medical Waste, Untreated *		
Medical Waste, Untreated, Sharps *		
Medical Waste, Treated *		
Pharmaceuticals *		
Cold Packs		
Blue Wrap		
Motor Oil		
Vehicle And Equipment Fluids		
Oil and Fuel Filters		
Batteries, Lead-Acid		
Batteries, Lithium Ion		
Batteries, Household - Size:		
Computer-Related Electronics, Small		
Computer-Related Electronics, Large		
Televisions And Monitors		
Consumer Electronics, Other		
Other Hazardous		
Remainder/Composite Hazardous Waste		

8. OTHER

Bags, Compostable Produce, - Brown. Green. Clear		
Bags, Grocery, Disposable Paper		
Bags, Grocery, Disposable Plastic		
Bags, Grocery, Other Merchandise		
Bags, Grocery, Reusable		
Textiles and Leather		
Furniture		
Mattresses & Box Springs		
Tires, All kinds		
Rubber, Other:		
Cooking Oil *		

* Targeted Materials

Types, Materials, Counts and Pounds

9. REUSABLES *

	R	T

ORGANICS CART

Leaves And Grass		
Woody Prunings And Trimmings		
Branches, Logs And Stumps		
Agricultural Crop Residues		
Food Scraps, Edible		
Food Scraps, Inedible		
Recoverable Food		
Other Compostable Organics		
Diapers		
Sanitary Products		
Dog and Cat Feces and Litter		
Manures, Other Animal		
Carpet, Compostable		
Compostable Organics, Other		
Remainder/Composite Non-Compostable Organic		

OFFICE USE		

Mt. View WCS Material Sheet, Oct 2018 - C&D

Day/Date **MO 10/01**

Scale Master/Recorder

Set-Out ID

Percents

1. PAPER

Uncoated Corrugated Cardboard - Clean, Flattened		
Uncoated Corrugated Cardboard - Clean, Unflattened		
Kraft Paper - Grocery Bags or Paper		
Newspaper		
Office Paper		
Catalogs, Directories and Ma...es		
Phonebooks		
Other Clean Paper		
Coated Corrugated Cardboard		
Pizzeria Boxes		
Paper Towels/Tissues		
Aseptic Packaging		
Gable Top Cartons		
Paper Takeout Containers, Poly-Lined		
Paper Cups, Poly-Lined or Eco-Cups		
Other Poly-Lined Paperboard		
Compostable Paper		
Remainder/Composite Non-Compostable Paper		

2. PLASTIC

PETE Bottles, (#1)		
PETE Food Containers and Packaging (#1)		
PETE Non-Food Packaging		
HDPE Containers (One Gallon Or Less) (#2)		
HDPE Containers (Greater Than One Gallon)		
Expanded Polystyrene, Food Packaging (#6)		
Expanded Polystyrene, Other (#6)		
Miscellaneous Food Service Containers (#3, #4, #5, #7)		
Miscellaneous Containers (#3, #4, #5 #7)		
Flexible Pouches		
Film, Non-Bag Commercial And Industrial Packaging		
Durable Plastic Items, Bulky Rigid (#2, #5)		
Durable Plastic Items - Other		
Remainder/Composite Plastics		

3. GLASS

Glass Bottles & Containers, Clear		
Glass Bottles & Containers, Blue or Red		
Glass Bottles & Containers, Brown		
Glass Bottles & Containers, Green		
Glass Bottles & Containers, Other		
Non-Composite Glass, Other		
Remainder/Composite Glass		

4. METAL

Aluminum Cans		
Non-Ferrous Metal, Other		
Tin/Steel Cans		
Appliances, Small		
Appliances, Major		
Ferrous Metal, Other		
Remainder/Composite Metal		

5. ORGANICS

Leaves And Grass		
Woody Prunings And Trimmings		
Branches, Logs And Stumps		
Agricultural Crop Residues		
Food Scraps, Edible		
Food Scraps, Inedible		
Recoverable Food		
Other Compostable Organics		
Diapers		
Sanitary Products		
Dog and Cat Feces and Litter		
Manures, Other Animal		
Carpet, Compostable		
Compostable Organics, Other		
Remainder/Composite Non-Compostable Organic		

6. C & D

Dimensional Lumber, Untreated		
Dimensional Lumber, Treated		
Engineered Wood, Untreated		
Engineered Wood, Treated		
Pallets And Crates		
Asphalt Paving		
Asphalt Composition Shingles		
Other Asphalt Roofing Material		
Concrete		
Gypsum, Unpainted		
Gypsum, Painted		
C&D Glass		
Fiberglass Insulation		
Carpet, Non-compostable		
Remainder/Composite C & D		

Mt. View WCS Material Sheet, Oct 2018 - C&D

Day/Date **MO 10/01**

Scale Master/Recorder

Set-Out ID

7. HAZARDOUS

	Counts	
Paint, Latex		
Paint, Oil		
Non-Empty Aerosol Cans - Propane, Butane, Pesticides		
Pesticides, Other		
Fluorescent Lamps, Mercury *		
Mercury Products - Thermometers, Thermostats		
Cleaning Products		
Medical Waste, Untreated *		
Medical Waste, Untreated, Sharps *		
Medical Waste, Treated *		
Pharmaceuticals *		
Cold Packs		
Blue Wrap		
Motor Oil		
Vehicle And Equipment Fluids		
Oil and Fuel Filters		
Batteries, Lead-Acid		
Batteries, Lithium Ion		
Batteries, Household - Size:		
Computer-Related Electronics, Small		
Computer-Related Electronics, Large		
Televisions And Monitors		
Consumer Electronics, Other		
Other Hazardous		
Remainder/Composite Hazardous Waste		

8. OTHER

Bags, Compostable Produce, - Brown. Green. Clear		
Bags, Grocery, Disposable Paper		
Bags, Grocery, Disposable Plastic		
Bags, Grocery, Other Merchandise		
Bags, Grocery, Reusable		
Textiles and Leather		
Furniture		
Mattresses & Box Springs		
Tires, All kinds		
Rubber, Other:		
Cooking Oil *		

* Targeted Materials

9. REUSABLES *

Types, Materials, Counts and Percents

ORGANICS CART

	Percents	
Leaves And Grass		
Woody Prunings And Trimmings		
Branches, Logs And Stumps		
Agricultural Crop Residues		
Food Scraps, Edible		
Food Scraps, Inedible		
Recoverable Food		
Other Compostable Organics		
Diapers		
Sanitary Products		
Dog and Cat Feces and Litter		
Manures, Other Animal		
Carpet, Compostable		
Compostable Organics, Other		
Remainder/Composite Non-Compostable Organic		

OFFICE USE		

MON

Front Loader

08-1

10/8/2018

Route	
Truck	

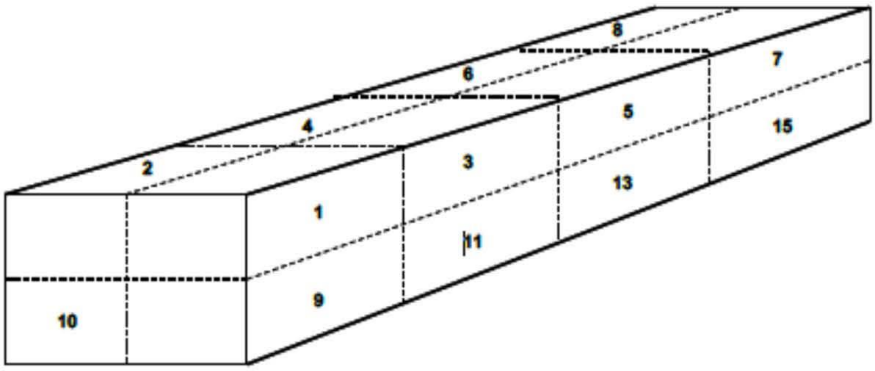
DRIVERS:
Please check in with the scale attendant. Thanks!

Abbe and Associates, Mt. View Waste Characterization Study, October 2018

MON

Front Loader

08-1



Cell 7

Abbe and Associates, Mt. View Waste Characterization Study, October 2018

MON

C&D
08-1

10/8/18

Route/Truck	
Contractor	
Service Address	

DRIVERS:

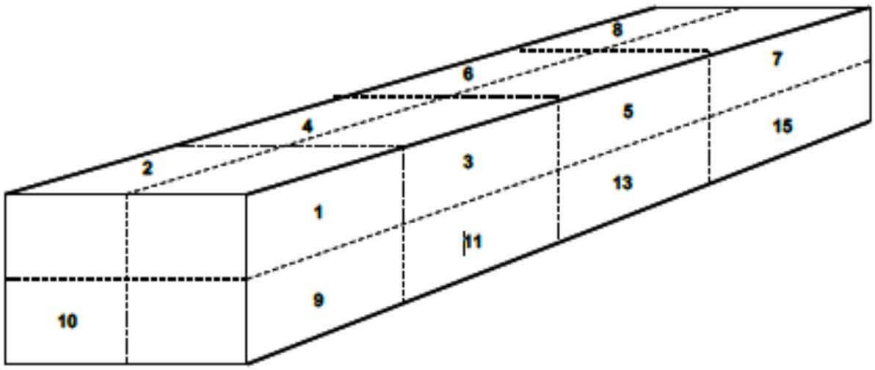
Please check in with scale attendant. Do not drop load until you hand this placard to study crew and are directed where to drop. -- Thanks!

Abbe and Associates, Mt. View Waste Characterization Study, October 2018

MON

C&D

08-1



Cell 8

Abbe and Associates, Mt. View Waste Characterization Study, October 2018

Appendix B
Material Type Definitions

Samples were characterized according to the following list of 100 material types.

MATERIAL CLASS	MATERIAL TYPE	DEFINITION	EXAMPLES
PAPER			
1	**Uncoated Corrugated Cardboard - Clean, Flattened**	Uncoated boxes, packaging, sheets and other pieces with a corrugated layer sandwiched between two layers that has been flattened to reduce the volume.	Shipping boxes, some shoe boxes.
2	**Uncoated Corrugated Cardboard - Clean, Unflattened**	Uncoated boxes, packaging, sheets and other pieces with a corrugated layer sandwiched between two layers that has NOT been flattened to reduce the volume.	Shipping boxes, clean pizza boxes, some shoe boxes.
3	**Kraft Bags/Kraft Paper**	Bags and sheets made from brown (unbleached) or white (bleached).	Paper fast food bags, department store bags and heavyweight sheets of Kraft packing paper.
4	**Newspaper**	Ground wood paper used in newspapers.	Clay coated glossy ad inserts and other items made from newsprint, such as advertising circulars, election guides and tax instruction booklets.
5	**Office Paper**	Paper used in offices.	Photocopy and printer paper, letter paper, colored ledger, manila folders, manila envelopes, index cards, envelopes, notebook paper, junk mail and carbonless forms.
6	**Catalogs, Directories and Magazines**	Items made of glossy coated paper or thin paper between coated covers. These items are bound along the spine with glue.	Magazines, catalogs, brochures, pamphlets, whole or damaged telephone books, yellow pages and real estate listings.

MATERIAL CLASS	MATERIAL TYPE	DEFINITION	EXAMPLES
7	**Clean Paper, Other**	Paper and paper products recycled curbside except paper items otherwise categorized.	High grade white or colored ledger, paper bags, bond, rag, stationary, office, copy or printing paper and low grade mixed junk mail, envelopes (plastic windows ok), magazines, clay coated glossy catalogs, brochures and pamphlets, hardback and paperback books, spiral notebooks, manila folders, index cards, self-adhesive notes, phonebooks, shredded paper, construction paper, butcher paper, Kraft or bleached sheets, toilet paper tubes, non-corrugated box/liner/chip/paper board (e.g., cereal and tissue boxes, six pack holders), egg cartons, tissue wrapping paper, blueprints, photographs (not Polaroid), hard cover books and carbonless forms. Minor amounts of glue or other binding are okay.
8	**Coated Corrugated Cardboard**	Boxes, packaging, sheets and other pieces with a corrugated layer sandwiched between two outer layers where at least one of the 3 layers is waxed or paraffin or poly coated, typically to make it liquid resistant such as for perishable produce shipping boxes.	
9	**Pizzeria Boxes**	Boxes used for take-out or delivery of prepared pizza.	Clean and soiled boxes.
10	**Paper Towels/Tissues**	Paper towels, napkins, tissues, toilet paper and other short fiber, potentially soiled, paper that is not recyclable, but is compostable.	Cotton balls, pads and non-plastic swabs and wipes.
11	**Aseptic Packaging**	Multilayer composite cartons of bleached paper, poly film and foil, such as juice, milk, soup and tofu boxes.	
12	**Gable Top Cartons**	Containers that are poly or wax (not clay) coated inside and/or outside with a gable top.	Milk and juice cartons (including those with plastic spouts). Does not include aseptic packaging.

MATERIAL CLASS	MATERIAL TYPE	DEFINITION	EXAMPLES
13	**Paper Takeout Containers, Poly-Lined**	Rigid paper containers used for serving or transporting single-use, ready to eat, prepared foods from a food service point-of-sale.	Boxes and clamshells from grocery store or deli "hot food" or salad bars, "Chinese food" take out cartons, etc. Does not include paper cups or wraps (like for a hamburger, deli sandwich or burrito) or items in paper retail packaging like frozen foods, cereals.
14	**Paper Cups, Poly-Lined**	Hot or cold cups, poly or wax coated inside and/or outside.	Coffee and other hot drinks, soda and other cold drinks.
15	**Paper Cups, Eco-Cups**	Hot or cold cups, PLA lined inside and/or outside.	Coffee and other hot drinks, soda and other cold drinks.
16	**Poly-Coated Paperboard Packaging**	Paper and paper products that are poly, compostable plastic or wax (not clay) coated inside and/or outside.	Fast food wrappers, pizza box liners, butcher paper and ice cream and other frozen/refrigerated food packaging. This does not include coated corrugated cardboard, items with a gable top or prepared food takeout containers.
17	**Compostable Paper**	Paper not defined in other categories that can be composted, but not recycled due to being soiled with food or other materials accepted in the organic program.	Paper towels, cups, plates, take-away food packaging, tissues.
18	**Remainder/Composite Non-Compostable Paper**	Predominantly paper items with one or more material rendering them hard to recycle or compost.	Chip, cereal or juice concentrate cans, carbon paper, foil laminated paper boxes and gum wrappers, packaging with large plastic windows (blister packs) or integrated foam and heavily plastic laminated or painted paper.
PLASTIC			
19	**Pete Bottles (#1)**	Polyethylene terephthalate bottles one liter or less in size. May bear "1" in the triangular recycling symbol, "PETE" and/or "PET".	Single-serve water bottles, sports drink bottles and soda bottles. Usually has ribs and a narrow neck as well as a small dot on bottom, not a seam, from the manufacturing process.
20	**Pete Food Containers and Packaging (#1)**	Polyethylene terephthalate food containers and packaging. May bear "1" in the triangular recycling symbol, "PETE" and/or "PET".	Jars, clamshells, frozen food trays, retail packaging and other rigid items.

MATERIAL CLASS	MATERIAL TYPE	DEFINITION	EXAMPLES
21	**Pete Non-Food Packaging (#1)**	PETE (polyethylene terephthalate) non-food packaging. May bear "1" in the triangular recycling symbol and/or "PETE" or "PET".	Electronics packaging, small retail packaging, battery packaging and many other types.
22	**HDPE Containers (One Gallon or Less) (#2)**	High-density polyethylene bottles, jars, tubs, lids and other rigid items. May bear "2" in the triangular recycling symbol and/or "HDPE".	Distilled water, milk, juice, vinegar, yogurt, detergent and empty motor oil or antifreeze containers.
23	**HDPE Containers (Greater Than One Gallon) (#2)**	High-density polyethylene containers - typically bottles, buckets or pails, designed to hold 1 gallon or more. Usually cloudy white (natural) or a solid (colored). May bear "2" in the triangular recycling symbol and/or "HDPE".	Includes commercial buckets with or without metal handles used to contain food or products.
24	**Expanded Polystyrene, Food Packaging (#6)**	Expanded polystyrene or “Styrofoam” food containers. May bear "6" in the triangular recycling symbol and/or “PS".	Clamshells, cups, plates and bowls.
25	**Expanded Polystyrene, Other (#6)**	Styrofoam and other expanded polystyrene items.	Packaging blocks and peanuts, insulation, non- corrugated foam core, including sandwiched between two layers of paper or plastic and other rigid items.
26	**Miscellaneous Food Service Containers (#3, #4, #5, #7)**	Food service containers with 2 or more hinged or fitted parts that must be pried, torn or cut open. Items may be made of PVC (polyvinyl chloride), LDPE (low-density polyethylene), PP (polypropylene) or mixed resins. May bear "3", "4", "5" or "7" in the triangular recycling symbol or letters ("PP", "PVC", etc.).	Clam shells, plastic flatware, plastic plates, plastic cups, plastic tubs and all other food service plastic that does not occur in another plastics category. Does not include HDPE (high-density polyethylene) or PETE (polyethylene terephthalate) containers.
27	**Miscellaneous Containers (#3, #4, #5, #7)**	Assorted containers made of polyvinyl chloride (PVC), low-density polyethylene (LDPE), polypropylene (PP), non-expanded styrene (PS) and other resins - "7".	Unlabeled, unidentifiable plastic bottles, jars, tubs, lids and other rigid items that does not occur in another category. Does not include HDPE (high-density polyethylene) or PETE (polyethylene terephthalate) containers.

MATERIAL CLASS	MATERIAL TYPE	DEFINITION	EXAMPLES
28	**Flexible Pouches**	Plastic pouches made multi-layer flexible material thicker than potato chip and frozen vegetable bags. May have a flat bottom so that package would stand up on its own. Does not include thinner, single-layer packaging.	Plastic coffee bags like Starbucks and Peet's; Capri Sun pouches; baby food pouches - may have plastic screw top; soup pouches; salad dressing pouches; wine pouches; backpacking meals in pouches; soap refill pouches; laundry detergent pouches; and other similar items. Does not include Potato chip and similar bags, Tortilla bags , Frozen food bags (vegetables, berries), Nut/snack bags, Candy wrappers, Shrink plastic wrappers (Slim Jim and string cheese), Ziploc bags intended for home use. Thin produce bags as used in grocery stores, newspaper bags, Bread bags , Small (2 inch) sachets for condiments (mustard, relish, etc.), Yogurt tubes (Gogurt), Mailing pouches, usually colored or white (not clear) (LL Bean, medication pouches), 100% Plastic mailing pouches with bubble wrap, Other similar items.
29	**Film, Bags**	Single layer clear or colored bags film without an inner foil or metallic layer.	Dry cleaning, newspaper, sandwich, bread, cracker, tortilla chip, stretch, shrink and bubble wrap, plastic sheeting, frozen food and clear or colored grocery, department store and other retail and food establishment merchandise and to-go bags.
30	**Film, Non-Bag Commercial and Industrial Packaging**	Single layer clear or colored film without an inner foil or metallic layer.	
31	**Durable Plastic Items, Bulky Rigid (#2, #5)**	Rigid items made predominately from plastic (usually a single resin) and intended for multiple uses.	Clothes hangers, buckets, lawn furniture, plastic pipe and some toys,

MATERIAL CLASS	MATERIAL TYPE	DEFINITION	EXAMPLES
32	**Durable Plastic Items, Other**	Plastic items other than containers, film or miscellaneous plastic containers (#3-#7). May bear numbers in the triangular recycling symbol.	Plastic outdoor furniture, plastic toys and sporting goods, CDs and plastic housewares, such as mop buckets, dishes, cups and cutlery. This type also includes building materials such as house siding, window sashes and frames, housings for electronics such as computers, televisions and stereos, fan blades, impact-resistant cases such as tool boxes and first aid boxes.
33	**Bags, Compostable**	Polylactic acid (PLA) and other bags labeled "compostable".	Kitchen compost and produce bags, in restroom paper towel or restaurant food scrap bags. Does not include compostable plastic bags that are not ASTM D6400 or D6868 compliant.
34	**Compostable Plastics, Other**	Polylactic acid (PLA) and polyhydroxyalkanoate (PHA) cups, lids, plates, bowls, clamshells, trays, utensils and other non-bags labeled "compostable".	Does not include compostable plastic products that are not ASTM D6400 or D6868 compliant.
35	**Remainder/Composite Plastics**	Items that are predominantly rigid plastic, but have more than one type of plastic and/or other materials like metal or film plastics not categorized elsewhere.	Toothbrushes, disposable razors, pens, some toys, lighters, vinyl binders, hoses, foil and plastic blister packs (such as for medications) and fiberglass products except insulation. Includes non-recyclable film like trash bags, condiment pouches, mailing pouches, shower curtain, woven polyethylene (e.g., grain bags, wipes, dryer sheets) and mylar balloons. Does not include appliances or electronics.
GLASS			
36	**Glass Bottles & Containers, Clear**	Clear, container grade glass bottles and jars.	Water, soda, juice, wine, beer, liquor, vinegar, condiments, pickles, body care and other products.
37	**Glass Bottles & Containers, Brown**	Brown, container grade glass bottles and jars.	Water, soda, juice, wine, beer, liquor, vinegar, condiments, pickles, body care and other products.
38	**Glass Bottles & Containers, Green**	Green, container grade glass bottles and jars.	Water, soda, juice, wine, beer, liquor, vinegar, condiments, pickles, body care and other products.

MATERIAL CLASS	MATERIAL TYPE	DEFINITION	EXAMPLES
39	**Glass Bottles & Containers, Red or Blue**	Red or blue, container grade glass bottles and jars.	Water, soda, juice, wine, beer, liquor, vinegar, condiments, pickles, body care and other products.
40	**Non-Composite Glass, Other**	Items made only of clear or tinted glass that is not container glass.	Drinking glasses, crystal and laboratory ware, table tops or blown glass. Includes tempered or toughened glass (such as flat side or rear window auto glass).
41	**Remainder/Composite Glass**	Items that are predominantly glass, but have other materials like wire mesh or plastic lamination (curved auto windshields, bus shelter and other safety glass), silvering (mirrors) or other components (incandescent and halogen bulbs).	Does not include mercury lamps or construction glass, both of which have its own category.
METAL			
42	**Aluminum Cans**	Aluminum and bi-metal cans made mostly of aluminum, aluminum aerosol cans (empty or full) with non-toxic contents.	Aluminum soda or beer cans and some pet food cans. Does not include bimetal containers with steel sides and aluminum ends.
43	**Non-Ferrous Metal, Other**	Items at least 75% non-ferrous metal (metals not derived from iron, to which a magnet will not adhere and not stainless steel).	Products and scrap that are not cans and foil, such as window frames, siding and cookware. Includes metals and alloys such as aluminum, copper, brass, bronze, lead and zinc and products such as pipe and shell casings.
44	**Tin/Steel Cans**	Steel containers including bi-metal cans made mostly of steel.	Food cans, empty steel paint cans, empty steel aerosol cans for hazardous products and all (empty or full) steel aerosol cans with non-toxic contents.
45	**Appliances, Small**	Small appliances without extensive circuitry.	Toasters, blenders, mixers, coffee makers, kitchen scales and other small appliances.
46	**Ferrous Metal, Other**	Items at least 75% ferrous metal (iron or steel that is magnetic or stainless steel), but not cans & lids or appliances.	Coat hangers, stainless steel cookware, bed frames, pipe, beams, rebar, security bars, small car parts and other ferrous scrap.
47	**Remainder/Composite Metal**	Items predominately metal, both ferrous and non-ferrous and/or with more than 25% non-metal materials, such as certain motors, insulated wire and other products that are not appliances.	
ORGANICS			

MATERIAL CLASS	MATERIAL TYPE	DEFINITION	EXAMPLES
48	**Leaves and Grass**	Prunings and cuttings from bushes, shrubs and trees and non-woody plant materials.	Grass clippings, sod, leaves, dead flowers, weeds, loose or rolled tobacco (without filters but including any rolling paper), cork, hemp rope and other plant material. Includes all plant types and branches, trunks and stumps of any size.
49	**Woody Prunings And Trimmings**	Woody plant material up to 4 inches in diameter from any public or private landscape.	Prunings, shrubs and small branches with branch diameters that do not exceed 4 inches. This type does not include stumps, tree trunks, branches exceeding 4 inches in diameter or material from agricultural sources.
50	**Branches, Logs and Stumps**	Branches, logs and stumps that exceed 4 inches in diameter, from any public or private landscape.	
51	**Food Scraps, Edible**	The components of food that, in a particular food supply chain, are intended to be consumed by humans. What is considered edible varies (e.g., chicken feet are consumed in some food supply chains but not others), changes over time and is influenced by a range of variables.	
52	**Food Scraps, Inedible**	The components of food not included in edible food.	Skins, pits, bones, eggshells, coffee grounds, tea bags, artichoke leaves etc.
53	**Recoverable Food**	Unexpired, unopened food containers and packages that were edible and recoverable when placed in cart.	Canned food, bottled beverages, large amounts of produce such as pumpkins or apples.
54	**Diapers**	Diapers made from a combination of fibers, synthetic and/or natural, primarily for single use.	Disposable baby diapers and any contents, including human feces not in diapers, etc.
55	**Sanitary Products**	Non-diaper sanitary products made from a combination of fibers, synthetic and/or natural, primarily for single use.	Adult protective undergarments, feminine hygiene products including contents.
56	**Dog and Cat Feces and Litter**	Non-human animal feces and associated litter.	Soiled paper and other litter materials and animal carcasses not resulting from food storage or preparation. Cat feces and kitty litter, dog poop, bird droppings, horse manure and soiled bedding.

MATERIAL CLASS	MATERIAL TYPE	DEFINITION	EXAMPLES
57	**Compostable Organics, Other**	Disposable foodware, wood utensils, stirrers, toothpicks, popsicle sticks, candles, compostable packaging peanuts, hair, finger nails, etc.	
58	**Remainder/Composite Non-Compostable Organic**	Predominantly organic items that are mixed with non-organic materials and cannot easily be separated for composting.	
C&D			
59	**Dimensional Lumber, Untreated**	New or demolition milled lumber, packaging panelboard and sawdust.	Small amounts of paint, nails and other contaminants allowed such as 2 x 4s with painted ends.
60	**Dimensional Lumber, Treated**	New or demolition milled lumber, packaging panelboard and sawdust treated with a chemical preservative for protection against pests and environmental conditions.	Treated with creosote, arsenic, chrO56:P64omium, copper or pentachlorophenol - typically identified by "staple marks" by which chemical was injected into the wood, a characteristic green color and/or presence of obvious crystals. Does NOT include painted or stained wood.
61	**Engineered Wood, Untreated**	Unpainted new or demolition scrap used for sheathing and related construction.	Plywood, particleboard, wafer board oriented strand board and other residual materials. May contain nails or other trace contaminants.
62	**Engineered Wood, Treated**	Painted or stained new or demolition scrap used for sheathing and related construction treated with a chemical preservative for protection against pests and environmental conditions.	Treated plywood, particleboard, wafer board oriented strand board and other residual materials. May contain nails or other trace contaminants.
63	**Pallets and Crates**	Unpainted wood pallets and crates (whole or broken), as well as packaging made of lumber or engineered wood.	
64	**Asphalt Composition Shingles**	Fiberglass or organic felts saturated with asphalt and covered with inert aggregates.	Commonly known as three tab roofing; does not include built-up roofing.

MATERIAL CLASS	MATERIAL TYPE	DEFINITION	EXAMPLES
65	**Roofing Materials, Other**	Built-up roof membranes, other asphaltic roofing membranes, single-ply roofing membranes, roof paneling that is gypsum sandwiched between fiberglass-reinforced coatings, contaminated wood shingles, contaminated clay roofing and contaminated metal roofing.	If clean, put in respective category.
66	**Inerts/Concrete, Rock, Soil and Fines**	Concrete (building foundations, sidewalk paving and cinder blocks), cement mix, asphalt, brick, clay roofing, ceramic or porcelain (toilets, sinks, tile and some dishware), rock, gravel, soil and sand with minimal organic contamination.	Concrete containing steel mesh and/or reinforcement bars (rebar).
67	**Gypsum, Unpainted**	Calcium sulfate dehydrate sandwiched between layers of Kraft-type paper.	Unpainted and untreated, new or old, broken or whole sheets of drywall, sheetrock, wallboard, plasterboard (without plaster), gypboard or gyproc. Excludes exterior or roof paneling that is gypsum sandwiched between fiberglass-reinforced coatings.
68	**Gypsum, Painted**	Used or demolition gypsum drywall that has been painted, treated or plastered.	Exterior paneling that is gypsum sandwiched between fiberglass-reinforced coatings.
69	**C&D Glass**	Glass used for construction purposes.	Window panes, sliding doors and architectural glass.
70	**Fiberglass Insulation**	Fiberglass building and mechanical insulation, batts or rigid.	
71	**Carpeting, Non-Compostable**	Flooring applications of various natural (e.g., wool) or synthetic (e.g., nylon) fibers typically bonded to some type of backing material.	Other soft floor coverings such as synthetic turf, carpet padding, commonly made of urethane foam, but could be felt from jute, hair or other synthetic materials, such as recycled carpet fibers and coated with latex or other resin.
72	**Remainder/Composite C&D**	Materials commonly used in residential and commercial construction that cannot be put in any other type. May include items from different materials combined, because they would be very hard to separate.	Wood with significant metal, concrete, drywall or other contaminants, such as substantial glue or binders in plywood, particleboard, wafer board or oriented strand board.
HAZARDOUS			

MATERIAL CLASS	MATERIAL TYPE	DEFINITION	EXAMPLES
73	**Paint, Latex**	Water based latex coatings	Architectural paint, automotive, specialty (traffic marking) paint NOT packaged under pressure.
74	**Paint, Oil**	Oil-based alkyds and coatings	Architectural paint, automotive, specialty (traffic marking) paint NOT packaged under pressure.
75	**Non-Empty Aerosol Cans (Propane, Butane, Pesticides)**	Non-empty pressurized containers which hold a consumer product characterized as a hazardous waste.	Spray paint, bug sprays, hair spray, oven cleaners, waterproofing sprays. Does NOT include cooking oil, deodorant, room/air freshener, starch or compressed air (keyboard cleaner).
76	**Pesticides, Other**	Pesticides, insecticides, herbicides and wood preservatives NOT packaged under pressure. (No aerosols.)	
77	**Fluorescent Lamps, Mercury**	Lighting bulbs and tubes with intentionally added mercury.	Fluorescent and compact fluorescents, High Intensity Discharge (HID), sodium vapor lamps and neon signs. Does NOT include incandescent or halogen bulbs or tubes.
78	**Cleaning Products**	Consumer products intended for cleaning NOT packaged under pressure. (No aerosols.)	Ammonia, bleach, "green" cleaners, waxes and polishes.
79	**Medical Waste, Untreated**	Materials used in medical processes.	Tubing, surgical tray liners, exam table liners, latex gloves, bandages and any materials in red biohazard bags.
80	**Medical Waste, Untreated, Sharps**	Needles, syringes and lancets.	
81	**Medical Waste, Treated**	Medical waste that has been processed in order to change its physical, chemical or biological character or composition or to remove or reduce its harmful properties or characteristics, as defined in Section 25123.5 of the Health and Safety Code. Bags of treated medical waste may appear shrunken from sterilization.	
82	**Pharmaceuticals**	Medicine intended for human or veterinary use, including prescription and over-the-counter drugs, vitamins, nutritional products.	

MATERIAL CLASS	MATERIAL TYPE	DEFINITION	EXAMPLES
83	**Blue Wrap**	Blue polypropylene (# 5 plastic) used for wrapping surgical instruments for sterilization.	
84	**Cold Packs**	Re-usable liquid or gel packs commonly used to keep food cool in portable coolers or as a cold compress to alleviate the pain of minor injuries. Packs may be either flexible or rigid.	
85	**Vehicle and Equipment Fluids**	Containers with fluids used in vehicles or engines.	Used motor oil, antifreeze, brake fluid. Does not include empty vehicle and equipment fluid containers.
86	**Oil and Fuel Filters**	Metal and plastic oil and fuel filters used in vehicles or other types of equipment.	
87	**Batteries, Lead-Acid**	Batteries fueled by lead-acid cells, such as auto batteries.	
88	**Batteries, Other**	All battery other than lead-acid (automotive) batteries.	Alkaline, Ni-Cd, Ni-MH, Lithium, Lithium-ion and small sealed lead acid (SSLA) batteries often used in battery backup units.
89	**Computer-Related Electronics, Small**	Small computer-related electronics with circuitry not including monitors.	Mice, disk drives and modems. Items in this category should be smaller than a basketball.
90	**Computer-Related Electronics, Large**	Large computer-related electronics with circuitry not including monitors.	Processors, scanners, keyboards and printers. Items in this category should be larger than a basketball.
91	**Televisions and Monitors**	Video displays larger than 4 inches containing a cathode ray tube (CRT)	Televisions, computer monitor, portable DVD players, laptop computers, and non-CRT televisions such as LCD and LED televisions.
92	**Consumer Electronics, Other**	Portable non-computer-related electronics with large circuitry.	Personal digital assistants (PDA), cell phones, phone systems, phone answering machines, computer games and other electronic toys, portable CD players, camcorders and digital cameras.

MATERIAL CLASS	MATERIAL TYPE	DEFINITION	EXAMPLES
93	**Remainder/Composite Hazardous**	Items and materials not fitting into any of the other hazardous categories and meeting California's hazardous waste characteristics for ignitability, corrosivity, reactivity or toxicity.	Segregated or mixed lab chemicals, solvents (paint thinner, nail polish and nail polish remover), mercury thermometers and thermostats, adhesives, glues, fuel, non-empty and pressurized gas canisters and cylinders, antifreeze, asbestos containing material, ammunition, ink, hair dye. Does NOT typically include cosmetics or personal care products or empty containers 5 gallons in size and smaller which previously contained a hazardous material.
OTHER			
94	**Textiles and Leather**	Items made of thread, yarn, fabric, or cloth from natural or synthetic materials such as cotton, wool, silk, leather, nylon, rayon or polyester.	Clothes, fabric trimmings, curtains, drapes, and linens, real and synthetic leather shoes, handbags, belts, scraps, etc. Does not include mattresses, furniture or carpet or upholstery.
95	**Furniture**	Mixed-material furniture.	Upholstered chairs and couches. Furniture made purely of one material, such as plastic or metal, would be categorized as that material.
96	**Mattresses and Box Springs**	Mattresses, box springs and platforms, but not frames.	Futons, foam and contour mattresses, infant and pet beds.
97	**Tires, All Kinds**	Pneumatic or solid tires and tubes of all sizes and types.	
98	**Rubber, Other**	Finished products and scrap made of natural or synthetic rubber.	Bath mats, rubber hoses, rubber bands and foam rubber.
99	**Reusables, Other**	An item or material considered functional or valuable by the sort crew not placed in another category.	Functional lumber, sellable furniture, household goods, wearables...
100	**Residuals**	Remainders that cannot be sorted into any other category.	