EXECUTIVE SUMMARY

StopWaste.Org (StopWaste) has retained R. W. Beck, Inc. (R. W. Beck) to complete the 2008 Alameda County (County) Waste Characterization Study (Study). This Study was designed to provide updated solid waste composition and quantity results for evaluation of current conditions and further comparison with previous studies completed in 1995 and 2000. These waste characterization results will contribute to a comprehensive understanding of solid waste disposal within each of the waste streams and jurisdictions of the County, in addition to overall Countywide totals.

The primary objectives of this Study are to:

1) Provide updated composition data for each of the 17 member agencies of StopWaste, in addition to a Countywide aggregate;
2) Compare the current composition and quantity data with that of previous studies in 1995 and 2000 to identify changes within each waste stream, when possible, and measure the effect of previously implemented waste reduction programs; and
3) Identify potential specific waste streams to be targeted for future waste reduction programs.

Updated waste disposal characterization data is needed because of: evolving local and Countywide waste management programs and policies; improvements in diversion activities; new solid waste infrastructure; changes to recyclable/reusable material markets; and changes in materials generated and discarded.

The study results will assist StopWaste to evaluate options for achieving its 75 percent and beyond waste diversion goal by further enhancing existing solid waste programs, promoting future diversion, and evaluating current solid waste conditions or trends. Detailed characterization results presented throughout this report provide an opportunity for limited evaluation of the performance of current solid waste management programs within the County. Because this report focuses only on disposed solid waste, excluding recyclables, analysis of the design and performance of specific diversion programs within the County is beyond the scope of this Study.

To provide direct comparability with previous Alameda studies, this study analyzed the same five segments of the overall waste stream as were used in earlier studies:

- Single-Family Residential
- Multi-Family Residential
- Commercial
- Roll-Off Container
- Self-Haul

For the purposes of this Study, we have defined each of these five segments as a unique "waste stream". While single-family residential, multi-family residential, and commercial waste streams represent typical generator types with distinct compositions, roll-off container, and self-haul waste streams represent delivery methods for non-generator specific waste received at solid waste facilities. In an effort to provide meaningful comparison of generator specific data, we have also provided results for roll-off and self-haul waste streams by generator type.

Quantities of waste disposed from jurisdictions within Alameda County during 2008 were provided for each waste stream by StopWaste staff. Table ES-1 presents the quantity of waste disposed from each jurisdiction in 2008 classified by waste stream. Tonnages presented throughout this report represent waste disposal originating within Alameda County including that which is delivered by franchised haulers to out of County facilities, but does not include waste that may be self-hauled out of County.

Table ES-1
2008 Solid Waste Disposal by Waste Stream (tons)

Jurisdiction	SF Res	MF Res	Comm	Roll-off	Self-haul	Total	%
Alameda (City)	11,951	3,650	12,303	6,424	8,719	43,048	3.6%
Albany	1,873	874	1,358	1,257	607	5,968	0.5%
Berkeley	14,953	5,210	17,594	14,805	38,445	91,008	7.7%
Castro Valley SD	12,624	3,018	4,708	3,253	3,963	27,565	2.3%
Dublin	6,449	2,933	10,398	5,584	6,259	31,623	2.7%
Emeryville	639	2,318	4,747	5,706	843	14,253	1.2%
Fremont	37,545	17,384	31,981	38,094	44,540	169,544	14.3%
Hayward (1)	28,201	14,611	20,514	40,962	16,807	121,095	10.2%
Livermore	29,003	6,954	23,952	18,759	23,622	102,290	8.6%
Newark	7,819	3,667	9,839	13,567	1,253	36,145	3.0%
Oakland	55,555	51,621	55,284	41,975	64,373	268,809	22.6%
Oro Loma SD (1)	16,413	5,466	7,531	4,134	935	34,479	2.9%
Piedmont	2,534	0	0	798	413	3,745	0.3%
Pleasanton (2)	20,283	1,236	11,124	41,436	17,858	91,937	7.7%
San Leandro (1)	17,854	8,603	15,080	22,074	24,049	87,660	7.4%
Union City	11,257	4,538	9,825	13,380	8,827	47,826	4.0%
Unincorp County (1)	125	0	1,077	1,213	7,700	10,114	0.9%
Total Countywide	275,079	132,081	237,315	273,420	269,213	1,187,108	100%
% of Total	23.2%	11.1%	20.0%	23.0%	22.7%		

1. The waste flows reported for Oro Loma SD represent the waste which is collected from unincorporated areas of the district only; waste collected in portions of other jurisdictions are included in the waste flows for those jurisdictions..
2. Pleasanton single-family residential waste is delivered to the PGS MRF for processing to remove recyclables. Waste flow reported represents disposed waste that was not recovered.

Note: all waste flows provided by StopWaste.Org in annual tons of disposed waste.

Table ES-2 presents historic trends in overall solid waste disposal quantities generated within each jurisdiction. Overall annual solid waste quantities within the County have decreased by approximately 24 percent since 2000, with the greatest decrease (based on weight) represented by the City of Oakland and the greatest percentage decrease represented by Emeryville and Albany.

Table ES-2
Historic Solid Waste Disposal by Jurisdiction (tons)

Jurisdiction	1995	2000	2008	% Change from 2000
Alameda (City)	58,398	48,421	43,048	-11%
Albany	11,443	9,902	5,968	-40%
Berkeley	83,983	92,802	91,008	-2%
Castro Valley SD	31,614	30,936	27,565	-11%
Dublin	35,840	35,780	31,623	-12%
Emeryville	16,135	24,151	14,253	-41%
Fremont	185,311	199,922	169,544	-15%
Hayward	144,089	178,518	121,095	-32%
Livermore	83,304	126,183	102,290	-19%
Newark	51,860	52,558	36,145	-31%
Oakland	500,368	392,456	268,809	-32%
Oro Loma SD	39,194	37,758	34,479	-9%
Piedmont	6,620	5,411	3,745	-31%
Pleasanton	98,519	125,205	91,937	-27%
San Leandro	98,010	126,406	87,660	-31%
Union City	57,130	55,281	47,826	-13%
Unincorp County	12,628	10,993	10,114	-8%
Total Countywide	1,514,446	1,552,683	1,187,108	-24%

Interpretation of the 2008 Alameda County waste characterization results is difficult because of the significantly reduced waste quantities. The decline in waste flows from the 2000 study was certainly more dramatic between 2007 and the end of 2008, aligning with the recent construction and economic downturn. However, it is also likely that other factors have also contributed to some extent, such as public education regarding waste reduction, implementation of new diversion programs, and further participation of existing diversion programs. As the results of this Study are limited to solid waste, further evaluation, and integration of actual diversion (or material recovery) data would provide more support for program performance review. Effects of the recent economic downturn on solid waste disposal are discussed later.

For a more comprehensive look into what portions of the overall waste stream have varied most in the last eight years, Table ES-3 provides the amount of material by waste stream and percent change from 2000. Commercial and roll-off waste (primarily consisting of commercial and/or industrial) experienced the largest declines in waste disposal.

Section 3
RESULTS AND FINDINGS

3.1 Introduction

The purpose of this Study was to obtain current and statistically representative characterization data regarding the quantity and composition of solid waste disposed from each of StopWaste's member jurisdictions as well as an overall Countywide aggregate. Because the composition of each of the five selected waste streams is distinct in nature, a unique characterization is required for each waste stream.

The following composition results are based on field work, including sampling, surveying and sorting, performed by R. W. Beck during four seasons throughout calendar year 2008. The waste tonnages presented herein were provided by StopWaste staff based on information obtained from various solid waste haulers and facilities within the County and are comparable to waste tonnages determined in previous studies.

3.2 Countywide Composition and Quantity Data

The development of an overall Countywide waste characterization involves multiple levels of statistical analysis and aggregation of the individual sample data obtained from field work. All samples from the same jurisdiction and waste stream were grouped and averaged to develop a unique composition (i.e. material averages and confidence intervals). In order to obtain Countywide composition results for each of the five waste streams, the jurisdiction-specific data was weight-averaged based on the disposed waste tonnages of each jurisdiction within that waste stream.

This section presents Countywide characterization results for each waste stream as well as the overall Countywide characterization. Jurisdiction-specific results are provided as Appendix A of this report. Detailed Countywide results comparing historic confidence intervals are presented as Appendix B.

For each waste stream, the following tables and figures are provided for complete evaluation of the results:

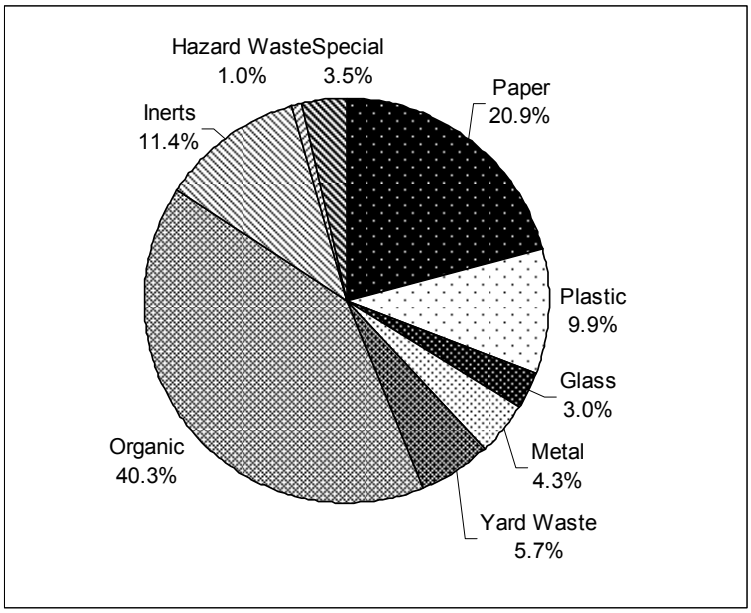
- Composition profile summary showing allocation by major material group and associated table with tons of waste disposed, mean, and upper/lower bounds;
- Detailed composition table presenting tons of waste disposed, mean, and upper/lower bounds for each material category;
- Historic comparison bar chart of disposed waste tonnages from 1995 and 2000 studies for major material groups, and detailed historic comparison table of each material category;

- Summary of top 12 most common materials from 2000 Study with historic comparison and
- Summary of top12 most common materials from 2008 Study with historic comparison.

3.2.1 Countywide Waste Stream

The overall composition of all waste disposed in Alameda County classified by major material group is presented as Figure 3-1. The largest portion of the overall waste stream is represented by Organics, with significant amounts of Paper, Plastics, and Inerts as well.

Figure 3-1 2008 Countywide Composition by Major Material Group



Material Group	Tons Disposed	Mean (%)	90 % Confidence Interval Lower Bound	Upper Bound
Paper	248,198	20.9%	20.4%	21.5%
Plastic	117,789	9.9%	9.7%	10.2%
Glass	35,172	3.0%	2.8%	3.2%
Metal	50,530	4.3%	4.1%	4.5%
Yard Waste	68,072	5.7%	5.3%	6.3%
Organic	478,530	40.3%	39.3%	41.4%
Inerts	135,715	11.4%	10.6%	12.4%
Hazard Waste	11,879	1.0%	0.9%	1.1%
Special	41,225	3.5%	3.1%	4.0%
TOTAL	1,187,108	100.0%		

Table 3-1 presents the Countywide detailed characterization results.

Appendix A2
2008 WASTE CHARACTERIZATION RESULTS
CITY OF ALBANY

This section presents a summary of the composition and quantity of disposed waste from the City of Albany. The 2008 Study results presented herein are based on compositions developed using data obtained from field sample collection and sorting activities performed over four seasons during calendar year 2008. A complete description of the Study and presentation of Countywide aggregate results are included in Section 3 of the report.

Table 1 summarizes selected demographic and waste disposal characteristics for the City of Albany. The total amount of waste disposed in 2008 represents 0.5 percent of the Countywide waste stream, and decreased approximately 40 percent from 2000.

Table 1
City of Albany Waste Disposal Data

	2000	2008
Population[1]	17,836	16,877
Housing Units	7,493	7,351
Number of Business Establishments [2]	510	526
Waste Disposal (tons)[3]	9,902	5,968
Single Family	3,350	1,873
Multi-Family	1,399	874
Commercial	2,209	1,358
Roll-off	2,396	1,257
Self-Haul	549	607
Residential Disposal Rate (lbs/capita/year) [4]	533	402
Non-residential Disposal Rate (tons/establishment/year)	9	5

[1] Source: State of California, Department of Finance, City/County Population and Housing Estimates for 2000 and Jan 2008.
[2] Source: California Board of Equalization. "Taxable Sales in California (Sales & Use Tax)", 1999 and 2007.
[3] Data provided byStopWaste.Org staff.

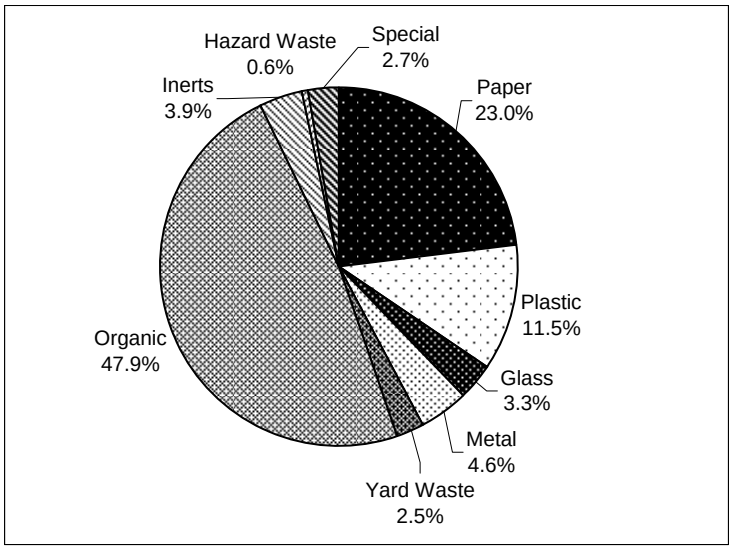
Table 2 presents the number of samples collected from each type of waste stream. Approximately 3 percent of the total number of samples collected were from this jurisdiction.

Table 2
Summary of Samples Obtained from City of Albany

Waste Stream	Total Samples
Single-family	20
Multi-family	11
Commercial	32
Roll-off	6
Self-haul	0
Total	69

The following tables and figures are presented for waste originating from the City of Albany. The introduction to Appendix B presents a summary of the information provided within each table or figure.

Figure 1 City of Albany 2008 Overall Waste Composition by Major Material Group



Material Group	Tons Disposed	Mean (%)	90 % Confidence Interval Lower Bound	90 % Confidence Interval Upper Bound
Paper	1,375	23.0%	20.6%	25.8%
Plastic	684	11.5%	10.6%	12.4%
Glass	194	3.3%	2.4%	4.5%
Metal	275	4.6%	3.7%	6.1%
Yard Waste	148	2.5%	1.7%	3.7%
Organic	2,861	47.9%	43.9%	52.1%
Inerts	232	3.9%	3.0%	5.1%
Hazard Waste	37	0.6%	0.3%	1.0%
Special	162	2.7%	1.9%	4.8%
TOTAL	5,968	100.0%		

Figure 2 City of Albany Single-Family Residential Composition by Major Material Group

Material Group	Tons Disposed	Mean (%)	90 % Confidence Interval Lower Bound	90 % Confidence Interval Upper Bound
Paper	404	21.6%	19.6%	23.6%
Plastic	268	14.3%	12.8%	15.9%
Glass	35	1.9%	1.3%	2.5%
Metal	45	2.4%	2.0%	2.8%
Yard Waste	6	0.3%	0.1%	0.6%
Organic	988	52.8%	48.8%	56.7%
Inerts	116	6.2%	3.8%	9.2%
Hazard Waste	9	0.5%	0.3%	0.7%
Special	3	0.1%	0.0%	0.3%
TOTAL	1,873	100.0%		

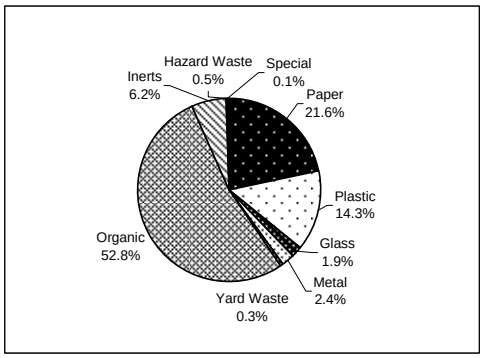


Figure 3 City of Albany Multi-Family Residential Composition by Major Material Group

Material Group	Tons Disposed	Mean (%)	90 % Confidence Interval Lower Bound	90 % Confidence Interval Upper Bound
Paper	509	27.2%	23.3%	31.3%
Plastic	288	15.4%	14.0%	16.8%
Glass	53	2.8%	1.6%	4.4%
Metal	29	1.6%	1.3%	1.9%
Yard Waste	51	2.7%	0.8%	5.7%
Organic	879	46.9%	42.7%	51.2%
Inerts	41	2.2%	1.0%	3.9%
Hazard Waste	12	0.6%	0.2%	1.3%
Special	11	0.6%	0.1%	1.4%
TOTAL	874	100.0%		

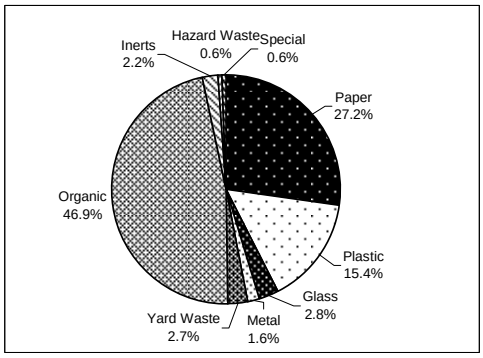


Figure 4 City of Albany Commercial Composition by Major Material Group

Material Group	Tons Disposed	Mean (%)	90 % Confidence Interval Lower Bound	90 % Confidence Interval Upper Bound
Paper	551	29.4%	24.7%	34.4%
Plastic	239	12.8%	11.3%	14.3%
Glass	66	3.5%	2.0%	5.5%
Metal	94	5.0%	3.7%	6.6%
Yard Waste	55	2.9%	1.6%	4.7%
Organic	787	42.0%	35.7%	48.5%
Inerts	49	2.6%	1.4%	4.2%
Hazard Waste	26	1.4%	0.8%	2.3%
Special	6	0.3%	0.1%	0.6%
TOTAL	1,358	100.0%		

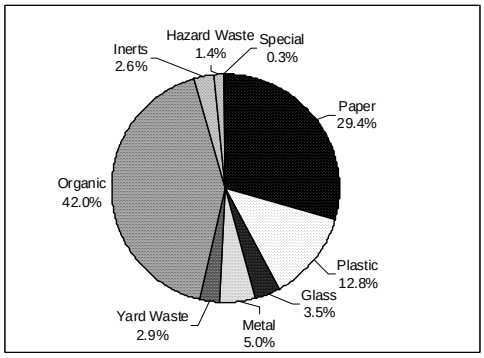


Figure 5 City of Albany Roll-off Composition by Major Material Group

Material Group	Tons Disposed	Mean (%)	90 % Confidence Interval Lower Bound	Upper Bound
Paper	290	15.5%	3.6%	33.4%
Plastic	58	3.1%	0.5%	7.9%
Glass	100	5.4%	0.3%	16.1%
Metal	179	9.6%	0.5%	27.8%
Yard Waste	94	5.0%	0.1%	17.0%
Organic	896	47.9%	13.1%	83.8%
Inerts	55	3.0%	0.1%	9.7%
Hazard Waste	0	0.0%	0.0%	0.0%
Special	199	10.6%	0.0%	39.8%
TOTAL	1,257	100.0%		

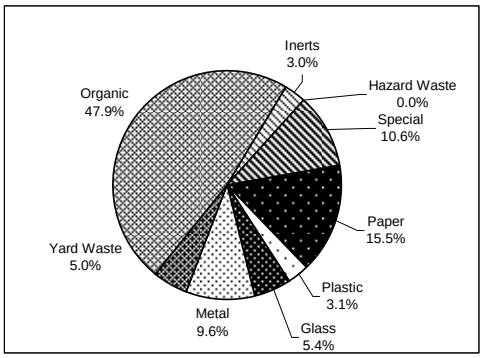


Figure 6 City of Albany Self Hauler Composition by Major Material Group

Not applicable: overall composition for Self-Haul waste quantity was used.

Figure 7 Historic Comparison of City of Albany Aggregate Disposal

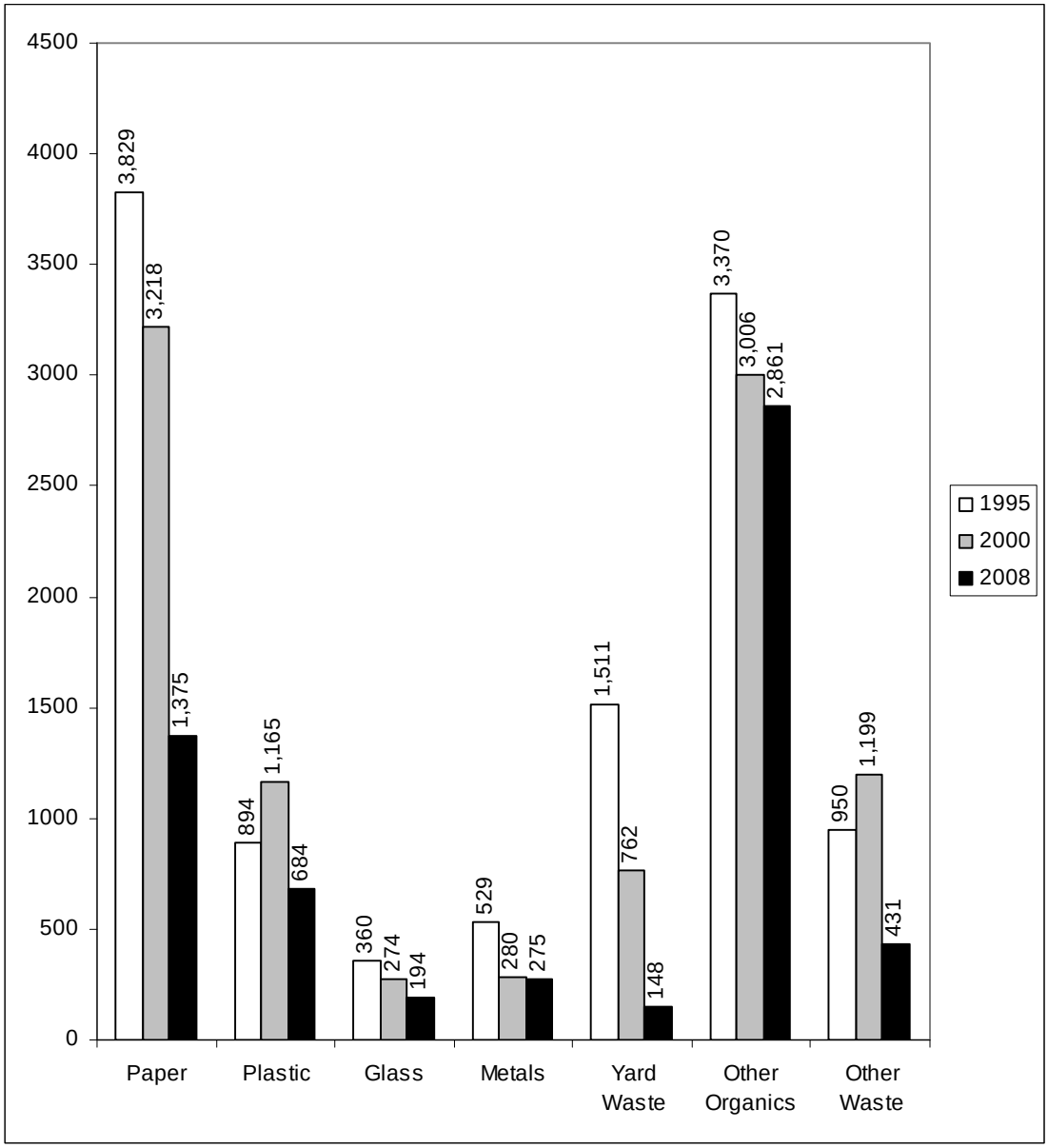


Figure 8 City of Albany Top 12 Most Common Materials – Aggregate

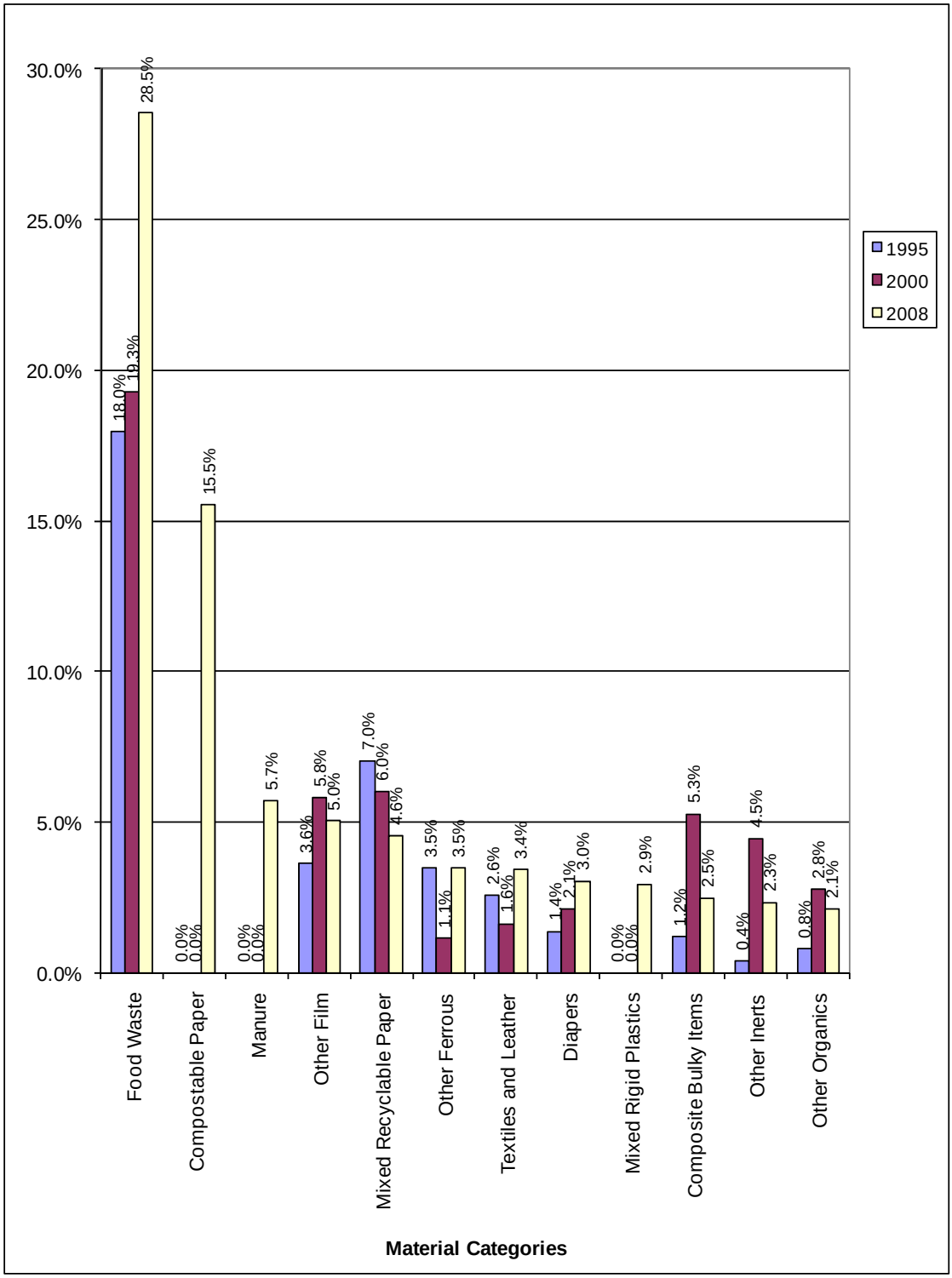


Figure 9: City of Albany Top 12 Most Common Materials from 2000

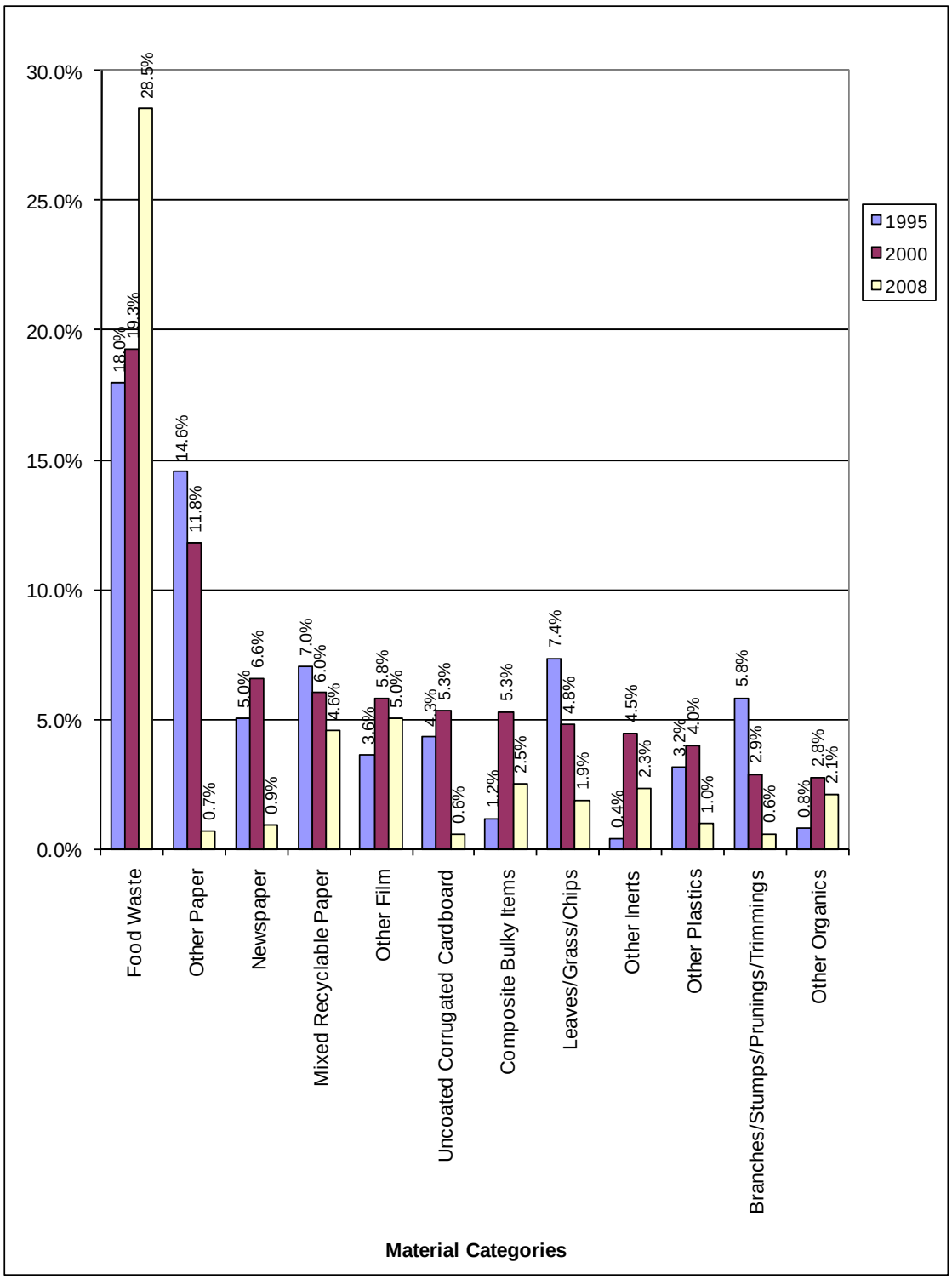


Table 3
Summary of Overall Material Proportions for City of Albany

Material Group		Material	Single-Family Residential	Multi-Family Residential	Commercial	Roll-off	Self Hauler	Aggregated
Paper			21.6%	27.2%	29.4%	15.5%	23.0%	23.0%
	1	Uncoated Corrugated Cardboard	0.1%	0.3%	1.2%	0.8%	0.6%	0.6%
	2	High Grade Paper	0.1%	0.5%	1.6%	1.0%	0.8%	0.8%
	3	Newspaper	0.6%	0.6%	1.5%	0.9%	0.9%	0.9%
	4	Mixed Recyclable Paper	2.0%	4.0%	6.1%	7.1%	4.6%	4.6%
	5	Compostable Paper	17.6%	21.0%	18.4%	5.5%	15.5%	15.5%
	6	Other Paper	1.1%	0.8%	0.7%	0.1%	0.7%	0.7%
Plastics			14.3%	15.4%	12.8%	3.1%	11.5%	11.5%
	7	HDPE Bottles (#2)	0.3%	0.6%	0.7%	0.0%	0.4%	0.4%
	8	PETE Bottles (#1)	0.3%	0.9%	0.5%	0.0%	0.4%	0.4%
	9	Other Plastic Containers	0.8%	0.9%	0.7%	0.0%	0.6%	0.6%
	10	Plastic Bags	1.3%	1.3%	1.0%	0.0%	0.9%	0.9%
	11	Other Film	6.4%	6.6%	5.2%	1.7%	5.0%	5.0%
	12	Expanded Polystyrene Blocks	0.1%	0.3%	0.2%	0.0%	0.1%	0.1%
	13	Mixed Rigid Plastics	3.6%	3.5%	3.3%	1.1%	2.9%	2.9%
	14	Other Plastics	1.3%	1.3%	1.1%	0.1%	1.0%	1.0%
Glass			1.9%	2.8%	3.5%	5.4%	3.3%	3.3%
	15	Recyclable Glass Bottles/Containers	1.6%	2.6%	1.3%	1.5%	1.7%	1.7%
	16	Other Glass	0.2%	0.2%	2.2%	3.8%	1.6%	1.6%
Metals			2.4%	1.6%	5.0%	9.6%	4.6%	4.6%
	17	Aluminum Cans	0.2%	0.2%	0.2%	0.0%	0.1%	0.1%
	18	Other Non-Ferrous	0.4%	0.4%	0.3%	0.4%	0.4%	0.4%
	19	Steel Food and Beverage Cans	0.8%	0.7%	0.8%	0.0%	0.6%	0.6%
	20	Other Ferrous	1.0%	0.2%	3.7%	9.1%	3.5%	3.5%
	21	White Goods	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Yard Waste			0.3%	2.7%	2.9%	5.0%	2.5%	2.5%
	22	Leaves/Grass/Chips	0.3%	1.7%	2.2%	4.1%	1.9%	1.9%
	23	Branches/Stumps/Prunings/Trimmings	0.1%	1.0%	0.8%	1.0%	0.6%	0.6%
Organics			52.8%	46.9%	42.0%	47.9%	47.9%	47.9%
	24	Food Waste	33.8%	31.3%	31.8%	15.2%	28.5%	28.5%
	25	Tires	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	26	Untreated Lumber	0.2%	0.3%	1.4%	1.3%	0.8%	0.8%
	27	Pallets	0.0%	0.0%	0.0%	7.9%	1.8%	1.8%
	28	Treated Wood Waste	1.3%	1.4%	2.0%	1.7%	1.6%	1.6%
	29	Textiles and Leather	4.0%	3.7%	3.7%	2.0%	3.4%	3.4%
	30	Carpet	0.0%	0.0%	0.4%	3.5%	0.9%	0.9%
	31	Diapers	5.5%	5.8%	0.6%	0.1%	3.0%	3.0%
	32	Manure	5.1%	1.4%	0.6%	15.2%	5.7%	5.7%
	33	Other Organics	2.9%	3.1%	1.6%	0.9%	2.1%	2.1%
Inerts			6.2%	2.2%	2.6%	3.0%	3.9%	3.9%
	34	Crushable Inerts	1.3%	0.4%	0.8%	2.4%	1.3%	1.3%
	35	Other Inerts	4.2%	1.8%	1.7%	0.6%	2.3%	2.3%
	36	Gypsum Board	0.6%	0.0%	0.1%	0.0%	0.2%	0.2%
	37	Asphalt Roofing	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
HHW			0.5%	0.6%	1.4%	0.0%	0.6%	0.6%
	38	Paint/Adhesives	0.2%	0.0%	0.1%	0.0%	0.1%	0.1%
	39	Vehicle & Equipment Fluids	0.0%	0.4%	0.1%	0.0%	0.1%	0.1%
	40	Universal Hazardous Waste	0.1%	0.1%	0.0%	0.0%	0.1%	0.1%
	41	Medical Waste	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
	42	Medicine	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	43	Covered E-Waste	0.0%	0.0%	0.4%	0.0%	0.1%	0.1%
	44	Other E-Waste	0.0%	0.0%	0.8%	0.0%	0.2%	0.2%
	45	Other Hazardous Waste	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Special			0.1%	0.6%	0.3%	10.6%	2.7%	2.7%
	46	Brown Goods	0.1%	0.6%	0.3%	0.0%	0.2%	0.2%
	47	Composite Bulky Items	0.0%	0.0%	0.0%	10.6%	2.5%	2.5%
	48	Other Special Waste	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
TOTAL			100.0%	100.0%	100.0%	100.0%	100.0%	100.0%