MAKING A
GREAT
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Metro

APPENDICES
Single-family Recycling and Waste Composition
Studies Report

July 2015

Appendices

APPENDIX A: DETAILED METHODOLOGY

RESIDENTIAL RECYCLING AND WASTE CHARACTERIZATION STUDY DETAILED METHODOLOGY

Measure #1: Curbside Recycling Program Performance Study

Description	This measure is the percentage of acceptable curbside recyclables in the garbage.
Measurement method	Loads of waste will be randomly selected from residential routes. Using information from Metro's Data Resource Center, random households are identified. These addresses are then used to identify routes to be sampled. Samples weighing 250 pounds will be collected from the selected residential garbage route truck and sorted into categories to determine what types and quantities of acceptable standard recyclables are being thrown away by single family households. Additional categories of potentially recyclable materials are also included for program planning purposes.
Confidence Interval	A 95 percent confidence interval is being used for the study.
Planning Standard Deviation	The standard deviation (sigma) is used to project a required sample size and is estimated based on data from prior studies and may be refined based on the initial sampling from the study. Data from the 2009 Oregon Department of Environmental Quality waste composition study was used to determine the variation in the amount of recyclables found in the garbage. The standard deviation was calculated based on that range as shown below.

Residential Waste Composition 2009				
Jurisdiction	Mean	St. Dev.	+/- 95% CI	# samples
Metro excluding Portland	13.87%	4.60%	1.40%	44
Portland	12.70%	5.01%	2.17%	23
All Metro combined	13.47%	4.74%	1.16%	67
Marion County	16.28%	6.00%	2.16%	32
Lane County	13.40%	6.59%	2.16%	38
Rest of Oregon	18.67%	6.26%	2.53%	26
All Oregon excluding Metro	15.79%	6.60%	1.34%	96
Statewide total	14.83%	6.00%	0.93%	163

The resulting standard deviation estimates are 0.06 and 0.046 for Statewide and Metro, respectively. Metro selected .05 as the standard deviation to provide a more conservative planning estimate. As the study progresses and as data accumulates, planned sample sizes can be recalculated using standard deviations from available study data.

Level of precision

The error bound or required precision for the study was selected to +\- .01 to provide increased accuracy.

Seasonality

An analysis of 2009 Oregon Department of Environmental Quality waste composition data indicated minimal variation in the amount of curbside recyclables in the garbage between warm (April-September) and cold (October-March) seasons with the exception of yard debris. As a result, the study will not be a yearlong analysis although samples will be collected from both warm and cold months.

Material categories

The Curbside Recycling Program Performance Study will sort acceptable standard recyclables into individual categories and will serve as the primary measure for evaluating the impact of collection frequency. Additional material categories will be included in the study to inform future program planning. Detailed definitions for categories will be consistent with the Oregon Department of Environmental Quality waste composition studies.

Curbside Recycling Program Performance Material Categories
Acceptable standard recyclables:

1) Cardboard
   2) Paper
   3) Plastic
   4) Metal
   5) Glass

Program planning:

6) Yard Debris
   7) Food
   8) Compostable material (non-food)
   9) Household hazardous waste
   10) Covered electronics
   11) Waste

Sampling Plan

Program	Samples Required	Explanation
Weekly Recycling	485	Samples will be randomly selected from households within the five largest jurisdictions that comprise more than 90 percent of the region's households with weekly recycling. Results will be used to provide a combined estimate for the entire region by using a weighted average of the individual jurisdiction estimates, effectively using post-stratification and the estimation formulas of stratified random sampling. Individual jurisdiction results will also be provided with this approach.

Sample Size Calculations

Jurisdiction	Single Family Households 2012	Error Bound	Sigma	z	n
Clackamas County	52,860	0.01	0.05	1.96	97
Portland	157,310	0.01	0.05	1.96	97
Beaverton	17,591	0.01	0.05	1.96	97
Gresham	21,908	0.01	0.05	1.96	97
Lake Oswego	11,150	0.01	0.05	1.96	97
TOTAL					485

Program	Samples Require	Explanation
Every-other-week Recycling and Monthly Glass	388	Samples will be randomly selected from four of the five jurisdictions with every-other-week recycling that comprise 99.65 percent of the households with bi- weekly recycling programs. Samples will be drawn from two of the three jurisdictions with monthly glass recycling that comprise 98.28 percent of the households with monthly glass collection.

Sample size calculations

Jurisdiction	Single Family Households 2012	Error Bound	Sigma	z	n
Hillsboro	20,275	0.01	0.05	1.96	97
Washington County	61,250	0.01	0.05	1.96	97
Tigard	12,595	0.01	0.05	1.96	97
Sherwood	5,200	0.01	0.05	1.96	97
TOTAL					388

Measure #2: Contaminants in Recycling Study

Description   This indicator is the percentage of non-acceptable items (contaminants) placed in the commingled curbside recycling container by households.

Measurement method   Loads of recycling will be randomly selected from residential routes. Samples weighing 250 pounds will be collected from the residential recycling route truck and sorted into categories to determine what types of materials are being placed in commingled recycling containers by households.

Confidence Interval   A 95 percent confidence interval is being used for the study.

Planning Standard Deviation   The standard deviation was calculated using 2011 Oregon Department of Environmental Quality data on incoming loads to material recovery facilities. The mean for the samples was 8.62 percent contamination and provided .0458 standard deviation outlined in the table below.

Jurisdiction	Mean	St. Dev.	+/- 95% CI	# samples
Metro region	8.62%	4.58%	1.81%	27

Additional data from the City of Portland indicated a higher level of variability in contamination in loads. To address the potential for increased variability, a standard deviation of .06 was selected for the study. Planned sample sizes may recalculated using standard deviations from the initial sampling of the study.

Level of Precision   The error bound or required precision for the study was selected to +\- .01 to provide increased accuracy.

Material categories   The Contaminants in the Recycling Study will include eleven material categories with one category for the total amount of acceptable standard recyclables and individual categories to measure major contaminants. Detailed definitions for categories will be consistent with the Oregon Department of Environmental Quality waste composition studies.

Bad Stuff in Recycling
Material categories:
1) Acceptable standard recyclables
2) Glass containers (mixed with other recycling)
3) Plastic bags and film
4) Unacceptable paper
5) Unacceptable rigid plastics
6) Yard debris and food waste
7) Diapers and pet waste
8) Household hazardous waste
9) Oregon E-Cycles
10) Other residuals

Sampling Plan

Program	Samples Required	Explanation
Weekly Garbage	139	The study will include stratified samples of the Metro region households with weekly garbage service.

Sample Size Calculations					
Jurisdiction	Single Family Households 2012	Error Bound	Sigma	z	n
Metro region	228,412	.01	.06	1.96	139

Program	Samples Required	Explanation
Curbside Recycling Program Performance Material Categories	139	Samples will be randomly selected from households within the city to calculate the Percent Bad Stuff in Trash for the bi-weekly garbage program

Definition

Corrugated cardboard and Kraft paper. Includes wine-bag-in boxes. Does not include waxed and plastic coated cardboard.

Sample Size Calculations

2 **Paper:** High grade paper, low grade, mixed paper, newspaper, phone books, magazines, milk cartons and drink boxes.

Jurisdiction	Single Family Households 2012	Error Bound	Sigma	z	n
Portland	157,310	.01	.06	1.96	139

3 **Plastics:** Deposit and non-deposit plastic bottles 6oz or larger with necks smaller than the base. Plastic Tubs 6 oz or larger, usually round with a wider rim than base and contain products such as salsa or yogurt. Rigid nursery pots larger than 4 inches in diameter and buckets 5 gallons or smaller. Does not include bottles that have held motor oil, pesticides or herbicides.

4 **Metal:** Deposit and non-deposit steel and aluminum cans, aluminum foil and trays, empty aerosol cans, all other metal that are less than 30" long and weigh less than 30 pounds. Does not include metal with food or other-non metallic materials.

5 **Container Glass:** Glass bottles and jars only, all colors.

6 **Yard Debris:** Weeds, leaves, grass clipping, branches and other vegetation, including soil adhering to plant roots. Branches must be less than 4" in diameter and 36" long.

7 **Food:** All food such as vegetables, fruits, breads, meats & pastas. Does not include large amounts of grease and oil. If packaging is more than 10% of the weight, food will need to be de-packaged and weighed separately

8 **Compostable Non-Food Waste:** Paper towels, napkins, pizza delivery boxes, coffee filters, tea bags and compostable bags with food residue.

APPENDIX B: MATERIAL CATEGORY DEFINTIONS

Curbside Recycling Program Performance Material Category Definitions

#	Material	Definition
1	Cardboard:	Corrugated cardboard and Kraft paper. Includes wine-bag-in boxes. Does not include waxed and plastic coated cardboard.
2	Paper:	High grade paper, low grade, mixed paper, newspaper, phone books, magazines, milk cartons and drink boxes.
3	Plastics:	Deposit and non-deposit plastic bottles 6oz. or larger with necks smaller than the base. Plastic Tubs 6 oz. or larger, usually round with a wider rim than base and contain products such as salsa or yogurt. Rigid nursery pots larger than 4 inches in diameter and buckets 5 gallons or smaller. Does not include bottles that have held motor oil, pesticides or herbicides.
4	Metal:	Deposit and non-deposit steel and aluminum cans, aluminum foil and trays, empty aerosol cans, all other metal that are less than 30 inches long and weigh less than 30 pounds. Does not include metal with food or other-non metallic materials.
5	Container Glass:	Glass bottles and jars only, all colors.
6	Yard Debris:	Weeds, leaves, grass clipping, branches and other vegetation, including soil adhering to plant roots. Branches must be less than 4 inches in diameter and 36 inches long.
7	Food:	All food, such as vegetables, fruits, breads, meats & pastas. Does not include large amounts of grease and oil. If packaging is more than 10% of the weight, food is de-packaged and weighed separately
8	Compostable Non-Food Waste:	Paper towels, napkins, pizza delivery boxes, coffee filters, tea bags and compostable bags with food residue.
9	Household Hazardous Waste:	HHW waste accepted at Metro facilities (paint, batteries, pesticides and cleaners). Does not include empty containers.
10	Covered Electronics:	Desktops, laptops, monitors and TVs. Includes computer peripherals (keyboards and mice) even though they aren't currently covered by the law until 2015.
11	Waste:	All other waste—includes garbage bags.

Contaminants in Recycling Material Category Definitions

#	Material	Definition
1	**Standard Recyclables:**	All acceptable curbside standard recyclables including: Cardboard Mixed paper (includes milk cartons and drink boxes) Newspaper and magazines Plastic containers Metal
2	**Deposit Containers:**	Any beverage container up to 3 liters in size with an Oregon deposit for beer, soft drink, carbonated water, non-carbonated water and juice. Does not include out-of-state bottles or soft drink syrup containers. Deposit containers will need to be both counted and weighed.
3	**Glass:**	Glass bottles and jars all colors mixed in with other recycling.
4	**Plastic film and plastic bags:**	Plastic grocery bags, retail bags, newspaper bags, dry cleaner bags, pallet-wrap, shrink and bubble wrap, clear and black polyethylene plastic sheeting, hay sleeves and silage bags, fertilizer, peat, and feed bags from nurseries/agricultural operations, furniture and mattress wrap. This category includes a count for plastic bags as defined by Portland Bag Ban's definition. See below
5	**Unacceptable paper:**	Freezer boxes, coffee cups, waxed/poly-coated containers.
6	**Unacceptable plastics:**	All other rigid plastics, includes lids. Does not include mixed plastic material such as kitchenware or car parts, plastic beverage pouches or non-recyclable film.
7	**Yard Debris, food and compostable non-food waste:**	Weeds, leaves, grass clipping, branches and other vegetation, including soil adhering to plant roots. Branches must be less than 4" in diameter and 36" long. All food such as vegetables, fruits, breads, meats pastas, coffee filters and tea bags. Paper towels, napkins, pizza delivery boxes, coffee filters, tea bags and compostable bags with food waste residue. Does not include large amounts of grease and oil.
8	**Diapers and pet waste:**	Diapers and pet waste.
9	**Household hazardous waste:**	Household hazardous waste accepted at Metro facilities (paint, batteries, pesticides and cleaners). Does not include empty containers. See HHW page for more details.
10	**Covered electronics:**	Desktops, laptops, monitors and TVs. Includes computer peripherals (keyboards and mice) even though they aren't currently covered by the law until 2015.
11	**Other residuals:**	All other non-recyclables, including non-recyclable film.

G. "Single-use plastic checkout bag" means a plastic bag that is provided by a retail establishment or food provider to a customer and is not a reusable bag. A single-use checkout bag does not include either of the following:

1. A bag provided by a pharmacist to contain prescription medication purchased by customers of the pharmacy;
2. A non-handled bag used to protect a purchased item from damaging or contaminating other purchased items when placed in a recycled paper bag or reusable bag; or,
3. A plastic cover designed and used for protecting garments on a hanger.

APPENDIX C: CURBSIDE RECYCLING PROGRAM PERFORMANCE STATISTICAL ANALYSIS

Appendix C and D provides a summary of the data and analysis used to produce each of the figures and tables cited in this report. The first section provides background on the calculations used in the study, number of samples and average sample weight. The remaining sections are organized by figure or table and include statistical analysis and outputs from the SPSS statistical software program.

BACKGROUND DATA CALCULATIONS

The standard deviation of the amount of recyclables in the garbage samples for this study is .039. The amount of recycling in each sample is calculated by dividing the total weight of the recyclables by the total weight of the garbage sample:

Amount of recyclables in the garbage sample = Total weight of recyclables in the sample*
Total weight of the sample**

*The "total weight of recyclables" is the sum total of the study variables paper, cardboard (OCC), plastics, metal and glass.
** The total weight of the sample is the sum total of all the sample materials.

Standard Deviation

Descriptive Statistics

	N	Minimum	Maximum	Mean	Standard Deviation
Recyclables in Garbage	860	.05	.34	.1395	.03931

Average Sample Weights

The study drew samples from the cities of Beaverton, Gresham, Hillsboro, Lake Oswego, Portland, Sherwood, Tigard, and unincorporated Clackamas and Washington County. There are at least 97 samples from each jurisdiction in this study except for City of Portland and Lake Oswego.

Jurisdiction	Total weight of samples	Total number of samples	Average sample weight
Beaverton	26,250.82	98	267.87
Clackamas County	27,545.83	99	278.24
Gresham	28,174.25	98	287.49
Hillsboro	26,923.51	97	277.56
Lake Oswego	24,007.42	79	303.89
Portland	26,752.66	96	278.67
Sherwood	26,508.58	97	273.28
Tigard	26,388.78	97	272.05
Washington County	27,629.36	99	279.08
Total	240,181.2	860	279.28

FIGURE 1: RECYCLABLES IN THE GARBAGE CART

Summary

The mean for the percentage of recyclables found in garbage samples is 13.95%, 95% CI [13.69%, 14.22%].

The following table provides the mean for paper, cardboard (OCC), plastics, metal, glass, and the non-recyclable curbside materials including compostable materials, covered electronics, household hazardous waste (HHW) at a 95% confidence interval (CI).

Material	Lower	Mean	Upper
Paper	5.36%	5.52%	5.69%
OCC	1.25%	1.32%	1.40%
Plastics	1.97%	2.03%	2.08%
Metal	2.87%	2.97%	3.08%
Glass	2.02%	2.11%	2.20%
Non-curbside recyclables (i.e. compostable materials, covered electronics, household hazardous waste)	85.78%	86.05%	86.31%

Analysis

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Percent Recyclables in Garbage	860	100.0%	0	.0%	860	100.0%

Descriptives

			Statistic	Standard Error
Recyclables in Garbage	Mean		13.9547	.13404
	95% Confidence Interval for Mean	Lower Bound	13.6916	
		Upper Bound	14.2178	
	5% Trimmed Mean		13.8300	
	Median		13.8130	
	Variance		15.452	
	Std. Deviation		3.93087	
	Minimum		5.07	
	Maximum		33.57	
	Range		28.50	
	Interquartile Range		5.34	
	Skewness		.534	.083
	Kurtosis		.772	.167

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Percent Sum Garbage	860	100.0%	0	.0%	860	100.0%

Descriptives

		Statistic	Std. Error
Percent Sum Garbage	Mean	.8605	.00134
	95% Confidence Interval for Mean — Lower Bound	.8578	
	95% Confidence Interval for Mean — Upper Bound	.8631	
	5% Trimmed Mean	.8617	
	Median	.8619	
	Variance	.002	
	Std. Deviation	.03931	
	Minimum	.66	
	Maximum	.95	
	Range	.28	
	Interquartile Range	.05	
	Skewness	-.534	.083
	Kurtosis	.772	.167

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Percent Paper	860	100.0%	0	.0%	860	100.0%
Percent Cardboard (OCC)	860	100.0%	0	.0%	860	100.0%
Percent Plastics	860	100.0%	0	.0%	860	100.0%
Percent Yard Debris	860	100.0%	0	.0%	860	100.0%
Percent Metal	860	100.0%	0	.0%	860	100.0%
Percent Glass	860	100.0%	0	.0%	860	100.0%
Percent Food	860	100.0%	0	.0%	860	100.0%
Percent Compost Non-Food Waste	860	100.0%	0	.0%	860	100.0%
Percent Electronics	860	100.0%	0	.0%	860	100.0%
Percent HHW	860	100.0%	0	.0%	860	100.0%
Percent Other Waste	860	100.0%	0	.0%	860	100.0%

Descriptives

		Statistic	Std. Error
Percent Paper	Mean	.05525	.000847
	95% Confidence Interval for Mean — Lower Bound	.05359	
	95% Confidence Interval for Mean — Upper Bound	.05691	

			Statistic	Std. Error
	5% Trimmed Mean		.05350	
	Median		.05088	
	Variance		.001	
	Std. Deviation		.024832	
	Minimum		.000	
	Maximum		.256	
	Range		.256	
	Interquartile Range		.030	
	Skewness		1.607	.083
	Kurtosis		6.360	.167
Percent Cardboard (OCC)	Mean		.0132	.00038
	95% Confidence Interval for Mean	Lower Bound	.0125	
		Upper Bound	.0140	
	5% Trimmed Mean		.0121	
	Median		.0109	
	Variance		.000	
	Std. Deviation		.01123	
	Minimum		.00	
	Maximum		.14	
	Range		.14	
	Interquartile Range		.01	
	Skewness		4.087	.083
	Kurtosis		32.000	.167
Percent Plastics	Mean		.0203	.00029
	95% Confidence Interval for Mean	Lower Bound	.0197	
		Upper Bound	.0208	
	5% Trimmed Mean		.0199	
	Median		.0191	
	Variance		.000	
	Std. Deviation		.00855	
	Minimum		.00	
	Maximum		.07	
	Range		.07	
	Interquartile Range		.01	
	Skewness		.890	.083
	Kurtosis		1.732	.167
Percent Yard Debris	Mean		.0178	.00101
	95% Confidence Interval for Mean	Lower Bound	.0159	
		Upper Bound	.0198	
	5% Trimmed Mean		.0133	

	Statistic	Std. Error
Median	.0075	
Variance	.001	

			Statistic	Std. Error
	Std. Deviation		.02956	
	Minimum		.00	
	Maximum		.25	
	Range		.25	
	Interquartile Range		.02	
	Skewness		3.658	.083
	Kurtosis		17.943	.167
Percent Metal	Mean		.0297	.00054
	95% Confidence Interval for Mean	Lower Bound	.0287	
		Upper Bound	.0308	
	5% Trimmed Mean		.0283	
	Median		.0262	
	Variance		.000	
	Std. Deviation		.01578	
	Minimum		.00	
	Maximum		.12	
	Range		.12	
	Interquartile Range		.02	
	Skewness		1.574	.083
	Kurtosis		3.594	.167
Percent Glass	Mean		.0211	.00047
	95% Confidence Interval for Mean	Lower Bound	.0202	
		Upper Bound	.0220	
	5% Trimmed Mean		.0203	
	Median		.0190	
	Variance		.000	
	Std. Deviation		.01371	
	Minimum		.00	
	Maximum		.09	
	Range		.09	
	Interquartile Range		.02	
	Skewness		.985	.083
	Kurtosis		1.313	.167
Percent Food	Mean		.1579	.00196
	95% Confidence Interval for Mean	Lower Bound	.1540	
		Upper Bound	.1617	
	5% Trimmed Mean		.1558	
	Median		.1512	
	Variance		.003	

		Statistic	Std. Error
	Std. Deviation	.05739	
	Minimum	.00	
	Interquartile Range	.08	
	Skewness	.612	.083

			Statistic	Std. Error
	Kurtosis		.463	.167
Percent Compost Non-Food Waste	Mean		.0350	.00059
	95% Confidence Interval for Mean	Lower Bound	.0338	
		Upper Bound	.0361	
	5% Trimmed Mean		.0340	
	Median		.0324	
	Variance		.000	
	Std. Deviation		.01732	
	Minimum		.00	
	Maximum		.15	
	Range		.15	
	Interquartile Range		.02	
	Skewness		1.170	.083
	Kurtosis		3.623	.167
Percent Electronics	Mean		.0029	.00039
	95% Confidence Interval for Mean	Lower Bound	.0022	
		Upper Bound	.0037	
	5% Trimmed Mean		.0009	
	Median		.0000	
	Variance		.000	
	Std. Deviation		.01143	
	Minimum		.00	
	Maximum		.19	
	Range		.19	
	Interquartile Range		.00	
	Skewness		7.979	.083
	Kurtosis		97.475	.167
Percent HHW	Mean		.0040	.00035
	95% Confidence Interval for Mean	Lower Bound	.0033	
		Upper Bound	.0046	
	5% Trimmed Mean		.0024	
	Median		.0012	
	Variance		.000	
	Std. Deviation		.01028	
	Minimum		.00	
	Maximum		.16	
	Range		.16	
	Interquartile Range		.00	
	Skewness		8.708	.083
	Kurtosis		104.794	.167
			Statistic	Std. Error
Percent Other Waste	Mean		.6429	.00299

95% Confidence Interval for Mean	Lower Bound		.6370		
	Upper Bound		.6487		
5% Trimmed Mean			.6446		
Median			.6492		
Variance			.008		
Std. Deviation			.08765		
Minimum			.32		
Maximum			.90		
Range			.58		
Interquartile Range			.12		
Skewness			-.306	.083	
Kurtosis			-.159	.167	

FIGURES 2, 3 AND 4: ESTIMATE OF THE MEAN FOR THE PERCENTAGE OF RECYCLABLES BY JURISDICTION

Summary

There is a difference in the amount of recyclables in garbage across jurisdictions. The observed effect is moderate. There are a number of pair-wise differences, but Beaverton has the lowest amount of recycling in garbage compared to other jurisdictions. Portland, Gresham and Washington County also have low amounts of recyclables in garbage that are very close to Beaverton's observed amount of recyclables in garbage.

The following table provides the population mean for the percentage of recyclables by jurisdiction at a 95% confidence interval. Recyclables for this study include materials accepted in the residential curbside recycling roll cart including Paper, OCC, Plastics, Metal, and Glass on the side.

Jurisdiction	lower	mean	upper
Beaverton	11.44%	12.26%	13.08%
Clackamas County	13.94%	14.78%	15.63%
Gresham	12.86%	13.52%	14.18%
Hillsboro	13.70%	14.50%	15.30%
Lake Oswego	14.09%	14.93%	15.78%
Portland	11.85%	12.67%	13.49%
Sherwood	14.59%	15.30%	16.00%
Tigard	14.10%	14.78%	15.46%
Washington County	12.27%	13.04%	13.81%
Total	13.69%	13.95%	14.22%

Analysis

Between-Subjects Factors

		Value Label	N
	1.00	Beaverton	98
	2.00	Clackamas County	99
	3.00	Gresham	98
	4.00	Hillsboro	97
Jurisdiction Number	5.00	Lake Oswego	79
	6.00	Portland	96
	7.00	Sherwood	97
	8.00	Tigard	97
	10.00	Washington County	99

Descriptive Statistics

Dependent Variable: Recyclables in Garbage Percentage

Jurisdiction	Mean	Std. Deviation	N
Beaverton	12.2628	4.08306	98
Clackamas County	14.7827	4.23533	99
Gresham	13.5223	3.28075	98
Hillsboro	14.5002	3.94949	97
Lake Oswego	14.9349	3.76342	79
Portland	12.6676	4.05414	96
Sherwood	15.2989	3.49956	97
Tigard	14.7788	3.37518	97
Washington County	13.0369	3.86768	99
Total	13.9547	3.93087	860

Levene's Test of Equality of Error Variances[a]

Dependent Variable: Recyclables in Garbage Percentage

F	df1	df2	Sig.
1.211	8	851	.289

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.[a]

a.   Design: Intercept + JurisNumber

Tests of Between-Subjects Effects

Dependent Variable: Recyclables in Garbage Percentage

Source	Type III Sum of Squares	df	Mean Square	F	Partial Eta Squared
Corrected Model	955.035[a]	8	119.379	8.247	.072
Intercept	167227.218	1	167227.218	11553.042	.931
Jurisdiction Number	955.035	8	119.379	8.247	.072
Error	12317.999	851	14.475		
Total	180744.748	860			
Corrected Total	13273.034	859			

Estimated Marginal Means

Jurisdiction Number

Dependent Variable: Recyclables in Garbage Percentage

Jurisdiction Number	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Beaverton	12.263	.384	11.509	13.017
Clackamas County	14.783	.382	14.032	15.533
Gresham	13.522	.384	12.768	14.277
Hillsboro	14.500	.386	13.742	15.258
Lake Oswego	14.935	.428	14.095	15.775
Portland	12.668	.388	11.905	13.430
Sherwood	15.299	.386	14.541	16.057
Tigard	14.779	.386	14.021	15.537
Washington County	13.037	.382	12.286	13.787

Multiple Comparisons

Dependent Variable: Recyclables in Garbage Percentage

Bonferroni

(I) Jurisdiction Number	(J) Jurisdiction Number	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Beaverton	Clackamas	-2.5198*	.54214	.000	-4.2587	-.7809
	Gresham	-1.2594	.54351	.746	-3.0028	.4839
	Hillsboro	-2.2374*	.54491	.002	-3.9852	-.4896
	Lake Oswego	-2.6720*	.57526	.000	-4.5172	-.8268
	Portland	-.4047	.54633	1.000	-2.1571	1.3477
	Sherwood	-3.0360*	.54491	.000	-4.7838	-1.2882
	Tigard	-2.5159*	.54491	.000	-4.2637	-.7681
	Washington	-.7741	.54214	1.000	-2.5130	.9649
Clackamas County	Beaverton	2.5198*	.54214	.000	.7809	4.2587
	Gresham	1.2604	.54214	.731	-.4785	2.9993
	Hillsboro	.2825	.54354	1.000	-1.4609	2.0259
	Lake Oswego	-.1522	.57396	1.000	-1.9932	1.6888
	Portland	2.1151*	.54497	.004	.3671	3.8631
	Sherwood	-.5162	.54354	1.000	-2.2596	1.2272
	Tigard	.0039	.54354	1.000	-1.7395	1.7473
	Washington	1.7458*	.54076	.047	.0113	3.4803
Gresham	Beaverton	1.2594	.54351	.746	-.4839	3.0028
	Clackamas	-1.2604	.54214	.731	-2.9993	.4785
	Hillsboro	-.9779	.54491	1.000	-2.7257	.7699
	Lake Oswego	-1.4126	.57526	.514	-3.2577	.4326
	Portland	.8547	.54633	1.000	-.8977	2.6071
	Sherwood	-1.7766*	.54491	.042	-3.5244	-.0288
	Tigard	-1.2565	.54491	.769	-3.0043	.4913
	Washington	.4854	.54214	1.000	-1.2535	2.2243
Hillsboro	Beaverton	2.2374*	.54491	.002	.4896	3.9852
	Clackamas	-.2825	.54354	1.000	-2.0259	1.4609
	Gresham	.9779	.54491	1.000	-.7699	2.7257
	Lake Oswego	-.4347	.57658	1.000	-2.2841	1.4147
	Portland	1.8326*	.54772	.031	.0758	3.5895
	Sherwood	-.7987	.54630	1.000	-2.5510	.9536
	Tigard	-.2786	.54630	1.000	-2.0309	1.4737
	Washington	1.4633	.54354	.261	-.2801	3.2067
Lake Oswego	Beaverton	2.6720*	.57526	.000	.8268	4.5172
	Clackamas	.1522	.57396	1.000	-1.6888	1.9932
	Gresham	1.4126	.57526	.514	-.4326	3.2577
	Hillsboro	.4347	.57658	1.000	-1.4147	2.2841
	Portland	2.2673*	.57793	.003	.4136	4.1210
	Sherwood	-.3640	.57658	1.000	-2.2134	1.4854
	Tigard	.1561	.57658	1.000	-1.6933	2.0055
	Washington	1.8980*	.57396	.035	.0570	3.7390

(I) Jurisdiction Number	(J) Jurisdiction Number	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Portland	Beaverton	.4047	.54633	1.000	-1.3477	2.1571
	Clackamas	-2.1151*	.54497	.004	-3.8631	-.3671
	Gresham	-.8547	.54633	1.000	-2.6071	.8977
	Hillsboro	-1.8326*	.54772	.031	-3.5895	-.0758
	Lake Oswego	-2.2673*	.57793	.003	-4.1210	-.4136
	Sherwood	-2.6313*	.54772	.000	-4.3881	-.8745
	Tigard	-2.1112*	.54772	.004	-3.8680	-.3544
	Washington	-.3693	.54497	1.000	-2.1173	1.3787
Sherwood	Beaverton	3.0360*	.54491	.000	1.2882	4.7838
	Clackamas	.5162	.54354	1.000	-1.2272	2.2596
	Gresham	1.7766*	.54491	.042	.0288	3.5244
	Hillsboro	.7987	.54630	1.000	-.9536	2.5510
	Lake Oswego	.3640	.57658	1.000	-1.4854	2.2134
	Portland	2.6313*	.54772	.000	.8745	4.3881
	Tigard	.5201	.54630	1.000	-1.2322	2.2724
	Washington	2.2620*	.54354	.001	.5186	4.0054
Tigard	Beaverton	2.5159*	.54491	.000	.7681	4.2637
	Clackamas	-.0039	.54354	1.000	-1.7473	1.7395
	Gresham	1.2565	.54491	.769	-.4913	3.0043
	Hillsboro	.2786	.54630	1.000	-1.4737	2.0309
	Lake Oswego	-.1561	.57658	1.000	-2.0055	1.6933
	Portland	2.1112*	.54772	.004	.3544	3.8680
	Sherwood	-.5201	.54630	1.000	-2.2724	1.2322
	Washington	1.7419	.54354	.050	-.0015	3.4853
Washington County	Beaverton	.7741	.54214	1.000	-.9649	2.5130
	Clackamas	-1.7458*	.54076	.047	-3.4803	-.0113
	Gresham	-.4854	.54214	1.000	-2.2243	1.2535
	Hillsboro	-1.4633	.54354	.261	-3.2067	.2801
	Lake Oswego	-1.8980*	.57396	.035	-3.7390	-.0570
	Portland	.3693	.54497	1.000	-1.3787	2.1173
	Sherwood	-2.2620*	.54354	.001	-4.0054	-.5186
	Tigard	-1.7419	.54354	.050	-3.4853	.0015

Based on observed means. The error term is Mean Square (Error) = 14.475.

Descriptives

Recyclables in Garbage

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Beaverton	98	.1226	.04083	.00412	.1144	.1308	.05	.23
Clackamas County	99	.1478	.04235	.00426	.1394	.1563	.05	.34
Gresham	98	.1352	.03281	.00331	.1286	.1418	.06	.22
Hillsboro	97	.1450	.03949	.00401	.1370	.1530	.05	.26
Lake Oswego	79	.1493	.03763	.00423	.1409	.1578	.07	.25
Portland	96	.1267	.04054	.00414	.1185	.1349	.06	.27
Sherwood	97	.1530	.03500	.00355	.1459	.1600	.08	.26
Tigard	97	.1478	.03375	.00343	.1410	.1546	.08	.25
Washington County	99	.1304	.03868	.00389	.1227	.1381	.05	.27
Total	860	.1395	.03931	.00134	.1369	.1422	.05	.34

TABLE 3: MATERIAL COMPOSITION FOR RECYCLABLES IN GARBAGE BY JURISDICTION

Summary

The following table shows the percentage of curbside recyclables in the garbage for each material by jurisdiction.

Jurisdiction	Paper	OCC	Plastics	Metal	Glass
City of Sherwood	6.14%	1.12%	2.46%	3.21%	2.37%
City of Lake Oswego	6.09%	1.49%	1.63%	3.59%	2.14%
City of Hillsboro	6.00%	1.14%	2.08%	2.88%	2.41%
City of Gresham	5.78%	1.22%	1.82%	2.96%	1.75%
Unincorporated Clackamas County	5.64%	1.43%	2.34%	3.13%	2.25%
City of Tigard	5.51%	1.20%	2.62%	2.86%	2.60%
Unincorporated Washington County	5.18%	1.19%	1.95%	2.70%	2.01%
City of Beaverton	4.84%	1.09%	1.59%	2.65%	2.09%
City of Portland	4.66%	2.06%	1.68%	2.88%	1.38%

Analysis

Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
Percent Paper * Jurisdiction	860	100.0%	0	.0%	860	100.0%
Percent OCC * Jurisdiction	860	100.0%	0	.0%	860	100.0%
Percent Plastics * Jurisdiction	860	100.0%	0	.0%	860	100.0%
Percent Metal * Jurisdiction	860	100.0%	0	.0%	860	100.0%
Percent Glass * Jurisdiction	860	100.0%	0	.0%	860	100.0%

Report

Mean

Jurisdiction	Percent Paper	Percent Cardboard (OCC)	Percent Plastics
City of Beaverton	.04838	.0109	.0159
City of Gresham	.05777	.0122	.0182
City of Hillsboro	.05999	.0114	.0208
City of Lake Oswego	.06085	.0149	.0163
City of Portland	.04664	.0206	.0168
City of Sherwood	.06135	.0112	.0246
City of Tigard	.05506	.0120	.0262
Unincorporated Clackamas County	.05638	.0143	.0234
Unincorporated Washington County	.05184	.0119	.0195
Total	.05525	.0132	.0203

Report

Mean

Jurisdiction	Percent Metal	Percent Glass
City of Beaverton	.0265	.0209
City of Gresham	.0296	.0175
City of Hillsboro	.0288	.0241
City of Lake Oswego	.0359	.0214
City of Portland	.0288	.0138
City of Sherwood	.0321	.0237
City of Tigard	.0286	.0260
Unincorporated Clackamas County	.0313	.0225
Unincorporated Washington County	.0270	.0201
Total	.0297	.0211

FIGURE 5: PERCENTAGE OF GARBAGE THAT IS RECYCLABLES AGGREGATED BY PROGRAM TYPE

Summary

There are four possible frequencies of collection and these correspond to the four program types:

1) Weekly commingle and weekly glass
2) Every-other-week (EOW) commingle and every-other-week glass
3) Every-other-week commingle and monthly glass
4) Weekly commingle and monthly glass

There was a significant effect of collection frequency on the amount of recyclables found in the garbage samples at the p<.05 level for the four types of collection frequency. The every-other-week commingle/every-other-week glass program performs equivalently to weekly commingle/weekly glass collection. Programs with monthly glass collection do not perform equivalent to weekly collection programs. In other words, even though the graph shows weekly and every-other-week collection frequency as being slightly different (.17%), an UNIANOVA test used to compare the two programs showed there is no difference detected between the two collection frequencies. Using the same test to compare the two alternative programs with monthly glass collection against the weekly standard shows there is a statically significant difference.

Analysis

Between-Subjects Factors

		Value Label	N
Program Type	1.00	Weekly Commingle, Weekly Glass	470
	2.00	EOW Commingle, EOW Glass	196
	3.00	EOW Commingle, Monthly Glass	97
	4.00	Weekly Comingle, Monthly Glass	97

Descriptive Statistics

Dependent Variable: Recyclables in Garbage Percentage

Program Type	Mean	Std. Deviation	N
Weekly Commingle, Weekly Glass	13.5880	4.03178	470
EOW Commingle, EOW Glass	13.7611	3.96674	196
EOW Commingle, Monthly Glass	15.2989	3.49956	97
Weekly Commingle, Monthly Glass	14.7788	3.37518	97
Total	13.9547	3.93087	860

Levene's Test of Equality of Error Variances [a]

Dependent Variable: Recycle in Garbage Percent

F	df1	df2	Sig.
1.529	3	856	.205

Tests the null hypothesis that the error variance of the
dependent variable is equal across groups. [a]
a. Design: Intercept + Program Type

Tests of Between-Subjects Effects

Dependent Variable: Recyclables in Garbage Percentage

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	311.676[a]	3	103.892	6.861	.000	.023
Intercept	118421.441	1	118421.441	7820.844	.000	.901
Program Type	311.676	3	103.892	6.861	.000	.023
Error	12961.357	856	15.142			
Total	180744.748	860				
Corrected Total	13273.034	859				

a. R Squared = .023 (Adjusted R Squared = .020)

Estimated Marginal Means

Program Type

Dependent Variable: Recyclables in Garbage Percentage

Program Type	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Weekly Commingle, Weekly Glass	13.588	.179	13.236	13.940
EOW Commingle, EOW Glass	13.761	.278	13.216	14.307
EOW Commingle, Monthly Glass	15.299	.395	14.523	16.074
Weekly Commingle, Monthly Glass	14.779	.395	14.003	15.554

Multiple Comparisons

Dependent Variable: Recyclables in Garbage Percentage

Bonferroni

(I) Program Type	(J) Program Type	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Weekly Commingle, Weekly Glass	EOW Commingle, EOW Glass	-.1731	.33086	1.000	-1.0480	.7019
	EOW Commingle, Monthly Glass	-1.7109*	.43396	.001	-2.8584	-.5633
	Weekly Commingle, Monthly Glass	-1.1908*	.43396	.037	-2.3383	-.0432
	Weekly Recycling	.1731	.33086	1.000	-.7019	1.0480
EOW Commingle, EOW Glass	EOW Commingle, Monthly Glass	-1.5378*	.48307	.009	-2.8152	-.2604
	Weekly Commingle, Monthly Glass	-1.0177	.48307	.213	-2.2951	.2597
	Weekly Recycling	1.7109*	.43396	.001	.5633	2.8584
EOW Commingle, Monthly Glass	EOW Commingle, EOW Glass	1.5378*	.48307	.009	.2604	2.8152
	Weekly Commingle, Monthly Glass	.5201	.55875	1.000	-.9575	1.9977
	Weekly Recycling	1.1908*	.43396	.037	.0432	2.3383
Weekly Commingle, Monthly Glass	EOW Commingle, EOW Glass	1.0177	.48307	.213	-.2597	2.2951
	EOW Commingle, Monthly Glass	-.5201	.55875	1.000	-1.9977	.9575

Post Hoc Tests by Program Type

Based on observed means.

The error term is Mean Square (Error) = 15.142.

Group Statistics

	Weekly Collection	N	Mean	Std. Deviation	Std. Error Mean
Percent Recyclables in Garbage	Weekly Collection	567	13.7917	3.95007	.16589
	EOW Collection	293	14.2702	3.88070	.22671

Descriptives

	Jurisdiction by Program Type			Statistic	Std. Error
Percent Recyclables in Garbage	Weekly	Mean		13.5880	.18597
		95% Confidence Interval for Mean	Lower Bound	13.2226	
			Upper Bound	13.9535	
		5% Trimmed Mean		13.4211	
		Median		13.1645	
		Variance		16.255	
		Std. Deviation		4.03178	
		Minimum		5.10	
		Maximum		33.57	
		Range		28.47	
		Interquartile Range		5.36	
		Skewness		.756	.113
		Kurtosis		1.357	.225
	Hillsboro/WA County	Mean		13.7611	.28334
		95% Confidence Interval for Mean	Lower Bound	13.2023	
			Upper Bound	14.3199	
		5% Trimmed Mean		13.6378	
		Median		13.5805	
		Variance		15.735	
		Std. Deviation		3.96674	
		Minimum		5.07	
		Maximum		26.81	
		Range		21.73	
		Interquartile Range		5.17	
		Skewness		.433	.174
		Kurtosis		.323	.346
	Sherwood	Mean		15.2989	.35533
		95% Confidence Interval for Mean	Lower Bound	14.5936	
			Upper Bound	16.0042	
		5% Trimmed Mean		15.2368	
		Median		15.2714	
		Variance		12.247	
		Std. Deviation		3.49956	
		Minimum		7.81	
		Maximum		25.96	
		Range		18.15	
		Interquartile Range		4.05	
		Skewness		.185	.245
		Kurtosis		.324	.485

Jurisdiction by Program Type			Statistic	Std. Error
Tigard	Mean	Lower Bound	14.7788	.34270
	5% Trimmed Mean	Upper Bound	14.6977	
	Median		14.8854	
	Variance		11.392	
	Std. Deviation		3.37518	
	Minimum		7.84	
	Maximum		25.13	
	Range		17.29	
	Interquartile Range		4.92	
	Skewness		.314	.245
	Kurtosis		.036	.485

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Percent Recyclables in Garbage	Equal variances assumed	.018	.892	-1.694	858	.091
	Equal variances not assumed			-1.703	599.688	.089

Independent Samples Test

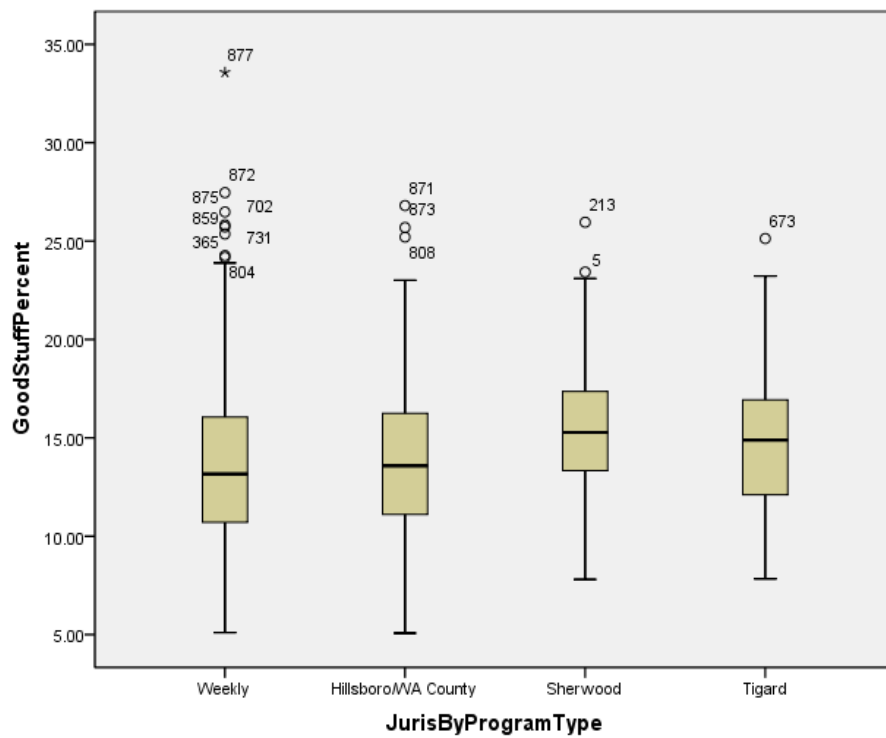|		t-test for Equality of Means			
		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
				Lower	Upper
Percent Recyclable in Garbage	Equal variances assumed	-.47846	.28251	-1.03296	.07604
	Equal variances not assumed	-.47846	.28092	-1.03017	.07325

FIGURE 6: REGIONAL AVERAGE OF GARBAGE THAT IS ORGANICS GRAPHIC

Summary

On average in the region, the total amount of organics (yard debris, food waste, and compost [non-food]) is 21.07%.

Analysis

Descriptive Statistics

	N	Mean
Y D/Compost /Food Combo Percent	860	.2107
Valid N (listwise)	860	

FIGURE 7: AVERAGE OF GARBAGE THAT IS ORGANICS BY JURISDICTION

Summary

The average amount of yard debris, compost and food by jurisdiction ranges from 16.61% to 26.05%.

Analysis

Report

Mean

Jurisdiction	YD compost Food Combo Percent
City of Beaverton	.1929
City of Gresham	.1736
City of Hillsboro	.2244
City of Lake Oswego	.2605
City of Portland	.1661
City of Sherwood	.2030
City of Tigard	.2460
Clackamas County	.2109
Washington County	.2279
Total	.2107

FIGURE 8: PERCENTAGE OF GARBAGE THAT IS ORGANICS

Summary

The average percentage of food in the garbage ranges from 12.50% to 19.44%. The average percentage of compost [non-food] ranges from 2.90% to 4.39%. The average percentage of yard debris ranges from 1.02% to 2.89%.

Analysis

Report

Mean

Jurisdiction	Percent Food	Percent Compost Non-Food Waste	Percent Yard Debris
City of Beaverton	.1444	.0342	.0143
City of Gresham	.1333	.0290	.0113
City of Hillsboro	.1717	.0349	.0178
City of Lake Oswego	.1944	.0372	.0289
City of Portland	.1250	.0309	.0102
City of Sherwood	.1512	.0356	.0162
City of Tigard	.1784	.0439	.0237
Clackamas County	.1640	.0329	.0140
Washington County	.1650	.0365	.0264
Total	.1579	.0350	.0178

Summary

Household Hazardous Waste

 The study showed a regional average of .40% of household hazardous waste (HHW) found in the garbage. Further analysis of this category was conducted by Metro staff that sorted the material into additional categories. The Metro Household Hazardous Waste Program staff disaggregated the HHW into the following categories: latex paint, oil-based paint and other flammables, automotive, pesticides and fertilizers, cleaners and other water-based products, aerosols, acids/bases/oxiders, batteries, mercury containing lamps, sharps, pharmaceuticals, and miscellaneous. The percentage of the total HHW collected was determined by placing the material on a scale and subtracting for the estimated weight of the container.

Material Composition of HHW collected in the Recycling Program Performance Study												
	Latex paint	Oil-based paint & other flammables	Automotive: oil, antifreeze, lead-acid batteries	Pesticides & Fertilizer	Cleaners & water-based	Aerosols	Acids, bases, oxidizers	Batteries (household)	Mercury-containing lamps	Sharps	Pharmaceuticals	Misc.
Material Composition of HHW collected in the Recycling Program Performance Study (Figure 10)	9.5%	9.7%	10.5%	2.1%	8.3%	7.7%	1.1%	28.5%	1.9%	4.3%	8.7%	7.8%
% of HHW (packaging excluded)	0.020%	0.021%	0.022%	0.005%	0.018%	0.016%	0.002%	0.061%	0.004%	0.009%	0.019%	0.017%

Oregon E-cycles electronics

The study showed a regional average of .29% percent of electronics found in the garbage.

Analysis

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Percent Electronics	877	.00	.19	.0029	.01139
Valid N (listwise)	877				

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Percent HHW	877	.00	.16	.0040	.01022
Valid N (listwise)	877				

APPENDIX D: CONTAMINANTS IN THE RECYCLING STATISTICAL ANALYSIS

Background Data Summary

The standard deviation of the amount of contaminants in the recycling samples for this study is .04. The amount of contaminants in each sample is calculated by dividing the total weight of the contaminant items by the total weight of the sample:

Amount of contaminants in the sample = $\dfrac{\text{Total weight of contaminant items in the sample*}}{\text{Total weight of the sample**}}$

*The "total weight of contaminant items" is the sum total of the study variables including glass, unacceptable paper, rigid plastic, yard/food/ compost, non-food, diapers, HHW, electronics, film plastic and other residual.

**The total weight of the sample is the sum total of all the materials assessed for this study.

Analysis

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Percent Contamination in Recycle	278	.02	.34	.0886	.04387
Valid N (listwise)	278				

Background Information: Samples by jurisdiction

This study drew samples from two comparison groups: 1) Portland and 2) Region-wide which are the non-Portland cities and counties located within the Metro boundary. Collection of garbage in Portland is every-other-week (EOW) while garbage is collected weekly outside of Portland. The region-wide group is composed of samples from the city of Beaverton, Cornelius, Forest Grove, Gladstone, Gresham, Happy Valley, Hillsboro, King City, Lake Oswego, Oregon City, Sherwood, Tigard, Troutdale, Tualatin, West Linn, Wilsonville and unincorporated Clackamas and Washington County. The number of samples taken from Portland is 139. The number of samples taken from the region-wide group is also 139. The total weight of all the samples taken from all jurisdictions is 78,356.92 lbs.

Figure B: Samples by Jurisdiction			
Jurisdiction	**total weight of samples**	**total number of samples**	**average sample weight**
Portland	39,431.27	139	283.68
Region-wide	38,925.66	139	280.04
Total	78,356.92	278	281.86

Number of samples by Jurisdiction

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Beaverton	10	3.6	3.6	3.6
	Cornelius	2	.7	.7	4.3
	Forest Grove	5	1.8	1.8	6.1
	Gladstone	3	1.1	1.1	7.2
	Gresham	14	5.0	5.0	12.2
	Happy Valley	4	1.4	1.4	13.7
	Hillsboro	3	1.1	1.1	14.7
	King City	1	.4	.4	15.1
	Lake Oswego	8	2.9	2.9	18.0
	Oregon City	6	2.2	2.2	20.1
	Portland	139	50.0	50.0	70.1
	Sherwood	3	1.1	1.1	71.2
	Tigard	9	3.2	3.2	74.5
	Troutdale	5	1.8	1.8	76.3
	Tualatin	3	1.1	1.1	77.3
	West Linn	10	3.6	3.6	80.9
	Wilsonville	3	1.1	1.1	82.0
	Clackamas County	17	6.1	6.1	88.1
	Washington County	33	11.9	11.9	100.0
	Total	278	100.0	100.0	

FIGURE 12 AND 13: THE MEAN FOR THE PERCENT OF CONTAMINANTS

Summary

The mean for the percentage of contaminants found in recycling across all jurisdictions (including Portland) is 8.86%, 95% CI [8.34%, 9.37%].

Analysis

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Percent Contamination in Recycle	278	100.0%	0	.0%	278	100.0%

Descriptives

			Statistic	Std. Error
Percent Contamination in Recycle	Mean		.0886	.00263
	95% Confidence Interval for Mean	Lower Bound	.0834	
		Upper Bound	.0937	
	5% Trimmed Mean		.0860	
	Median		.0812	
	Variance		.002	
	Std. Deviation		.04387	
	Minimum		.02	
	Maximum		.34	
	Range		.32	
	Interquartile Range		.06	
	Skewness		1.140	.146
	Kurtosis		2.999	.291

FIGURE 14: PERCENTAGE OF CONTAMINANTS IN RECYCLING BETWEEN WEEKLY AND EVERY-OTHER-WEEK GARBAGE COLLECTION

Summary

Even though the results indicate a slight difference in the average contamination for the two groups, the statistical test used to compare them show there is no observed statistical difference for the contamination in recycling for weekly garbage collection compared to every-other-week collection. The mean for the percent of contamination found in recycling in EOW collection samples is 8.62%, 95% CI [7.94%, 9.30%] The mean for the percent of contamination found in recycling in Weekly samples is 9.09%, 95% CI [8.30%, 9.88%]

Analysis

Group Statistics

	Jurisdiction Dichotomous	N	Mean	Std. Deviation	Std. Error Mean
Percent Contamination in Recycle	Portland	139	.0862	.04036	.00342
	Other Metro Jurisdiction	139	.0909	.04715	.00400

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Percent Contamination in Recycle	Equal variances assumed	.827	.364	-.902	276	.368
	Equal variances not assumed			-.902	269.582	.368

		t-test for Equality of Means			
		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
				Lower	Upper
Percent Contamination in Recycle	Equal variances assumed	-.00475	.00526	-.01511	.00562
	Equal variances not assumed	-.00475	.00526	-.01511	.00562

Case Processing Summary

			Cases					
			Valid		Missing		Total	
			N	Percent	N	Percent	N	Percent
Percent Contamination in Recycle	dimension 1	Portland	139	100.0%	0	.0%	139	100.0%
		Region-wide	139	100.0%	0	.0%	139	100.0%

Descriptives

Study Jurisdiction				Statistic	Std. Error
Percent Contamination in Recycle	Portland	Mean		.0862	.00342
		95% Confidence Interval for Mean	Lower Bound	.0794	
			Upper Bound	.0930	
		5% Trimmed Mean		.0841	
		Median		.0784	
		Variance		.002	
		Std. Deviation		.04036	
		Minimum		.02	
		Maximum		.20	
		Range		.18	
		Interquartile Range		.06	
		Skewness		.664	.206
		Kurtosis		-.170	.408
	Region-wide	Mean		.0909	.00400
		95% Confidence Interval for Mean	Lower Bound	.0830	
			Upper Bound	.0988	
		5% Trimmed Mean		.0878	
		Median		.0837	
		Variance		.002	

Study Jurisdiction	Statistic	Std. Error
Std. Deviation	.04715	
Minimum	.02	
Maximum	.34	
Range	.32	
Interquartile Range	.06	
Skewness	1.400	.206
Kurtosis	4.423	.408

FIGURES 15, 16, 17 AND 18: PERCENT AND AMOUNT OF SELECTED MATERIALS IN THE RECYCLING BY COLLECTION FREQUENCY

Summary

Even though there is no difference in the overall average of contamination between the two comparison groups, there are statistical difference between every-other-week and weekly garbage collection for four materials:

- Other Residuals
- Diapers
- Glass
- Plastic Film (shopping bags only)

The materials that did not have a statistically significant different average percentage and amount were:

- Unacceptable Paper
- Rigid Plastic
- Yard/Food/Compostable materials [non-food]
- HHW
- Oregon e-cycles electronics
- Total Film Plastic (non-shopping bag film plastic plus shopping bags)

A t-test was used to identify differences between the two group's average percent and amount for each material. The effect size was determined by taking into account the absolute difference between the averages and the standard deviation. The higher the absolute differences or the lower the standard deviation, the larger the effect size. More information on the difference by percent can be found by looking at the tables showing percent in the analysis section for this figure.
A summary of the difference by amount is presented here:

For the material other residuals, a significant difference with a medium effect size was found between weekly collection and EOW collection in terms of the average amount of other residuals in the garbage can, t(-3.808) = 276, p = .00. Every-other-week collection averaged 5.009 lbs of other residuals per sample and Weekly collection averaged 8.232 lbs per sample.

For the material diapers, a significant difference with a medium effect size was found between weekly collection and every-other-week collection in terms of the average amount of diapers in the garbage can, t(1.909) = 180.504, p = .058. Every-other-week collection averaged .877lbs. of diapers and weekly collection averaged .401 lbs.

For the material glass, a significant difference with a medium effect size was found between weekly collection and every-other-week collection in terms of the average amount of glass in the garbage can, t(2.303) = 276, p = .02. Every-other-week collection averaged 5.182lbs of glass and weekly collection averaged 3.755 lbs.

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Analysis

Group Statistics

	Study Jurisdiction	N	Mean	Std. Deviation	Std. Error Mean
Glass	Portland	139	5.182	5.4093	.4588
	Region-wide	139	3.755	4.9105	.4165
Unacceptable Paper	Portland	139	1.388	1.6390	.1390
	Region-wide	139	1.250	1.2603	.1069
Rigid Plastic	Portland	139	5.432	2.9543	.2506
	Region-wide	139	5.339	2.9661	.2516
Yard/ Food/ Compost, Non-Food	Portland	139	4.106	4.3687	.3705
	Region-wide	139	3.785	3.2533	.2759
Diapers, Pet Waste	Portland	139	.877	2.7301	.2316
	Region-wide	139	.401	1.0846	.0920
HHW	Portland	139	.352	1.3441	.1140
	Region-wide	139	.185	.7015	.0595
Electronic	Portland	139	.1153	.59581	.05054
	Region-wide	139	.4245	2.42008	.20527
Other, Residual	Portland	139	5.009	6.1353	.5204
	Region-wide	139	8.232	7.8700	.6675
Plastic Film, Other Bags	Portland	139	1.827	1.4320	.1215
	Region-wide	139	1.802	1.5692	.1331
Shopping Plastic Bag Only	Portland	139	.1105	.16399	.01391
	Region-wide	139	.3290	.36477	.03094
Total Film Plastic	Portland	139	1.9378	1.48620	.12606
	Region-wide	139	2.1308	1.67319	.14192

Independent Samples Test

		Levene's Test for Equality of Variances	
		F	Sig.
Glass	Equal variances assumed	.908	.341
	Equal variances not assumed		
Unacceptable Paper	Equal variances assumed	1.103	.295
	Equal variances not assumed		
Rigid Plastic	Equal variances assumed	1.052	.306
	Equal variances not assumed		
Yard/Food/ Compost , Non-Food	Equal variances assumed	2.069	.151
	Equal variances not assumed		

| | | Levene's Test for Equality of Variances | |
		F	Sig.
Diapers, Pet Waste	Equal variances assumed	8.989	.003
	Equal variances not assumed		
HHW	Equal variances assumed	5.206	.023
	Equal variances not assumed		
Electronic	Equal variances assumed	8.125	.005
	Equal variances not assumed		
Other Residual	Equal variances assumed	10.528	.001
	Equal variances not assumed		
Plastic Film, Other Bags	Equal variances assumed	.617	.433
	Equal variances not assumed		
Shopping Plastic Bag Only	Equal variances assumed	39.205	.000
	Equal variances not assumed		
Total Film Plastic	Equal variances assumed	1.648	.200
	Equal variances not assumed		

Independent Samples Test

		t	df	Sig. (2-tailed)
		t-test for Equality of Means		
Glass	Equal variances assumed	2.303	276	.022
	Equal variances not assumed	2.303	273.456	.022
Unacceptable Paper	Equal variances assumed	.786	276	.432
	Equal variances not assumed	.786	258.917	.432
Rigid Plastic	Equal variances assumed	.262	276	.794
	Equal variances not assumed	.262	275.996	.794
Yard/Food/Compost, Non-Food	Equal variances assumed	.694	276	.488
	Equal variances not assumed	.694	255.059	.488
Diapers, Pet Waste	Equal variances assumed	1.909	276	.057
	Equal variances not assumed	1.909	180.504	.058
HHW	Equal variances assumed	1.297	276	.196
	Equal variances not assumed	1.297	207.986	.196
Electronic	Equal variances assumed	-1.463	276	.145
	Equal variances not assumed	-1.463	154.667	.146

		t	df	Sig. (2-tailed)
		t-test for Equality of Means		
Other Residual	Equal variances assumed	-3.808	276	.000
	Equal variances not assumed	-3.808	260.495	.000
Plastic Film, Other Bags	Equal variances assumed	.142	276	.887
	Equal variances not assumed	.142	273.722	.887
Shopping Plastic Bag Only	Equal variances assumed	-6.442	276	.000
	Equal variances not assumed	-6.442	191.592	.000
Total Film Plastic	Equal variances assumed	-1.016	276	.310
	Equal variances not assumed	-1.016	272.212	.310

Independent Samples Test

		t-test for Equality of Means	
		Mean Difference	Std. Error Difference
Glass	Equal variances assumed	1.4271	.6197
	Equal variances not assumed	1.4271	.6197
Unacceptable Paper	Equal variances assumed	.1379	.1754
	Equal variances not assumed	.1379	.1754
Rigid Plastic	Equal variances assumed	.0929	.3551
	Equal variances not assumed	.0929	.3551
Yard/Food/Compost, Non-Food	Equal variances assumed	.3205	.4620
	Equal variances not assumed	.3205	.4620
Diapers, Pet Waste	Equal variances assumed	.4757	.2492
	Equal variances not assumed	.4757	.2492
HHW	Equal variances assumed	.1668	.1286
	Equal variances not assumed	.1668	.1286
Electronic	Equal variances assumed	-.30921	.21140
	Equal variances not assumed	-.30921	.21140
Other Residual	Equal variances assumed	-3.2232	.8464
	Equal variances not assumed	-3.2232	.8464
Plastic Film, Other Bags	Equal variances assumed	.0256	.1802
	Equal variances not assumed	.0256	.1802
Shopping Plastic Bag Only	Equal variances assumed	-.21853	.03392
	Equal variances not assumed	-.21853	.03392
Total Film Plastic	Equal variances assumed	-.19291	.18982
	Equal variances not assumed	-.19291	.18982

Independent Samples Test

		t-test for Equality of Means	
		95% Confidence Interval of the Difference	
		Lower	Upper
Glass	Equal variances assumed	.2073	2.6470
	Equal variances not assumed	.2072	2.6470
Unacceptable Paper	Equal variances assumed	-.2073	.4831
	Equal variances not assumed	-.2074	.4832
Rigid Plastic	Equal variances assumed	-.6061	.7920
	Equal variances not assumed	-.6061	.7920
Yard/Food/Compost, Non-Food	Equal variances assumed	-.5890	1.2300
	Equal variances not assumed	-.5893	1.2303
Diapers, Pet Waste	Equal variances assumed	-.0148	.9662
	Equal variances not assumed	-.0160	.9673
HHW	Equal variances assumed	-.0864	.4199
	Equal variances not assumed	-.0868	.4203
Electronic	Equal variances assumed	-.72537	.10695
	Equal variances not assumed	-.72681	.10839
Other Residual	Equal variances assumed	-4.8895	-1.5570
	Equal variances not assumed	-4.8899	-1.5566
Plastic Film, Other Bags	Equal variances assumed	-.3291	.3803
	Equal variances not assumed	-.3291	.3803
Shopping Plastic Bag Only	Equal variances assumed	-.28530	-.15175
	Equal variances not assumed	-.28543	-.15162
Total Film Plastic	Equal variances assumed	-.56659	.18076
	Equal variances not assumed	-.56661	.18079

Group Statistics

Study Jurisdiction		N	Mean	Std. Deviation	Std. Error Mean
Percent Glass	Portland	139	.0187	.01994	.00169
	Region-wide	139	.0136	.01883	.00160
Percent U paper	Portland	139	.0049	.00572	.00049
	Region-wide	139	.0045	.00458	.00039
Percent Rigid	Portland	139	.0191	.01013	.00086
	Region-wide	139	.0189	.00992	.00084
Percent Yard FC	Portland	139	.0145	.01487	.00126
	Region-wide	139	.0135	.01120	.00095
Percent Diapers Pet	Portland	139	.0030	.00912	.00077
	Region-wide	139	.0013	.00355	.00030
Percent HHW	Portland	139	.0013	.00500	.00042
	Region-wide	139	.0007	.00256	.00022
Percent Electronic	Portland	139	.0004	.00205	.00017
	Region-wide	139	.0015	.00817	.00069
Percent Other Residual	Portland	139	.0174	.02056	.00174
	Region-wide	139	.0294	.02882	.00244
Percent Shop B	Portland	139	.0004	.00060	.00005
	Region-wide	139	.0012	.00126	.00011
Percent Plastic Film Other Bags	Portland	139	.0065	.00514	.00044
	Region-wide	139	.0065	.00565	.00048
Percent S Bags and Plastic Film	Portland	139	.0069	.00532	.00045
	Region-wide	139	.0076	.00598	.00051

Independent Samples Test

		Levene's Test for Equality of Variances	
		F	Sig.
Percent Glass	Equal variances assumed	.702	.403
	Equal variances not assumed		
Percent U paper	Equal variances assumed	1.092	.297
	Equal variances not assumed		
Percent Rigid	Equal variances assumed	.587	.444
	Equal variances not assumed		
Percent Yard FC	Equal variances assumed	2.514	.114
	Equal variances not assumed		
Percent Diapers Pet	Equal variances assumed	10.611	.001
	Equal variances not assumed		

Independent Samples Test

		Levene's Test for Equality of Variances	
		F	Sig.
Percent HHW	Equal variances assumed	5.608	.019
	Equal variances not assumed		
Percent Electronic	Equal variances assumed	8.259	.004
	Equal variances not assumed		
Percent Other Residual	Equal variances assumed	11.690	.001
	Equal variances not assumed		
Percent Shop B	Equal variances assumed	36.536	.000
	Equal variances not assumed		
Percent Plastic Film Other Bags	Equal variances assumed	.796	.373
	Equal variances not assumed		
Percent S Bags and Plastic Film	Equal variances assumed	1.679	.196
	Equal variances not assumed		

Independent Samples Test

		t-test for Equality of Means		
		t	df	Sig. (2-tailed)
Percent Glass	Equal variances assumed	2.180	276	.030
	Equal variances not assumed	2.180	275.099	.030
Percent U paper	Equal variances assumed	.727	276	.468
	Equal variances not assumed	.727	263.389	.468
Percent Rigid	Equal variances assumed	.176	276	.860
	Equal variances not assumed	.176	275.873	.860
Percent Yard FC	Equal variances assumed	.644	276	.520
	Equal variances not assumed	.644	256.439	.520
Percent Diapers Pet	Equal variances assumed	2.032	276	.043
	Equal variances not assumed	2.032	178.950	.044
Percent HHW	Equal variances assumed	1.337	276	.182
	Equal variances not assumed	1.337	205.552	.183
Percent Electronic	Equal variances assumed	-1.473	276	.142
	Equal variances not assumed	-1.473	155.369	.143
Percent Other Residual	Equal variances assumed	-4.007	276	.000
	Equal variances not assumed	-4.007	249.599	.000

Independent Samples Test

		t-test for Equality of Means		
		t	df	Sig. (2-tailed)
Percent Shop B	Equal variances assumed	-6.466	276	.000
	Equal variances not assumed	-6.466	196.660	.000
Percent Plastic Film Other Bags	Equal variances assumed	.037	276	.971
	Equal variances not assumed	.037	273.545	.971
Percent S Bags and Plastic Film	Equal variances assumed	-1.094	276	.275
	Equal variances not assumed	-1.094	272.381	.275

Independent Samples Test

		t-test for Equality of Means	
		Mean Difference	Std. Error Difference
Percent Glass	Equal variances assumed	.00507	.00233
	Equal variances not assumed	.00507	.00233
Percent U paper	Equal variances assumed	.00045	.00062
	Equal variances not assumed	.00045	.00062
Percent Rigid	Equal variances assumed	.00021	.00120
	Equal variances not assumed	.00021	.00120
Percent Yard FC	Equal variances assumed	.00102	.00158
	Equal variances not assumed	.00102	.00158
Percent Diapers Pet	Equal variances assumed	.00169	.00083
	Equal variances not assumed	.00169	.00083
Percent HHW	Equal variances assumed	.00064	.00048
	Equal variances not assumed	.00064	.00048
Percent Electronic	Equal variances assumed	-.00105	.00071
	Equal variances not assumed	-.00105	.00071
Percent Other Residual	Equal variances assumed	-.01203	.00300
	Equal variances not assumed	-.01203	.00300
Percent Shop B	Equal variances assumed	-.00077	.00012
	Equal variances not assumed	-.00077	.00012
Percent Plastic Film Other Bags	Equal variances assumed	.00002	.00065
	Equal variances not assumed	.00002	.00065
Percent S Bags and Plastic Film	Equal variances assumed	-.00074	.00068
	Equal variances not assumed	-.00074	.00068

Independent Samples Test

| | | t-test for Equality of Means | |
| | | 95% Confidence Interval of the Difference | |
		Lower	Upper
Percent Glass	Equal variances assumed	.00049	.00965
	Equal variances not assumed	.00049	.00965
Percent U paper	Equal variances assumed	-.00077	.00168
	Equal variances not assumed	-.00077	.00168
Percent Rigid	Equal variances assumed	-.00216	.00258
	Equal variances not assumed	-.00216	.00258
Percent Yard FC	Equal variances assumed	-.00209	.00413
	Equal variances not assumed	-.00209	.00413
Percent Diapers Pet	Equal variances assumed	.00005	.00332
	Equal variances not assumed	.00005	.00333
Percent HHW	Equal variances assumed	-.00030	.00158
	Equal variances not assumed	-.00030	.00158
Percent Electronic	Equal variances assumed	-.00246	.00035
	Equal variances not assumed	-.00246	.00036
Percent Other Residual	Equal variances assumed	-.01794	-.00612
	Equal variances not assumed	-.01794	-.00612
Percent Shop B	Equal variances assumed	-.00100	-.00053
	Equal variances not assumed	-.00100	-.00053
Percent Plastic Film Other Bags	Equal variances assumed	-.00125	.00130
	Equal variances not assumed	-.00125	.00130
Percent S Bags and Plastic Film	Equal variances assumed	-.00208	.00059
	Equal variances not assumed	-.00208	.00059

Table 5: Other film and shopping bags

Summary

A t-test was used to identify differences between the every-other-week and weekly garbage collection for the amount of other film (non-shopping bag) and the amount as well as count of shopping bags found in the recycling rollcart. Plastic shopping bags were weighed and counted separately from non-shopping bag film plastic, which is called "other film." There was no statistical difference between the average weights of "other film" in every-other-week samples compared to weekly samples.

A significant difference with a medium effect size was found between weekly collection and every-other-week collection for the average amount of plastic bags in the recycling cart, $t(-6.442) = 276$, $p = .00$. Every-other-week collection averaged .1105lbs of plastic bags and Weekly collection averaged .3290 lbs.

A significant difference with a medium effect size was also found between weekly collection and every-other-week collection for the average count of plastic bags found in the recycling cart, $t(-7.500) = 276$, $p = .00$. EOW collection averaged five plastic bags and weekly collection averaged 17 plastic bags.

Analysis

Group Statistics

	Study Jurisdiction	N	Mean	Std. Deviation	Std. Error Mean
Shopping Plastic Bag Only	Portland	139	.1105	.16399	.01391
	Region-wide	139	.3290	.36477	.03094
Shopping Plastic Bag Count	Portland	139	4.45	6.268	.532
	Region-wide	139	16.68	18.162	1.541

Independent Samples Test

		Levene's Test for Equality of Variances	
		F	Sig.
Shopping Plastic Bag Only	Equal variances assumed	39.205	.000
	Equal variances not assumed		
Shopping Plastic Bag Count	Equal variances assumed	51.997	.000
	Equal variances not assumed		

Independent Samples Test

		t-test for Equality of Means		
		t	df	Sig. (2-tailed)
Shopping Plastic Bag Only	Equal variances assumed	-6.442	276	.000
	Equal variances not assumed	-6.442	191.592	.000
Shopping Plastic Bag Count	Equal variances assumed	-7.500	276	.000
	Equal variances not assumed	-7.500	170.416	.000

Independent Samples Test

		t-test for Equality of Means	
		Mean Difference	Std. Error Difference
Shopping Plastic Bag Only	Equal variances assumed	-.21853	.03392
	Equal variances not assumed	-.21853	.03392
Shopping Plastic Bag Count	Equal variances assumed	-12.223	1.630
	Equal variances not assumed	-12.223	1.630

Independent Samples Test

		t-test for Equality of Means	
		95% Confidence Interval of the Difference	
		Lower	Upper
Shopping Plastic Bag Only	Equal variances assumed	-.28530	-.15175
	Equal variances not assumed	-.28543	-.15162
Shopping Plastic Bag Count	Equal variances assumed	-15.431	-9.015
	Equal variances not assumed	-15.440	-9.006

Group Statistics

Study Jurisdiction			N	Mean	Std. Deviation	Std. Error Mean
Shopping Plastic Bag Count	dimension1	Portland	139	4.45	6.268	.532
		Region-wide	139	16.68	18.162	1.541

Independent Samples Test

		Levene's Test for Equality of Variances	
		F	Sig.
Shopping Plastic Bag Count	Equal variances assumed	51.997	.000
	Equal variances not assumed		

Independent Samples Test

		t-test for Equality of Means		
		t	df	Sig. (2-tailed)
Shopping Plastic Bag Count	Equal variances assumed	-7.500	276	.000
	Equal variances not assumed	-7.500	170.416	.000

Independent Samples Test

		t-test for Equality of Means	
		Mean Difference	Std. Error Difference
Shopping Plastic Bag Count	Equal variances assumed	-12.223	1.630
	Equal variances not assumed	-12.223	1.630

Independent Samples Test

		t-test for Equality of Means	
		95% Confidence Interval of the Difference	
		Lower	Upper
Shopping Plastic Bag Count	Equal variances assumed	-15.431	-9.015
	Equal variances not assumed	-15.440	-9.006

Group Statistics

Study Jurisdiction			N	Mean	Std. Deviation	Std. Error Mean
Percent Plastic Film Other Bags	dimension1	Portland	139	.0065	.00514	.00044
		Region-wide	139	.0065	.00565	.00048
Plastic Film Other Bags	dimension1	Portland	139	1.827	1.4320	.1215
		Region-wide	139	1.802	1.5692	.1331

Independent Samples Test

		Levene's Test for Equality of Variances	
		F	Sig.
Percent Plastic Film Other Bags	Equal variances assumed	.796	.373
	Equal variances not assumed		
Plastic Film Other Bags	Equal variances assumed	.617	.433
	Equal variances not assumed		

Independent Samples Test

		t-test for Equality of Means		
		t	df	Sig. (2-tailed)
Percent Plastic Film Other Bags	Equal variances assumed	.037	276	.971
	Equal variances not assumed	.037	273.545	.971
Plastic Film Other Bags	Equal variances assumed	.142	276	.887
	Equal variances not assumed	.142	273.722	.887

Independent Samples Test

		t-test for Equality of Means	
		Mean Difference	Std. Error Difference
Percent Plastic Film Other Bags	Equal variances assumed	.00002	.00065
	Equal variances not assumed	.00002	.00065
Plastic Film Other Bags	Equal variances assumed	.0256	.1802
	Equal variances not assumed	.0256	.1802

Independent Samples Test

		t-test for Equality of Means	
		95% Confidence Interval of the Difference	
		Lower	Upper
Percent Plastic Film Other Bags	Equal variances assumed	-.00125	.00130
	Equal variances not assumed	-.00125	.00130
Plastic Film Other Bags	Equal variances assumed	-.3291	.3803
	Equal variances not assumed	-.3291	.3803

TABLE 6: AVERAGE WEIGHT AND COUNT FOR DEPOSIT CONTAINERS

Summary

A significant difference was found between weekly collection and every-other-week programs for the average weight and count of deposit containers found in the recycling rollcart. The weight of deposit containers, t(-3.271) = 276, p = .00 for every-other-week collection averaged 2.03 pounds and weekly collection averaged 2.44 pounds. For the count of deposit containers, t(-2.444) = 276, p = .02. Every-other-week collection averaged 45 containers and weekly collection averaged 52 containers.

Analysis

Group Statistics			N	Mean	Std. Deviation	Std. Error Mean
	Study Jurisdiction					
Percent D C	dimension1	Portland	139	.0072	.00332	.00028
		Region-wide	139	.0087	.00385	.00033
Deposit Containers	dimension1	Portland	139	2.032	.9543	.0809
		Region-wide	139	2.437	1.1072	.0939
Deposit Container Count	dimension1	Portland	139	44.89	22.390	1.899
		Region-wide	139	52.12	26.690	2.264

Independent Samples Test

		Levene's Test for Equality of Variances	
		F	Sig.
Percent D C	Equal variances assumed	.952	.330
	Equal variances not assumed		
Deposit Containers	Equal variances assumed	.922	.338
	Equal variances not assumed		
Deposit Container Count	Equal variances assumed	.868	.352
	Equal variances not assumed		

Independent Samples Test

		t-test for Equality of Means		
		t	df	Sig. (2-tailed)
Percent D C	Equal variances assumed	-3.577	276	.000
	Equal variances not assumed	-3.577	270.195	.000
Deposit Containers	Equal variances assumed	-3.271	276	.001
	Equal variances not assumed	-3.271	270.121	.001
Deposit Container Count	Equal variances assumed	-2.444	276	.015
	Equal variances not assumed	-2.444	267.898	.015

Independent Samples Test

		t-test for Equality of Means	
		Mean Difference	Std. Error Difference
Percent D C	Equal variances assumed	-.00154	.00043
	Equal variances not assumed	-.00154	.00043
Deposit Containers	Equal variances assumed	-.4055	.1240
	Equal variances not assumed	-.4055	.1240
Deposit Container Count	Equal variances assumed	-7.223	2.955
	Equal variances not assumed	-7.223	2.955

Independent Samples Test

		t-test for Equality of Means	
		95% Confidence Interval of the Difference	
		Lower	Upper
Percent D C	Equal variances assumed	-.00239	-.00069
	Equal variances not assumed	-.00239	-.00069
Deposit Containers	Equal variances assumed	-.6496	-.1615
	Equal variances not assumed	-.6496	-.1614
Deposit Container Count	Equal variances assumed	-13.040	-1.406
	Equal variances not assumed	-13.041	-1.405