
**CITY OF SEATTLE
DEPARTMENT OF ENGINEERING
SOLID WASTE UTILITY**

1992

Waste Stream Composition Study

Final Report

Prepared by:

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and
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In cooperation with:

Solid Waste Utility Staff

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CITY OF SEATTLE
DEPARTMENT OF ENGINEERING
SOLID WASTE UTILITY

1992
WASTE STREAM COMPOSITION STUDY
FINAL REPORT

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I. Summary of Findings

A. Introduction

This report provides waste composition estimates for the City of Seattle, Washington based on sampling from January through December, 1992. This study focuses on two primary waste substreams:

- commercial route-collected wastes; and
- self-hauled wastes.

Composition data are provided for these waste streams. This sampling program concluded a three-part study which began in 1988. This Chapter presents a summary of the study purpose and results. Chapters III and IV provide more detailed findings and composition tables.

B. Overview of Three Phases

In response to the need for a more detailed examination of the City's waste stream the Solid Waste Utility launched a Waste Stream Composition Study in early 1988. The City's objectives included:

- obtaining information for characterizing the total waste stream;
- establishing a factual basis for recycling and waste reduction programs and a baseline for continued long-term measurement of system performance;
- obtaining specific data about various waste substreams to enable the City to estimate the recycling potential within each;
- understanding the differences between substreams so that targeted recycling programs can be designed, implemented, and monitored;
- determining waste generation factors for various residential and commercial substreams, thereby enabling the City to forecast future composition; and
- creating a database for ongoing evaluation and analysis of waste composition sampling data.

The results of the first year's efforts can be found in the report entitled "*Waste Stream Composition Study 1988-1989*," prepared by the Matrix Management Group for the City of Seattle Solid Waste Utility. The first year's sampling included the City's residential, commercial and self-haul waste streams. The second phase of the study covered only the residential and self-hauled waste streams. Results of that work can be found in the report "*Waste Stream Composition Study 1990*".

In late March, 1988, residential sampling began. Self-haul and commercial sampling began in April. Residential and commercial sampling concluded in February, 1989. Self-haul sampling concluded in March. In all, 550 field samples were sorted during the first 13 months of the Study.

A similar sequence of events occurred for the 1990 study. The second year of sampling began in January, 1990. A total of 317 samples, 114 residential and 203 self-haul, were sorted over a 12-month period. Samples from both residential and self-haul waste substreams were sampled monthly on a random basis.

The third phase of the work, that which is presented in this report, resulted in 197 self-haul and 251 commercial samples. Both sets of samples spanned the calendar year 1992. The detailed methodology is presented in the Appendix.

C. Results of 1992 Sampling

If there were no overall changes in tonnage in the waste stream over time, it would be sufficient to look at the percentage change of a component to estimate quantity trends. However, when quantities change, percentages and tonnages must be considered at the same time.

Commercial Waste Stream Changes

Several components which have percentage changes between the 1989/90 and 1992 commercial and 1990 and 1992 self-haul studies are described below. The corresponding tonnage changes for those components are also listed. When comparing a waste stream component percentage, or "piece of the pie", from one year to the next, it is important to remember that a seemingly large change may, in fact, be statistically insignificant.¹

Figure I-1 demonstrates the changes in Seattle's commercial waste stream from 1988/89 to 1992. Overall, the quantity of Seattle's commercial waste fell by 16%, from 230,780 tons in 1988/89 to 194,340 in 1992. Table I-1 shows the composition of the total commercial waste stream for 1992.

¹ Statistically significant differences occur where the confidence levels for two estimates of the same component do not overlap.

One of the major shifts in the commercial waste stream was the reduction in the amount of **wood** waste. Wood waste fell from 22.64% to 12.45% of the commercial waste stream between 1988/89 and 1992. The quantity dropped by 28,053 tons during the same period.²

Another major change in Seattle's commercial waste stream was the reduction in the amount of **newspaper** being disposed in the commercial waste stream, from 3.48% to 1.90% between 1988/89 and 1992. The quantity fell by 4,339 tons. **PET and HDPE bottles** increased by 51% (up 234 tons).

The *percentage* of **food** waste in the commercial waste stream increased between 1988/89 and 1992. However, the *quantity* of food dropped by 1,545 tons. As explained above, this apparent contradiction is the result of the overall tonnage decrease in the commercial waste stream.

Self-Haul Waste Stream Changes

Figure I-2 displays changes in Seattle's self-haul waste stream between 1990 and 1992. Overall, the self-haul waste stream grew by 23,210 tons, from 66,165 tons in 1990 to 89,308 tons in 1992 (35% increase).^{3 4} Notable changes in components of the self-haul waste stream are described below and displayed in Figure I-2 and Table I-2.

The percentage of **newspaper** decreased from 2.60% to 0.53% of the self-haul waste stream between 1990 and 1992. The tonnage was reduced by 1,247 tons. Although **corrugated paper** dropped as a percentage of the self-haul waste stream there was a quantity increase of 418 tons. This apparent contradiction is due to the overall increase of the self-haul tonnage.

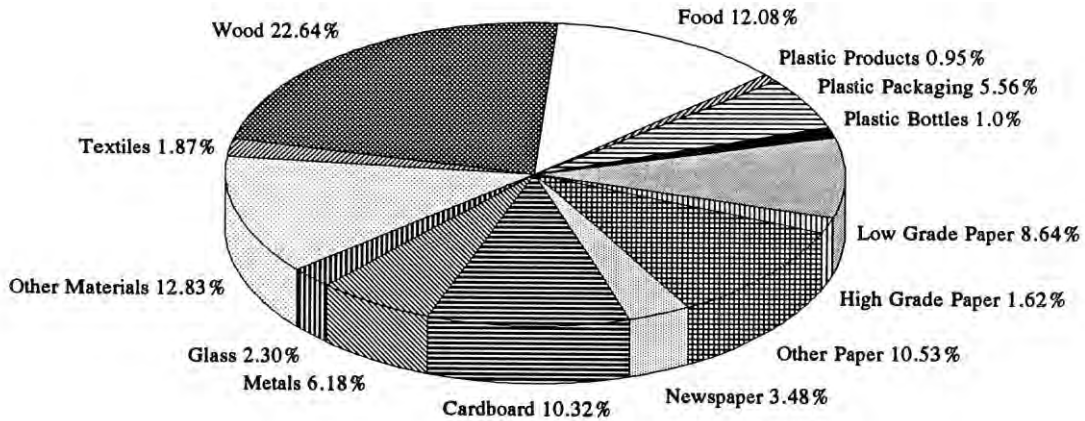
Construction debris has a much bigger "piece of the pie" (Figure I-2), in 1992 than in 1990; its percent change more than doubled. CDL tonnage increased by 3,645 tons. **Total plastic** increased by 63%, with a tonnage increase of 3,267 tons. **Yard waste** showed a 28 percent change; there were 1,547 more tons of yard waste in the self-haul waste stream in 1992 than in 1990.

The changes described above give a brief idea of the changes within the commercial and self-haul waste streams. Further information can be found in Chapters III and IV.

² Drop in wood waste is due to diversion of this material from the MSW waste stream to the CDL waste stream.

³ This increase is primarily due to enforcement of flow control for this waste stream which began in 1991.

⁴ Actual self-haul tons in 1990 were adjusted downward to account for temporary tonnage increase of CDL and to temporary absence of local access to CDL disposal self-haul.

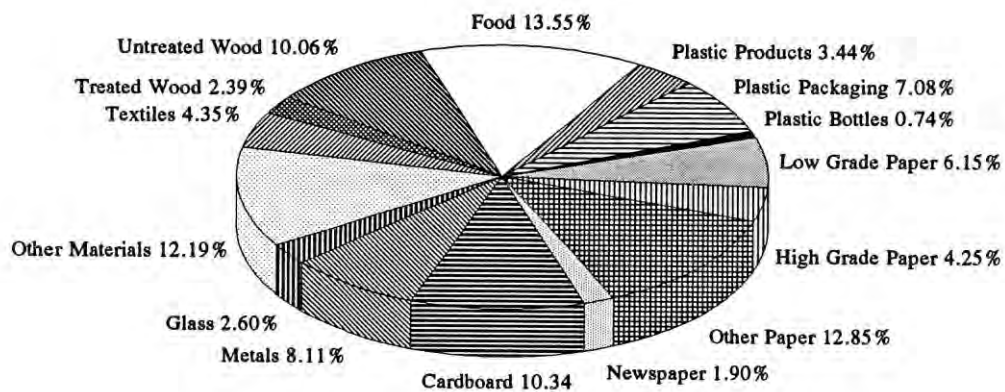


TOTAL DISPOSED: 230,780 Tons

1988/89

1992

TOTAL DISPOSED: 194,340 Tons

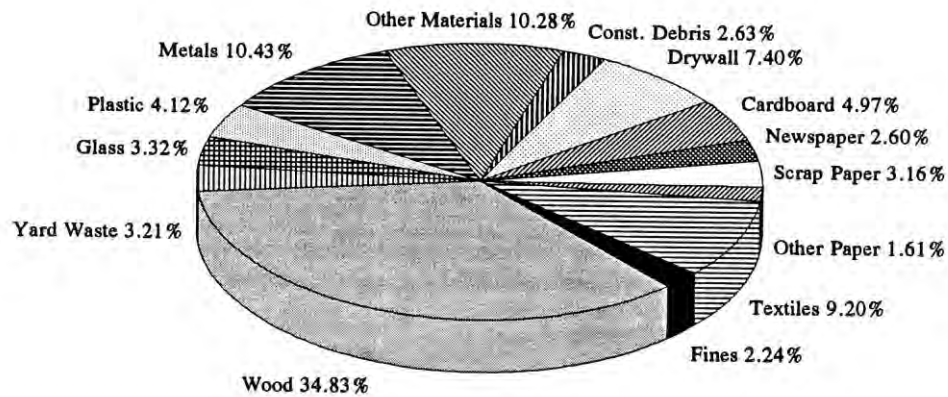


Note: Drop in wood waste due to diversion of this material to CDL waste stream.

City of Seattle
1992 Waste Composition Study

TABLE I-1
1992 OVERALL ANNUAL COMMERCIAL COMPOSITION
Disposed Component Quantities and Percentages by Weight

	Tonnes	Percentage and Range at 90% Confidence Level			
		%	+/-	Low %	High %
PAPER	68,971	35.49%			
Newspaper	3,692.4	1.90	0.30	1.60	2.19
Corrugated Paper	20,094.5	10.34	0.98	9.36	11.33
Computer Paper	2,021.1	1.04	0.43	0.61	1.47
Office Paper	6,238.2	3.21	0.76	2.45	3.98
Scrap Paper	11,951.8	6.15	0.69	5.46	6.84
Other Paper	24,972.4	12.85	1.31	11.55	14.18
PLASTIC	22,796	11.73%			
PET Bottles	136.0	0.07	0.02	0.05	0.08
HDPE Bottles	952.3	0.49	0.14	0.35	0.63
Other Plastic Bottles	349.8	0.18	0.04	0.14	0.22
Expanded Polystyrene	913.4	0.47	0.10	0.36	0.57
Plastic Packaging	13,759.1	7.08	0.97	6.11	8.06
Other Plastic Products	6,685.2	3.44	0.81	2.63	4.25
GLASS	5,053	2.60%			
Nonrefillable Beer	485.8	0.25	0.07	0.17	0.32
Refillable Beer	369.2	0.19	0.06	0.13	0.25
Nonrefillable Soft Drink	874.5	0.45	0.07	0.38	0.52
Refillable Soft Drink	38.9	0.02	0.02	0.00	0.04
Container Glass	1,185.5	0.61	0.13	0.48	0.73
Nonrecyclable Glass	2,098.9	1.08	0.62	0.46	1.70
METAL	15,761	8.11%			
Aluminum Cans	621.9	0.32	0.05	0.27	0.37
Aluminum Containers	77.7	0.04	0.02	0.03	0.06
Tin Cans	796.8	0.41	0.09	0.32	0.51
Bi-metal Cans	38.9	0.02	0.02	0.00	0.03
Ferrous Metals	5,519.2	2.84	0.72	2.12	3.56
White Goods	0.0	0.00	0.00	0.00	0.00
Nonferrous	524.7	0.27	0.19	0.08	0.46
Mixed Metal/Materials	8,181.6	4.21	0.76	3.45	4.97
RUBBER	2,915	1.50%			
Rubber Products	2,643.0	1.36	0.45	0.92	1.81
Tires	272.1	0.14	0.10	0.04	0.23
ORGANICS	54,978	28.29%			
Food	26,332.8	13.55	2.33	11.23	15.88
Prunings	971.7	0.50	0.32	0.18	0.82
Leaves & Grass	3,478.7	1.79	0.59	1.20	2.38
Untreated Wood	19,550.4	10.06	1.70	8.35	11.76
Treated Wood	4,644.7	2.39	0.87	1.51	3.26
OTHER	23,321	12.00%			
Disposable Diapers	408.1	0.21	0.10	0.11	0.31
Textiles	8,453.7	4.35	1.19	3.16	5.53
Leather	291.5	0.15	0.13	0.02	0.28
Ash	77.7	0.04	0.06	-0.02	0.10
Ceramics, Porcelain, China	874.5	0.45	0.29	0.17	0.74
Rocks, Concrete, Bricks	1,477.0	0.76	0.37	0.38	1.13
Sand, Soil, Nondistinct Fines	8,298.2	4.27	0.92	3.34	5.19
Gypsum Wallboard	1,477.0	0.76	0.43	0.33	1.19
Fiberglass Insulation	310.9	0.16	0.10	0.06	0.26
Other Construction Debris	1,651.9	0.85	0.34	0.51	1.18
HAZARDOUS	544	0.28%			
Latex Paints	0.0	0.00	0.00	0.00	0.01
Adhesives, Glues	38.9	0.02	0.02	0.00	0.04
Oil-based Paints, Solvents	291.5	0.15	0.16	-0.01	0.32
Caustic Cleaners	0.0	0.00	0.00	0.00	0.00
Pesticides, Herbicides	0.0	0.00	0.00	0.00	0.00
Batteries	19.4	0.01	0.00	0.00	0.01
Gas, Kerosene	0.0	0.00	0.00	0.00	0.00
Motor Oil, Diesel Oil	0.0	0.00	0.00	0.00	0.00
Asbestos	38.9	0.02	0.02	0.00	0.04
Explosives	0.0	0.00	0.00	0.00	0.00
Other Chemicals	155.5	0.08	0.07	0.01	0.16
NUMBER OF SAMPLES: 251	194,338				

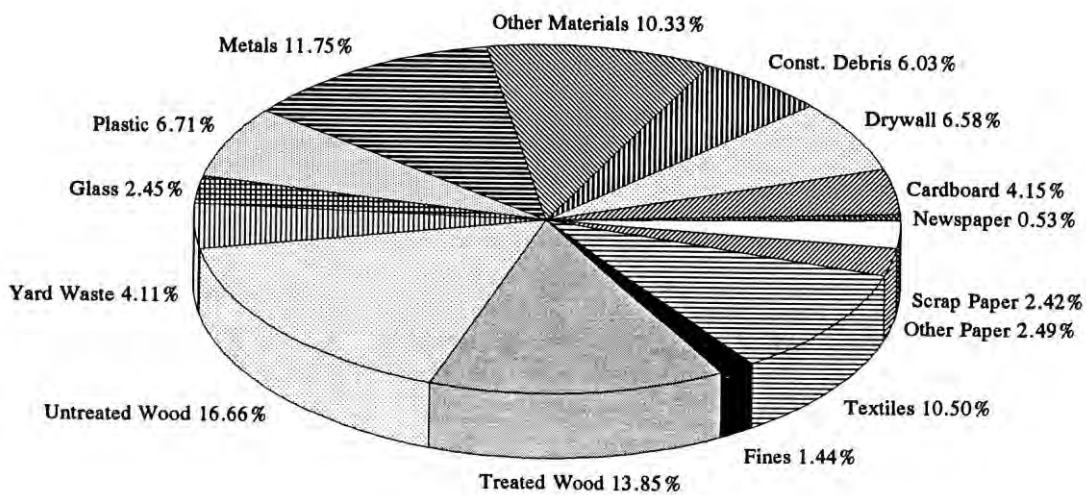


TOTAL DISPOSED: 66,165 Tons

1990

1992

TOTAL DISPOSED: 89,308 Tons



Note: Increase in tonnage primarily due to flow control enforcement begun in 1991.

City of Seattle
1992 Waste Composition Study

TABLE I-2
1992 OVERALL ANNUAL SELF-HAUL COMPOSITION
Disposed Component Quantities and Percentages by Weight

	Tonnes	Percentage and Range at 90% Confidence Level			
		%	+/-	Low %	High %
PAPER	8,565	9.59%			
Newspaper	473.3	0.53	0.26	0.27	0.79
Corrugated Paper	3,706.3	4.15	0.84	3.31	4.98
Computer Paper	80.4	0.09	0.13	-0.04	0.23
Office Paper	437.6	0.49	0.38	0.11	0.88
Scrap Paper	2,161.3	2.42	0.85	1.57	3.27
Other Paper	1,705.8	1.91	0.49	1.43	2.40
PLASTIC	5,993	6.71%			
PET Bottles	26.8	0.03	0.02	0.01	0.04
HDPE Bottles	357.2	0.40	0.19	0.21	0.58
Other Plastic Bottles	62.5	0.07	0.02	0.04	0.09
Expanded Polystyrene	134.0	0.15	0.05	0.10	0.20
Plastic Packaging	1,357.5	1.52	0.34	1.18	1.86
Other Plastic Products	4,054.6	4.54	1.29	3.26	5.83
GLASS	2,188	2.45%			
Nonrefillable Beer	169.7	0.19	0.14	0.05	0.33
Refillable Beer	107.2	0.12	0.09	0.04	0.21
Nonrefillable Soft Drink	134.0	0.15	0.05	0.10	0.20
Refillable Soft Drink	0.0	0.00	0.00	0.00	0.00
Container Glass	259.0	0.29	0.10	0.19	0.38
Nonrecyclable Glass	1,518.2	1.70	0.69	1.02	2.39
METAL	10,494	11.75%			
Aluminum Cans	116.1	0.13	0.05	0.08	0.18
Aluminum Containers	8.9	0.01	0.01	0.00	0.01
Tin Cans	71.4	0.08	0.04	0.04	0.13
Bi-metal Cans	0.0	0.00	0.01	0.00	0.01
Ferrous Metals	4,286.8	4.80	1.30	3.51	6.10
White Goods	44.7	0.05	0.08	-0.03	0.12
Nonferrous	571.6	0.64	0.34	0.30	0.98
Mixed Metal/Materials	5,394.2	6.04	1.49	4.55	7.54
RUBBER	1,616	1.81%			
Rubber Products	1,357.5	1.52	0.48	1.04	2.01
Tires	259.0	0.29	0.25	0.03	0.54
ORGANICS	31,678	35.47%			
Food	759.1	0.85	0.30	0.55	1.15
Prunings	1,143.1	1.28	0.77	0.51	2.05
Leaves & Grass	2,527.4	2.83	1.60	1.23	4.44
Untreated Wood	14,878.7	16.66	2.92	13.73	19.57
Treated Wood	12,369.2	13.85	3.29	10.55	17.13
OTHER	27,962	31.31%			
Disposable Diapers	44.7	0.05	0.04	0.01	0.09
Textiles	9,377.3	10.50	2.34	8.16	12.83
Leather	98.2	0.11	0.10	0.01	0.21
Ash	62.5	0.07	0.08	-0.01	0.15
Ceramics, Porcelain, China	2,563.1	2.87	1.29	1.58	4.16
Rocks, Concrete, Bricks	3,107.9	3.48	1.73	1.75	5.22
Sand, Soil, Nondistinct Fines	1,286.0	1.44	0.56	0.88	2.00
Gypsum Wallboard	5,876.5	6.58	2.09	4.47	8.66
Fiberglass Insulation	160.8	0.18	0.10	0.08	0.29
Other Construction Debris	5,385.3	6.03	2.31	3.72	8.34
HAZARDOUS	813	0.91%			
Latex Paints	98.2	0.11	0.12	0.00	0.23
Adhesives, Glues	232.2	0.26	0.17	0.09	0.43
Oil-based Paints, Solvents	62.5	0.07	0.05	0.02	0.12
Caustic Cleaners	8.9	0.01	0.01	0.00	0.02
Pesticides, Herbicides	0.0	0.00	0.01	0.00	0.01
Batteries	17.9	0.02	0.02	0.00	0.04
Gas, Kerosene	0.0	0.00	0.00	0.00	0.00
Motor Oil, Diesel Oil	17.9	0.02	0.02	0.00	0.04
Asbestos	53.6	0.06	0.10	-0.04	0.17
Explosives	8.9	0.01	0.02	-0.01	0.03
Other Chemicals	312.6	0.35	0.23	0.11	0.58
NUMBER OF SAMPLES: 197	89,308				

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II. Terminology and Definitions

A. Generating Sources

For any specific geographic area, the total waste stream is composed of various substreams. A "substream" can be defined by the particular generation, collection, or composition characteristics which make it a unique portion of the total waste stream. For this portion of the Seattle study, two primary substreams were defined: commercial, and self-hauled.

The **commercial** substream comprises the waste from commercial accounts collected by the two haulers franchised to provide collection services within the City. Commercial wastes include only waste from businesses, industry, and other non-residential generators.

The **self-hauled** substream comprises waste hauled to the City's two transfer stations by any vehicle, except for commercial vehicles engaged in providing waste collection services. Self-hauled waste contains both residential and commercial wastes.

B. Waste Types

Waste samples were sorted by hand into more than 50 waste component categories. Medical wastes, animal carcasses, feces, and similar substances were excluded from sorting; virtually everything else was weighed and recorded. A defined list of component categories follows:

NEWSPAPER: Printed newsprint, including advertising "slicks" (glossy paper), unless found separately.

CORRUGATED PAPER: Old corrugated container boxes and kraft paper, and brown paper bags, unless waxed or laminated with other paper such as glossy stock.

COMPUTER PAPER: Continuous-feed sulphite/sulphate/ground wood computer printouts and forms of all types, excluding carbonless paper.

OFFICE PAPER: White or lightly colored sulphite/sulphate bond, copy papers, and envelopes.

MIXED SCRAP PAPER: Low-grade, potentially recyclable papers, including magazines, colored papers, bleached kraft, boxboard, mailing tubes, and paperback books.

OTHER PAPER: Contaminated papers including carbon/carbonless copy paper, tissues, paper towels, paper plates, waxed papers, frozen food containers, envelopes with plastic windows, paper combined with metal or plastic parts, and hardcover books.

PET BOTTLES: Polyethylene terephthalate 2-liter and 16-ounce pop bottles, with base, and PET liquor bottles.

HDPE BOTTLES: High-density polyethylene milk and juice containers.

OTHER PLASTIC BOTTLES: Plastic bottles and containers not otherwise classified in the defined PET or HDPE categories.

EXPANDED POLYSTYRENE: Includes packaging and finished products made of expanded polystyrene.

PLASTIC PACKAGING: All plastic packaging, films, and shipping materials including thermoplastics and thermoset plastics used as packaging.

OTHER PLASTIC PRODUCTS: Finished plastic products such as toys, toothbrushes, vinyl hose, and shower curtains. Includes fiberglass resin products and materials.

NONREFILLABLE BEER BOTTLES: All green, clear, or quart-sized glass beer bottles; all brown glass beer bottles not categorized as refillable.

REFILLABLE BEER BOTTLES: Refillable brown glass bottles from western breweries, such as Rainier, Olympia, and Lucky.

NONREFILLABLE POP BOTTLES: All non-deposit glass soda pop, juice, and water bottles of any colors.

REFILLABLE POP BOTTLES: Deposit glass soda pop bottles of any color.

CONTAINER GLASS: All glass food containers, wine and wine cooler bottles, liquor bottles and other glass containers of any color.

NON-RECYCLABLE GLASS: Window glass, light bulbs, glassware, etc.

ALUMINUM CANS: Aluminum beverage cans (UBC).

ALUMINUM CONTAINERS: Aluminum food containers and aluminum foil.

TINNED CANS: Tinned steel food containers.

BI-METAL CANS: Steel-aluminum food and beverage cans.

FERROUS METALS: Ferrous and alloyed ferrous scrap metals to which a magnet adheres and which are not significantly contaminated with other metals or materials.

WHITE GOODS: Large household appliances or parts thereof.

NONFERROUS METALS: Metals not derived from iron, to which a magnet will not adhere, which are not significantly contaminated with other metals or materials.

MIXED METALS/MATERIALS: Small appliances, motors, insulated wire, and finished products containing a mixture of metals, or other materials, whose weight is derived significantly from the metal portion of its construction.

RUBBER PRODUCTS: Finished products and scrap materials made of rubber, such as bath mats, inner tubes, rubber hose, and foam rubber.

TIRES: Vehicle tires of all types.

FOOD: Food wastes and scraps, including bone, rinds, etc. Excludes the weight of food containers, except when container weight is not appreciable compared to the food inside.

YARD WASTE—PRUNINGS: Cut prunings, 6" or less in diameter, from bushes, shrubs, and trees.

YARD WASTE—LEAVES AND GRASS: Grass clippings, leaves, and weeds.

UNTREATED WOOD: Compostable, untreated dimensioned lumber and prunings or stumps 6" or greater in diameter.

TREATED WOOD: Lumber and wood products which have been painted, treated, or contaminated with other materials so as to render them difficult to compost.

DISPOSABLE DIAPERS: Disposable baby diapers and adult protective undergarments.

TEXTILES: Cloth, carpeting, upholstery material, fiber rope, rubberized cloth.

LEATHER: Finished products or scraps of leather.

ASH: Fireplace, burn barrel, or firepit ash.

CERAMICS, PORCELAIN, CHINA: Finished ceramic products of such material including dishware, toilets, etc.

ROCK, CONCRETE, BRICKS: Includes rock gravel larger than 2" diameter, Portland cement mixtures (set or unset), and fired-clay bricks.

SAND, SOIL, DIRT, AND NONDISTINCT FINES: Contains mixed fines smaller than 2" in diameter including, nondistinct organics.

GYPSUM DRYWALL: Used or new gypsum wallboard.

FIBERGLASS INSULATION: Fiberglass building and mechanical insulation, batt or rigid.

CONSTRUCTION DEBRIS: Construction debris, other than wood, which could not be classified into other component categories, e.g., asphalt shingles, mixed fine material scraps.

HOUSEHOLD HAZARDOUS WASTES: Latex paints, adhesives/glues, oil-based paints, cleaners, pesticides/herbicides, batteries, gasoline, motor oil/diesel oil, asbestos, explosives, and other chemicals.

C. Composition Calculations

The composition estimates represent **component percentages by weight** for each noted substream. They are derived by summing each component's weight across all of the selected records, as shown in the following equation:

$$C = \left(\frac{w}{t} \right) \times 100$$

where: C = Component mean percentage by weight for the selected samples.
w = Sum of the component weights in pounds for the selected samples.
t = Sum of the sample weights in pounds for the selected samples.

Precision levels at the 90% confidence level are calculated for a component's mean as follows:

$$PL_{lbs} = \pm \frac{(z \times s)}{\sqrt{n}}$$

where: z = Value of the t statistic (1.645) corresponding to a 90% confidence level.
s = Standard deviation of the mean component weight of the selected samples.
n = Number of selected samples.

The formula above results in a precision level expressed as a range of pounds around the mean component weight per sample. This is converted to a percentage as follows:

$$PL_{pct} - \left(\frac{PL_{lbs}}{x} \right) \times C$$

where: x = Mean value in pounds for the component.

The precision **range** for each component's proportion estimate is then calculated:

$$\begin{aligned} \text{Lower limit of range} &= C - PL_{pct} \\ \text{Upper limit of range} &= C + PL_{pct} \end{aligned}$$

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III. The Commercial Waste Stream

A. Disposed Composition

Commercial sampling occurred primarily from January through December, 1992. A total of 240 samples were sorted during this period. An additional 11 samples were subsequently sorted in March of 1993 from night routes. It was determined that some businesses were not adequately represented in the 1992 daytime sorts. Composition estimates were calculated for each of four seasons, and for the year as a whole. The 251 commercial samples were statistically weighted for different truck types and for each hauler. A more detailed description of the sample weighting procedure is included in Appendix B.

TABLE III-1: COMMERCIAL SAMPLING INFORMATION

A variety of information on the 251 commercial samples is given in Table III-1.

TABLE III-2: 1992 OVERALL ANNUAL COMMERCIAL COMPOSITION

Table III-2 shows the component composition percentages which resulted from the sampling and their respective calculated tonnages. This table, and the following seasonal tables, were calculated using weighted data.

TABLE III-3: WINTER COMMERCIAL COMPOSITION

TABLE III-4: SPRING COMMERCIAL COMPOSITION

TABLE III-5: SUMMER COMMERCIAL COMPOSITION

TABLE III-6: FALL COMMERCIAL COMPOSITION

Tables showing composition by season include the 11 night samples, taken in March, 1993. The night samples were assigned randomly to months during 1992, no more than one per month. In this way, the effect of the night loads was distributed evenly throughout the seasons.

TABLE III-7: COMMERCIAL COMPOSITION - MANUFACTURING

TABLE III-8: COMMERCIAL COMPOSITION - WHOLESALE

TABLE III-9: COMMERCIAL COMPOSITION - RETAIL

TABLE III-10: COMMERCIAL COMPOSITION - OFFICE

TABLE III-11: COMMERCIAL COMPOSITION - OTHER SERVICES

TABLE III-12: COMMERCIAL COMPOSITION - MIXED GENERATORS

Although 12 categories of commercial generators were established before sorting, Table III-1 shows that most of the commercial truckloads could be classified into one of six generator categories. These six generator types received enough samples to make it worthwhile to calculate categorical composition estimates. It should be noted, however, that 20 or 30 samples in any given group of commercial samples is far fewer than desired for statistical comparisons between groups. As can be seen in these tables, the confidence intervals are relatively wide; the different mean component percentages are interesting and useful, nonetheless.

These tables were created from raw, unweighted sampling data. Sample weighting is only necessary for the combined waste stream estimates given previously.

B. Quantity of Disposed Commercial Waste

The total disposed commercial waste from the City's two franchised haulers was determined from Utility records. This disposed quantity amounted to 194,338 tons in 1992.

C. Findings

Overall composition highlights for the commercial sampling have been described in Chapter I. As can be seen in Tables III-3 through III-6, the seasonal changes shown are slight. There appears to be very little variation in commercial waste composition over the course of a year.

There are some interesting differences between the various generating classes, however. Tables III-7 to III-12 show composition estimates for the six largest groups of businesses. In the **manufacturing** substream (Table III-7), the largest group of disposed materials were the categories of paper, representing 29.18% of the wastes. Other paper and cardboard accounted for most of this, at 11.27% and 10.92%, respectively. The largest single component was untreated wood, at 15.71%. Textiles ran 11.14%, plastic products 7.93%, and plastic packaging 7.82%. Food waste amounted to 6.36%.

Paper was also the largest group of materials from **wholesale** operations (Table III-8). Other paper again led the way, at 13.75%. It is also the largest single component. Cardboard was at 9.29%, and the high grade papers (office and computer) were 8.7% of the wholesale substream. Plastic packaging accounted for 11.21%; food, 10.67%; and untreated wood, 10.18%.

The largest single component in the **retail** wastes (Table III-9) was food, at 20.66%. Other paper led the paper group at 17.18%; papers accounted for 39.54% of the retail

substream. Cardboard was at 12.28%, mixed scrap paper at 6.75%, and high papers totaled 2.54%. Plastic packaging accounted for 7.38% and textiles, for 6.92%.

Not surprisingly, paper was the largest group of materials for the **office** substream (Table III-10). Other paper was by far the largest item, at 16.68%; it was also the largest single component. Office paper amounted to 9.38%, computer paper 2.99% and mixed scrap paper 8.86%. Cardboard was at 6.52% and newspaper 2.53%. Plastic packaging was 8.84%, ferrous metals 8.38%, and untreated wood 7.89%.

Organics were the largest group of materials for other services (Table III-11), particularly untreated wood (21.88%), food (6.49%), and yard wastes (5.80%). Other paper amounted to 9.21% and cardboard was 8.38%. Plastic packaging ran to 7.31%, ferrous metals 5.42%, and textiles 3.30%

Paper was again the largest group among **mixed generator** components (Table III-12), particularly other paper (11.91%), cardboard (10.79%), and mixed scrap (6.55%). High grade papers were 3.13% and newspaper 2.78%. Food was the largest single component, at 15.79%. Untreated wood was 7.84%, plastic packaging 6.18%, yard wastes 3.75%, and textiles 2.74%.

GENERAL INFORMATION

Sampling Period: January 1992 through December 1992, and March 1993 (night loads)

Total Number of Samples:	251		
Average Sample Weight (pounds):	289	Sum of Sample Weights (pounds):	72,406

INFORMATION BY GENERATOR TYPE

Number of Samples by Truckload Generator Type:

25 Manufacturing
16 Wholesale
27 Retail
0 Restaurant/Eatery
2 Hotel/Motel/Inn
21 Office - Private or Government
3 Health Facility/Services
0 Educational Institution
8 Transportation Shop
18 Other Services
128 Mixed Generator Types
3 <u>Construction/Demolition</u>
251 TOTAL

INFORMATION BY VEHICLE TYPE

Average Total Load Weight (pounds):		Sum of Total Load Weights (pounds):	
All Trucks	12,295	All Trucks	3,085,981
Roll-Off Trucks	7,804	Roll-Off Trucks	952,144
Front/Rear Load Trucks	16,541	Front/Rear Load Trucks	2,133,837

Note: All weights in pounds.

City of Seattle
1992 Waste Composition Study

TABLE III-2
1992 OVERALL ANNUAL COMMERCIAL COMPOSITION
Disposed Component Quantities and Percentages by Weight

	Tonnes	Percentage and Range at 90% Confidence Level				
		%	+/-	Low %	High %	
PAPER	68,971	35.49%				
Newspaper	3,692.4	1.90	0.30	1.60	2.19	
Corrugated Paper	20,094.5	10.34	0.98	9.36	11.33	
Computer Paper	2,021.1	1.04	0.43	0.61	1.47	
Office Paper	6,238.2	3.21	0.76	2.45	3.98	
Scrap Paper	11,951.8	6.15	0.69	5.46	6.84	
Other Paper	24,972.4	12.85	1.31	11.55	14.18	
PLASTIC	22,796	11.73%				
PET Bottles	136.0	0.07	0.02	0.05	0.08	
HDPE Bottles	952.3	0.49	0.14	0.35	0.63	
Other Plastic Bottles	349.8	0.18	0.04	0.14	0.22	
Expanded Polystyrene	913.4	0.47	0.10	0.36	0.57	
Plastic Packaging	13,759.1	7.08	0.97	6.11	8.06	
Other Plastic Products	6,685.2	3.44	0.81	2.63	4.25	
GLASS	5,053	2.60%				
Nonrefillable Beer	485.8	0.25	0.07	0.17	0.32	
Refillable Beer	369.2	0.19	0.06	0.13	0.25	
Nonrefillable Soft Drink	874.5	0.45	0.07	0.38	0.52	
Refillable Soft Drink	38.9	0.02	0.02	0.00	0.04	
Container Glass	1,185.5	0.61	0.13	0.48	0.73	
Nonrecyclable Glass	2,098.9	1.08	0.62	0.46	1.70	
METAL	15,761	8.11%				
Aluminum Cans	621.9	0.32	0.05	0.27	0.37	
Aluminum Containers	77.7	0.04	0.02	0.03	0.06	
Tin Cans	796.8	0.41	0.09	0.32	0.51	
Bi-metal Cans	38.9	0.02	0.02	0.00	0.03	
Ferrous Metals	5,519.2	2.84	0.72	2.12	3.56	
White Goods	0.0	0.00	0.00	0.00	0.00	
Nonferrous	524.7	0.27	0.19	0.08	0.46	
Mixed Metal/Materials	8,181.6	4.21	0.76	3.45	4.97	
RUBBER	2,915	1.50%				
Rubber Products	2,643.0	1.36	0.45	0.92	1.81	
Tires	272.1	0.14	0.10	0.04	0.23	
ORGANICS	54,978	28.29%				
Food	26,332.8	13.55	2.33	11.23	15.88	
Prunings	971.7	0.50	0.32	0.18	0.82	
Leaves & Grass	3,478.7	1.79	0.59	1.20	2.38	
Untreated Wood	19,550.4	10.06	1.70	8.35	11.76	
Treated Wood	4,644.7	2.39	0.87	1.51	3.26	
OTHER	23,321	12.00%				
Disposable Diapers	408.1	0.21	0.10	0.11	0.31	
Textiles	8,453.7	4.35	1.19	3.16	5.53	
Leather	291.5	0.15	0.13	0.02	0.28	
Ash	77.7	0.04	0.06	-0.02	0.10	
Ceramics, Porcelain, China	874.5	0.45	0.29	0.17	0.74	
Rocks, Concrete, Bricks	1,477.0	0.76	0.37	0.38	1.13	
Sand, Soil, Nondistinct Fines	8,298.2	4.27	0.92	3.34	5.19	
Gypsum Wallboard	1,477.0	0.76	0.43	0.33	1.19	
Fiberglass Insulation	310.9	0.16	0.10	0.06	0.26	
Other Construction Debris	1,651.9	0.85	0.34	0.51	1.18	
HAZARDOUS	544	0.28%				
Latex Paints	0.0	0.00	0.00	0.00	0.01	
Adhesives, Glues	38.9	0.02	0.02	0.00	0.04	
Oil-based Paints, Solvents	291.5	0.15	0.16	-0.01	0.32	
Caustic Cleaners	0.0	0.00	0.00	0.00	0.00	
Pesticides, Herbicides	0.0	0.00	0.00	0.00	0.00	
Batteries	19.4	0.01	0.00	0.00	0.01	
Gas, Kerosene	0.0	0.00	0.00	0.00	0.00	
Motor Oil, Diesel Oil	0.0	0.00	0.00	0.00	0.00	
Asbestos	38.9	0.02	0.02	0.00	0.04	
Explosives	0.0	0.00	0.00	0.00	0.00	
Other Chemicals	155.5	0.08	0.07	0.01	0.16	
NUMBER OF SAMPLES: 251	194,338					

City of Seattle
1992 Waste Composition Study

TABLE III-3
WINTER COMMERCIAL COMPOSITION
January/February/March

Percentage by Weight and Range at 90% Confidence Level					
	%	+/-	Low %	High %	
PAPER	36.18%				
Newspaper	1.94	0.56	1.37	2.50	
Corrugated Paper	12.27	2.92	9.34	15.19	
Computer Paper	1.12	0.64	0.49	1.76	
Office Paper	2.26	0.86	1.40	3.12	
Scrap Paper	6.09	1.51	4.58	7.59	
Other Paper	12.50	2.49	10.01	14.99	
PLASTIC	12.34%				
PET Bottles	0.05	0.03	0.02	0.08	
HDPE Bottles	0.47	0.35	0.13	0.82	
Other Plastic Bottles	0.17	0.08	0.09	0.25	
Expanded Polystyrene	0.66	0.24	0.42	0.89	
Plastic Packaging	7.20	1.75	5.45	8.95	
Other Plastic Products	3.79	1.84	1.95	5.63	
GLASS	3.44%				
Nonrefillable Beer	0.26	0.15	0.12	0.41	
Refillable Beer	0.21	0.12	0.09	0.33	
Nonrefillable Soft Drink	0.46	0.13	0.32	0.59	
Refillable Soft Drink	0.01	0.02	0.00	0.03	
Container Glass	0.74	0.31	0.43	1.05	
Nonrecyclable Glass	1.76	1.72	0.04	3.48	
METAL	7.62%				
Aluminum Cans	0.32	0.08	0.24	0.40	
Aluminum Containers	0.02	0.02	0.00	0.04	
Tin Cans	0.40	0.19	0.21	0.58	
Bi-metal Cans	0.00	0.00	0.00	0.01	
Ferrous Metals	2.41	1.09	1.32	3.51	
White Goods	0.00	0.00	0.00	0.00	
Nonferrous	0.05	0.05	0.00	0.10	
Mixed Metal/Materials	4.42	1.26	3.17	5.68	
RUBBER	0.76%				
Rubber Products	0.73	0.44	0.29	1.18	
Tires	0.03	0.05	-0.02	0.09	
ORGANICS	27.76%				
Food	12.52	3.95	8.57	16.47	
Prunings	0.44	0.40	0.04	0.85	
Leaves & Grass	0.32	0.29	0.03	0.62	
Untreated Wood	13.13	3.76	9.36	16.89	
Treated Wood	1.35	1.19	0.16	2.54	
OTHER	11.28%				
Disposable Diapers	0.27	0.22	0.05	0.48	
Textiles	2.92	0.95	1.97	3.88	
Leather	0.00	0.00	0.00	0.00	
Ash	0.00	0.00	0.00	0.00	
Ceramics, Porcelain, China	0.69	0.76	-0.07	1.45	
Rocks, Concrete, Bricks	0.61	0.54	0.08	1.15	
Sand, Soil, Nondistinct Fines	4.91	1.42	3.49	6.32	
Gypsum Wallboard	0.16	0.17	-0.01	0.33	
Fiberglass Insulation	0.15	0.18	-0.03	0.33	
Other Construction Debris	1.57	1.14	0.43	2.71	
HAZARDOUS	0.61%				
Latex Paints	0.00	0.00	0.00	0.00	
Adhesives, Glues	0.00	0.00	0.00	0.00	
Oil-based Paints, Solvents	0.55	0.65	-0.10	1.20	
Caustic Cleaners	0.00	0.00	0.00	0.00	
Pesticides, Herbicides	0.00	0.00	0.00	0.00	
Batteries	0.01	0.01	0.00	0.02	
Gas, Kerosene	0.00	0.00	0.00	0.00	
Motor Oil, Diesel Oil	0.00	0.00	0.00	0.00	
Asbestos	0.05	0.08	-0.03	0.12	
Explosives	0.00	0.00	0.00	0.00	
Other Chemicals	0.00	0.00	0.00	0.00	

NUMBER OF SAMPLES: 63

City of Seattle
1992 Waste Composition Study

TABLE III-4
SPRING COMMERCIAL COMPOSITION
April/May/June

Percentage by Weight and Range at 90% Confidence Level					
	%	+/-	Low %	High %	
PAPER	31.00%				
Newspaper	2.00	0.45	1.56	2.45	
Corrugated Paper	8.94	1.40	7.54	10.33	
Computer Paper	0.99	0.63	0.35	1.62	
Office Paper	2.19	1.01	1.18	3.20	
Scrap Paper	5.45	1.00	4.45	6.45	
Other Paper	11.43	2.05	9.38	13.48	
PLASTIC	11.30%				
PET Bottles	0.02	0.01	0.01	0.03	
HDPE Bottles	0.50	0.24	0.25	0.74	
Other Plastic Bottles	0.17	0.08	0.09	0.26	
Expanded Polystyrene	0.33	0.14	0.19	0.47	
Plastic Packaging	6.47	1.68	4.79	8.15	
Other Plastic Products	3.81	2.21	1.61	6.02	
GLASS	3.64%				
Nonrefillable Beer	0.28	0.13	0.16	0.41	
Refillable Beer	0.13	0.07	0.05	0.20	
Nonrefillable Soft Drink	0.60	0.17	0.43	0.77	
Refillable Soft Drink	0.07	0.08	0.00	0.15	
Container Glass	0.64	0.26	0.37	0.90	
Nonrecyclable Glass	1.92	1.86	0.06	3.79	
METAL	9.67%				
Aluminum Cans	0.31	0.08	0.23	0.38	
Aluminum Containers	0.02	0.02	0.00	0.05	
Tin Cans	0.42	0.19	0.24	0.61	
Bi-metal Cans	0.00	0.00	0.00	0.00	
Ferrous Metals	3.31	1.52	1.78	4.83	
White Goods	0.00	0.00	0.00	0.00	
Nonferrous	0.84	0.81	0.04	1.65	
Mixed Metal/Materials	4.77	1.73	3.04	6.50	
RUBBER	2.77%				
Rubber Products	2.61	1.46	1.15	4.07	
Tires	0.16	0.19	-0.03	0.34	
ORGANICS	30.77%				
Food	12.69	4.35	8.35	17.04	
Prunings	1.58	1.32	0.26	2.91	
Leaves & Grass	4.85	2.17	2.68	7.01	
Untreated Wood	9.82	3.76	6.06	13.58	
Treated Wood	1.83	1.09	0.75	2.92	
OTHER	10.65%				
Disposable Diapers	0.15	0.09	0.06	0.24	
Textiles	3.57	1.83	1.74	5.40	
Leather	0.04	0.03	0.01	0.07	
Ash	0.02	0.04	-0.01	0.06	
Ceramics, Porcelain, China	0.30	0.38	-0.07	0.68	
Rocks, Concrete, Bricks	1.10	1.08	0.02	2.17	
Sand, Soil, Nondistinct Fines	3.61	1.23	2.38	4.85	
Gypsum Wallboard	1.03	0.99	0.04	2.02	
Fiberglass Insulation	0.01	0.02	-0.01	0.04	
Other Construction Debris	0.82	0.49	0.33	1.30	
HAZARDOUS	0.20%				
Latex Paints	0.01	0.01	-0.01	0.02	
Adhesives, Glues	0.01	0.02	0.00	0.03	
Oil-based Paints, Solvents	0.04	0.03	0.01	0.08	
Caustic Cleaners	0.01	0.01	0.00	0.02	
Pesticides, Herbicides	0.00	0.00	0.00	0.00	
Batteries	0.01	0.01	0.00	0.01	
Gas, Kerosene	0.00	0.00	0.00	0.00	
Motor Oil, Diesel Oil	0.00	0.00	0.00	0.00	
Asbestos	0.00	0.00	0.00	0.00	
Explosives	0.00	0.00	0.00	0.00	
Other Chemicals	0.12	0.20	-0.08	0.32	

NUMBER OF SAMPLES: 59

Percentage by Weight and Range at 90% Confidence Level					
	%	+/-	Low %	High %	
PAPER	37.14%				
Newspaper	1.30	0.35	0.95	1.65	
Corrugated Paper	9.76	1.60	8.16	11.35	
Computer Paper	1.33	1.27	0.06	2.59	
Office Paper	4.94	2.34	2.60	7.29	
Scrap Paper	6.11	1.25	4.86	7.36	
Other Paper	13.70	2.76	10.94	16.46	
PLASTIC	12.34%				
PET Bottles	0.09	0.04	0.05	0.13	
HDPE Bottles	0.64	0.30	0.34	0.94	
Other Plastic Bottles	0.14	0.06	0.09	0.20	
Expanded Polystyrene	0.32	0.20	0.12	0.51	
Plastic Packaging	7.82	2.56	5.26	10.38	
Other Plastic Products	3.33	1.40	1.93	4.73	
GLASS	1.80%				
Nonrefillable Beer	0.19	0.11	0.08	0.30	
Refillable Beer	0.21	0.10	0.11	0.31	
Nonrefillable Soft Drink	0.37	0.13	0.24	0.50	
Refillable Soft Drink	0.00	0.00	0.00	0.01	
Container Glass	0.44	0.23	0.22	0.67	
Nonrecyclable Glass	0.59	0.49	0.10	1.08	
METAL	6.78%				
Aluminum Cans	0.23	0.05	0.17	0.28	
Aluminum Containers	0.03	0.03	0.00	0.05	
Tin Cans	0.23	0.10	0.14	0.33	
Bi-metal Cans	0.00	0.01	0.00	0.01	
Ferrous Metals	3.02	1.79	1.23	4.82	
White Goods	0.00	0.00	0.00	0.00	
Nonferrous	0.07	0.05	0.02	0.12	
Mixed Metal/Materials	3.20	1.36	1.84	4.56	
RUBBER	1.70%				
Rubber Products	1.37	0.76	0.62	2.13	
Tires	0.33	0.32	0.01	0.65	
ORGANICS	27.78%				
Food	13.38	5.28	8.10	18.66	
Prunings	0.02	0.03	-0.01	0.05	
Leaves & Grass	1.39	0.80	0.60	2.19	
Untreated Wood	10.43	3.71	6.72	14.13	
Treated Wood	2.56	1.35	1.21	3.91	
OTHER	12.37%				
Disposable Diapers	0.04	0.05	-0.01	0.09	
Textiles	6.44	3.68	2.76	10.12	
Leather	0.47	0.48	-0.02	0.95	
Ash	0.13	0.22	-0.09	0.36	
Ceramics, Porcelain, China	0.60	0.70	-0.11	1.30	
Rocks, Concrete, Bricks	0.56	0.51	0.04	1.07	
Sand, Soil, Nondistinct Fines	3.00	1.29	1.70	4.29	
Gypsum Wallboard	0.49	0.46	0.03	0.94	
Fiberglass Insulation	0.17	0.22	-0.05	0.40	
Other Construction Debris	0.47	0.33	0.14	0.80	
HAZARDOUS	0.11%				
Latex Paints	0.00	0.00	0.00	0.00	
Adhesives, Glues	0.05	0.08	-0.03	0.13	
Oil-based Paints, Solvents	0.03	0.03	0.00	0.06	
Caustic Cleaners	0.00	0.00	0.00	0.00	
Pesticides, Herbicides	0.00	0.00	0.00	0.00	
Batteries	0.00	0.00	0.00	0.00	
Gas, Kerosene	0.00	0.00	0.00	0.00	
Motor Oil, Diesel Oil	0.00	0.00	0.00	0.00	
Asbestos	0.00	0.00	0.00	0.00	
Explosives	0.00	0.00	0.00	0.00	
Other Chemicals	0.03	0.05	-0.01	0.08	

NUMBER OF SAMPLES: 62

City of Seattle
1992 Waste Composition Study

TABLE III-6
FALL COMMERCIAL COMPOSITION
October/November/December

Percentage by Weight and Range at 90% Confidence Level					
	%	+/-	Low %	High %	
PAPER	37.15%				
Newspaper	2.38	0.87	1.51	3.25	
Corrugated Paper	10.37	1.57	8.80	11.94	
Computer Paper	0.70	0.59	0.11	1.30	
Office Paper	3.24	1.12	2.13	4.36	
Scrap Paper	6.86	1.63	5.23	8.49	
Other Paper	13.60	2.97	10.63	16.57	
PLASTIC	10.89%				
PET Bottles	0.10	0.04	0.06	0.14	
HDPE Bottles	0.34	0.19	0.15	0.54	
Other Plastic Bottles	0.24	0.11	0.13	0.34	
Expanded Polystyrene	0.56	0.22	0.34	0.78	
Plastic Packaging	6.75	1.50	5.25	8.25	
Other Plastic Products	2.90	1.00	1.91	3.90	
GLASS	1.67%				
Nonrefillable Beer	0.25	0.18	0.07	0.43	
Refillable Beer	0.21	0.18	0.03	0.39	
Nonrefillable Soft Drink	0.39	0.13	0.26	0.52	
Refillable Soft Drink	0.00	0.00	0.00	0.00	
Container Glass	0.63	0.21	0.42	0.84	
Nonrecyclable Glass	0.19	0.18	0.01	0.37	
METAL	8.58%				
Aluminum Cans	0.43	0.15	0.28	0.58	
Aluminum Containers	0.10	0.05	0.05	0.15	
Tin Cans	0.61	0.25	0.35	0.86	
Bi-metal Cans	0.06	0.06	0.00	0.12	
Ferrous Metals	2.63	1.23	1.40	3.86	
White Goods	0.00	0.00	0.00	0.00	
Nonferrous	0.19	0.14	0.05	0.33	
Mixed Metal/Materials	4.56	1.71	2.85	6.26	
RUBBER	0.88%				
Rubber Products	0.86	0.69	0.17	1.56	
Tires	0.02	0.02	-0.01	0.04	
ORGANICS	27.11%				
Food	15.49	4.82	10.67	20.31	
Prunings	0.09	0.08	0.01	0.18	
Leaves & Grass	0.89	0.68	0.21	1.57	
Untreated Wood	6.96	2.12	4.84	9.08	
Treated Wood	3.68	2.69	0.99	6.37	
OTHER	13.50%				
Disposable Diapers	0.38	0.32	0.06	0.70	
Textiles	4.24	1.74	2.50	5.98	
Leather	0.05	0.04	0.01	0.10	
Ash	0.01	0.01	0.00	0.02	
Ceramics, Porcelain, China	0.22	0.29	-0.07	0.50	
Rocks, Concrete, Bricks	0.80	0.80	-0.01	1.60	
Sand, Soil, Nondistinct Fines	5.54	2.83	2.71	8.38	
Gypsum Wallboard	1.39	1.33	0.06	2.72	
Fiberglass Insulation	0.29	0.25	0.04	0.54	
Other Construction Debris	0.58	0.46	0.12	1.03	
HAZARDOUS	0.26%				
Latex Paints	0.01	0.01	0.00	0.02	
Adhesives, Glues	0.01	0.01	0.00	0.03	
Oil-based Paints, Solvents	0.01	0.01	0.00	0.02	
Caustic Cleaners	0.00	0.00	0.00	0.00	
Pesticides, Herbicides	0.00	0.00	0.00	0.00	
Batteries	0.02	0.01	0.01	0.03	
Gas, Kerosene	0.00	0.00	0.00	0.00	
Motor Oil, Diesel Oil	0.00	0.00	0.00	0.00	
Asbestos	0.03	0.06	-0.02	0.09	
Explosives	0.00	0.00	0.00	0.00	
Other Chemicals	0.18	0.21	-0.03	0.39	

NUMBER OF SAMPLES: 67

City of Seattle
1992 Waste Composition Study

TABLE III-7
COMMERCIAL COMPOSITION - MANUFACTURING

Percentage by Weight and Range at 90% Confidence Level					
	%	+ -	Low %	High %	
PAPER	29.18%				
Newspaper	0.61	0.27	0.34	0.88	
Corrugated Paper	10.92	3.61	7.31	14.54	
Computer Paper	0.57	0.45	0.12	1.02	
Office Paper	1.71	1.00	0.70	2.71	
Scrap Paper	4.10	1.75	2.36	5.85	
Other Paper	11.27	4.16	7.12	15.43	
PLASTIC	17.35%				
PET Bottles	0.01	0.00	0.00	0.01	
HDPE Bottles	0.85	0.73	0.13	1.58	
Other Plastic Bottles	0.12	0.08	0.04	0.20	
Expanded Polystyrene	0.62	0.53	0.09	1.15	
Plastic Packaging	7.82	3.48	4.33	11.30	
Other Plastic Products	7.93	5.18	2.75	13.11	
GLASS	2.79%				
Nonrefillable Beer	0.00	0.00	0.00	0.00	
Refillable Beer	0.06	0.07	-0.01	0.12	
Nonrefillable Soft Drink	0.34	0.20	0.13	0.54	
Refillable Soft Drink	0.00	0.00	0.00	0.00	
Container Glass	0.22	0.19	0.03	0.40	
Nonrecyclable Glass	2.17	3.35	-1.18	5.52	
METAL	7.09%				
Aluminum Cans	0.16	0.06	0.09	0.22	
Aluminum Containers	0.01	0.01	0.00	0.02	
Tin Cans	0.01	0.01	0.00	0.03	
Bi-metal Cans	0.01	0.01	-0.01	0.02	
Ferrous Metals	2.76	1.54	1.22	4.29	
White Goods	0.00	0.00	0.00	0.00	
Nonferrous	0.10	0.12	-0.02	0.21	
Mixed Metal/Materials	4.04	2.46	1.58	6.50	
RUBBER	1.09%				
Rubber Products	1.09	1.13	-0.04	2.22	
Tires	0.00	0.00	0.00	0.00	
ORGANICS	27.19%				
Food	6.36	3.83	2.53	10.19	
Prunings	0.00	0.00	0.00	0.00	
Leaves & Grass	0.09	0.14	-0.06	0.23	
Untreated Wood	15.71	7.90	7.82	23.61	
Treated Wood	5.03	3.06	1.97	8.09	
OTHER	15.10%				
Disposable Diapers	0.00	0.00	0.00	0.00	
Textiles	11.14	8.59	2.55	19.72	
Leather	0.00	0.00	0.00	0.00	
Ash	0.00	0.00	0.00	0.00	
Ceramics, Porcelain, China	0.00	0.00	0.00	0.00	
Rocks, Concrete, Bricks	0.00	0.00	0.00	0.00	
Sand, Soil, Nondistinct Fines	2.89	2.06	0.83	4.95	
Gypsum Wallboard	0.00	0.00	0.00	0.00	
Fiberglass Insulation	0.65	0.72	-0.08	1.37	
Other Construction Debris	0.42	0.42	0.00	0.84	
HAZARDOUS	0.23%				
Latex Paints	0.00	0.00	0.00	0.00	
Adhesives, Glues	0.03	0.04	-0.01	0.07	
Oil-based Paints, Solvents	0.09	0.11	-0.02	0.20	
Caustic Cleaners	0.01	0.02	-0.01	0.04	
Pesticides, Herbicides	0.00	0.00	0.00	0.00	
Batteries	0.00	0.00	0.00	0.00	
Gas, Kerosene	0.00	0.00	0.00	0.00	
Motor Oil, Diesel Oil	0.00	0.00	0.00	0.00	
Asbestos	0.10	0.16	-0.06	0.26	
Explosives	0.00	0.00	0.00	0.00	
Other Chemicals	0.00	0.00	0.00	0.00	

NUMBER OF SAMPLES: 25

City of Seattle
1992 Waste Composition Study

TABLE III-8
COMMERCIAL COMPOSITION - WHOLESALE

Percentage by Weight and Range at 90% Confidence Level					
	%	+/-	Low %	High %	
PAPER	37.90%				
Newspaper	0.87	0.59	0.28	1.46	
Corrugated Paper	9.29	2.58	6.71	11.86	
Computer Paper	2.50	3.54	-1.04	6.04	
Office Paper	6.20	5.65	0.56	11.85	
Scrap Paper	5.29	3.02	2.27	8.31	
Other Paper	13.75	6.92	6.84	20.67	
PLASTIC	16.36%				
PET Bottles	0.08	0.07	0.01	0.15	
HDPE Bottles	0.87	0.82	0.04	1.69	
Other Plastic Bottles	0.08	0.09	-0.01	0.17	
Expanded Polystyrene	0.06	0.05	0.01	0.10	
Plastic Packaging	11.21	7.23	3.99	18.44	
Other Plastic Products	4.06	2.47	1.59	6.53	
GLASS	2.06%				
Nonrefillable Beer	0.08	0.12	-0.03	0.20	
Refillable Beer	0.06	0.07	-0.01	0.14	
Nonrefillable Soft Drink	0.13	0.09	0.03	0.22	
Refillable Soft Drink	0.01	0.02	-0.01	0.03	
Container Glass	0.33	0.33	-0.01	0.66	
Nonrecyclable Glass	1.45	1.92	-0.47	3.37	
METAL	7.51%				
Aluminum Cans	0.25	0.14	0.11	0.39	
Aluminum Containers	0.05	0.08	-0.03	0.14	
Tin Cans	0.06	0.08	-0.02	0.14	
Bi-metal Cans	0.00	0.00	0.00	0.01	
Ferrous Metals	3.04	2.20	0.85	5.24	
White Goods	0.00	0.00	0.00	0.00	
Nonferrous	0.00	0.00	0.00	0.00	
Mixed Metal/Materials	4.11	3.84	0.27	7.95	
RUBBER	0.93%				
Rubber Products	0.93	1.47	-0.54	2.40	
Tires	0.00	0.00	0.00	0.00	
ORGANICS	25.91%				
Food	10.67	11.67	-1.00	22.35	
Prunings	0.00	0.00	0.00	0.00	
Leaves & Grass	0.00	0.00	0.00	0.00	
Untreated Wood	10.18	6.63	3.55	16.80	
Treated Wood	5.06	7.49	-2.43	12.55	
OTHER	8.24%				
Disposable Diapers	0.01	0.01	-0.01	0.02	
Textiles	1.38	1.06	0.32	2.44	
Leather	0.04	0.07	-0.03	0.11	
Ash	0.00	0.00	0.00	0.00	
Ceramics, Porcelain, China	0.01	0.02	-0.01	0.04	
Rocks, Concrete, Bricks	1.86	2.66	-0.79	4.52	
Sand, Soil, Nondistinct Fines	3.66	3.39	0.27	7.05	
Gypsum Wallboard	0.00	0.00	0.00	0.00	
Fiberglass Insulation	0.27	0.44	-0.17	0.71	
Other Construction Debris	1.01	1.66	-0.65	2.66	
HAZARDOUS	1.09%				
Latex Paints	0.00	0.00	0.00	0.00	
Adhesives, Glues	0.00	0.00	0.00	0.00	
Oil-based Paints, Solvents	1.09	1.78	-0.70	2.87	
Caustic Cleaners	0.00	0.00	0.00	0.00	
Pesticides, Herbicides	0.00	0.00	0.00	0.00	
Batteries	0.00	0.00	0.00	0.00	
Gas, Kerosene	0.00	0.00	0.00	0.00	
Motor Oil, Diesel Oil	0.00	0.00	0.00	0.00	
Asbestos	0.00	0.00	0.00	0.00	
Explosives	0.00	0.00	0.00	0.00	
Other Chemicals	0.00	0.00	0.00	0.00	

NUMBER OF SAMPLES: 16

Percentage by Weight and Range at 90% Confidence Level					
	%	+/-	Low %	High %	
PAPER	39.54%				
Newspaper	0.79	0.39	0.41	1.18	
Corrugated Paper	12.28	4.52	7.75	16.80	
Computer Paper	0.42	0.55	-0.12	0.97	
Office Paper	2.12	1.48	0.64	3.60	
Scrap Paper	6.75	2.38	4.37	9.13	
Other Paper	17.18	4.37	12.81	21.55	
PLASTIC	12.59%				
PET Bottles	0.06	0.06	0.00	0.12	
HDPE Bottles	0.26	0.14	0.12	0.40	
Other Plastic Bottles	0.14	0.08	0.06	0.22	
Expanded Polystyrene	0.47	0.20	0.26	0.67	
Plastic Packaging	7.38	2.07	5.32	9.45	
Other Plastic Products	4.28	1.92	2.36	6.20	
GLASS	1.63%				
Nonrefillable Beer	0.15	0.16	-0.01	0.32	
Refillable Beer	0.10	0.15	-0.04	0.25	
Nonrefillable Soft Drink	0.24	0.14	0.10	0.38	
Refillable Soft Drink	0.00	0.00	0.00	0.00	
Container Glass	0.38	0.34	0.04	0.72	
Nonrecyclable Glass	0.76	0.88	-0.12	1.64	
METAL	7.97%				
Aluminum Cans	0.17	0.06	0.12	0.23	
Aluminum Containers	0.08	0.07	0.01	0.15	
Tin Cans	0.28	0.20	0.08	0.48	
Bi-metal Cans	0.00	0.00	0.00	0.00	
Ferrous Metals	1.70	0.79	0.91	2.50	
White Goods	0.00	0.00	0.00	0.00	
Nonferrous	0.04	0.04	0.00	0.08	
Mixed Metal/Materials	5.70	3.23	2.48	8.93	
RUBBER	0.11%				
Rubber Products	0.11	0.11	0.00	0.21	
Tires	0.00	0.00	0.00	0.00	
ORGANICS	28.68%				
Food	20.66	8.25	12.41	28.91	
Prunings	0.31	0.51	-0.20	0.82	
Leaves & Grass	0.40	0.38	0.01	0.78	
Untreated Wood	4.58	1.62	2.97	6.20	
Treated Wood	2.73	1.65	1.08	4.38	
OTHER	9.43%				
Disposable Diapers	0.07	0.10	-0.03	0.17	
Textiles	6.92	4.14	2.78	11.07	
Leather	0.73	0.94	-0.21	1.68	
Ash	0.01	0.02	-0.01	0.03	
Ceramics, Porcelain, China	0.07	0.07	0.00	0.14	
Rocks, Concrete, Bricks	0.06	0.11	-0.04	0.17	
Sand, Soil, Nondistinct Fines	1.18	0.80	0.38	1.98	
Gypsum Wallboard	0.00	0.00	0.00	0.00	
Fiberglass Insulation	0.03	0.04	-0.01	0.07	
Other Construction Debris	0.36	0.59	-0.23	0.95	
HAZARDOUS	0.01%				
Latex Paints	0.00	0.00	0.00	0.00	
Adhesives, Glues	0.00	0.00	0.00	0.00	
Oil-based Paints, Solvents	0.00	0.00	0.00	0.00	
Caustic Cleaners	0.00	0.00	0.00	0.00	
Pesticides, Herbicides	0.00	0.00	0.00	0.00	
Batteries	0.01	0.01	0.00	0.01	
Gas, Kerosene	0.00	0.00	0.00	0.00	
Motor Oil, Diesel Oil	0.00	0.00	0.00	0.00	
Asbestos	0.00	0.00	0.00	0.00	
Explosives	0.00	0.00	0.00	0.00	
Other Chemicals	0.00	0.00	0.00	0.00	

NUMBER OF SAMPLES: 27

City of Seattle
1992 Waste Composition Study

TABLE III-10
COMMERCIAL COMPOSITION - OFFICE

Percentage by Weight and Range at 90% Confidence Level					
	%	+/-	Low %	High %	
PAPER	46.96%				
Newspaper	2.53	0.76	1.77	3.29	
Corrugated Paper	6.52	1.60	4.92	8.12	
Computer Paper	2.99	1.94	1.05	4.93	
Office Paper	9.38	3.80	5.58	13.18	
Scrap Paper	8.86	2.38	6.47	11.24	
Other Paper	16.68	3.84	12.84	20.52	
PLASTIC	12.59%				
PET Bottles	0.11	0.08	0.03	0.19	
HDPE Bottles	0.04	0.04	0.01	0.08	
Other Plastic Bottles	0.07	0.06	0.00	0.13	
Expanded Polystyrene	0.88	0.55	0.33	1.43	
Plastic Packaging	8.84	3.40	5.44	12.24	
Other Plastic Products	2.65	0.91	1.74	3.56	
GLASS	2.13%				
Nonrefillable Beer	0.36	0.47	-0.11	0.83	
Refillable Beer	0.08	0.07	0.01	0.15	
Nonrefillable Soft Drink	0.60	0.29	0.31	0.89	
Refillable Soft Drink	0.02	0.03	-0.01	0.05	
Container Glass	0.45	0.38	0.07	0.83	
Nonrecyclable Glass	0.62	1.00	-0.38	1.63	
METAL	16.36%				
Aluminum Cans	0.64	0.29	0.35	0.93	
Aluminum Containers	0.04	0.05	-0.01	0.09	
Tin Cans	0.33	0.39	-0.06	0.72	
Bi-metal Cans	0.00	0.00	0.00	0.00	
Ferrous Metals	8.38	7.21	1.16	15.59	
White Goods	0.00	0.00	0.00	0.00	
Nonferrous	1.95	2.65	-0.70	4.61	
Mixed Metal/Materials	5.02	1.99	3.02	7.01	
RUBBER	1.66%				
Rubber Products	1.66	2.29	-0.64	3.95	
Tires	0.00	0.00	0.00	0.00	
ORGANICS	12.16%				
Food	3.83	1.86	1.98	5.69	
Prunings	0.00	0.00	0.00	0.00	
Leaves & Grass	0.00	0.00	0.00	0.00	
Untreated Wood	7.89	5.39	2.50	13.28	
Treated Wood	0.44	0.47	-0.04	0.91	
OTHER	8.10%				
Disposable Diapers	0.39	0.53	-0.13	0.92	
Textiles	1.94	1.61	0.33	3.55	
Leather	0.00	0.00	0.00	0.00	
Ash	0.00	0.00	0.00	0.00	
Ceramics, Porcelain, China	0.00	0.00	0.00	0.00	
Rocks, Concrete, Bricks	0.18	0.30	-0.12	0.48	
Sand, Soil, Nondistinct Fines	1.27	0.81	0.46	2.07	
Gypsum Wallboard	3.11	4.06	-0.94	7.17	
Fiberglass Insulation	0.00	0.00	0.00	0.00	
Other Construction Debris	1.21	1.24	-0.03	2.45	
HAZARDOUS	0.04%				
Latex Paints	0.00	0.00	0.00	0.00	
Adhesives, Glues	0.04	0.06	-0.02	0.09	
Oil-based Paints, Solvents	0.00	0.01	0.00	0.01	
Caustic Cleaners	0.00	0.00	0.00	0.00	
Pesticides, Herbicides	0.00	0.00	0.00	0.00	
Batteries	0.00	0.00	0.00	0.00	
Gas, Kerosene	0.00	0.00	0.00	0.00	
Motor Oil, Diesel Oil	0.00	0.00	0.00	0.00	
Asbestos	0.00	0.00	0.00	0.00	
Explosives	0.00	0.00	0.00	0.00	
Other Chemicals	0.00	0.00	0.00	0.00	

NUMBER OF SAMPLES: 21

Percentage by Weight and Range at 90% Confidence Level					
	%	+ -	Low %	High %	
PAPER	28.93%				
Newspaper	1.27	0.58	0.69	1.84	
Corrugated Paper	8.38	2.85	5.53	11.23	
Computer Paper	1.99	1.67	0.32	3.65	
Office Paper	2.32	1.79	0.52	4.11	
Scrap Paper	5.76	3.45	2.32	9.21	
Other Paper	9.21	3.49	5.72	12.70	
PLASTIC	13.40%				
PET Bottles	0.00	0.00	0.00	0.01	
HDPE Bottles	0.07	0.04	0.03	0.11	
Other Plastic Bottles	0.17	0.18	-0.01	0.36	
Expanded Polystyrene	0.60	0.33	0.27	0.92	
Plastic Packaging	7.31	5.12	2.18	12.43	
Other Plastic Products	5.25	5.22	0.02	10.47	
GLASS	1.11%				
Nonrefillable Beer	0.07	0.06	0.01	0.13	
Refillable Beer	0.05	0.06	-0.01	0.10	
Nonrefillable Soft Drink	0.40	0.24	0.16	0.64	
Refillable Soft Drink	0.04	0.06	-0.02	0.10	
Container Glass	0.49	0.48	0.01	0.97	
Nonrecyclable Glass	0.06	0.07	-0.01	0.13	
METAL	8.93%				
Aluminum Cans	0.27	0.10	0.18	0.37	
Aluminum Containers	0.01	0.01	0.00	0.02	
Tin Cans	0.07	0.05	0.02	0.13	
Bi-metal Cans	0.01	0.01	0.00	0.02	
Ferrous Metals	5.42	4.07	1.35	9.49	
White Goods	0.00	0.00	0.00	0.00	
Nonferrous	0.39	0.41	-0.02	0.79	
Mixed Metal/Materials	2.76	1.90	0.87	4.66	
RUBBER	1.01%				
Rubber Products	1.01	1.24	-0.23	2.24	
Tires	0.00	0.00	0.00	0.00	
ORGANICS	34.98%				
Food	6.49	6.57	-0.08	13.06	
Prunings	2.60	3.16	-0.55	5.76	
Leaves & Grass	3.20	2.12	1.08	5.33	
Untreated Wood	21.88	8.73	13.16	30.61	
Treated Wood	0.81	1.34	-0.52	2.15	
OTHER	11.48%				
Disposable Diapers	0.00	0.00	0.00	0.00	
Textiles	3.30	2.60	0.70	5.90	
Leather	0.02	0.03	-0.01	0.04	
Ash	0.00	0.00	0.00	0.00	
Ceramics, Porcelain, China	1.06	1.75	-0.68	2.81	
Rocks, Concrete, Bricks	0.99	1.02	-0.03	2.01	
Sand, Soil, Nondistinct Fines	4.41	2.77	1.64	7.18	
Gypsum Wallboard	0.04	0.06	-0.02	0.09	
Fiberglass Insulation	0.56	0.65	-0.09	1.21	
Other Construction Debris	1.10	1.62	-0.53	2.72	
HAZARDOUS	0.17%				
Latex Paints	0.00	0.00	0.00	0.00	
Adhesives, Glues	0.00	0.00	0.00	0.00	
Oil-based Paints, Solvents	0.14	0.16	-0.03	0.30	
Caustic Cleaners	0.00	0.00	0.00	0.00	
Pesticides, Herbicides	0.00	0.00	0.00	0.00	
Batteries	0.03	0.05	-0.02	0.08	
Gas, Kerosene	0.00	0.00	0.00	0.00	
Motor Oil, Diesel Oil	0.00	0.00	0.00	0.00	
Asbestos	0.00	0.00	0.00	0.00	
Explosives	0.00	0.00	0.00	0.00	
Other Chemicals	0.00	0.00	0.00	0.00	

NUMBER OF SAMPLES: 18

City of Seattle
1992 Waste Composition Study

TABLE III-12
COMMERCIAL COMPOSITION - MIXED GENERATORS

Percentage by Weight and Range at 90% Confidence Level					
	%	+/-	Low %	High %	
PAPER	35.16%				
Newspaper	2.78	0.58	2.20	3.37	
Corrugated Paper	10.79	1.08	9.71	11.87	
Computer Paper	0.51	0.27	0.24	0.78	
Office Paper	2.62	0.70	1.92	3.32	
Scrap Paper	6.55	0.83	5.72	7.38	
Other Paper	11.91	1.38	10.53	13.29	
PLASTIC	9.51%				
PET Bottles	0.08	0.02	0.06	0.11	
HDPE Bottles	0.56	0.16	0.40	0.72	
Other Plastic Bottles	0.23	0.07	0.16	0.30	
Expanded Polystyrene	0.38	0.12	0.26	0.50	
Plastic Packaging	6.18	0.65	5.53	6.83	
Other Plastic Products	2.08	0.56	1.52	2.63	
GLASS	3.42%				
Nonrefillable Beer	0.39	0.11	0.28	0.50	
Refillable Beer	0.32	0.13	0.19	0.45	
Nonrefillable Soft Drink	0.57	0.11	0.46	0.68	
Refillable Soft Drink	0.03	0.04	-0.01	0.07	
Container Glass	0.87	0.22	0.65	1.08	
Nonrecyclable Glass	1.24	0.97	0.27	2.21	
METAL	7.30%				
Aluminum Cans	0.36	0.08	0.28	0.44	
Aluminum Containers	0.04	0.02	0.02	0.06	
Tin Cans	0.68	0.17	0.51	0.85	
Bi-metal Cans	0.03	0.03	-0.01	0.06	
Ferrous Metals	2.04	0.62	1.42	2.66	
White Goods	0.00	0.00	0.00	0.00	
Nonferrous	0.21	0.16	0.05	0.38	
Mixed Metal/Materials	3.94	0.85	3.10	4.79	
RUBBER	2.12%				
Rubber Products	1.82	0.75	1.06	2.57	
Tires	0.30	0.21	0.09	0.51	
ORGANICS	28.94%				
Food	15.79	2.68	13.10	18.47	
Prunings	0.51	0.31	0.20	0.83	
Leaves & Grass	3.24	1.20	2.04	4.44	
Untreated Wood	7.84	1.36	6.48	9.20	
Treated Wood	1.56	0.62	0.95	2.18	
OTHER	13.27%				
Disposable Diapers	0.36	0.20	0.16	0.55	
Textiles	2.74	0.59	2.15	3.33	
Leather	0.08	0.04	0.04	0.12	
Ash	0.09	0.13	-0.04	0.23	
Ceramics, Porcelain, China	0.82	0.58	0.25	1.40	
Rocks, Concrete, Bricks	1.03	0.61	0.42	1.64	
Sand, Soil, Nondistinct Fines	6.30	1.76	4.54	8.06	
Gypsum Wallboard	1.05	0.70	0.35	1.75	
Fiberglass Insulation	0.05	0.05	0.01	0.10	
Other Construction Debris	0.75	0.37	0.38	1.12	
HAZARDOUS	0.28%				
Latex Paints	0.01	0.01	0.00	0.02	
Adhesives, Glues	0.03	0.05	-0.02	0.08	
Oil-based Paints, Solvents	0.08	0.05	0.02	0.13	
Caustic Cleaners	0.00	0.00	0.00	0.00	
Pesticides, Herbicides	0.00	0.00	0.00	0.00	
Batteries	0.01	0.01	0.01	0.02	
Gas, Kerosene	0.00	0.00	0.00	0.00	
Motor Oil, Diesel Oil	0.00	0.00	0.00	0.00	
Asbestos	0.03	0.04	-0.02	0.07	
Explosives	0.00	0.00	0.00	0.00	
Other Chemicals	0.12	0.11	0.00	0.23	

NUMBER OF SAMPLES: 128

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IV. The Self-Hauled Waste Stream

A. Disposed Composition

Self-haul sampling occurred on a monthly basis from January through December, 1992. A total of 100 samples from the South Transfer Station and 97 from the North Transfer Station were sorted.

The composition estimate for self-hauled waste was calculated by combining three separate substreams: 1) self-hauled waste from commercial trucks; 2) self-hauled waste from residential trucks, and 3) self-hauled waste from autos. Samples were selected systematically for autos and for all trucks. Desired numbers of trucks versus autos were established beforehand, based on estimated tonnages contributed to the self-haul waste stream. The distribution between residential and commercial generators was a result of the selection process. Each driver of a sample vehicle was asked whether he was disposing of waste from a residence or from a commercial establishment.

Sampling occurred from wastes "as-delivered" to City transfer stations. Some amount of recycling undoubtedly occurred at both residences and businesses before materials were hauled to the transfer stations. Loads with nothing but recyclables, clean green yard wastes, or clean wood were excluded from the sample, because composition and quantity of these materials are tracked separately by the Utility. In addition, samples from selected vehicles included only wastes destined for disposal — items which the driver intended for recycling were left in the vehicle for drop off in the appropriate bins, and not sampled.

Composition estimates were calculated using samples which were statistically weighted for different vehicle types and for each transfer station. A more detailed description of the sample weighting procedure is included in Appendix B.

TABLE IV-1: SELF-HAUL SAMPLING INFORMATION

Table IV-1 provides a general profile of the 197 samples used in this report. Composition tables are explained below.

TABLE IV-2: 1992 OVERALL ANNUAL SELF-HAUL COMPOSITION

Table IV-2 shows calculated component tonnages and the composition percentages which resulted from sampling. The composition percentages were calculated using weighted data.

- TABLE IV-3: 1992 SELF-HAUL AUTOMOBILE COMPOSITION
- TABLE IV-4: 1992 SELF-HAUL TRUCK COMPOSITION
- TABLE IV-5: 1992 SELF-HAUL RESIDENTIAL TRUCK COMPOSITION
- TABLE IV-6: 1992 SELF-HAUL COMMERCIAL TRUCK COMPOSITION

Three estimates of component quantities and composition by vehicle type are presented in these tables: automobiles, residential trucks, and commercial trucks. Precision levels for these estimates are also provided.

Table IV-3 was calculated using a weighted data set of automobile samples. Tables IV-4 through IV-6 were calculated in a similar manner using a weighted data set of truck samples.

- TABLE IV-7: 1992 NORTH TRANSFER STATION COMPOSITION
- TABLE IV-8: 1992 SOUTH TRANSFER STATION COMPOSITION

Both of these composition estimates were created using weighted data for each transfer station. Component tonnage calculations were derived using the total reported 1992 quantities from each station.

TABLE IV-9: TOTAL SELF-HAUL BY SEASON

Monthly samples were combined to create the seasonal percentage estimates shown in Table IV-9 using the weighted overall self-haul data.

- TABLE IV-10: SELF-HAUL AUTOS BY SEASON
- TABLE IV-11: SELF-HAUL RESIDENTIAL TRUCKS BY SEASON
- TABLE IV-12: SELF-HAUL COMMERCIAL TRUCKS BY SEASON

Tables IV-10 through IV-12 give the seasonal composition percentages derived from the 50, 72, and 75 samples taken respectively from automobiles, residential trucks, and commercial trucks. The weighted data sets for automobiles and trucks were used to create these tables.

B. Quantity of Disposed Self-Haul Waste

Estimates of disposed quantity were calculated for three self-haul substreams: autos, trucks with residential waste, and trucks with commercial waste. Utility information from 1992, however, provided tonnage data for only two substreams:

Self-haul autos: 8,555 tons
Self-haul trucks: 80,753 tons

Self-haul trucks involved in the field sampling were classified as delivering either residential or commercial wastes. After weighting the data between transfer stations, an estimate of the residential and commercial proportions was made.

Residential trucks accounted for approximately 35.8% of the total truck tonnage, while commercial trucks contributed 64.2% of the total. Applying these percentages against total 1992 truck tons yields the following:

Estimated 1992 Self-hauled
Residential Truck Tonnage = $80,753 \times 0.3582 = 28,926$ tons

Estimated 1992 Self-hauled
Commercial Truck Tonnage = $80,753 \times 0.6418 = 51,827$ tons

Thus, it was estimated that the total 1992 self-hauled waste stream included the following quantities:

Auto	=	8,555 tons
Residential truck	=	28,926
Commercial truck	=	<u>51,827</u>
Total	=	89,308 tons

C. Findings

Differences in the total self-haul waste stream between 1990 and 1992 are described in Chapter I. Composition changes by vehicle type are noted here, along with seasonal highlights.

The percentage of recyclable papers dropped for all vehicle types, most notably for autos. In 1990, autos brought 8.98% newspaper, 6.73% mixed scrap paper, and 1.35% office paper. Last year these figures were 0.34%, 2.43%, and 0.37%, respectively.

Wood wastes rose for autos from 1990 to 1992, from 18.64% to 35.75%. They remained relatively constant for residential trucks, 33.15 to 29.68 percent, and dropped for commercial trucks from 40.42% to 30.21%.

The proportion of construction debris tonnage increased for residential vehicles (both cars and trucks), but dropped for commercial trucks. However, particularly for commercial trucks, the total quantity of construction debris and related materials (wood, gypsum wall board, etc.) increased a modest amount.

Yard wastes dropped dramatically for autos, from 21.71% to 2.42%. Residential truck yard waste increased slightly, from 5.30% to 6.11%, and for commercial trucks it rose from 0.69% to 2.51%.

Winter (January/February/March) saw the largest amounts of recyclable papers (11.06%) and plastic products (7.39%). Nonrecyclable glass was low in winter (0.82%), but climbed throughout each season to a high of 2.71% in the fall (October/November/December). Wood wastes peaked in the spring (April/May/June) at 37.08%, and were lowest in the winter at 26.29%. Construction debris and related wastes — porcelain, concrete, wallboard, and insulation — was also highest in the spring, at 20.53% of the self-haul waste stream. Ferrous metals were roughly twice as prevalent in the spring and summer (6.7% and 6.57%) than in winter or fall (2.46% and 3.87%).

GENERAL INFORMATION

Sampling Period: January 1992 through December 1992

Total Number of Samples:	197		
<i>North</i>	97		
<i>South</i>	100		
Average Sample Weight (pounds):	239	Sum of Sample Weights (pounds):	47,141
Average Total Load Weight:	812	Sum of Total Load Weights:	160,030

INFORMATION BY GENERATOR TYPE

Total Commercial Samples:	79	Total Residential Samples:	118
<i>North</i>	32	<i>North</i>	65
<i>South</i>	47	<i>South</i>	53
Average Commercial Load Weight:	1,282	Average Residential Load Weight:	498

INFORMATION BY VEHICLE TYPE

Number of Trucks Sampled:	147	Number of Autos Sampled:	50
<i>Commercial</i>	75	<i>Commercial</i>	4
<i>Residential</i>	72	<i>Residential</i>	46
Average Total Load Weight (pounds):		Average Total Load Weight (pounds):	
All Trucks	1,003	All Autos	250
<i>Commercial Trucks</i>	1,327	<i>Commercial Autos</i>	435
<i>Residential Trucks</i>	667	<i>Residential Autos</i>	234
Sum of Total Load Weights:		Sum of Total Load Weights:	
All Trucks	147,510	All Autos	12,520
<i>Commercial Trucks</i>	99,500	<i>Commercial Autos</i>	1,740
<i>Residential Trucks</i>	48,010	<i>Residential Autos</i>	10,780

Note: All Weights in Pounds.

City of Seattle
1992 Waste Composition Study

TABLE IV-2
1992 OVERALL ANNUAL SELF-HAUL COMPOSITION
Disposed Component Quantities and Percentages by Weight

	Tonnes	Percentage and Range at 90% Confidence Level			
		%	+/-	Low %	High %
PAPER	8,565	9.59%			
Newspaper	473.3	0.53	0.26	0.27	0.79
Corrugated Paper	3,706.3	4.15	0.84	3.31	4.98
Computer Paper	80.4	0.09	0.13	-0.04	0.23
Office Paper	437.6	0.49	0.38	0.11	0.88
Scrap Paper	2,161.3	2.42	0.85	1.57	3.27
Other Paper	1,705.8	1.91	0.49	1.43	2.40
PLASTIC	5,993	6.71%			
PET Bottles	26.8	0.03	0.02	0.01	0.04
HDPE Bottles	357.2	0.40	0.19	0.21	0.58
Other Plastic Bottles	62.5	0.07	0.02	0.04	0.09
Expanded Polystyrene	134.0	0.15	0.05	0.10	0.20
Plastic Packaging	1,357.5	1.52	0.34	1.18	1.86
Other Plastic Products	4,054.6	4.54	1.29	3.26	5.83
GLASS	2,188	2.45%			
Nonrefillable Beer	169.7	0.19	0.14	0.05	0.33
Refillable Beer	107.2	0.12	0.09	0.04	0.21
Nonrefillable Soft Drink	134.0	0.15	0.05	0.10	0.20
Refillable Soft Drink	0.0	0.00	0.00	0.00	0.00
Container Glass	259.0	0.29	0.10	0.19	0.38
Nonrecyclable Glass	1,518.2	1.70	0.69	1.02	2.39
METAL	10,494	11.75%			
Aluminum Cans	116.1	0.13	0.05	0.08	0.18
Aluminum Containers	8.9	0.01	0.01	0.00	0.01
Tin Cans	71.4	0.08	0.04	0.04	0.13
Bi-metal Cans	0.0	0.00	0.01	0.00	0.01
Ferrous Metals	4,286.8	4.80	1.30	3.51	6.10
White Goods	44.7	0.05	0.08	-0.03	0.12
Nonferrous	571.6	0.64	0.34	0.30	0.98
Mixed Metal/Materials	5,394.2	6.04	1.49	4.55	7.54
RUBBER	1,616	1.81%			
Rubber Products	1,357.5	1.52	0.48	1.04	2.01
Tires	259.0	0.29	0.25	0.03	0.54
ORGANICS	31,678	35.47%			
Food	759.1	0.85	0.30	0.55	1.15
Prunings	1,143.1	1.28	0.77	0.51	2.05
Leaves & Grass	2,527.4	2.83	1.60	1.23	4.44
Untreated Wood	14,878.7	16.66	2.92	13.73	19.57
Treated Wood	12,369.2	13.85	3.29	10.55	17.13
OTHER	27,962	31.31%			
Disposable Diapers	44.7	0.05	0.04	0.01	0.09
Textiles	9,377.3	10.50	2.34	8.16	12.83
Leather	98.2	0.11	0.10	0.01	0.21
Ash	62.5	0.07	0.08	-0.01	0.15
Ceramics, Porcelain, China	2,563.1	2.87	1.29	1.58	4.16
Rocks, Concrete, Bricks	3,107.9	3.48	1.73	1.75	5.22
Sand, Soil, Nondistinct Fines	1,286.0	1.44	0.56	0.88	2.00
Gypsum Wallboard	5,876.5	6.58	2.09	4.47	8.66
Fiberglass Insulation	160.8	0.18	0.10	0.08	0.29
Other Construction Debris	5,385.3	6.03	2.31	3.72	8.34
HAZARDOUS	813	0.91%			
Latex Paints	98.2	0.11	0.12	0.00	0.23
Adhesives, Glues	232.2	0.26	0.17	0.09	0.43
Oil-based Paints, Solvents	62.5	0.07	0.05	0.02	0.12
Caustic Cleaners	8.9	0.01	0.01	0.00	0.02
Pesticides, Herbicides	0.0	0.00	0.01	0.00	0.01
Batteries	17.9	0.02	0.02	0.00	0.04
Gas, Kerosene	0.0	0.00	0.00	0.00	0.00
Motor Oil, Diesel Oil	17.9	0.02	0.02	0.00	0.04
Asbestos	53.6	0.06	0.10	-0.04	0.17
Explosives	8.9	0.01	0.02	-0.01	0.03
Other Chemicals	312.6	0.35	0.23	0.11	0.58
NUMBER OF SAMPLES: 197	89,308				

City of Seattle
1992 Waste Composition Study

TABLE IV-3
1992 SELF-HAUL AUTOMOBILE COMPOSITION
Disposed Component Quantities and Percentages by Weight

	Tonnes	Percentage and Range at 90% Confidence Level			
		%	+/-	Low %	High %
PAPER	670	7.83%			
Newspaper	29.1	0.34	0.28	0.06	0.62
Corrugated Paper	265.2	3.10	1.11	1.99	4.21
Computer Paper	5.1	0.06	0.09	-0.04	0.15
Office Paper	31.7	0.37	0.38	-0.01	0.75
Scrap Paper	207.9	2.43	1.37	1.07	3.80
Other Paper	130.9	1.53	1.31	0.21	2.84
PLASTIC	654	7.65%			
PET Bottles	1.7	0.02	0.02	0.00	0.05
HDPE Bottles	16.3	0.19	0.15	0.04	0.34
Other Plastic Bottles	12.8	0.15	0.13	0.03	0.28
Expanded Polystyrene	21.4	0.25	0.18	0.07	0.43
Plastic Packaging	110.4	1.29	0.87	0.42	2.16
Other Plastic Products	491.9	5.75	3.10	2.64	8.85
GLASS	172	2.01%			
Nonrefillable Beer	12.8	0.15	0.17	-0.02	0.31
Refillable Beer	5.1	0.06	0.10	-0.04	0.17
Nonrefillable Soft Drink	0.0	0.00	0.00	0.00	0.00
Refillable Soft Drink	0.0	0.00	0.01	0.00	0.01
Container Glass	48.8	0.57	0.35	0.22	0.91
Nonrecyclable Glass	105.2	1.23	0.95	0.28	2.17
METAL	760	8.88%			
Aluminum Cans	12.8	0.15	0.19	-0.04	0.34
Aluminum Containers	1.7	0.02	0.03	0.00	0.05
Tin Cans	4.3	0.05	0.04	0.01	0.09
Bi-metal Cans	0.0	0.00	0.00	0.00	0.00
Ferrous Metals	248.1	2.90	1.59	1.31	4.49
White Goods	0.0	0.00	0.00	0.00	0.00
Nonferrous	12.8	0.15	0.15	0.00	0.31
Mixed Metal/Materials	479.9	5.61	2.37	3.23	7.98
RUBBER	191	2.23%			
Rubber Products	190.8	2.23	1.74	0.50	3.97
Tires	0.0	0.00	0.00	0.00	0.00
ORGANICS	3,349	39.15%			
Food	83.8	0.98	0.81	0.17	1.79
Prunings	42.8	0.50	0.48	0.02	0.98
Leaves & Grass	164.3	1.92	1.50	0.42	3.42
Untreated Wood	1,843.6	21.55	8.36	13.20	29.91
Treated Wood	1,214.8	14.20	6.17	8.03	20.36
OTHER	2,704	31.61%			
Disposable Diapers	3.4	0.04	0.04	-0.01	0.08
Textiles	603.1	7.05	4.03	3.02	11.08
Leather	18.0	0.21	0.28	-0.07	0.49
Ash	0.0	0.00	0.00	0.00	0.00
Ceramics, Porcelain, China	119.8	1.40	1.10	0.30	2.51
Rocks, Concrete, Bricks	729.7	8.53	7.26	1.27	15.79
Sand, Soil, Nondistinct Fines	59.9	0.70	0.43	0.27	1.13
Gypsum Wallboard	501.3	5.86	4.36	1.50	10.22
Fiberglass Insulation	40.2	0.47	0.41	0.05	0.88
Other Construction Debris	628.8	7.35	5.36	1.99	12.71
HAZARDOUS	55	0.64%			
Latex Paints	7.7	0.09	0.12	-0.03	0.21
Adhesives, Glues	24.8	0.29	0.30	-0.01	0.59
Oil-based Paints, Solvents	2.6	0.03	0.03	0.01	0.06
Caustic Cleaners	0.0	0.00	0.00	0.00	0.00
Pesticides, Herbicides	4.3	0.05	0.08	-0.03	0.13
Batteries	7.7	0.09	0.13	-0.04	0.22
Gas, Kerosene	0.0	0.00	0.00	0.00	0.00
Motor Oil, Diesel Oil	3.4	0.04	0.06	-0.02	0.10
Asbestos	0.0	0.00	0.00	0.00	0.00
Explosives	0.0	0.00	0.00	0.00	0.00
Other Chemicals	4.3	0.05	0.08	-0.03	0.12
NUMBER OF SAMPLES: 50	8,555				

City of Seattle
1992 Waste Composition Study

TABLE IV-4
1992 SELF-HAUL TRUCK COMPOSITION
Disposed Component Quantities and Percentages by Weight

	Tonnes	Percentage and Range at 90% Confidence Level			
		%	+/-	Low %	High %
PAPER	7,906	9.79%			
Newspaper	444.1	0.55	0.29	0.26	0.84
Corrugated Paper	3,440.1	4.26	0.89	3.37	5.15
Computer Paper	80.8	0.10	0.15	-0.05	0.24
Office Paper	411.8	0.51	0.42	0.09	0.93
Scrap Paper	1,954.2	2.42	0.92	1.49	3.34
Other Paper	1,574.7	1.95	0.51	1.44	2.46
PLASTIC	5,330	6.60%			
PET Bottles	24.2	0.03	0.02	0.01	0.05
HDPE Bottles	339.2	0.42	0.21	0.21	0.62
Other Plastic Bottles	48.5	0.06	0.02	0.04	0.08
Expanded Polystyrene	113.1	0.14	0.05	0.09	0.19
Plastic Packaging	1,243.6	1.54	0.35	1.19	1.90
Other Plastic Products	3,561.2	4.41	1.37	3.04	5.79
GLASS	2,019	2.50%			
Nonrefillable Beer	161.5	0.20	0.15	0.05	0.35
Refillable Beer	105.0	0.13	0.10	0.03	0.23
Nonrefillable Soft Drink	137.3	0.17	0.06	0.11	0.22
Refillable Soft Drink	0.0	0.00	0.00	0.00	0.00
Container Glass	201.9	0.25	0.10	0.15	0.36
Nonrecyclable Glass	1,413.2	1.75	0.75	1.01	2.50
METAL	9,747	12.07%			
Aluminum Cans	105.0	0.13	0.05	0.08	0.18
Aluminum Containers	8.1	0.01	0.01	0.00	0.01
Tin Cans	72.7	0.09	0.05	0.04	0.13
Bi-metal Cans	0.0	0.00	0.01	0.00	0.01
Ferrous Metals	4,045.7	5.01	1.40	3.61	6.40
White Goods	40.4	0.05	0.08	-0.03	0.13
Nonferrous	557.2	0.69	0.37	0.31	1.06
Mixed Metal/Materials	4,917.9	6.09	1.61	4.48	7.70
RUBBER	1,429	1.77%			
Rubber Products	1,170.9	1.45	0.50	0.95	1.95
Tires	258.4	0.32	0.28	0.04	0.60
ORGANICS	28,320	35.07%			
Food	678.3	0.84	0.32	0.52	1.16
Prunings	1,098.2	1.36	0.85	0.51	2.21
Leaves & Grass	2,366.1	2.93	1.76	1.17	4.69
Untreated Wood	13,025.5	16.13	3.04	13.09	19.17
Treated Wood	11,152.0	13.81	3.52	10.28	17.33
OTHER	25,243	31.26%			
Disposable Diapers	40.4	0.05	0.05	0.00	0.09
Textiles	8,769.8	10.86	2.48	8.38	13.34
Leather	80.8	0.10	0.10	0.00	0.20
Ash	56.5	0.07	0.09	-0.02	0.16
Ceramics, Porcelain, China	2,446.8	3.03	1.42	1.61	4.44
Rocks, Concrete, Bricks	2,382.2	2.95	1.76	1.19	4.71
Sand, Soil, Nondistinct Fines	1,227.4	1.52	0.61	0.90	2.13
Gypsum Wallboard	5,362.0	6.64	2.25	4.39	8.89
Fiberglass Insulation	121.1	0.15	0.11	0.05	0.26
Other Construction Debris	4,756.4	5.89	2.48	3.41	8.37
HAZARDOUS	759	0.94%			
Latex Paints	88.8	0.11	0.13	-0.01	0.24
Adhesives, Glues	210.0	0.26	0.18	0.07	0.44
Oil-based Paints, Solvents	56.5	0.07	0.06	0.02	0.13
Caustic Cleaners	8.1	0.01	0.02	0.00	0.03
Pesticides, Herbicides	0.0	0.00	0.00	0.00	0.00
Batteries	8.1	0.01	0.01	0.00	0.03
Gas, Kerosene	0.0	0.00	0.00	0.00	0.00
Motor Oil, Diesel Oil	16.2	0.02	0.02	0.00	0.04
Asbestos	56.5	0.07	0.12	-0.05	0.19
Explosives	8.1	0.01	0.02	-0.01	0.03
Other Chemicals	306.9	0.38	0.26	0.12	0.64
NUMBER OF SAMPLES: 147	80,753				

City of Seattle
1992 Waste Composition Study

TABLE IV-5
1992 SELF-HAUL RESIDENTIAL TRUCK COMPOSITION
Disposed Component Quantities and Percentages by Weight

	Tonnes	Percentage and Range at 90% Confidence Level			
		%	+/-	Low %	High %
PAPER	2,642	8.53%			
Newspaper	192.0	0.62	0.38	0.24	1.00
Corrugated Paper	1,207.8	3.90	1.22	2.68	5.11
Computer Paper	0.0	0.00	0.00	0.00	0.00
Office Paper	43.4	0.14	0.12	0.02	0.26
Scrap Paper	715.4	2.31	1.07	1.24	3.38
Other Paper	483.1	1.56	0.49	1.07	2.05
PLASTIC	1,697	5.48%			
PET Bottles	9.3	0.03	0.02	0.00	0.05
HDPE Bottles	99.1	0.32	0.11	0.21	0.43
Other Plastic Bottles	21.7	0.07	0.03	0.04	0.10
Expanded Polystyrene	49.6	0.16	0.08	0.09	0.24
Plastic Packaging	356.1	1.15	0.35	0.80	1.51
Other Plastic Products	1,161.3	3.75	1.14	2.61	4.89
GLASS	842	2.72%			
Nonrefillable Beer	105.3	0.34	0.30	0.05	0.64
Refillable Beer	46.5	0.15	0.12	0.04	0.27
Nonrefillable Soft Drink	52.6	0.17	0.08	0.09	0.25
Refillable Soft Drink	0.0	0.00	0.00	0.00	0.00
Container Glass	123.9	0.40	0.19	0.20	0.59
Nonrecyclable Glass	514.1	1.66	0.87	0.79	2.53
METAL	3,605	11.64%			
Aluminum Cans	49.6	0.16	0.08	0.08	0.24
Aluminum Containers	3.1	0.01	0.01	0.00	0.02
Tin Cans	40.3	0.13	0.09	0.05	0.22
Bi-metal Cans	0.0	0.00	0.00	0.00	0.00
Ferrous Metals	1,220.2	3.94	1.48	2.46	5.41
White Goods	31.0	0.10	0.17	-0.07	0.27
Nonferrous	244.7	0.79	0.55	0.24	1.33
Mixed Metal/Materials	2,016.1	6.51	2.03	4.48	8.54
RUBBER	626	2.02%			
Rubber Products	442.9	1.43	0.66	0.77	2.09
Tires	182.7	0.59	0.56	0.03	1.15
ORGANICS	11,418	36.87%			
Food	334.5	1.08	0.43	0.65	1.51
Prunings	644.2	2.08	1.43	0.65	3.51
Leaves & Grass	1,248.1	4.03	2.23	1.80	6.27
Untreated Wood	4,890.0	15.79	4.17	11.61	19.95
Treated Wood	4,301.6	13.89	4.93	8.95	18.81
OTHER	9,789	31.61%			
Disposable Diapers	12.4	0.04	0.05	-0.01	0.09
Textiles	3,403.5	10.99	3.25	7.74	14.24
Leather	21.7	0.07	0.07	0.00	0.14
Ash	46.5	0.15	0.18	-0.03	0.32
Ceramics, Porcelain, China	913.6	2.95	2.20	0.75	5.15
Rocks, Concrete, Bricks	1,012.7	3.27	1.74	1.53	5.01
Sand, Soil, Nondistinct Fines	421.2	1.36	0.77	0.59	2.13
Gypsum Wallboard	2,155.4	6.96	3.32	3.64	10.28
Fiberglass Insulation	3.1	0.01	0.01	0.00	0.03
Other Construction Debris	1,799.3	5.81	3.80	2.01	9.61
HAZARDOUS	350	1.13%			
Latex Paints	68.1	0.22	0.26	-0.03	0.48
Adhesives, Glues	74.3	0.24	0.27	-0.02	0.51
Oil-based Paints, Solvents	24.8	0.08	0.07	0.02	0.15
Caustic Cleaners	6.2	0.02	0.03	-0.01	0.06
Pesticides, Herbicides	0.0	0.00	0.00	0.00	0.00
Batteries	3.1	0.01	0.01	0.00	0.02
Gas, Kerosene	0.0	0.00	0.00	0.00	0.00
Motor Oil, Diesel Oil	12.4	0.04	0.04	-0.01	0.08
Asbestos	0.0	0.00	0.00	0.00	0.00
Explosives	6.2	0.02	0.04	-0.01	0.06
Other Chemicals	154.8	0.50	0.41	0.09	0.91
NUMBER OF SAMPLES: 72	30,969				

City of Seattle
1992 Waste Composition Study

TABLE IV-6
1992 SELF-HAUL COMMERCIAL TRUCK COMPOSITION
Disposed Component Quantities and Percentages by Weight

	Tonnes	Percentage and Range at 90% Confidence Level			
		%	+/-	Low %	High %
PAPER	5,491	11.03%			
Newspaper	243.9	0.49	0.44	0.05	0.93
Corrugated Paper	2,295.0	4.61	1.31	3.30	5.92
Computer Paper	94.6	0.19	0.29	-0.10	0.48
Office Paper	433.1	0.87	0.82	0.05	1.69
Scrap Paper	1,259.5	2.53	1.50	1.02	4.03
Other Paper	1,164.9	2.34	0.89	1.45	3.23
PLASTIC	3,828	7.69%			
PET Bottles	14.9	0.03	0.03	0.01	0.06
HDPE Bottles	253.9	0.51	0.39	0.12	0.91
Other Plastic Bottles	19.9	0.04	0.03	0.02	0.07
Expanded Polystyrene	59.7	0.12	0.06	0.06	0.18
Plastic Packaging	960.8	1.93	0.61	1.32	2.53
Other Plastic Products	2,519.1	5.06	2.48	2.58	7.55
GLASS	1,135	2.28%			
Nonrefillable Beer	24.9	0.05	0.07	-0.01	0.12
Refillable Beer	54.8	0.11	0.15	-0.04	0.26
Nonrefillable Soft Drink	79.7	0.16	0.08	0.08	0.24
Refillable Soft Drink	0.0	0.00	0.00	0.00	0.01
Container Glass	59.7	0.12	0.07	0.05	0.18
Nonrecyclable Glass	916.0	1.84	1.21	0.63	3.05
METAL	6,213	12.48%			
Aluminum Cans	49.8	0.10	0.05	0.06	0.15
Aluminum Containers	0.0	0.00	0.00	0.00	0.01
Tin Cans	19.9	0.04	0.04	0.00	0.08
Bi-metal Cans	5.0	0.01	0.01	0.00	0.02
Ferrous Metals	3,016.9	6.06	2.35	3.70	8.41
White Goods	0.0	0.00	0.00	0.00	0.00
Nonferrous	293.7	0.59	0.51	0.08	1.10
Mixed Metal/Materials	2,827.7	5.68	2.49	3.18	8.17
RUBBER	757	1.52%			
Rubber Products	731.8	1.47	0.76	0.71	2.22
Tires	24.9	0.05	0.05	0.00	0.11
ORGANICS	16,588	33.32%			
Food	298.7	0.60	0.47	0.13	1.08
Prunings	328.6	0.66	0.92	-0.26	1.57
Leaves & Grass	921.0	1.85	2.71	-0.86	4.56
Untreated Wood	8,204.4	16.48	4.46	12.01	20.92
Treated Wood	6,835.3	13.73	5.07	8.66	18.80
OTHER	15,393	30.92%			
Disposable Diapers	24.9	0.05	0.08	-0.02	0.13
Textiles	5,346.8	10.74	3.76	6.98	14.50
Leather	64.7	0.13	0.19	-0.06	0.32
Ash	0.0	0.00	0.00	0.00	0.00
Ceramics, Porcelain, China	1,543.3	3.10	1.81	1.29	4.91
Rocks, Concrete, Bricks	1,309.3	2.63	3.05	-0.42	5.68
Sand, Soil, Nondistinct Fines	836.4	1.68	0.96	0.72	2.64
Gypsum Wallboard	3,151.3	6.33	3.06	3.27	9.39
Fiberglass Insulation	144.4	0.29	0.21	0.08	0.50
Other Construction Debris	2,972.1	5.97	3.22	2.75	9.19
HAZARDOUS	378	0.76%			
Latex Paints	5.0	0.01	0.01	-0.01	0.02
Adhesives, Glues	134.4	0.27	0.25	0.02	0.52
Oil-based Paints, Solvents	29.9	0.06	0.09	-0.03	0.15
Caustic Cleaners	0.0	0.00	0.00	0.00	0.00
Pesticides, Herbicides	0.0	0.00	0.00	0.00	0.00
Batteries	10.0	0.02	0.03	-0.01	0.04
Gas, Kerosene	0.0	0.00	0.00	0.00	0.00
Motor Oil, Diesel Oil	0.0	0.00	0.01	0.00	0.01
Asbestos	69.7	0.14	0.23	-0.09	0.37
Explosives	0.0	0.00	0.00	0.00	0.00
Other Chemicals	129.4	0.26	0.32	-0.05	0.58
NUMBER OF SAMPLES: 75	49,784				

City of Seattle
1992 Waste Composition Study

TABLE IV-7
1992 NORTH TRANSFER STATION COMPOSITION
Disposed Component Quantities and Percentages by Weight

	Tonnes		Percentage and Range at 90% Confidence Level			
			%	+/-	Low %	High %
PAPER	3,677		8.09%			
Newspaper	322.7		0.71	0.48	0.23	1.20
Corrugated Paper	1,854.2		4.08	1.13	2.95	5.21
Computer Paper	4.5		0.01	0.02	-0.01	0.03
Office Paper	159.1		0.35	0.41	-0.05	0.76
Scrap Paper	659.0		1.45	0.57	0.88	2.03
Other Paper	677.1		1.49	0.62	0.87	2.11
PLASTIC	2,845		6.26%			
PET Bottles	4.5		0.01	0.00	0.00	0.01
HDPE Bottles	90.9		0.20	0.09	0.10	0.29
Other Plastic Bottles	27.3		0.06	0.03	0.03	0.09
Expanded Polystyrene	72.7		0.16	0.07	0.09	0.22
Plastic Packaging	704.4		1.55	0.53	1.03	2.08
Other Plastic Products	1,945.0		4.28	1.80	2.48	6.09
GLASS	1,154		2.54%			
Nonrefillable Beer	22.7		0.05	0.04	0.01	0.09
Refillable Beer	13.6		0.03	0.02	0.00	0.05
Nonrefillable Soft Drink	31.8		0.07	0.04	0.03	0.11
Refillable Soft Drink	0.0		0.00	0.00	0.00	0.01
Container Glass	109.1		0.24	0.12	0.12	0.37
Nonrecyclable Glass	977.1		2.15	1.20	0.96	3.35
METAL	4,940		10.87%			
Aluminum Cans	45.4		0.10	0.06	0.04	0.17
Aluminum Containers	4.5		0.01	0.01	0.00	0.01
Tin Cans	13.6		0.03	0.02	0.00	0.05
Bi-metal Cans	0.0		0.00	0.00	0.00	0.00
Ferrous Metals	1,945.0		4.28	1.74	2.53	6.02
White Goods	40.9		0.09	0.15	-0.06	0.24
Nonferrous	309.0		0.68	0.48	0.21	1.16
Mixed Metal/Materials	2,581.3		5.68	1.91	3.77	7.59
RUBBER	536		1.18%			
Rubber Products	481.7		1.06	0.49	0.56	1.55
Tires	54.5		0.12	0.12	-0.01	0.24
ORGANICS	17,392		38.27%			
Food	213.6		0.47	0.23	0.24	0.70
Prunings	840.7		1.85	1.33	0.52	3.18
Leaves & Grass	731.7		1.61	1.47	0.15	3.08
Untreated Wood	8,425.5		18.54	4.17	14.39	22.74
Treated Wood	7,180.3		15.80	4.84	10.96	20.64
OTHER	14,347		31.57%			
Disposable Diapers	4.5		0.01	0.01	0.00	0.02
Textiles	3,303.9		7.27	2.42	4.85	9.69
Leather	68.2		0.15	0.18	-0.03	0.32
Ash	9.1		0.02	0.03	-0.01	0.05
Ceramics, Porcelain, China	1,781.4		3.92	2.04	1.88	5.96
Rocks, Concrete, Bricks	2,281.3		5.02	3.04	1.98	8.05
Sand, Soil, Nondistinct Fines	681.7		1.50	0.76	0.74	2.25
Gypsum Wallboard	3,094.8		6.81	3.14	3.67	9.96
Fiberglass Insulation	100.0		0.22	0.15	0.08	0.37
Other Construction Debris	3,022.1		6.65	2.97	3.68	9.62
HAZARDOUS	554		1.22%			
Latex Paints	59.1		0.13	0.18	-0.05	0.31
Adhesives, Glues	90.9		0.20	0.23	-0.03	0.43
Oil-based Paints, Solvents	59.1		0.13	0.10	0.03	0.23
Caustic Cleaners	0.0		0.00	0.00	0.00	0.00
Pesticides, Herbicides	4.5		0.01	0.02	-0.01	0.02
Batteries	18.2		0.04	0.03	0.00	0.07
Gas, Kerosene	0.0		0.00	0.00	0.00	0.00
Motor Oil, Diesel Oil	4.5		0.01	0.01	0.00	0.02
Asbestos	59.1		0.13	0.21	-0.08	0.33
Explosives	0.0		0.00	0.00	0.00	0.00
Other Chemicals	259.0		0.57	0.45	0.13	1.02
NUMBER OF SAMPLES: 97	45,445					

City of Seattle
1992 Waste Composition Study

TABLE IV-8
1992 SOUTH TRANSFER STATION COMPOSITION
Disposed Component Quantities and Percentages by Weight

	Tonnes		Percentage and Range at 90% Confidence Level			
			%	+/-	Low %	High %
PAPER	4,886		11.14%			
Newspaper		149.1	0.34	0.19	0.15	0.54
Corrugated Paper		1,846.6	4.21	1.25	2.97	5.46
Computer Paper		79.0	0.18	0.27	-0.10	0.45
Office Paper		280.7	0.64	0.65	-0.01	1.29
Scrap Paper		1,500.1	3.42	1.62	1.80	5.04
Other Paper		1,030.8	2.35	0.75	1.60	3.10
PLASTIC	3,141		7.16%			
PET Bottles		21.9	0.05	0.03	0.02	0.08
HDPE Bottles		263.2	0.60	0.37	0.23	0.97
Other Plastic Bottles		30.7	0.07	0.04	0.04	0.11
Expanded Polystyrene		65.8	0.15	0.07	0.08	0.22
Plastic Packaging		649.2	1.48	0.43	1.06	1.91
Other Plastic Products		2,109.8	4.81	1.84	2.97	6.65
GLASS	1,026		2.34%			
Nonrefillable Beer		144.7	0.33	0.28	0.06	0.61
Refillable Beer		96.5	0.22	0.17	0.05	0.40
Nonrefillable Soft Drink		100.9	0.23	0.10	0.14	0.33
Refillable Soft Drink		0.0	0.00	0.00	0.00	0.00
Container Glass		144.7	0.33	0.16	0.17	0.49
Nonrecyclable Glass		539.5	1.23	0.63	0.60	1.86
METAL	5,562		12.68%			
Aluminum Cans		70.2	0.16	0.07	0.09	0.23
Aluminum Containers		4.4	0.01	0.01	0.00	0.02
Tin Cans		61.4	0.14	0.09	0.06	0.23
Bi-metal Cans		4.4	0.01	0.01	0.00	0.02
Ferrous Metals		2,346.6	5.35	1.93	3.42	7.28
White Goods		0.0	0.00	0.00	0.00	0.00
Nonferrous		258.8	0.59	0.49	0.10	1.08
Mixed Metal/Materials		2,815.9	6.42	2.32	4.10	8.74
RUBBER	1,083		2.47%			
Rubber Products		881.6	2.01	0.84	1.17	2.85
Tires		201.8	0.46	0.50	-0.04	0.97
ORGANICS	14,273		32.54%			
Food		548.3	1.25	0.56	0.69	1.81
Prunings		302.6	0.69	0.75	-0.07	1.44
Leaves & Grass		1,798.3	4.10	2.89	1.22	6.99
Untreated Wood		6,434.6	14.67	4.06	10.61	18.72
Treated Wood		5,188.9	11.83	4.43	7.39	16.24
OTHER	13,615		31.04%			
Disposable Diapers		39.5	0.09	0.08	0.00	0.17
Textiles		6,079.3	13.86	3.99	9.85	17.84
Leather		30.7	0.07	0.07	0.00	0.14
Ash		48.2	0.11	0.16	-0.05	0.27
Ceramics, Porcelain, China		780.7	1.78	1.56	0.23	3.34
Rocks, Concrete, Bricks		833.4	1.90	1.57	0.32	3.47
Sand, Soil, Nondistinct Fines		605.3	1.38	0.84	0.54	2.22
Gypsum Wallboard		2,767.7	6.31	2.77	3.55	9.08
Fiberglass Insulation		65.8	0.15	0.15	0.00	0.29
Other Construction Debris		2,364.2	5.39	3.55	1.84	8.94
HAZARDOUS	276		0.63%			
Latex Paints		43.9	0.10	0.15	-0.05	0.25
Adhesives, Glues		144.7	0.33	0.25	0.08	0.57
Oil-based Paints, Solvents		4.4	0.01	0.01	0.00	0.02
Caustic Cleaners		8.8	0.02	0.03	-0.01	0.05
Pesticides, Herbicides		0.0	0.00	0.00	0.00	0.00
Batteries		0.0	0.00	0.00	0.00	0.01
Gas, Kerosene		0.0	0.00	0.00	0.00	0.00
Motor Oil, Diesel Oil		17.5	0.04	0.04	0.00	0.08
Asbestos		0.0	0.00	0.00	0.00	0.00
Explosives		8.8	0.02	0.03	-0.01	0.06
Other Chemicals		48.2	0.11	0.10	0.01	0.22
NUMBER OF SAMPLES: 100	43,862					

City of Seattle
1992 Waste Composition Study

TABLE IV-9
TOTAL SELF-HAUL BY SEASON
January 1992 through December 1992

	Winter	Spring	Summer	Fall
PAPER	13.51%	5.98%	7.98%	10.41%
Newspaper	0.96	0.29	0.13	0.67
Corrugated Paper	4.71	3.42	4.43	4.01
Computer Paper	0.29	0.02	0.00	0.02
Office Paper	0.77	0.02	0.24	0.90
Scrap Paper	4.33	1.30	1.29	2.48
Other Paper	2.45	0.93	1.89	2.33
PLASTIC	9.47%	2.80%	6.83%	7.50%
PET Bottles	0.06	0.02	0.03	0.01
HDPE Bottles	0.36	0.24	0.59	0.42
Other Plastic Bottles	0.07	0.09	0.06	0.05
Expanded Polystyrene	0.13	0.25	0.09	0.14
Plastic Packaging	1.46	0.52	1.73	2.40
Other Plastic Products	7.39	1.68	4.33	4.48
GLASS	1.57%	2.30%	2.59%	3.45%
Nonrefillable Beer	0.22	0.14	0.01	0.38
Refillable Beer	0.10	0.22	0.12	0.05
Nonrefillable Soft Drink	0.15	0.16	0.18	0.11
Refillable Soft Drink	0.00	0.00	0.00	0.01
Container Glass	0.28	0.39	0.28	0.19
Nonrecyclable Glass	0.82	1.39	2.00	2.71
METAL	9.50%	13.28%	14.32%	10.35%
Aluminum Cans	0.13	0.10	0.18	0.11
Aluminum Containers	0.02	0.00	0.01	0.00
Tin Cans	0.17	0.06	0.01	0.08
Bi-metal Cans	0.00	0.00	0.00	0.01
Ferrous Metals	2.46	6.70	6.57	3.87
White Goods	0.00	0.18	0.00	0.00
Nonferrous	0.40	0.22	0.93	1.05
Mixed Metal/Materials	6.32	6.02	6.62	5.23
RUBBER	2.12%	1.32%	2.94%	0.94%
Rubber Products	1.52	1.26	2.55	0.86
Tires	0.60	0.06	0.39	0.08
ORGANICS	31.52%	43.71%	33.66%	33.11%
Food	1.81	0.44	0.72	0.34
Prunings	1.77	1.49	1.22	0.58
Leaves & Grass	1.65	4.70	3.80	1.38
Untreated Wood	15.71	17.25	17.05	16.70
Treated Wood	10.58	19.83	10.87	14.11
OTHER	30.73%	29.93%	31.27%	33.34%
Disposable Diapers	0.11	0.00	0.05	0.02
Textiles	11.82	6.52	11.76	11.90
Leather	0.10	0.08	0.02	0.24
Ash	0.03	0.22	0.00	0.00
Ceramics, Porcelain, China	4.12	2.58	1.24	3.27
Rocks, Concrete, Bricks	1.49	5.43	0.88	6.09
Sand, Soil, Nondistinct Fines	0.85	2.58	1.26	1.12
Gypsum Wallboard	6.27	5.87	7.40	6.85
Fiberglass Insulation	0.24	0.03	0.15	0.30
Other Construction Debris	5.70	6.62	8.51	3.55
HAZARDOUS	1.58%	0.68%	0.41%	0.90%
Latex Paints	0.19	0.01	0.02	0.22
Adhesives, Glues	0.54	0.15	0.25	0.07
Oil-based Paints, Solvents	0.02	0.09	0.11	0.06
Caustic Cleaners	0.04	0.00	0.00	0.00
Pesticides, Herbicides	0.02	0.00	0.00	0.00
Batteries	0.00	0.03	0.00	0.05
Gas, Kerosene	0.00	0.00	0.00	0.00
Motor Oil, Diesel Oil	0.06	0.02	0.00	0.00
Asbestos	0.23	0.00	0.00	0.00
Explosives	0.04	0.00	0.00	0.00
Other Chemicals	0.44	0.38	0.03	0.50

City of Seattle
1992 Waste Composition Study

TABLE IV-10
SELF-HAUL AUTOS BY SEASON
January 1992 through December 1992

	Winter	Spring	Summer	Fall
PAPER	3.88%	5.80%	7.42%	13.64%
Newspaper	0.53	0.15	0.16	0.64
Corrugated Paper	1.68	3.87	2.11	5.43
Computer Paper	0.00	0.00	0.00	0.25
Office Paper	0.01	0.03	0.23	1.21
Scrap Paper	0.95	1.17	1.97	5.59
Other Paper	0.71	0.58	2.95	0.52
PLASTIC	7.97%	4.45%	6.15%	12.70%
PET Bottles	0.01	0.00	0.04	0.03
HDPE Bottles	0.36	0.44	0.03	0.12
Other Plastic Bottles	0.17	0.43	0.00	0.19
Expanded Polystyrene	0.03	0.68	0.14	0.27
Plastic Packaging	0.80	1.02	0.37	3.58
Other Plastic Products	6.60	1.88	5.57	8.51
GLASS	1.63%	0.17%	1.85%	4.12%
Nonrefillable Beer	0.00	0.17	0.00	0.50
Refillable Beer	0.33	0.00	0.00	0.00
Nonrefillable Soft Drink	0.00	0.00	0.00	0.00
Refillable Soft Drink	0.02	0.00	0.00	0.00
Container Glass	0.70	0.00	0.32	1.35
Nonrecyclable Glass	0.58	0.00	1.53	2.27
METAL	9.73%	12.80%	8.73%	5.21%
Aluminum Cans	0.58	0.01	0.02	0.12
Aluminum Containers	0.02	0.00	0.04	0.03
Tin Cans	0.00	0.05	0.05	0.11
Bi-metal Cans	0.00	0.00	0.00	0.00
Ferrous Metals	1.26	6.16	2.51	2.31
White Goods	0.00	0.00	0.00	0.00
Nonferrous	0.02	0.45	0.00	0.30
Mixed Metal/Materials	7.85	6.13	6.11	2.34
RUBBER	4.86%	1.53%	2.40%	0.25%
Rubber Products	4.86	1.53	2.40	0.25
Tires	0.00	0.00	0.00	0.00
ORGANICS	37.05%	29.32%	44.16%	40.32%
Food	2.32	0.13	0.86	0.74
Prunings	0.07	1.67	0.14	0.53
Leaves & Grass	2.75	3.71	1.15	1.07
Untreated Wood	15.38	14.58	27.91	21.53
Treated Wood	16.53	9.23	14.10	16.45
OTHER	34.02%	43.88%	29.18%	23.55%
Disposable Diapers	0.13	0.00	0.00	0.05
Textiles	3.97	7.01	11.69	1.60
Leather	0.01	0.87	0.12	0.00
Ash	0.00	0.00	0.00	0.00
Ceramics, Porcelain, China	1.18	0.00	0.06	5.13
Rocks, Concrete, Bricks	19.37	20.07	0.19	4.15
Sand, Soil, Nondistinct Fines	0.47	0.47	0.75	1.00
Gypsum Wallboard	2.11	0.00	9.83	7.01
Fiberglass Insulation	1.14	0.00	0.14	0.85
Other Construction Debris	5.64	15.46	6.40	3.76
HAZARDOUS	0.86%	2.05%	0.11%	0.21%
Latex Paints	0.37	0.10	0.00	0.00
Adhesives, Glues	0.00	1.23	0.07	0.15
Oil-based Paints, Solvents	0.00	0.09	0.03	0.03
Caustic Cleaners	0.00	0.00	0.00	0.00
Pesticides, Herbicides	0.25	0.00	0.00	0.00
Batteries	0.00	0.43	0.01	0.03
Gas, Kerosene	0.00	0.00	0.00	0.00
Motor Oil, Diesel Oil	0.00	0.20	0.00	0.00
Asbestos	0.00	0.00	0.00	0.00
Explosives	0.00	0.00	0.00	0.00
Other Chemicals	0.24	0.00	0.00	0.00

City of Seattle
1992 Waste Composition Study

TABLE IV-11
SELF-HAUL RESIDENTIAL TRUCKS BY SEASON
January 1992 through December 1992

	Winter		Spring		Summer		Fall
PAPER	11.36%		5.19%		8.42%		11.40%
Newspaper	0.62		0.30		0.27		1.72
Corrugated Paper	5.64		2.86		3.85		3.32
Computer Paper	0.00		0.00		0.00		0.00
Office Paper	0.00		0.03		0.48		0.27
Scrap Paper	2.75		1.11		2.33		4.29
Other Paper	2.35		0.89		1.49		1.80
PLASTIC	7.36%		3.15%		5.25%		7.84%
PET Bottles	0.05		0.02		0.02		0.01
HDPE Bottles	0.50		0.21		0.33		0.24
Other Plastic Bottles	0.10		0.03		0.11		0.05
Expanded Polystyrene	0.13		0.18		0.12		0.22
Plastic Packaging	1.67		0.58		1.06		1.67
Other Plastic Products	4.91		2.13		3.61		5.65
GLASS	2.07%		2.78%		4.17%		2.22%
Nonrefillable Beer	0.33		0.19		0.00		1.08
Refillable Beer	0.17		0.08		0.31		0.14
Nonrefillable Soft Drink	0.19		0.15		0.19		0.16
Refillable Soft Drink	0.00		0.00		0.00		0.00
Container Glass	0.45		0.56		0.28		0.03
Nonrecyclable Glass	0.93		1.80		3.39		0.81
METAL	9.33%		12.63%		10.24%		14.89%
Aluminum Cans	0.15		0.05		0.37		0.19
Aluminum Containers	0.04		0.00		0.00		0.00
Tin Cans	0.29		0.09		0.01		0.10
Bi-metal Cans	0.00		0.00		0.00		0.00
Ferrous Metals	1.82		6.08		1.85		4.86
White Goods	0.00		0.27		0.00		0.00
Nonferrous	0.77		0.28		2.29		0.41
Mixed Metal/Materials	6.26		5.86		5.72		9.33
RUBBER	2.97%		1.12%		2.63%		1.77%
Rubber Products	1.68		1.05		1.50		1.77
Tires	1.29		0.07		1.13		0.00
ORGANICS	25.82%		43.95%		37.83%		38.74%
Food	2.21		0.60		0.96		0.36
Prunings	1.81		2.01		2.96		1.80
Leaves & Grass	2.37		6.55		0.91		4.40
Untreated Wood	12.49		13.80		22.73		18.84
Treated Wood	6.94		20.99		10.27		13.34
OTHER	39.13%		30.39%		31.37%		21.50%
Disposable Diapers	0.06		0.00		0.15		0.00
Textiles	19.50		6.34		5.12		13.11
Leather	0.22		0.02		0.00		0.00
Ash	0.07		0.33		0.00		0.00
Ceramics, Porcelain, China	4.39		3.81		0.04		1.49
Rocks, Concrete, Bricks	0.35		5.92		2.48		3.07
Sand, Soil, Nondistinct Fines	1.01		1.86		1.19		0.96
Gypsum Wallboard	4.03		8.60		12.21		2.72
Fiberglass Insulation	0.00		0.00		0.07		0.01
Other Construction Debris	9.50		3.51		10.11		0.14
HAZARDOUS	1.96%		0.79%		0.09%		1.64%
Latex Paints	0.35		0.00		0.00		0.76
Adhesives, Glues	0.68		0.09		0.00		0.08
Oil-based Paints, Solvents	0.02		0.13		0.00		0.17
Caustic Cleaners	0.08		0.00		0.00		0.00
Pesticides, Herbicides	0.00		0.00		0.00		0.00
Batteries	0.00		0.00		0.01		0.04
Gas, Kerosene	0.00		0.00		0.00		0.00
Motor Oil, Diesel Oil	0.13		0.00		0.00		0.00
Asbestos	0.00		0.00		0.00		0.00
Explosives	0.08		0.00		0.00		0.00
Other Chemicals	0.62		0.57		0.08		0.59

City of Seattle
1992 Waste Composition Study

TABLE IV-12
SELF-HAUL COMMERCIAL TRUCKS BY SEASON
January 1992 through December 1992

	Winter	Spring	Summer	Fall
PAPER	17.08%	8.11%	7.87%	9.49%
Newspaper	1.36	0.28	0.03	0.19
Corrugated Paper	4.22	4.79	5.62	4.13
Computer Paper	0.63	0.09	0.00	0.00
Office Paper	1.65	0.00	0.08	1.15
Scrap Paper	6.41	1.83	0.33	1.19
Other Paper	2.81	1.12	1.81	2.83
PLASTIC	11.80%	1.39%	8.15%	6.57%
PET Bottles	0.08	0.02	0.03	0.00
HDPE Bottles	0.21	0.27	0.96	0.53
Other Plastic Bottles	0.02	0.14	0.04	0.03
Expanded Polystyrene	0.15	0.30	0.06	0.07
Plastic Packaging	1.35	0.22	2.65	2.58
Other Plastic Products	9.99	0.44	4.41	3.36
GLASS	1.06%	1.60%	1.76%	3.94%
Nonrefillable Beer	0.14	0.00	0.02	0.03
Refillable Beer	0.00	0.66	0.03	0.02
Nonrefillable Soft Drink	0.13	0.21	0.25	0.10
Refillable Soft Drink	0.00	0.00	0.00	0.01
Container Glass	0.05	0.03	0.26	0.11
Nonrecyclable Glass	0.74	0.70	1.20	3.67
METAL	9.69%	15.23%	19.05%	8.92%
Aluminum Cans	0.06	0.25	0.12	0.07
Aluminum Containers	0.01	0.00	0.00	0.00
Tin Cans	0.08	0.00	0.00	0.06
Bi-metal Cans	0.00	0.00	0.00	0.02
Ferrous Metals	3.28	8.53	11.21	3.62
White Goods	0.00	0.00	0.00	0.00
Nonferrous	0.10	0.00	0.30	1.45
Mixed Metal/Materials	6.16	6.45	7.42	3.70
RUBBER	0.87%	1.81%	3.33%	0.64%
Rubber Products	0.87	1.75	3.33	0.51
Tires	0.00	0.06	0.00	0.13
ORGANICS	36.44%	47.04%	27.21%	29.54%
Food	1.35	0.08	0.51	0.28
Prunings	1.98	0.03	0.38	0.02
Leaves & Grass	0.78	0.00	6.70	0.00
Untreated Wood	18.98	27.26	9.44	15.06
Treated Wood	13.35	19.67	10.18	14.18
OTHER	21.78%	24.80%	31.90%	40.26%
Disposable Diapers	0.16	0.00	0.00	0.02
Textiles	5.24	6.90	16.39	12.77
Leather	0.00	0.00	0.00	0.38
Ash	0.00	0.00	0.00	0.00
Ceramics, Porcelain, China	4.27	0.00	2.47	3.85
Rocks, Concrete, Bricks	0.00	0.00	0.00	7.78
Sand, Soil, Nondistinct Fines	0.73	5.11	1.47	1.21
Gypsum Wallboard	9.13	0.19	3.24	8.76
Fiberglass Insulation	0.36	0.12	0.21	0.37
Other Construction Debris	1.89	12.48	8.12	5.12
HAZARDOUS	1.28%	0.02%	0.73%	0.64%
Latex Paints	0.00	0.00	0.03	0.00
Adhesives, Glues	0.48	0.00	0.48	0.05
Oil-based Paints, Solvents	0.01	0.00	0.22	0.01
Caustic Cleaners	0.00	0.00	0.00	0.00
Pesticides, Herbicides	0.00	0.00	0.00	0.00
Batteries	0.00	0.00	0.00	0.05
Gas, Kerosene	0.00	0.00	0.00	0.00
Motor Oil, Diesel Oil	0.00	0.02	0.00	0.00
Asbestos	0.50	0.00	0.00	0.00
Explosives	0.00	0.00	0.00	0.00
Other Chemicals	0.29	0.00	0.00	0.53

Appendix A

Sampling Summary

Section I. General Comments On Monthly Samplings

JANUARY 1992

Sampling began on Sunday 1/19 with self-haul sorting at the South Transfer Station (STS). A total of 16 samples were taken. Commercial sampling began on Tuesday 1/28, during which 8 loads were sampled at the STS. Two scheduled loads did not show. On Wednesday, 12 commercial samples were taken, one of which was a second sample from a mixed-generator rear-loader.

FEBRUARY 1992

On Wednesday 2/12, self-haul sampling occurred at the North Transfer Station (NTS). Sixteen vehicles were sampled. Late in the month, on Thursday and Friday the 27th and 28th, 21 commercial samples were sorted. Both haulers were having difficulty delivering loads; five front-loaders were double sampled. Two of the missed loads were roll offs, for which substitute samples could not be taken. Multiple samples were only taken from packer loads containing a mix of generators, so that two distinct samples could be taken from different cells within the load.

MARCH 1992

Self-haul sampling resulted in 16 samples from the STS on Wednesday 3/11. Commercial loads were sampled on the 18th and 19th. Nineteen commercial samples were taken during that Wednesday and Thursday. One front-loader did not arrive; another was double-sampled.

APRIL 1992

Commercial sampling on Thursday and Friday the 9th and 10th resulted in another 19 samples. The first occurrence of a Saturday self-haul sampling happened this month at the NTS. Unfortunately, so did the season's first Neighborhood Clean Up - which caused a peak amount of self-haul vehicles to arrive at the transfer station. Shortly after lunch it became necessary to cut the sampling short in order to give back the floor space to this traffic. Only 13 samples were taken.

MAY 1992

Commercial sampling for May began on Monday the 4th. Due to a mix-up in arrangements with the haulers, only three loads arrived for sampling. Makeups were scheduled for Tuesday, 5/5, but loads were still scarce. One rear-loader and three front-loaders were double-sampled. Self-haul sampling at the STS followed shortly behind the commercial sorts on Thursday 5/7. Sixteen self-haul samples were taken.

JUNE 1992

Commercial sampling in June was again early in the month, on Monday and Tuesday the 8th and 9th. Ten samples were taken on each day. Four front-loaders were double-sampled. Self-haul sampling at the NTS was scheduled for Monday the 22nd, but had to be rescheduled for the 29th, due to supervisor illness. Fourteen samples were taken on that Monday.

JULY 1992

Self-haul sampling resulted in 14 samples on Tuesday the 6th at the STS. Commercial sampling occurred on Thursday and Friday, 7/23 and 7/24. Twenty-one samples were taken, three of which were from double-sampled loads.

AUGUST 1992

Eighteen commercial samples were taken on the 18th and 19th, Tuesday and Wednesday. Two front-loaders were double sampled. Additionally, two self-haul make up samples were sorted on the 18th, at the STS. Regularly scheduled self-haul sampling occurred on Thursday 8/27 at the NTS. A total of 18 samples were taken.

SEPTEMBER 1992

Samplings for September were scheduled for the 19th, 24th, and 25th, all at the STS. A breakdown of the AMFAB compactor during the week of the 14th caused garbage to backup onto the tipping floor for over a week. Sampling was suspended until the backlog could be handled. All three days were re-scheduled for the 29th, 30th and October 1st. Twenty commercial samples were taken on Tuesday and Wednesday, two from double sampled front-loaders. Four self-haul samples were sorted on Tuesday, also. Thursday, 10/1 represented the bulk of the self-haul, with 14 additional samples. Although now October, the self-haul samples were dated 9/30 to include them in September for any seasonal data analysis.

OCTOBER 1992

Following the late-September make-ups, commercial sampling in October occurred on the 5th and 6th, Monday and Tuesday. On Monday, the scale printer was fouled up for most of the day, causing seven load weights to be missed. Average values were inserted for these loads and weights. Two front-loaders were double sampled. Nineteen commercial samples were taken. Three additional self-haul make-ups were also sorted on Monday. The regular self-haul sampling occurred on Tuesday the 13th, at the NTS; seventeen samples were sorted.

NOVEMBER 1992

November commercial sampling resulted in 20 samples being taken on Wednesday the 4th and Thursday the 5th. Self-haul sampling at the STS captured 15 samples.

DECEMBER 1992

Self-haul sampling for December was rescheduled from 12/10 to 12/18, due to a couple of crew member's having a family emergency. On Friday the 18th, 19 samples were sorted at the NTS, concluding the year's self-haul sampling. Commercial sampling on the 16th and 17th resulted in the final 25 samples for the year. Two front-loaders were double-sampled each day.

MARCH 1993

During data analysis in January, it was discovered that a set of night loads would probably be required, to fully represent the City's commercial waste stream. After this was confirmed, the particulars of a sample design modification were researched and finalized. A set of night loads were scheduled and sampled on Tuesday, March 25th. A total of 11 loads were sorted.

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Appendix B

Sampling Methodology

Section I. Commercial Waste Stream Sampling

A. Objective

The objective of the commercial waste stream sampling was to provide valid composition data by component of waste for Seattle businesses. Excluded from the definition of commercial wastes were apartments, which are collected under separate contract, and full loads of construction/demolition/land clearing (CDL) wastes, which are disposed at special landfills designated for that purpose. The universe of commercial wastes, for this analysis, included only those wastes destined for the Gilliam County Regional Landfill via rail transport.

B. Sample Selection

Samples were selected from 251 truckloads of commercial waste collected by franchised haulers. Twenty truckloads per month were sampled, from January through December, 1992. Trucks were diverted to the City's South Transfer Station for sorting. One set of night loads was sampled in March, 1993, after it was discovered that a relatively unique portion of the City's wastes may have been under-represented in the regular daytime samplings. Certain areas of the downtown business district are collected almost exclusively at night; these areas were the target of the additional samples.

The truckload to be sampled were selected a priori, using the following procedure:

1. The two commercial haulers holding franchises provided information identifying every commercial waste route. Loads were identified by:
 - day;
 - route number;
 - neighborhoods;
 - number of loads; and,
 - truck type.

Since trucks serving a particular route often delivered more than one load per day, each truckload was identified by an extension which noted the sequence in

which it arrived during a day. For example, "Route 999-2" identified the second load arriving from the truck serving Route 999.

Note that the "population" from which the sample was constructed is truckloads, not individual businesses or institutions.

2. The numbers of truckloads sampled was apportioned between the two haulers based on Utility forecasts for commercial tonnages for 1992. For each hauler, the number of truckloads sampled was apportioned among three truck types:
 - roll-offs;
 - front loaders;
 - rear loaders.

This was done in order to sample loads in proportion to the tonnage contributed by each type of truck, and not oversample types of loads that might be more numerous but less heavy, on average (e.g., certain roll-off containers). The two commercial haulers provided estimates of the average weight of loads arriving at the transfer station, by truck type.

3. One sampling day per month was randomly selected from the full set of possible sampling days. Days on which collection did not occur, such as weekends and holidays, were excluded. After this day was selected, the day immediately following was also selected for sampling. If the following day fell on a weekend or holiday, the preceding day was chosen.
4. Ten truckloads to be sampled were randomly selected for each sampling day. Selection was controlled so that each truckload on each route was chosen at least once.
5. About 20% of one hauler's commercial loads were dumped from about 6 pm to 2:30 am. The hauler believed that some of these "night" loads might differ in composition from "day" loads, because they originated in concentrations of office buildings. Since these loads would not have been seen during the normal sampling hours, one date was set aside for night sampling (11 loads). This helped make up the shortfall of night loads not sampled during the rest of the year.

C. Hauler Participation

Near the beginning of the sample year, the schedule showing the sampling days was given to each hauler. Before each monthly sampling, each hauler was sent a request for particular trucks to be diverted for sampling. The hauler was asked to inform the drivers of selected trucks. Each involved driver was then informed of the process to follow upon entering the sampling site with the chosen load.

The number of roll-off loads arriving on any specific day was difficult to know ahead of time (roll-offs are sometimes picked up on request, not on a set schedule). Because of this, haulers were allowed to choose loads to be sampled, if the requested truckload did not exist on the noted sampling day. For example, if the sample plan for July 1992 asked one hauler to provide a load from "Roll-off Route 999-6," and, on July 23 Route 999 only delivered 5 roll-offs, then the hauler could deliver load #5 in place of #6.

D. Weighting of the Data

After the sampling was completed, the data were statistically weighted to mirror the tonnage proportions between:

- the two commercial waste haulers; and between
- the truck types within each hauler's fleet.

Before the project began, proportions of different types of truckloads to be sampled were determined based on estimates. After the project, actual data were available by hauler and by truck type. The commercial tonnages carried during 1992 by the two haulers were compiled from scale data. Average load weights by truck type (separately for the two different haulers) were compiled from field observations during the study. These average load weights were used to update estimates of the tonnage hauled by truck types for each of the two haulers.

The total commercial tonnages carried by hauler were only slightly different from what had been estimated before the year began. When it came to load weights by truck type, however, hauler-supplied estimates varied substantially from observations. Therefore, weighting factors were calculated that would bring the data into proportions that more closely matched commercial tonnages actually arriving during the sampling period. Weighting factors were calculated using the following formula:

$$\text{Weighting Factor} = \frac{\text{Actual No. Samples Taken}}{\text{No. Samples That Should Have Been Taken}}$$

Separate weighting factors were calculated for each hauler, and for each truck type.

E. Field Sampling Procedures

Pre-established sampling schedules were used for each day's sampling. As each load to be sampled arrived, the field supervisor recorded the origin of the total load, approximate arrival time, and other load-description information.

The entire truckload of waste was dumped onto the floor or at the edge of the pit. An imaginary 8-section, 2-layer grid (16 cells total) was superimposed on the load, and a randomly selected cell was identified for sampling. Approximately 200-300 pounds of waste were extracted by machine from the designated cell and laid on a tarp.

Each sample was sorted by hand into the defined component groups. Baskets were used to contain component portions. Open baskets allowed the supervisor to see the material as it accumulated and to verify sample purity. Food containers were separated from the food and classified according to the containers' material.

Once a sample had been sorted, its components were weighed on portable scales and recorded on tally sheets, such as that shown in Exhibit I-A.

Each sample was sorted to the greatest reasonable detail, until no more than a small amount of non-sortable material remained. The amount and composition of this "supermix" varied. Generally, supermix consisted of mixed fines and pieces of waste material smaller than one inch. The goal was to sort each sample directly into the component categories, leaving no supermix at all. However, this was often not practical.

Any remaining supermix was combined, and its total weight recorded. A visual estimate of the supermix components was made, and the supermix contents were added back to the appropriate component weights for the total sample.

TOTAL LOAD WEIGHT: PERCENT SAMPLED: LOAD ORIGIN: GENERATOR TYPE: DATE: LOAD TYPE: ROUTE/RUN: ARRIVAL TIME:

PAPER		ORGANIC	
Newsprint		Food (excluding containers)	
Cardboard/Brown Bags		Prunings (less than 4")	
Computer Paper		Leaves and Grass	
High Grade Office Paper		OTHER MATERIALS	
Recyclable Scrap Paper		Disposable Diapers	
Nonrecyclable Paper		Untreated Wood	
PLASTIC		Painted or Treated Wood	
#1 PETE Bottles		Textiles	
#2 HDPE Bottles		Leather	
Other Plastic Bottles		Ash	
Styrofoam		Ceramics, China, Porcelain	
Plastic Film/Packaging		Rock, Concrete, Brick	
Other Plastic Products		Nondistinct Fines	
GLASS		Gypsum Wallboard	
Nonrefillable Beer Bottles		Fiberglass Insulation	
Refillable Beer Bottles		Construction Debris	
Nonrefillable Pop Bottles		HOUSEHOLD HAZARDOUS WASTES	
Refillable Pop Bottles		Latex Paint	
Container Glass/Jars		Adhesives, Glues	
Nonrecyclable Glass		Oil Paint, Solvents	
METAL		Caustic Cleaners	
Aluminum Pop & Beer Cans		Pesticide, Herbicide	
Aluminum Foil/Food Trays		Lead-Acid Batteries	
Tinned Food Cans		Dry Cell Batteries	
Bi-metal Cans		Gas, Kerosene	
Ferrous Metal/Iron		Motor Oil, Diesel Oil	
White Goods/Appliances		Asbestos	
Nonferrous Metal		Explosives	
Mixed Metal/Materials		Other Chemicals	
RUBBER		Notes:	
Rubber Products			
Tires & Inner Tubes			

Section II. Self-Haul Waste Stream Sampling

A. Objective

The objective of the self-haul sampling task was to understand the sources and composition of waste which is not hauled for-profit collection contractors. This includes waste from individual households and from commercial establishments. For the purposes of this study, vehicles were excluded if they carried nothing but "yard waste" (leaves, grass, branches), or nothing but recyclables (to deposit in recycling bins). The Utility separately records the aggregate composition and quantity of these wastes. One hundred ninety eight samples were to be sorted, from January through December, 1992.

B. Sample Selection

In self-haul waste composition studies, specific vehicles cannot be preselected for sampling. This is because, by definition, self-haul waste is not collected through the use of established routes. Therefore, vehicles to be sampled must be chosen by a systematic process (i.e., every "nth" vehicle is selected). Using 1990 monthly figures, the consultants determined the tonnages and the number of self-haul vehicles entering the transfer stations.

The steps used in determining the loads to be sampled were as follows:

1. One sampling day per month was randomly selected from the full set of possible sampling days. Days on which the transfer stations are not open were excluded from consideration.
2. These randomly selected days were assigned alternately to the North and South Transfer Stations.
3. There are two major identifiable classes of self-haul vehicles entering the transfer stations: trucks and automobiles. Calculations showed that automobiles contributed 10% of the tons self-hauled in 1990. Determining sample distribution solely on weight contributed would result in only 20 automobiles being sampled (10% of 198 total samples). In order to have enough samples from automobiles to make statistically significant comparisons between trucks and automobiles, it was decided to sample loads from:
 - 40 automobiles, and
 - 158 trucks.

This resulted in oversampling autos and undersampling trucks.

4. Tonnage figures for 1990 were used to allocate the total number of samples between the North and South Transfer Stations. The allocation resulted in the following sampling frame:

North Transfer Station

Automobiles	27
Trucks	<u>75</u>
TOTAL	102

South Transfer Station

Automobiles	13
Trucks	<u>83</u>
TOTAL	96

5. Historical data for 1990 (on the same day—not date—of the week) were used to estimate the number of automobiles and trucks expected to enter the transfer stations on each sampling day. For each sampling day and vehicle type, this expected value was divided by the number of samples required on that day.

The resulting figure was then multiplied by a "sampling period factor" to calculate the "sampling interval," i.e., the number of vehicles to skip before taking a load from the chosen vehicle (e.g., every 5th truck). The "sampling period factor" was calculated using the formula below:

$$\text{sampling period factor} = \frac{\text{sampling hours}}{\text{operating hours}} \text{ for the chosen day}$$

This compensated for the fact that the period during which loads were selected was shorter than the hours of transfer station operation.

The sampling interval was calculated using data from the same day of the same week in 1991 and the following formula:

$$\frac{\text{Anticipated number of autos (trucks)}}{\text{Desired number of samples}} \times \text{sample period factor} = \text{Sampling interval}$$

6. The starting times (i.e., the set of unique times at which vehicle selection commences on each sampling day) were randomly selected from the first 120 minutes of Transfer Station operation for each sampling day. An exception to these practices was when historical data showed no vehicles arriving for a

significant time after opening. In these cases, the starting times were randomly selected from the first 120 minutes after vehicles were expected to start arriving.

C. Transfer Station and Customer Participation

Transfer station managers were provided with sampling schedules and vehicle diversion guidelines appropriate to their sites. On the sampling day, the consultant field supervisor identified every "nth" vehicle from vehicles arriving at the site.

The field supervisor then briefly explained to the driver that a waste sampling project was being conducted for the City of Seattle, that his or her vehicle was randomly selected for inclusion in the study, and that anonymity was assured. The drivers of residential vehicles were asked to identify the approximate street address from which the waste originated. Census tracts were subsequently assigned to each sample based on this address. Drivers of commercial vehicles were asked which kind of business the waste was from.

Some drivers selected for the sample brought part of their loads to the transfer station for deposit in the recycling bins. The disposal portion of these loads were dumped for sampling. The recyclable materials were left with the vehicle, to be placed in recycling bins by the driver, and were not sampled.

D. Weighting of the Data

After the sampling was completed, the data were statistically weighted to mirror the actual self-haul tonnage proportions between:

- the two City-operated transfer stations; and between
- the vehicle types bringing self-haul waste to each transfer station (i.e., automobiles or trucks).

Before the project began, proportions of tonnages contributed by automobiles versus trucks were determined based on 1991 data. After the year-long project was completed, more up-to-date information was available from 1992 scale records. This information showed that proportions by transfer station were different from two years previous, and tonnages by vehicle type had shifted slightly, too.

Statistical weighting factors were calculated to adjust the sorted amounts to better represent the types of self-haul tonnages that actually arrived at the two transfer stations during the sampling period. Weighting factors were derived with the following formula:

$$\text{Weighting Factor} = \frac{\text{Pounds of Waste That Should Have Been Sorted}}{\text{Actual Pounds Sorted}}$$

Weighting factors were created within each transfer station by vehicle type, and for both transfer stations together by vehicle type.

"Pounds of waste that should have been sorted" was estimated for each transfer station/vehicle type combination. The estimate was derived by multiplying the proportion that arrived during 1992 by the pounds sorted. This represents the amount that "should" have been sorted were actual tonnages known before the fact. In reality, there is no way to know actual hauled tonnages before records are compiled, thus, statistical weighting is almost always necessary.

E. Field Sampling Procedures

Forms like the one shown as Exhibit II-A were used by the field supervisor to count and select sample vehicles and to record sample vehicle information.

Self-hauled loads which, in the estimation of the field supervisor, obviously totaled less than 100 pounds, were passed up in favor of the next available vehicle of the appropriate type. This was necessary in order to adjust for the inevitable occurrence of extremely small samples. Large loads from which a random 300-pound sample could not be reasonably obtained due to the physical difficulty in segregating the load were sampled in their entirety. Such samples were proportionately adjusted downward to 300 pounds prior to data entry.

The sorting and weighing procedures were the same as for residential route-collected loads, except that material too heavy for the scale (greater than 230 pounds) was either estimated or derived by subtracting the weights of the remaining components from the vehicle's total net load weight.

Exhibit II-A

SEATTLE 1992 WASTE STREAM STUDY: Self-Haul Waste Sampling Form

Location:	SOUTH
Date:	Sunday, January 19
Start Time:	9:13 AM

BEGINNING AT THE START-TIME, CIRCLE ONE NUMBER FOR EACH CAR OR TRUCK ENTERING STATION. WHEN YOU CIRCLE THE LAST NUMBER IN EACH BLOCK, THAT IS THE VEHICLE WHOSE LOAD SHOULD BE DUMPED ASIDE FOR SAMPLING.

CONTINUE FOR EACH BLOCK UNTIL THE REQUIRED NUMBER OF VEHICLES IS SAMPLED. IF THE TRANSFER STATION IS NEARING CLOSING TIME AND THE NUMBER OF SAMPLES TAKEN DOES NOT ADD UP TO THE REQUIRED NUMBER, THEN SAMPLE CONSECUTIVE/ALTERNATE LOADS UNTIL THE REQUIRED NUMBER IS REACHED.

CARS:	NEED 2 TOTAL -- SAMPLE EVERY 16TH CAR
--------------	--

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

TRUCKS:	NEED 14 TOTAL -- SAMPLE EVERY 3RD TRUCK
----------------	--

1	2	3
1	2	3
1	2	3
1	2	3
1	2	3
1	2	3
1	2	3
1	2	3
1	2	3
1	2	3
1	2	3
1	2	3
1	2	3
1	2	3
1	2	3

Section III. Database Description

Sampling records maintained in the database contained a wide variety of load-specific information in addition to the actual composition sampling results. Each record included route, demographic, and delivery characteristics of the sample. A description of the data fields and structure of each record follows.

A. Structure of the Database

Each record consisted of 75 fields of fixed size and type, requiring a total of 338 bytes per record. The database file was compatible with the dBase III Plus file construct. A complete description of all fields is given below.

The field types used include Character, Date, Numeric, and Memo. The Character and Date field widths represented the total formatted width of the field. Dates were carried as "mm/dd/yy". Numeric field widths represented the total number of digits contained, including the decimal point, if applicable. Each record could have an associated Memo of up to 64K characters in length.

Fields 14 to 19 were initially set aside for future use; Places for three numeric variables and three character variables were included in these extended variable fields. Fields 14 and 15 have been filled with census tract income levels for residential and self-hauled loads, as applicable.

<u>Field #</u>	<u>Field Name</u>	<u>Type</u>	<u>Width</u>	<u>Dec.</u>	<u>Description</u>
1	LOADTYPE	C	1		Type of Load
2	RD1	C	3		Route Designator 1
3	RD2	C	2		Route Designator 2
4	DATE	D	8		Date Collected
5	RESTYPE	C	1		Residence Type
6	GENTYPE	C	1		Generator Type
7	DESTNATN	C	1		Load Destination/Origin
8	VECLTYPE	C	1		Vehicle Type
9	TRACT1	C	5		Census Tract 1
10	TRACT2	C	5		Census Tract 2
11	RECYCLE	C	1		Recycling ?
12	HAULER	C	1		Name of Hauler
13	NUMACCTS	N	3	0	# of Accounts
14	NV1	N	5	0	Income Level (Residential)
15	NV2	N	5	0	Income Level (Self-Haul)
16	NV3	N	5	0	Num Var 3
17	CV1	C	3		Char Var 1
18	CV2	C	3		Char Var 2
19	CV3	C	3		Char Var 3
20	TOTLOADWT	N	6	0	Net Total Load
21	TOTSAMPWT	N	5	1	Net Total Sample

<u>Field #</u>	<u>Field Name</u>	<u>Type</u>	<u>Width</u>	<u>Dec.</u>	<u>Description</u>
22	NEWSPAP	N	5	1	Newspaper
23	CORRPAP	N	5	1	Corrugated Paper
24	COMPPAP	N	5	1	Computer Paper
25	OFFPAP	N	5	1	Office Paper
26	SCRAPAP	N	5	1	Mixed Scrap Paper
27	NRPAP	N	5	1	Other Paper
28	DIAPERS	N	5	1	Diapers
29	PETBOT	N	5	1	PET Bottles
30	HDPEBOT	N	5	1	HDPE Bottles
31	STYRO	N	5	1	Expanded Polystyrene
32	NRPLAS	N	5	1	Plastic Packaging
33	HARDPLAS	N	5	1	Other Plastics
34	NRBEER	N	5	1	Nonrefill Beer Bottles
35	REBEER	N	5	1	Refill Beer Bottles
36	NRPOP	N	5	1	Nonrefill Pop Bottles
37	REPOP	N	5	1	Refill Pop Bottles
38	CNTGLAS	N	5	1	Container Glass
39	NRGLASS	N	5	1	N/R Glass
40	ALCANS	N	5	1	Aluminum Cans
41	ALCONT	N	5	1	Aluminum Containers
42	TINCAN	N	5	1	Tinned Cans
43	BICANS	N	5	1	Bi-metal Cans
44	FERRMET	N	5	1	Ferrous Metals
45	WHTGDS	N	5	1	Large Appliances
46	NONFERR	N	5	1	Non-ferrous Metal
47	MIXMET	N	5	1	Mixed Metals
48	RUBBER	N	5	1	Rubber Products
49	TIRES	N	5	1	Tires
50	FOOD	N	5	1	Food
51	PRUNINGS	N	5	1	Prunings
52	LEAVES	N	5	1	Leaves and Grass
53	UNWOOD	N	5	1	Untreated Wood
54	TWOOD	N	5	1	Treated Wood
55	TEXTILES	N	5	1	Textiles
56	LEATHER	N	5	1	Leather
57	ASH	N	5	1	Ashes
58	CHINA	N	5	1	Ceramics/China
59	ROCKS	N	5	1	Rocks/Concrete
60	FINES	N	5	1	Dirt/Sand/Fines
61	GYP SUM	N	5	1	Gypsum Wallboard
62	INSUL	N	5	1	Fiberglass Insulation
63	DEBRIS	N	5	1	Construction Debris
64	LATEX	N	5	1	Latex Paints
65	GLUE	N	5	1	Glues/Adhesives
66	SOLVENT	N	5	1	Oil-based paints
67	CLEANER	N	5	1	Cleaners
68	PESTS	N	5	1	Pesticides
69	BATTS	N	5	1	Batteries
70	GAS	N	5	1	Gasoline
71	OIL	N	5	1	Motor, Diesel Oil
72	ASBESTOS	N	5	1	Asbestos Products
73	EXPLODE	N	5	1	Explosives
74	CHEMICAL	N	5	1	Other Chemicals
75	MEMO	M	10		Comments, etc...

B. Individual Record Structures

There were four types of sample loads represented in the database. These "LOADTYPES" were:

Route-collected Residential
 Route-collected Commercial
 Route-collected Commercial Pure
 Self-hauled

The database fields applicable to the records for each of these load types are described below. Only the header information is listed, because all records contained a complete set of components (Fields 22 - 74) and a memo field (Field 75).

Fields which were not applicable to an individual record, or contained missing values, were filled with an "X" or "-9" for Character and Numeric fields, respectively. Except for those records which included census tract income levels, all extra variables (Fields 14-19) have missing value identifiers in them.

RESIDENTIAL RECORDS:

<u>Field #</u>	<u>Field Name</u>	<u>Type</u>	<u>Width</u>	<u>Dec</u>	<u>Description</u>
1	LOADTYPE	C	1		Type of Load
2	RD1	C	3		Route Designator 1
3	RD2	C	3		Route Designator 2
4	DATE	D	8		Date Collected
5	RESTYPE	C	1		Residence Type
7	DESTNATN	C	1		Load Origin
9	TRACT1	C	5		Census Tract 1
10+*	TRACT2	C	5		Census Tract 2
11	RECYCLE	C	1		Recycling?
12	HAULER	C	1		Name of Hauler
13+	NUMACCTS	N	3	0	# of Accounts
14++	NV1	N	5	0	TRACT1 Median Income
15++	NV2	N	5	0	TRACT2 Median Income
20	TOTLOADWT	N	6	0	Total Load Weight
21	TOTSAMPWT	N	6	1	Total Sample Weight
+	Not applicable to RESTYPE 2 (multifamily)				
*	Tract 2 pertains to RESTYPE 1 (single), and may or may not be applicable for an individual record				
++	As applicable for individual record				

COMMERCIAL RECORDS:

<u>Field #</u>	<u>Field Name</u>	<u>Type</u>	<u>Width</u>	<u>Dec</u>	<u>Description</u>	
1	LOADTYPE	C		1	Type of Load	
2	RD1	C		3	Route Designator 1	
3	RD2	C		2	Route Designator 2	
4	DATE	D		8	Date Collected	
6	GENTYPE	C		1	Generator Type	
7	DESTNATN	C		1	Load Destination	
11	RECYCLE	C		1	Recycling?	
12	HAULER	C		1	Name of Hauler	
20	TOTLOADWT	N		6	0	Total Load Weight
21	TOTSAMPWT	N		6	1	Total Sample Weight

COMMERCIAL PURE RECORDS:

<u>Field #</u>	<u>Field Name</u>	<u>Type</u>	<u>Width</u>	<u>Dec</u>	<u>Description</u>	
1	LOADTYPE	C		1	Type of Load	
2	RD1	C		3	Route Designator 1	
3	RD2	C		2	Route Designator 2	
4	DATE	D		8	Date Collected	
6	GENTYPE	C		1	Generator Type	
7	DESTNATN	C		1	Load Destination	
12	HAULER	C		1	Name of Hauler	
20	TOTLOADWT	N		6	0	Total Load Weight
21	TOTSAMPWT	N		6	1	Total Sample Weight

SELF-HAUL RECORDS:

<u>Field #</u>	<u>Field Name</u>	<u>Type</u>	<u>Width</u>	<u>Dec</u>	<u>Description</u>
1	LOADTYPE	C		1	Type of Load
2	RD1	C		1	Route Designator 1
3	RD2	C		1	Route Designator 2
4	DATE	D		8	Date Collected
5+	RESTYPE	C		1	Residence Type
6+	GENTYPE	C		1	Generator Type
7	DESTNATN	C		1	Load Destination
8	VECLTYPE	C		1	Vehicle Type
9*	TRACT1	C		5	Census Tract 1
14++	NV1	N		5	TRACT1 Median Income

+ One, or the other, as applicable (residential or commercial determination)

* Applicable only if residential, and if within City limits

++ As applicable for individual record

C. Field Definitions and Descriptions

Each field accepted only those values or characters which were specified as valid types of input. The valid entries and allowable ranges for each field are given below. A definition of the field is also given.

<u>Field #</u>	<u>Field Name</u>	<u>Valid Inputs</u>
1	LOADTYPE Load Type	R = Residential C = Commercial P = Commercial Pure S = Self Haul
2	RD1 Route Designator 1	(See Note Below)
3	RD2 Route Designator 2	(See Note Below)
4	DATE Date load was collected (not necessarily date of sample sorting)	MM/DD/YY

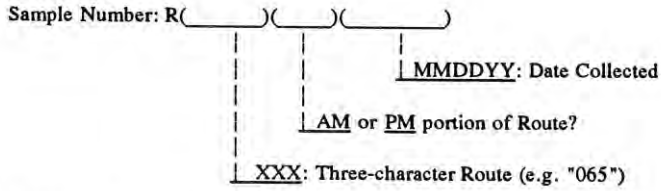
NOTE: SAMPLE NUMBERS

The first four fields collectively formed the "Sample Number" of each record. There was no "Sample Number" field, per se. Each Sample Number was unique, providing the user with a reference identifier for any given record, during both data collation and program use. These fields were also the four sorting key variables used by the program to sequentially store unprocessed data. The default sorting hierarchy was by DATE, LOADTYPE, RD1, and RD2. All data entry files and primary databases were organized according to these key variable.

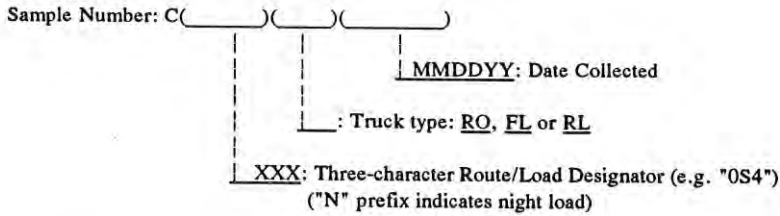
The allowable valid inputs for the RD1 and RD2 fields were specific to the LOADTYPE of each record. Route Designator 1 could be any combination of three numbers or letters signifying the route number

for all but Self Haul samples. Self Haul samples used this field for the first three vehicle license characters. Route Designator 2 identified whether the AM or PM portion of a Residential route was sampled. For Commercial and Commercial Pure loads, RD2 represented the truck type: Roll Off, Front Loader or Rear Loader. The 24-hour arrival time designation was contained in this field for Self Haul samples. The construction of "Sample Numbers" is given below:

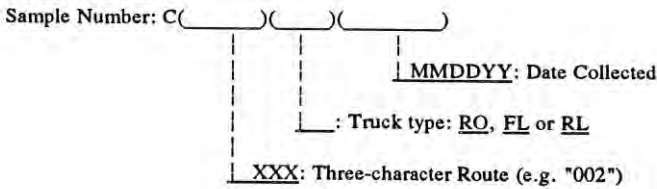
Residential



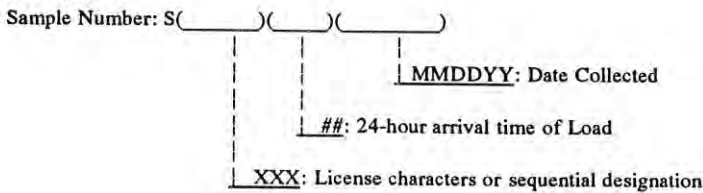
Commercial



Commercial Pure



Self Haul



- | | | |
|---|----------------|--------------------|
| 5 | RESTYPE | 1 = Single-family |
| | | 2 = Multi Family |
| | Residence Type | X = Not Applicable |

6	<p>GENTYPE</p> <p>Commercial Generator Type</p>	<p>A = Manufacturer</p> <p>B = Wholesaler</p> <p>C = Retailer</p> <p>D = Restaurant/Eatery</p> <p>E = Hotel/Motel/Inn</p> <p>F = Office - Private or Government</p> <p>G = Health Facility</p> <p>H = Educational Institution</p> <p>I = Transportation Shop</p> <p>J = Other Service</p> <p>K = Mixed Generator Types</p> <p>L = Construction/Demolition</p> <p>X = Not Applicable</p>
7	<p>DESTNATN</p> <p>Origin or destination of load</p>	<p>S = South Transfer Station or residential service area</p> <p>N = North Transfer Station or residential service area</p> <p>C = Newcastle Landfill</p> <p>B = Bayside Disposal's yard</p> <p>E = Evergreen (Seattle Disposal's yard)</p>
8	<p>VECLTYPE</p> <p>Type of Self Haul Vehicle which delivered the load</p>	<p>A = Passenger Auto (passenger plates)</p> <p>P = Pickup Trucks, Vans (truck plates)</p> <p>T = Other Trucks, and cars with trailers (truck plates)</p> <p>X = Not Applicable</p>
9	<p>TRACT1</p>	<p>##### - a five-digit number</p>
10	<p>TRACT2</p> <p>Census Tract(s) from which Residential or</p>	<p>corresponding to one of 130 possible census tracts. Two decimals are implied. Two tracts may be listed for each Residential Single Family Load, or one for each</p>

	Self Haul sample was collected	Self Haul Residential Load within City limits. X = Not Applicable
11	RECYCLE	Y = Yes N = No X = Not Applicable
	For Residential:	Was Curbside Recycling in effect?
	For Commercial:	Would the Hauler normally divert this load for recycling?
12	HAULER	B = Bayside Disposal S = Seattle Disposal G = General Disposal U = US Disposal X = Not Applicable
	Name of residential, commercial, or commercial pure Contract Hauler	
13	NUMACCTS	### - from 1 to 999 -9 = Not Applicable
	Approximate Number of Residential Accounts served by the load	
14, 15, 16	NV1, NV2, NV3	#####—a five-digit numerical variable reserved for future use. (filled with "-9" identifier) EXCEPT: Single-family residential and residential self-haul within City limits contain TRACT1 and TRACT2 Median Income in NV1 and NV2, respectively.
	Numerical Variable 1 Numerical Variable 2 Numerical Variable 3	

17, 18, 19	CV1, CV2, CV3	XXX—a three-character alphanumeric variable reserved for future use. (Filled with "X" identifier)
	Character Variable 1 Character Variable 2 Character Variable 3	
20	TOTLOADWT	##### - up to a maximum of 999,999 lbs.
	Total Net Weight in pounds of the Load from which the sample was taken	
21	TOTSAMPWT	####.# - up to a maximum of 9,999.9 lbs.
	Total Net Weight in pounds of the Sample, derived from the sum of all component weights	
22 ... 74	COMPONENTS	###.# - up to a maximum of 999.9 lbs
	Net Weight in pounds of Sample Component	
75	MEMO	Any and all text narrative is allowed in this field. This field is not an active processing field; it is part of the total historical record of the sample.
	Field sampling comments, notes and miscellaneous information about the sample	

