Contractor's Report to the Board

Targeted Statewide Waste Characterization Study:

Waste Disposal and Diversion Findings for Selected Industry Groups

June 2006

Produced under contract by:

Cascadia Consulting Group

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Publication #341-06-006
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Prepared as part of contract no. IWM-03027 (total contract amount: $1,034,700, includes other services not related to this report).

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Acknowledgements

This study would not have been possible without the cooperation and assistance of solid waste management companies, waste haulers, business and venue owners or operators throughout the State of California who generously agreed to participate in this effort, and the four solid waste facilities that served as the research team's base for sorting the waste samples:

- Tri-Cities Landfill in the City of Fremont
- Central Los Angeles Recycling Center and Transfer Station in the City of Los Angeles
- North Area Transfer Station in the County of Sacramento
- Otay Landfill in the City of Chula Vista

The cooperation of the businesses and venues that participated in this study is very much appreciated. Surveys of this kind are an imposition on their time. Thanks especially to a few businesses and individuals that were particularly cooperative.

Executive Summary

Summary of Objectives

The California Integrated Waste Management Board (CIWMB) commissioned a study of waste disposal and diversion practices by key types of commercial establishment. The study entailed quantifying and characterizing the material that is disposed as well as the material that is recycled or otherwise diverted. The study represents the largest effort conducted in the United States thus far to understand waste disposal and diversion practices simultaneously for major industry groups. The CIWMB conducted a study on industry groups in 1999 which characterized waste disposed only. The results of the present study provide a complete picture of waste management practices that are typical of the targeted industry groups. This information will be useful to local governments as well as businesses as they implement or refine their diversion programs.

Summary of Approach

A total of 371 commercial sites belonging to 14 industry groups participated in the study. Sites were recruited in the heavily urbanized areas of Los Angeles, Sacramento, San Diego, and San Francisco. In general, data was gathered from each participating site to confirm its industry group and size (in terms of numbers of employees, numbers of hotel rooms, numbers of visitors, or square footage), to quantify and characterize the materials that are diverted, and to quantify and characterize the materials that are disposed.

The study addressed the following 14 industry groups:

- Fast-food restaurants
- Full-service restaurants
- Food stores
- Durable wholesale goods distributors (e.g., warehouses and distributors of non-perishable items)
- Non-durable wholesale goods distributors (e.g., food warehouses and distributors)
- Large hotels
- Building material and garden stores belonging to certain "big box" chains
- Other building material and garden stores
- Retail stores belonging to certain "big box" chains
- Other retail stores
- Shopping malls
- Anchor stores at shopping malls
- Public venues and events
- Large office buildings

Diversion was documented through interviews with employees at the businesses and inspection of recycling and diversion systems during on-site visits. Disposal was quantified through measurements of waste accumulation in dumpsters or through interviews and examination of waste disposal records. Disposed waste was characterized by obtaining one or more 200-pound samples from each site and hand-sorting it into 74 material categories. Both disposal and diversion rates were determined, either on a per-employee basis (pounds per employee per year), or per room, per thousand square feet, or per visitor, as appropriate to the nature of the business.

Summary of Findings

The industry groups addressed by this study that achieve the highest diversion rates do so mainly by implementing effective programs to recycle corrugated cardboard boxes and other cardboard packaging. Of the groups addressed in this study, food stores have the highest diversion rate, with an average of 71 percent of all waste material (mostly cardboard) being diverted. They are followed by retail big-box stores, with an estimated 64 percent diversion rate (again, mostly cardboard). Non-durable goods wholesale distributors on average divert 59 percent of waste materials (mainly achieved through cardboard recycling and through the reuse of wood shipping pallets). The group with the fourth-highest diversion rate is other retail stores at 54 percent, which mostly reflects cardboard recycling.

Four of the industry groups addressed in this study divert less than a quarter of their solid waste. Other building material and garden stores divert an average of 24 percent of their waste, and large hotels divert approximately 23 percent. Public venues and events were found to divert about 11 percent of their waste. The diversion rate for large office buildings is estimated to be about 7 percent, although the estimate does not take into account any diversion (e.g., recycling of computer equipment, furniture, etc.) that might be done by tenants of the office buildings independently of the buildings' management and custodial services.

Based on the findings of the study, key opportunities for additional diversion are presented below in Table ES-1. For each industry sector, groups of divertible materials are listed starting with those that are most prevalent in the disposed waste by that industry sector, and proceeding in rank order.

In general, compostable materials such as food, leaves and grass, and lower grade compostable papers present opportunity to greatly increase diversion for most of the industry groups. Recyclable papers such as cardboard, newspaper, and other recyclable types also show significant potential for further recycling, as does lumber, for several industry groups.

Table ES-1: Opportunities for Diversion, by Industry Group

Industry Group	Key Opportunities for Additional Diversion (Figure in parentheses indicates percent of disposed waste stream by weight)
Fast-food restaurants	• Food and compostable paper (up to 73%) • Cardboard (5%) • Newspaper and other recyclable papers (3%) • Plastic bottles and containers, tin/steel cans, aluminum cans (3%)
Full-service restaurants	• Food and compostable paper (up to 74%) • Cardboard (4%) • Plastic bottles and containers, tin/steel cans, aluminum cans (3%) • Newspaper and other recyclable papers (3%) • Glass bottles and containers (2%)
Food stores	• Food, compostable paper, and leaves and grass (up to 75%) • Cardboard (4%) • Lumber (4%) • Recyclable papers (2%)
Durable goods wholesale distributors	• Lumber (29%) • Cardboard (10%) • Recyclable papers (6%) • Ferrous metal (5%) • Industrial plastic packaging film (4%) • Gypsum board (3%)
Nondurable goods wholesale distributors	• Food, leaves and grass, prunings and trimmings (31%) • Cardboard (11%) • Lumber (10%) • Recyclable papers (4%) • Industrial plastic packaging film (3%)
Large hotels	• Food, leaves and grass, prunings and trimmings, compostable paper (up to 49%) • Newspaper (9%) • Recyclable papers (7%) • Glass bottles and containers (4%) • Cardboard (3%) • Plastic bottles and containers, tin/steel cans, aluminum cans (3%) • Lumber (3%)

Table ES-1, continued: Opportunities for Diversion, by Industry Group

Industry Group	Key Opportunities for Additional Diversion (Figure in parentheses indicates percent of disposed waste stream by weight)
Building material and garden, big-box stores	• Lumber (23%) • Concrete (9%) • Gypsum board (6%) • Cardboard (6%) • Ferrous metal (4%) • Carpet (4%) • Industrial plastic packaging film (2%) • Recyclable papers (2%)
Building material and garden, other stores (not big-box)	• Lumber (23%) • Food, leaves and grass, prunings and trimmings (11%) • Concrete (8%) • Carpet (7%) • Recyclable papers (6%) • Gypsum board (5%) • Flat glass (4%) • Cardboard (3%) • Ferrous metal (2%) • Plastic bottles and containers, tin/steel cans, aluminum cans (2%)
Retail, big-box stores	• Food, leaves and grass, prunings and trimmings (21%) • Lumber (14%) • Cardboard (6%) • Recyclable papers (4%) • Ferrous metal (3%) • Industrial plastic packaging film (2%)
Retail, other stores (not big-box)	• Food, leaves and grass (12%) • Lumber (11%) • Recyclable papers (10%) • Cardboard (8%) • Ferrous metals (5%) • Industrial plastic packaging film (2%)
Anchor stores at shopping malls	• Food, leaves and grass, prunings and trimmings (13%) • Cardboard (7%) • Gypsum board (6%) • Recyclable papers (4%) • Ferrous metal (2%)

Table ES-1, continued: Opportunities for Diversion, by Industry Group

Industry Group	Key Opportunities for Additional Diversion (Figure in parentheses indicates percent of disposed waste stream by weight)
Other parts of shopping malls (not including anchor stores)	• Food, leaves and grass, prunings and trimmings, compostable paper (up to 46%) • Cardboard (8%) • Lumber (5%) • Recyclable papers (5%) • Plastic bottles and containers, tin/steel cans, aluminum cans (2%)
Public venues and events	• Food, leaves and grass, prunings and trimmings, compostable paper (up to 54%) • Recyclable papers (8%) • Plastic bottles and containers, tin/steel cans, aluminum cans (5%) • Cardboard (4%) • Glass bottles and containers (4%)
Large office buildings	• Recyclable papers (22%) • Food, leaves and grass (19%) • Cardboard (3%) • Plastic bottles and containers, tin/steel cans, aluminum cans (3%)

Introduction and Overview

The California Integrated Waste Management Board (CIWMB) commissioned a study of commercial waste generators as the first task of a four-task project. The commercial waste generator study entailed quantifying and characterizing the material that is disposed or diverted by representative members of key industry groups. The study represents the largest effort conducted in the United States thus far to characterize disposal and diversion simultaneously for major parts of the commercial sector. The result of the study is a set of average disposal and diversion profiles that can be used to estimate waste disposal and recycling practices by businesses in typical communities in California.

Objectives of the Study

The objective of this study was to characterize all waste generated, both disposed and diverted, from 14 common types of commercial establishments that are major sources of solid waste, and have significant opportunities for increased waste diversion, in typical urban communities. This was to be accomplished through a carefully designed sequence of field sampling, sorting, and quantification activities involving interviews and visits with representative commercial establishments. Taken together, the data were to provide a complete picture of waste generated by the businesses, as well as information on the types of diversion activities occurring in the business sectors that were studied. The study was to be based on business establishments in four major metropolitan areas of California, and it was intended to produce information that can be used by local governments as they implement or refine diversion programs that involve the business sectors addressed here. The data from the study will be used to update the CIWMB's waste characterization database.

Contributing Consultants

This study was managed by Cascadia Consulting Group, Inc., an environmental consulting firm based in Seattle, Washington. It relied on data collection activities conducted by SCS Engineers and Sky Valley Associates. The distribution of responsibilities was as follows.

Cascadia Consulting Group, Inc.	Project management; Study design; Coordination of data collection; Data entry and analysis; Reporting
SCS Engineers	Recruitment of business participants; Collection of data reflecting disposal and diversion quantities; Estimation of quantities and materials diverted
Sky Valley Associates	Collection and characterization of samples of disposed waste

Industry Groups Examined in This Study

The study addressed the 14 industry groups shown in the table below. See Appendix A for criteria used in selecting these groups. For each industry group, data were collected from numerous participating sites and businesses to reflect:

- The size and nature of each participant,
- The quantity of disposed waste,
- The composition of disposed waste, and
- The quantity and composition of diverted materials.

The study was originally intended to involve data collection from 320 business sites, but it ultimately included 371 sites. The original quota was exceeded mainly because some sites provided only partial data, and it therefore became necessary to recruit additional sites to make up for the missing types of data.

Data regarding the size and nature of the business site were collected for each of the 371 sites that participated in the study. In addition, the vast majority of sites provided data that addressed the three areas of disposal quantity, disposal composition, and diversion. However, for a minority of the sites, the study team was able to collect data that addressed only one or two of those topic areas. The numbers of sites that participated in the study and contributed each type of data are reflected in the table below. The industry groups are defined in Appendix B.

Table 1: Numbers of Business Sites Included in the Study

Industry Group	Number of Participating Sites	Sites Contributing Disposal Quantity Data	Sites Contributing Disposal Composition Data	Sites Contributing Diversion Data
Fast-Food Restaurants	24	22	22	24
Full-Service Restaurants	27	23	23	27
Food Stores	34	28	30	30
Durable Goods Wholesale Distributors	33	23	24	33
Non-Durable Goods Wholesale Distributors	30	23	26	29
Large Hotels	35	30	33	33
Building Material & Garden, Big Box Stores	23	13	20	21
Building Material & Garden, Other Stores	26	22	24	24
Retail, Big Box Stores	27	19	20	26
Retail, Other Stores	25	23	23	25
Anchor Stores at Shopping Malls	8	4	7	7
Other Parts of Shopping Malls	25	20	24	23
Public Venues & Events	32	29	31	27
Large Office Buildings	29	21	26	28
Totals	378	300	333	357

Selection and Recruitment of Participating Sites

This section describes the method for identifying and recruiting participants in the study. For a more detailed description of the study methodology, see Appendix A.

Screening Potential Sites

The study relied on data from sites located in four of California's largest metropolitan areas: the San Francisco Bay area, greater Los Angeles, greater Sacramento, and greater San Diego. In each of those areas, a waste disposal facility was selected to be the central base of operations, and individual sites were recruited that were within approximately 15 miles of the selected disposal facility. Sites were recruited starting in October 2004, and site visits to collect data reflecting disposal quantities and diversion practices occurred between October 2004 and December 2005. Site visits to collect samples of disposed waste occurred in January, February, July and August 2005.

From the national data clearinghouse *infoUSA*, the project manager purchased a list of business sites corresponding to the targeted industry groups in the ZIP codes covering the targeted geographical areas. The data records of the sites belonging to each industry group and geographic area were placed in a random sequence and were loaded into a database for use during

recruitment of participants. For some industry groups, including shopping malls, anchor stores, public venues, and large office buildings, other data sources were sought. These included phone directories, commercial real estate resources, and internet searches. Samples were distributed approximately evenly among the four regions.

Recruiting Sites

Business sites belonging to each industry group were contacted by phone approximately in the order they occurred in the database (i.e., in a random order). If the recruiter needed to discard a candidate site for any reason, or could not obtain the necessary information or permission, then the next business site on the list for that industry group and geographic area was contacted. Business sites were screened out of the study if they shared dumpster space with another business, such that it was impossible to measure the quantity of waste disposed by the specifically targeted business site. Likewise, they were screened out if their dumpsters were not accessible for measurement of their contents or for obtaining a sample of disposed waste, or if there were logistical barriers to getting accurate measurements of the accumulation of disposed waste or the time during which waste accumulated. Businesses that lay outside the designated geographical areas or that chose not to participate were also dropped from the list of candidates.

The database containing records of business sites was detailed so it could be accessed by the primary contractor and the subcontractors from their multiple office locations. Recruiters from subcontractor SCS Engineers were then trained in the recruitment process and were shown the operation of the shared database. Recruitment involved the following steps:

1. **Verifying** that the candidate business site was within the desired geographic area;
2. **Gaining permission** from the manager or corporate office for the business site to participate in the study;
3. **Obtaining information about the site**, including information about key contact people, hours of operation, number of employees, number of square feet, number of tables (for restaurants), number of rooms (for hotels), and number of visitors (for venues and events);
4. **Obtaining information about the handling of trash**, including the number of distinct "waste substreams," the types and locations of waste containers (e.g., dumpsters, compactors, etc.), the days and times of trash collection, and procedures required to access the waste containers for the purpose of measuring their contents and obtaining a sample of disposed waste;
5. **Conduct site visits**, to measure the accumulation of disposed waste and to characterize and quantify diversion at the site. A second site visit was made to each participating site for the purpose of obtaining a sample of disposed waste.
6. **Verifying the information that had been collected**, in order to ensure that adequate information had been collected in order to permit the waste sampling crew to access the disposed waste during the second planned site visit. This step was done by the project manager.
7. **Preparing instructions for the waste sampling crew**, giving them detailed instructions about where to go, permissible times when they could to obtain the sample, and special instructions for accessing the waste.

Site Visits to Collect Data

The study team visited each site twice to collect data reflecting disposal and diversion practices. The first visit, conducted by subcontractor SCS Engineers, entailed determining the amounts and types of materials that were diverted, as well as determining the amount of trash that was disposed. The second visit, conducted by subcontractor Sky Valley Associates, was for the purpose of obtaining a sample of disposed waste for later characterization.

Quantifying and Characterizing Material Diversion

During the first site visit, a member of the study team met with key personnel at the site to discuss recycling, composting, or other diversion practices implemented at the site. The team member obtained as much documentation as possible from the management at the site, in the form of receipts or records of amounts of materials diverted. In some cases, the team member conducted a visual composition assessment to estimate the amount of each material that was diverted on a daily, weekly, or monthly basis.

Quantifying Disposed Waste

Also during the first site visit, a member of the study team measured the waste that had accumulated in each of the dumpsters at the business site, while noting the amount of time that the waste had accumulated during the site's operational hours since the last waste collection. These data were used to estimate the volume of waste disposed per year. The estimate was used, in conjunction with information about the number of employees at the site and the average density of waste for the industry group, to produce a calculated average of the pounds of waste disposed per employee per year for each industry group. For sites that used mechanical compactors for waste disposal, estimates of the amount of waste disposed per collection cycle were obtained from the waste hauler or from the management at the site.

Characterizing Disposed Waste

When the waste sampling crew visited a business site, a sample of disposed waste was obtained through one of two possible methods. In most cases, a representative sample of disposed waste, weighing between 200 and 250 pounds, was obtained directly from the dumpsters used by the site. If a site disposed of its waste using a compactor (which typically prevents direct access to the waste for sampling purposes), then the sampling crew made arrangements for staff at the site to deposit waste in a set of rolling containers over a period of several hours or days. The resulting sample of disposed waste was then taken to the central base that had been established by the crew at a solid waste facility in the region. At the central base, each sample was sorted by hand into 74 material categories, and the weight of material in each category was recorded.

Results

This section describes the findings for each industry group. Pie charts included in the summary for each industry group refer to materials that are already diverted, as well as disposed materials that are easily divertible, potentially divertible and other disposed materials.

> **Already diverted**: This includes all materials that our analysis indicates are currently being diverted.
>
> **Disposed, easily divertible**: This includes materials for which source reduction programs or methods, or collection programs and recycling infrastructure exist, either broadly or in "forefront communities."
>
> **Disposed, potentially divertible**: This includes materials for which methods and/or technology exist for recycling, reuse, or other beneficial uses, although programs to collect and process the materials are rare or nonexistent.
>
> **Other disposed materials**: Materials that do not fit any of the definitions above.

A detailed list of what materials were classified in each group can be found in Appendix C.

Detailed findings for each industry group in this study are presented in composition tables following each section. The tables present composition percents for the disposed, diverted, and total generation waste streams. Waste material percents are presented in relation to just one waste stream. For example, the estimate of 5 percent cardboard in the disposed waste column indicates the portion of the disposed materials that is cardboard, not the percent of the all waste generated that is cardboard.

Composition findings for disposed waste are presented according to a more detailed list of materials than is used for diverted waste. This was done because the method for characterizing and quantifying diverted materials did not permit distinction among certain material types, such as different resin types for plastic bottles, different colors of glass containers, and different types of plastic film.

Confidence intervals (sometimes known as *error ranges*) are presented for each estimate of the amount of a material in the disposed waste stream. It is possible to calculate these expressions of our "certainty" in the percentage estimates for disposed waste, because the disposal composition estimates are based on a statistical sampling regimen involving randomly chosen segments of the disposed waste stream (i.e., randomly chosen businesses, randomly chosen dumpsters, and randomly chosen scoops full of waste). In contrast, it is not possible to calculate similar confidence intervals for the estimates of diverted materials, because the diversion estimates are not based on a statistical sampling approach. Instead, the study protocol called for the researchers to quantify *all* of each type of material that is diverted by each selected business, and their methods consisted more of tallying and accounting than randomized statistical sampling.

Summary of Findings

Approximately 80 percent of businesses surveyed about their diversion practices have some type of diversion program in place. Diversion rates vary considerably between industry groups from a low of 7 percent diversion to a high of 71 percent of materials diverted. Some of the most

commonly diverted materials are cardboard, paper, and wood pallets. However, paper also makes up a large portion of disposed material for many industry groups, as do food and plastics.

Table 2 lists the estimated pounds per employee of disposed and diverted materials, total material generation, and the diversion rate for each industry group. Results for shopping malls, anchor stores, and office buildings are expressed in pounds per 1000 square feet of building space, and results for public events and venues are expressed in pounds per 100 visitors.

Table 2: Industry Group Summary: Disposal, Diversion, Generation, and Diversion Rate

Industry Group	Disposal (pounds per employee)	Diversion (pounds per employee)	Waste Generation (pounds per employee)	Diversion Rate
Food Stores	4,754	11,825	16,578	71.3%
Retail, Big Box Stores	2,866	4,932	7,798	63.3%
Non-Durable Wholesale Distributors	2,861	4,070	6,931	58.7%
Retail, Other Stores	1,719	1,995	3,714	53.7%
Durable Wholesale Distributors	2,460	2,259	4,719	47.9%
Anchor Stores at Shopping Malls *(pounds per 1,000 sq ft)*	2,103	1,418	3,520	40.3%
Fast-Food Restaurants	4,262	2,267	6,528	34.7%
Full-Service Restaurants	4,403	2,034	6,437	31.6%
Building Material & Gardening, Big Box Stores	6,343	2,689	9,031	29.8%
Public Venues & Events *(pounds per 100 visitors)*	172	72	244	29.0%
Building Material & Gardening, Other Stores	3,481	1,118	4,599	24.3%
Large Hotels	3,903	1,145	5,049	22.7%
Shopping Malls *(pounds per 1,000 sq ft)*	2,028	471	2,499	18.9%
Large Office Buildings *(pounds per 1,000 sq ft)*	1,866	132	1,998	6.6%

Note: More detailed information on disposal rates can be found in Table 21 of Appendix A.

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Findings for Restaurants

The restaurant industry group was divided into two subgroups, fast-food restaurants and full-service restaurants. Both subgroups were further divided into small and large business types. After data collection, the results for small and large businesses from each type of restaurant were averaged together, based on the proportion of each found in California. The findings for the two restaurant types are presented in the following sections.

Fast-Food Restaurants

Disposal, diversion, and total generated waste composition results for fast-food restaurants are detailed in Table 3. Fast-food restaurants on average generate 6,528 pounds of waste material per employee per year. Of the total waste generation approximately 35 percent or 2,267 pounds, is diverted per employee per year.

Nearly 77 percent of the material diverted by fast-food restaurants is cardboard (1,743 pounds per employee). Cardboard also constitutes a sizeable portion (196 pounds per employee per year) of disposed waste and other types of recyclable paper materials are also disposed in significant amounts. Approximately 294 pounds per employee per year (6.9 percent) of disposed waste from this industry group consists of recyclable paper materials, and an additional 21.5 percent (916 pounds per employee per year) of disposed waste is remainder/composite paper (e.g. soiled napkins, paper serving trays, etc.). It is believed that much of the remainder/composite paper could be diverted to composting programs (unlike other industry groups considered in this study, for which the materials that are classified as remainder/composite paper generally are not suitable for composting).

Fast-food restaurants divert very little plastic material. Plastic film makes up 5.9 percent of the disposal stream (about 252 pounds per employee per year) and almost none of this is being diverted.

As expected, food makes up a large proportion of disposed material, 2,191 pounds per employee per year. Although the analysis shows that fast food restaurants divert a substantial portion of food material (13.5 percent of total diversion, or approximately 300 pound per employee per year), nearly all of that diversion consists of grease, which is often prohibited for disposal as MSW.

Figure A represents the portion of the waste stream that is currently being diverted, as well as what could easily be diverted or potentially be diverted, and the remaining disposed portion.

Reasons These Sites Divert Waste

Approximately 79 percent of the fast food restaurants surveyed about their diversion practices had some type of diversion program in place. Businesses were asked about their reasons for participating or not participating in a recycling/diversion program. The range of responses is presented below:

Participants said:

- They recycled because of pride in what they do.
- Recyclables fill up trash dumpster, and it saves space and money to use the recycling dumpster.

Non-participants said:

- They don't generate enough recyclables to be worth collecting.
- They don’t believe there is a need to divert material from the landfill.
- It is the corporate offices’ responsibility to set up a recycling program.
- There is limited space to store recyclables.
- They do not have enough time for recycling.

Figure A: Fast-Food Restaurants: Diverted and Divertible Waste Material, 2005

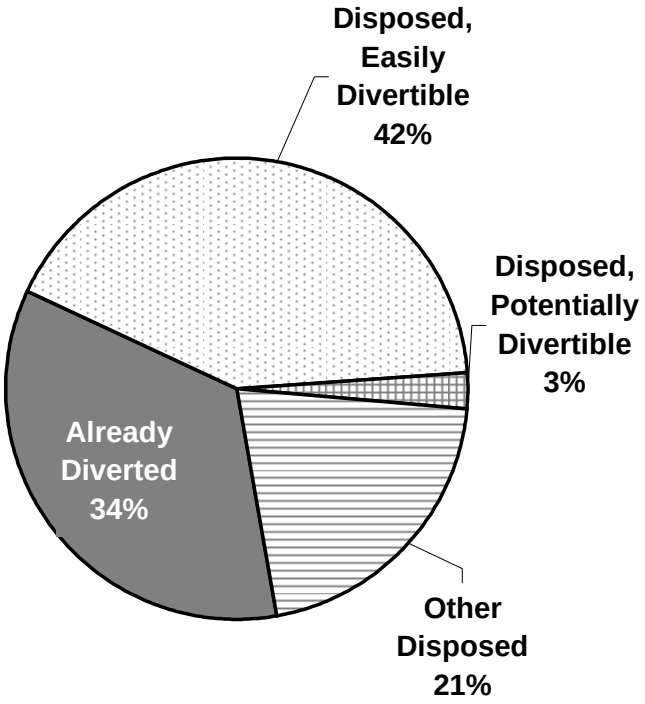

Table 3: Fast-Food Restaurants: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Paper	**33.0%**		**78.9%**	**49.0%**
Uncoated Corrugated Cardboard	4.6%	2.3%	76.9%	29.7%
Paper Bags/Kraft	0.3%	0.1%	0.0%	0.2%
Newspaper	2.4%	1.3%	0.0%	1.6%
White Ledger	0.4%	0.3%	2.0%	0.9%
Other Office Paper & Colored Ledger Paper	0.3%		0.0%	0.2%
Colored Ledger	*0.0%*	*0.0%*		
Other Office Paper	*0.3%*	*0.2%*		
Computer Paper	0.0%	0.0%	0.0%	0.0%
Magazines & Catalogs	0.2%	0.1%	0.0%	0.1%
Phone Books & Directories	0.0%	0.0%	0.0%	0.0%
Other Miscellaneous Paper	3.3%	0.9%	0.0%	2.2%
Remainder/Composite Paper	21.5%	5.3%	0.0%	14.1%
Glass	**0.6%**		**7.1%**	**2.9%**
Glass Bottles & Containers (colors not specified)	0.6%		7.1%	2.9%
Clear Glass Bottles & Containers	*0.5%*	*0.2%*		
Green Glass Bottles & Containers	*0.1%*	*0.2%*		
Brown Glass Bottles & Containers	*0.0%*	*0.0%*		
Other Colored Glass Bottles & Containers	*0.0%*	*0.0%*		
Flat Glass	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Glass	0.0%	0.0%	0.0%	0.0%
Metal	**1.6%**		**0.0%**	**1.0%**
Tin/Steel Cans	1.0%	0.5%	0.0%	0.7%
Major Appliances	0.0%	0.0%	0.0%	0.0%
Used Oil Filters	0.0%	0.0%	0.0%	0.0%
Other Ferrous	0.1%	0.1%	0.0%	0.1%
Aluminum Cans	0.1%	0.0%	0.0%	0.0%
Other Non-Ferrous	0.2%	0.1%	0.0%	0.1%
Remainder/Composite Metal	0.2%	0.4%	0.0%	0.2%
Plastic	**11.6%**		**0.5%**	**7.7%**
PETE & HDPE Bottles, Buckets, & Containers	1.4%		0.1%	0.9%
PETE Bottles	*0.5%*	*0.3%*		
Other PETE Containers	*0.0%*	*0.0%*		
HDPE Natural Bottles	*0.6%*	*0.3%*		
HDPE Colored Bottles	*0.1%*	*0.1%*		
HDPE 5-gallon Buckets — food	*0.1%*	*0.1%*		
HDPE 5-gallon Buckets — non-food	*0.0%*	*0.0%*		
Other HDPE Containers	*0.1%*	*0.1%*		
#3-#7 Bottles & Containers	0.5%		0.0%	0.3%
#3-#7 Bottles	*0.0%*	*0.0%*		
#3-#7 Other Containers	*0.5%*	*0.3%*		
Plastic Film	5.9%		0.0%	3.9%
Plastic Trash Bags	*2.3%*	*0.7%*		
Plastic Grocery & Other Merchandise Bags	*0.1%*	*0.1%*		
Non-Bag Comm. & Indust. Packg Film	*0.0%*	*0.1%*		
Film Products	*0.0%*	*0.1%*		
Other Film	*3.4%*	*0.6%*		
Durable Plastic Items	0.9%	0.4%	0.3%	0.7%
Remainder/Composite Plastic	3.0%	0.9%	0.0%	1.9%

Table 3,continued: Fast-Food Restaurants: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Electronics	**0.0%**		**0.0%**	**0.0%**
Brown Goods	0.0%	0.0%	0.0%	0.0%
Computer-related Electronics	0.0%	0.0%	0.0%	0.0%
Other Small Consumer Electronics	0.0%	0.0%	0.0%	0.0%
Televisions & Other Items with CRTs	0.0%	0.0%	0.0%	0.0%
Organics	**52.5%**		**13.5%**	**39.0%**
Food	51.4%	6.8%	13.5%	38.2%
Leaves, Grass, Prunings, & Trimmings	0.1%		0.0%	0.1%
Leaves & Grass	*0.1%*	*0.1%*		
Prunings & Trimmings	*0.0%*	*0.0%*		
Branches & Stumps	0.0%	0.0%	0.0%	0.0%
Agricultural Crop Residues	0.0%	0.0%	0.0%	0.0%
Manures	0.0%	0.0%	0.0%	0.0%
Textiles	0.6%	0.4%	0.0%	0.4%
Carpet	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Organics	0.4%	0.3%	0.0%	0.3%
Construction & Demolition	**0.6%**		**0.0%**	**0.4%**
Concrete	0.0%	0.0%	0.0%	0.0%
Asphalt Paving	0.0%	0.0%	0.0%	0.0%
Asphalt Roofing	0.0%	0.0%	0.0%	0.0%
Lumber & Treated Wood Waste	0.6%		0.0%	0.4%
Lumber	*0.4%*	*0.5%*		
Treated Wood Waste	*0.2%*	*0.3%*		
Gypsum Board	0.0%	0.0%	0.0%	0.0%
Rock, Soil, & Fines	0.1%	0.1%	0.0%	0.0%
Remainder/Composite C & D	0.0%	0.0%	0.0%	0.0%
Household Hazardous	**0.0%**		**0.0%**	**0.0%**
Paint	0.0%	0.0%	0.0%	0.0%
Vehicle & Equipment Fluids	0.0%	0.0%	0.0%	0.0%
Used Oil	0.0%	0.0%	0.0%	0.0%
Batteries	0.0%	0.0%	0.0%	0.0%
Remainder/Composite HHW	0.0%	0.0%	0.0%	0.0%
Special Waste	**0.0%**		**0.0%**	**0.0%**
Ash	0.0%	0.0%	0.0%	0.0%
Sewage Solids & Industrial Sludge	0.0%		0.0%	0.0%
Sewage Solids	*0.0%*	*0.0%*		
Industrial Sludge	*0.0%*	*0.0%*		
Treated Medical Waste	0.0%	0.0%	0.0%	0.0%
Bulky Items	0.0%	0.0%	0.0%	0.0%
Tires	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Special Waste	0.0%	0.0%	0.0%	0.0%
Mixed Residue	**0.0%**		**0.0%**	**0.0%**
Mixed Residue	0.0%	0.0%	0.0%	0.0%
Total:	100.0%		100.0%	100.0%
Total Pounds per Employee:	4,262		2,267	6,528
Number of Samples:	22		24	

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

Full-Service Restaurants

Disposal, diversion, and total generated waste composition results for full-service restaurants are detailed in Table 4. Full-service restaurants on average generate 6,437 pounds of waste material per employee per year. Of the total waste generation approximately 32 percent or 2,034 pounds, is diverted per employee per year.

As with fast-food restaurants, the majority of material diverted by full-service restaurants is cardboard (71.6 percent of diversion or 1,456 pound per employee per year). Although full-service restaurants dispose less paper overall than fast-food restaurants, much of the paper currently disposed, including cardboard, could be diverted through paper recycling activities (approximately 9.6 percent of disposed waste or 423 pound per employee per year).

Full-service restaurants dispose of nearly 125 pounds per employee per year of metal materials, and they divert almost none of these materials.

Again like fast-food restaurants, full-service restaurants divert very little plastic material. Just over 200 pounds per employee per year of plastic film is disposed (4.6 percent of disposed waste), and almost none is being diverted.

As expected, food makes up a large portion of disposed materials (2,910 pounds per employee per year or 66.1 percent). Nearly a quarter of what is diverted by full-service restaurants is food (478 pounds per employee per year), almost all of that diversion consists of grease, which is often prohibited for disposal as MSW.

Figure B represents the portion of the waste stream that is currently being diverted, as well as what could easily be diverted or potentially be diverted, and the remaining disposed portion.

Reasons These Sites Divert Waste

Approximately 78 percent of the full-service restaurants surveyed about their diversion practices had some type of diversion program in place. Businesses were asked about their reasons for participating or not participating in a recycling/diversion program. The range of responses is presented below:

Participants said:

- They try to recycle everything they can.

Non-participants said:

- They don’t believe there is a need to divert material from the landfill.
- There is limited space to store recyclables.
- They stopped participating because when the hauler came they had very little material in their recycling container due to scavenging.
- They do not have enough time for recycling.
- They don’t recycle because they haven’t set up a recycling program.
- They would participate if there was a commingled recycling option.

Figure B: Full-Service Restaurants: Diverted and Divertible Waste Material, 2005

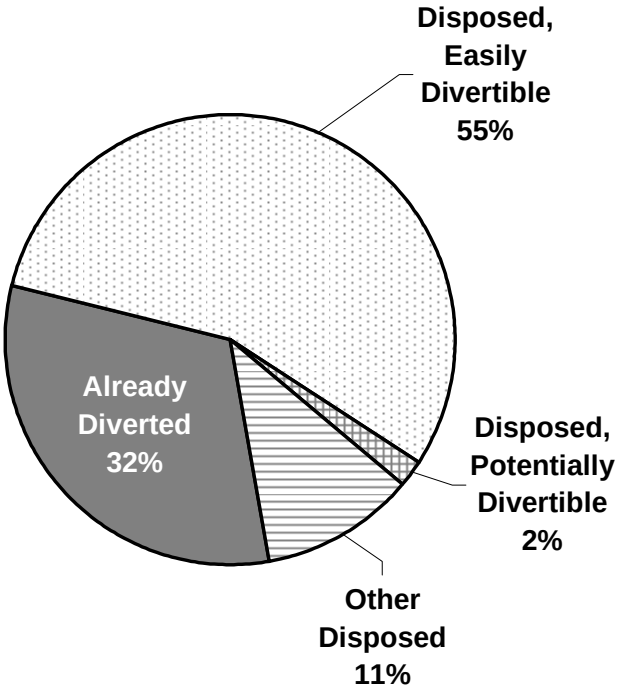

Table 4: Full-Service Restaurants: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Paper	**17.3%**		**71.6%**	**34.4%**
Uncoated Corrugated Cardboard	4.1%	1.4%	71.6%	25.4%
Paper Bags/Kraft	0.1%	0.0%	0.0%	0.1%
Newspaper	2.1%	1.0%	0.0%	1.5%
White Ledger	0.1%	0.0%	0.0%	0.0%
Other Office Paper & Colored Ledger Paper	0.5%		0.0%	0.3%
Colored Ledger	*0.0%*	*0.0%*		
Other Office Paper	*0.5%*	*0.3%*		
Computer Paper	0.0%	0.0%	0.0%	0.0%
Magazines & Catalogs	0.2%	0.2%	0.0%	0.2%
Phone Books & Directories	0.0%	0.0%	0.0%	0.0%
Other Miscellaneous Paper	2.5%	1.2%	0.0%	1.7%
Remainder/Composite Paper	7.7%	2.1%	0.0%	5.3%
Glass	**2.7%**		**1.9%**	**2.4%**
Glass Bottles & Containers (colors not specified)	2.5%		1.9%	2.3%
Clear Glass Bottles & Containers	*0.8%*	*0.3%*		
Green Glass Bottles & Containers	*0.8%*	*0.4%*		
Brown Glass Bottles & Containers	*0.9%*	*0.6%*		
Other Colored Glass Bottles & Containers	*0.0%*	*0.0%*		
Flat Glass	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Glass	0.1%	0.1%	0.0%	0.1%
Metal	**2.8%**		**0.2%**	**2.0%**
Tin/Steel Cans	2.3%	1.8%	0.0%	1.5%
Major Appliances	0.0%	0.0%	0.0%	0.0%
Used Oil Filters	0.0%	0.0%	0.0%	0.0%
Other Ferrous	0.2%	0.2%	0.0%	0.1%
Aluminum Cans	0.0%	0.0%	0.2%	0.1%
Other Non-Ferrous	0.2%	0.2%	0.0%	0.1%
Remainder/Composite Metal	0.1%	0.1%	0.0%	0.1%
Plastic	**7.3%**		**2.7%**	**5.9%**
PETE & HDPE Bottles, Buckets, & Containers	0.9%		0.1%	0.7%
PETE Bottles	*0.2%*	*0.1%*		
Other PETE Containers	*0.0%*	*0.0%*		
HDPE Natural Bottles	*0.4%*	*0.2%*		
HDPE Colored Bottles	*0.1%*	*0.0%*		
HDPE 5-gallon Buckets — food	*0.0%*	*0.1%*		
HDPE 5-gallon Buckets — non-food	*0.0%*	*0.1%*		
Other HDPE Containers	*0.1%*	*0.1%*		
#3-#7 Bottles & Containers	0.3%		0.0%	0.2%
#3-#7 Bottles	*0.0%*	*0.0%*		
#3-#7 Other Containers	*0.2%*	*0.2%*		
Plastic Film	4.6%		0.0%	3.2%
Plastic Trash Bags	*1.3%*	*0.4%*		
Plastic Grocery & Other Merchandise Bags	*0.1%*	*0.0%*		
Non-Bag Comm. & Indust. Packg Film	*0.0%*	*0.0%*		
Film Products	*0.0%*	*0.1%*		
Other Film	*3.2%*	*1.1%*		
Durable Plastic Items	0.6%	0.4%	2.6%	1.2%
Remainder/Composite Plastic	0.9%	0.2%	0.0%	0.6%

Table 4, continued: Full-Service Restaurants: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	Disposed Waste + / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Electronics	**0.1%**		**0.0%**	**0.0%**
Brown Goods	0.1%	0.1%	0.0%	0.0%
Computer-related Electronics	0.0%	0.0%	0.0%	0.0%
Other Small Consumer Electronics	0.0%	0.0%	0.0%	0.0%
Televisions & Other Items with CRTs	0.0%	0.0%	0.0%	0.0%
Organics	**66.5%**		**23.6%**	**52.9%**
Food	66.1%	5.9%	23.5%	52.7%
Leaves, Grass, Prunings, & Trimmings	0.1%		0.0%	0.1%
Leaves & Grass	*0.0%*	*0.0%*		
Prunings & Trimmings	*0.1%*	*0.1%*		
Branches & Stumps	0.0%	0.0%	0.0%	0.0%
Agricultural Crop Residues	0.0%	0.0%	0.0%	0.0%
Manures	0.0%	0.0%	0.0%	0.0%
Textiles	0.3%	0.2%	0.0%	0.2%
Carpet	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Organics	0.1%	0.1%	0.0%	0.1%
Construction & Demolition	**1.8%**		**0.0%**	**1.3%**
Concrete	0.3%	0.4%	0.0%	0.2%
Asphalt Paving	0.0%	0.0%	0.0%	0.0%
Asphalt Roofing	0.0%	0.0%	0.0%	0.0%
Lumber & Treated Wood Waste	0.6%		0.0%	0.4%
Lumber	*0.6%*	*0.8%*		
Treated Wood Waste	*0.0%*	*0.0%*		
Gypsum Board	0.0%	0.0%	0.0%	0.0%
Rock, Soil, & Fines	0.3%	0.3%	0.0%	0.2%
Remainder/Composite C & D	0.6%	0.5%	0.0%	0.4%
Household Hazardous	**0.0%**		**0.0%**	**0.0%**
Paint	0.0%	0.0%	0.0%	0.0%
Vehicle & Equipment Fluids	0.0%	0.0%	0.0%	0.0%
Used Oil	0.0%	0.0%	0.0%	0.0%
Batteries	0.0%	0.0%	0.0%	0.0%
Remainder/Composite HHW	0.0%	0.0%	0.0%	0.0%
Special Waste	**1.5%**		**0.0%**	**1.0%**
Ash	0.0%	0.0%	0.0%	0.0%
Sewage Solids & Industrial Sludge	0.0%		0.0%	0.0%
Sewage Solids	*0.0%*	*0.0%*		
Industrial Sludge	*0.0%*	*0.0%*		
Treated Medical Waste	0.0%	0.0%	0.0%	0.0%
Bulky Items	1.5%	2.4%	0.0%	1.0%
Tires	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Special Waste	0.0%	0.0%	0.0%	0.0%
Mixed Residue	**0.0%**		**0.0%**	**0.0%**
Mixed Residue	0.0%	0.1%	0.0%	0.0%
Total:	100.0%		100.0%	100.0%
Total Pounds per Employee:	4,403		2,034	6,437
Number of Samples:	23		27	

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

Findings for Food Stores

Disposal, diversion, and total generated waste composition results for food stores are detailed in Table 5. Food stores on average generate 16,578 pounds of waste material per employee per year. Of the total waste generation approximately 71 percent or 11,825 pounds, is diverted per employee per year.

Most food stores have successful cardboard diversion programs (9,283 pounds per employee per year is diverted). But little of other paper material is diverted. Nearly 4 percent of disposed material is cardboard, and another 4 percent consists of other types of recyclable paper, which combined accounts for over 375 pounds per employee per year.

Almost none of the recyclable glass, metal, or plastic bottles and containers generated by food stores are diverted. These three types of materials account for nearly 140 pounds per employee per year of disposed waste.

Again like restaurants, food stores divert very little plastic material. Plastic film accounts for more than 270 pounds per employee per year of the disposal stream, and almost none of this is diverted. However, plastic pallets, plastic crates, and wooden pallets together comprise about 6.4 percent of the material diverted by food stores, or approximately 757 pounds per employee per year.

As expected, food makes up a large portion of the disposed waste stream (about 63 percent, or 3,000 pounds per employee per year). A smaller but sizeable amount of food, approximately 1,632 pounds per employee per year, is diverted.

Figure C represents the portion of the waste stream that is currently being diverted, as well as what could easily be diverted or potentially be diverted, and the remaining disposed portion.

Reasons These Sites Divert Waste

Approximately 97 percent of the food stores surveyed about their diversion practices had some type of diversion program in place. Businesses were asked about their reasons for participating or not participating in a recycling/diversion program. The range of responses is presented below:

Participants said:

- They participate because they believe it is a good thing to do.
- They already recycle traditional materials, but they need corporate approval to expand recycling program to include organics.

Non-participants said:

- They do not generate enough recyclables.
- They don’t recycle because they haven’t set up a recycling program.

Figure C: Food Stores: Diverted and Divertible Waste Material, 2005

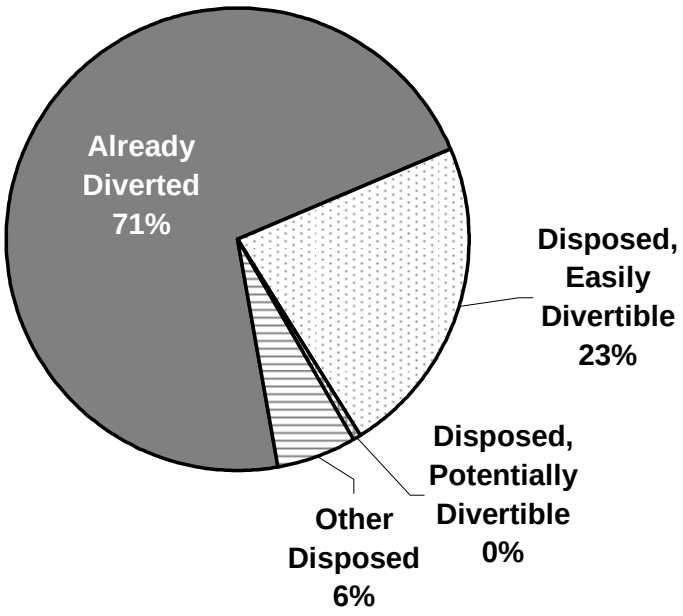

Table 5: Food Stores: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Paper	**18.5%**		**78.5%**	**61.3%**
Uncoated Corrugated Cardboard	3.9%	1.0%	78.5%	57.1%
Paper Bags/Kraft	0.5%	0.4%	0.0%	0.1%
Newspaper	1.1%	0.7%	0.0%	0.3%
White Ledger	0.2%	0.2%	0.0%	0.1%
Other Office Paper & Colored Ledger Paper	0.2%		0.0%	0.1%
Colored Ledger	*0.0%*	*0.0%*		
Other Office Paper	*0.2%*	*0.1%*		
Computer Paper	0.3%	0.5%	0.0%	0.1%
Magazines & Catalogs	0.2%	0.1%	0.0%	0.1%
Phone Books & Directories	0.1%	0.1%	0.0%	0.0%
Other Miscellaneous Paper	1.5%	0.4%	0.0%	0.4%
Remainder/Composite Paper	10.6%	3.5%	0.0%	3.0%
Glass	**0.5%**		**0.0%**	**0.2%**
Glass Bottles & Containers (colors not specified)	0.5%		0.0%	0.2%
Clear Glass Bottles & Containers	*0.4%*	*0.2%*		
Green Glass Bottles & Containers	*0.1%*	*0.0%*		
Brown Glass Bottles & Containers	*0.1%*	*0.1%*		
Other Colored Glass Bottles & Containers	*0.0%*	*0.0%*		
Flat Glass	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Glass	0.0%	0.0%	0.0%	0.0%
Metal	**1.4%**		**0.0%**	**0.4%**
Tin/Steel Cans	0.3%	0.2%	0.0%	0.1%
Major Appliances	0.0%	0.0%	0.0%	0.0%
Used Oil Filters	0.0%	0.0%	0.0%	0.0%
Other Ferrous	0.8%	0.7%	0.0%	0.2%
Aluminum Cans	0.0%	0.0%	0.0%	0.0%
Other Non-Ferrous	0.2%	0.1%	0.0%	0.1%
Remainder/Composite Metal	0.0%	0.0%	0.0%	0.0%
Plastic	**9.5%**		**1.6%**	**3.9%**
PETE & HDPE Bottles, Buckets, & Containers	0.7%		0.0%	0.2%
PETE Bottles	*0.2%*	*0.1%*		
Other PETE Containers	*0.0%*	*0.0%*		
HDPE Natural Bottles	*0.1%*	*0.0%*		
HDPE Colored Bottles	*0.1%*	*0.0%*		
HDPE 5-gallon Buckets — food	*0.1%*	*0.1%*		
HDPE 5-gallon Buckets — non-food	*0.1%*	*0.2%*		
Other HDPE Containers	*0.2%*	*0.2%*		
#3-#7 Bottles & Containers	0.3%		0.0%	0.1%
#3-#7 Bottles	*0.0%*	*0.0%*		
#3-#7 Other Containers	*0.3%*	*0.1%*		
Plastic Film	5.7%		0.0%	1.7%
Plastic Trash Bags	*1.0%*	*0.7%*		
Plastic Grocery & Other Merchandise Bags	*0.2%*	*0.2%*		
Non-Bag Comm. & Indust. Packg Film	*0.6%*	*0.3%*		
Film Products	*0.0%*	*0.0%*		
Other Film	*3.8%*	*1.3%*		
Durable Plastic Items	0.8%	0.7%	1.5%	1.3%
Remainder/Composite Plastic	2.1%	1.1%	0.0%	0.6%

Table 5, continued: Food Stores: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Electronics	**0.0%**		**0.0%**	**0.0%**
Brown Goods	0.0%	0.0%	0.0%	0.0%
Computer-related Electronics	0.0%	0.0%	0.0%	0.0%
Other Small Consumer Electronics	0.0%	0.0%	0.0%	0.0%
Televisions & Other Items with CRTs	0.0%	0.0%	0.0%	0.0%
Organics	**65.0%**		**14.9%**	**29.3%**
Food	63.1%	6.4%	13.8%	27.9%
Leaves, Grass, Prunings, & Trimmings	1.2%		1.1%	1.2%
Leaves & Grass	*1.0%*	*0.7%*		
Prunings & Trimmings	*0.2%*	*0.4%*		
Branches & Stumps	0.0%	0.0%	0.0%	0.0%
Agricultural Crop Residues	0.0%	0.0%	0.0%	0.0%
Manures	0.0%	0.0%	0.0%	0.0%
Textiles	0.1%	0.1%	0.0%	0.0%
Carpet	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Organics	0.6%	0.4%	0.0%	0.2%
Construction & Demolition	**5.0%**		**4.9%**	**5.0%**
Concrete	0.0%	0.0%	0.0%	0.0%
Asphalt Paving	0.0%	0.0%	0.0%	0.0%
Asphalt Roofing	0.0%	0.0%	0.0%	0.0%
Lumber & Treated Wood Waste	4.1%		4.9%	4.7%
Lumber	*4.1%*	*2.5%*		
Treated Wood Waste	*0.0%*	*0.0%*		
Gypsum Board	0.0%	0.0%	0.0%	0.0%
Rock, Soil, & Fines	0.1%	0.1%	0.0%	0.0%
Remainder/Composite C & D	0.9%	1.0%	0.0%	0.3%
Household Hazardous	**0.0%**		**0.0%**	**0.0%**
Paint	0.0%	0.0%	0.0%	0.0%
Vehicle & Equipment Fluids	0.0%	0.0%	0.0%	0.0%
Used Oil	0.0%	0.0%	0.0%	0.0%
Batteries	0.0%	0.0%	0.0%	0.0%
Remainder/Composite HHW	0.0%	0.0%	0.0%	0.0%
Special Waste	**0.0%**		**0.0%**	**0.0%**
Ash	0.0%	0.0%	0.0%	0.0%
Sewage Solids & Industrial Sludge	0.0%		0.0%	0.0%
Sewage Solids	*0.0%*	*0.0%*		
Industrial Sludge	*0.0%*	*0.0%*		
Treated Medical Waste	0.0%	0.0%	0.0%	0.0%
Bulky Items	0.0%	0.0%	0.0%	0.0%
Tires	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Special Waste	0.0%	0.0%	0.0%	0.0%
Mixed Residue	**0.0%**		**0.0%**	**0.0%**
Mixed Residue	0.0%	0.0%	0.0%	0.0%
Total:	100.0%		100.0%	100.0%
Total Pounds per Employee:	4,754		11,825	16,578
Number of Samples:	30		30	

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

Findings for Wholesale Goods Distributors

The wholesale industry group was divided into two subgroups, durable wholesale goods distributors and non-durable wholesale goods distributors. Both subgroups were further divided into small, medium, and large business types. After data collection the data from small, medium, and large businesses for each type of wholesale distributor were averaged together based on the proportion of each found in California. The findings for the two wholesale industry groups are presented in the following sections.

Durable Wholesale Goods Distributors

Disposal, diversion, and total generated waste composition results for durable wholesale goods distributors are detailed in Table 6. Durable wholesale goods distributors on average generate 4,719 pounds of waste material per employee per year. Of the total waste generation approximately 48 percent is diverted or 2,259 pounds per employee per year.

Durable wholesale goods distributors generate on average 538 pounds per employee per year of cardboard and divert about 56 percent of it, but little of other paper material is diverted. Roughly 240 pounds of cardboard is still disposed, and another 251 pounds of other types of recyclable paper is also disposed of per employee per year.

Many durable wholesale goods distributors also have successful glass diversion programs; nearly three quarters of the glass generated by durable wholesale distributors is being diverted.

Approximately 830 pounds per employee per year of recyclable metal is generated by this industry group. Of that, amount approximately 700 pounds per employee per year is currently diverted, and only about 16 percent is disposed (approximately 130 pounds per employee per year).

Durable wholesale goods distributors on average divert very little plastic material. Nearly 250 pounds per employee of plastic material is disposed of by this industry group per year. Recyclable plastic film alone accounts for about 111 pounds per employee per year of the disposed plastic (4.5 percent of total disposal), and almost none of this is diverted.

Durable wholesale goods distributors divert almost half of their wood waste (664 pounds per employee per year), which is largely pallets and some lumber waste. Still, this industry group disposed of nearly 750 pounds per employee per year of wood waste.

This industry group is different from most others in that it diverts a sizeable quantity of hazardous waste. Durable wholesale goods distributors divert over 100 pounds per employee of used oil and over 300 pounds per employee of batteries. Almost none of these materials were found in the disposed waste stream.

Additionally, it is important to note that three businesses diverted large quantities of particular materials that were specifically related to the nature of that business. These businesses were not included in the diversion calculations reflected in Table 6 below, because the consultant team believed their inclusion would skew the findings related to diversion and overall waste generation. The three businesses that were removed from the diversion analysis diverted large amounts of tires, sawdust, and marble and stone products (39,375 pounds, 7,800 pounds, and 76,267 pounds per employee per year, respectively). This practice is explained in more detail in the methodology in Appendix A.

Figure D represents the portion of the waste stream that is currently being diverted, as well as what could easily be diverted or potentially be diverted, and the remaining disposed portion.

Reasons These Sites Divert Waste

Approximately 73 percent of the durable wholesale goods distributors surveyed about their diversion practices had some type of diversion program in place. Businesses were asked about their reasons for participating or not participating in a recycling/diversion program. The range of responses is presented below:

Participants said:

- They started recycling when the city began offering recycling services for their location.
- They participate because they believe it is a good thing to do.

Non-participants said:

- They do not generate enough recyclables.
- They felt recycling was too expensive.
- There is limited space to store recyclables.

Figure D: Durable Wholesale Goods Distributors: Diverted and Divertible Waste Material, 2005

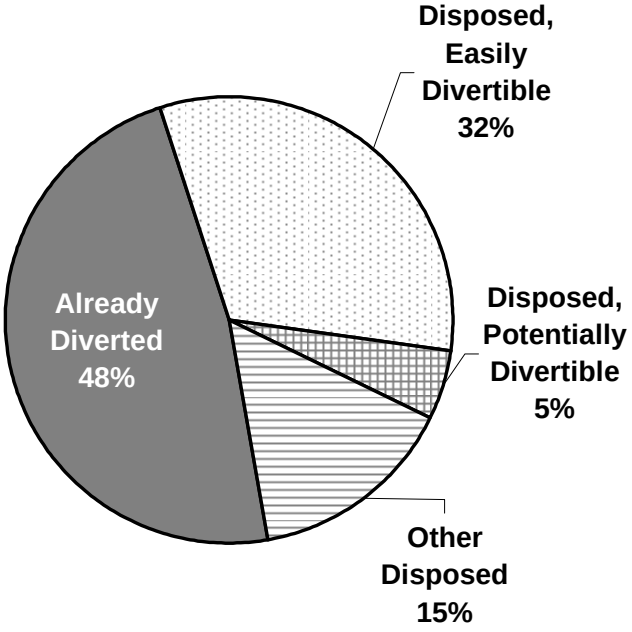

Table 6: Durable Wholesale Distributors: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Paper	**26.3%**		**18.0%**	**22.3%**
Uncoated Corrugated Cardboard	9.7%	3.9%	13.3%	11.4%
Paper Bags/Kraft	0.5%	0.4%	0.0%	0.2%
Newspaper	0.9%	0.5%	0.0%	0.5%
White Ledger	2.4%	2.3%	4.2%	3.3%
Other Office Paper & Colored Ledger Paper	1.4%		0.0%	0.7%
Colored Ledger	*0.1%*	*0.1%*		
Other Office Paper	*1.4%*	*1.1%*		
Computer Paper	0.2%	0.2%	0.5%	0.4%
Magazines & Catalogs	0.8%	0.7%	0.0%	0.4%
Phone Books & Directories	0.4%	0.4%	0.0%	0.2%
Other Miscellaneous Paper	3.8%	1.8%	0.0%	2.0%
Remainder/Composite Paper	6.4%	3.0%	0.0%	3.3%
Glass	**0.7%**		**2.9%**	**1.8%**
Glass Bottles & Containers (colors not specified)	0.6%		1.9%	1.2%
Clear Glass Bottles & Containers	*0.4%*	*0.4%*		
Green Glass Bottles & Containers	*0.2%*	*0.3%*		
Brown Glass Bottles & Containers	*0.0%*	*0.0%*		
Other Colored Glass Bottles & Containers	*0.0%*	*0.0%*		
Flat Glass	0.0%	0.0%	1.0%	0.5%
Remainder/Composite Glass	0.1%	0.1%	0.0%	0.0%
Metal	**11.4%**		**31.0%**	**20.8%**
Tin/Steel Cans	0.2%	0.2%	0.0%	0.1%
Major Appliances	0.0%	0.0%	0.1%	0.0%
Used Oil Filters	0.0%	0.0%	0.0%	0.0%
Other Ferrous	4.8%	5.3%	30.6%	17.1%
Aluminum Cans	0.1%	0.1%	0.4%	0.2%
Other Non-Ferrous	0.1%	0.1%	0.0%	0.0%
Remainder/Composite Metal	6.2%	6.2%	0.0%	3.2%
Plastic	**9.9%**		**0.5%**	**5.4%**
PETE & HDPE Bottles, Buckets, & Containers	0.7%		0.0%	0.3%
PETE Bottles	*0.3%*	*0.2%*		
Other PETE Containers	*0.0%*	*0.0%*		
HDPE Natural Bottles	*0.0%*	*0.0%*		
HDPE Colored Bottles	*0.0%*	*0.0%*		
HDPE 5-gallon Buckets — food	*0.0%*	*0.0%*		
HDPE 5-gallon Buckets — non-food	*0.3%*	*0.4%*		
Other HDPE Containers	*0.0%*	*0.0%*		
#3-#7 Bottles & Containers	0.1%		0.0%	0.0%
#3-#7 Bottles	*0.0%*	*0.0%*		
#3-#7 Other Containers	*0.1%*	*0.1%*		
Plastic Film	5.5%		0.0%	2.9%
Plastic Trash Bags	*0.4%*	*0.3%*		
Plastic Grocery & Other Merchandise Bags	*0.1%*	*0.1%*		
Non-Bag Comm. & Indust. Packg Film	*3.6%*	*3.8%*		
Film Products	*0.8%*	*1.4%*		
Other Film	*0.6%*	*0.3%*		
Durable Plastic Items	1.1%	0.9%	0.4%	0.8%
Remainder/Composite Plastic	2.5%	1.1%	0.0%	1.3%

Table 6, continued: Durable Wholesale Distributors: Waste Disposal, Diversion, and Total Generation Composition , 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Electronics	**0.5%**		**0.0%**	**0.2%**
Brown Goods	0.0%	0.0%	0.0%	0.0%
Computer-related Electronics	0.5%	0.7%	0.0%	0.2%
Other Small Consumer Electronics	0.0%	0.0%	0.0%	0.0%
Televisions & Other Items with CRTs	0.0%	0.0%	0.0%	0.0%
Organics	**5.4%**		**0.0%**	**2.8%**
Food	2.7%	1.5%	0.0%	1.4%
Leaves, Grass, Prunings, & Trimmings	0.8%		0.0%	0.4%
Leaves & Grass	*0.7%*	*0.7%*		
Prunings & Trimmings	*0.0%*	*0.0%*		
Branches & Stumps	0.0%	0.0%	0.0%	0.0%
Agricultural Crop Residues	0.0%	0.0%	0.0%	0.0%
Manures	0.0%	0.0%	0.0%	0.0%
Textiles	1.5%	1.2%	0.0%	0.8%
Carpet	0.1%	0.2%	0.0%	0.1%
Remainder/Composite Organics	0.3%	0.3%	0.0%	0.2%
Construction & Demolition	**43.5%**		**29.4%**	**36.7%**
Concrete	0.0%	0.0%	0.0%	0.0%
Asphalt Paving	0.0%	0.0%	0.0%	0.0%
Asphalt Roofing	0.0%	0.0%	0.0%	0.0%
Lumber & Treated Wood Waste	30.5%		29.4%	30.0%
Lumber	*29.1%*	*11.9%*		
Treated Wood Waste	*1.4%*	*1.7%*		
Gypsum Board	2.9%	4.7%	0.0%	1.5%
Rock, Soil, & Fines	0.6%	1.0%	0.0%	0.3%
Remainder/Composite C & D	9.5%	11.5%	0.0%	5.0%
Household Hazardous	**0.3%**		**18.1%**	**8.8%**
Paint	0.1%	0.1%	0.0%	0.0%
Vehicle & Equipment Fluids	0.0%	0.0%	0.0%	0.0%
Used Oil	0.1%	0.2%	4.5%	2.2%
Batteries	0.0%	0.0%	13.6%	6.5%
Remainder/Composite HHW	0.0%	0.1%	0.0%	0.0%
Special Waste	**2.1%**		**0.0%**	**1.1%**
Ash	0.3%	0.4%	0.0%	0.1%
Sewage Solids & Industrial Sludge	0.0%		0.0%	0.0%
Sewage Solids	*0.0%*	*0.0%*		
Industrial Sludge	*0.0%*	*0.0%*		
Treated Medical Waste	0.0%	0.0%	0.0%	0.0%
Bulky Items	0.0%	0.0%	0.0%	0.0%
Tires	1.8%	1.7%	0.0%	1.0%
Remainder/Composite Special Waste	0.0%	0.0%	0.0%	0.0%
Mixed Residue	**0.0%**		**0.0%**	**0.0%**
Mixed Residue	0.0%	0.1%	0.0%	0.0%
Total:	100.0%		100.0%	100.0%
Total Pounds per Employee:	2,460		2,259	4,719
Number of Samples:	24		33	

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

Non-Durable Wholesale Goods Distributors

Disposal, diversion, and total generated waste composition results for non-durable wholesale goods distributors are detailed in Table 7. Non-durable wholesale goods distributors on average generate 6,931 pounds of waste material per employee per year. Of the total waste generation almost 59 percent or 4,070 pounds per employee per year is diverted.

Non-durable wholesale goods distributors divert over five times more cardboard than they dispose. Over 2,015 pounds per employee per year of cardboard and white ledger paper is diverted. Approximately 325 pounds per employee per year of cardboard is disposed, and another 225 pounds of disposed waste consists of other types of recyclable paper.

On average, non-durable wholesale goods distributors divert almost half of the approximately 865 pounds of plastic material they generate per employee per year. As one of the few industry groups that diverts plastic film, non-durable wholesale distributors divert nearly 50 pounds of plastic film per employee per year and dispose approximately 210 pounds per employee per year. Non-durable wholesale goods distributors divert about 350 pounds per employee per year of durable plastic items, a figure which mainly reflects the reuse of plastic pallets.

Annually, non-durable wholesale goods distributors dispose of about 787 pounds of food per employee and divert approximately 269 pounds per employee of food. An additional 112 pounds per employee per year of leaves, grass, prunings, and trimmings, is disposed of by this industry group that could get captured through a composting program along with food waste.

Non-durable wholesale goods distributors divert about 1,320 pounds per employee per year of lumber and treated wood waste and dispose of nearly 300 pounds of lumber waste per employee per year. Almost all of the diverted wood waste is from wood pallet recycling or reuse.

Additionally, it is important to note that two businesses diverted large quantities of particular materials that were specifically related to the nature of that business. These businesses were not included in the diversion calculations reflected in Table 7, below, because the consultant team believed their inclusion would skew the findings related to diversion and overall waste generation. The two businesses that were removed from the diversion analysis diverted large amounts of polystyrene packaging and plastic film (35,739 pounds and 25,430 pounds per employee per year, respectively). This practice is explained in more detail in the methodology in Appendix A.

Figure E represents the portion of the waste stream that is currently being diverted, as well as what could easily be diverted or potentially be diverted, and the remaining disposed portion.

Reasons These Sites Divert Waste

Approximately 86 percent of the non-durable wholesale goods distributors surveyed about their diversion practices had some type of diversion program in place. Businesses were asked about their reasons for participating or not participating in a recycling/diversion program. The range of responses is presented below:

Participants said:

- They participate because they believe it is a good thing to do.

Non-participants said:

- They do not participate because there is not a city sponsored program.
- They felt recycling was too expensive.
- There is no incentive to recycle because it costs them to have a recycling program.
- The property management handles the recycling and does not have a program set up.
- They mainly generate plastic packaging/film, but there is not a convenient program to recycle that material.

Figure E: Non-Durable Wholesale Distributors: Diverted and Divertible Waste Material, 2005

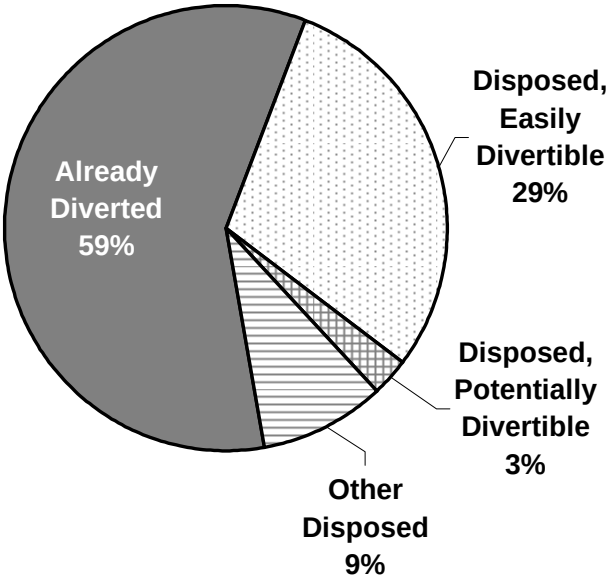

Table 7: Non-Durable Wholesale Distributors: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Paper	**26.5%**		**49.8%**	**40.1%**
Uncoated Corrugated Cardboard	11.4%	6.0%	42.6%	29.7%
Paper Bags/Kraft	0.3%	0.4%	0.0%	0.1%
Newspaper	1.0%	0.5%	0.0%	0.4%
White Ledger	1.3%	0.8%	7.0%	4.6%
Other Office Paper & Colored Ledger Paper	0.3%		0.0%	0.1%
Colored Ledger	*0.0%*	*0.1%*		
Other Office Paper	*0.2%*	*0.1%*		
Computer Paper	0.5%	0.6%	0.0%	0.2%
Magazines & Catalogs	0.3%	0.3%	0.0%	0.1%
Phone Books & Directories	0.0%	0.0%	0.0%	0.0%
Other Miscellaneous Paper	4.2%	1.1%	0.2%	1.8%
Remainder/Composite Paper	7.2%	4.6%	0.0%	3.0%
Glass	**0.5%**		**0.0%**	**0.2%**
Glass Bottles & Containers (colors not specified)	0.3%		0.0%	0.1%
Clear Glass Bottles & Containers	*0.2%*	*0.2%*		
Green Glass Bottles & Containers	*0.0%*	*0.0%*		
Brown Glass Bottles & Containers	*0.0%*	*0.0%*		
Other Colored Glass Bottles & Containers	*0.0%*	*0.0%*		
Flat Glass	0.2%	0.3%	0.0%	0.1%
Remainder/Composite Glass	0.1%	0.1%	0.0%	0.0%
Metal	**3.3%**		**0.8%**	**1.8%**
Tin/Steel Cans	0.1%	0.1%	0.0%	0.1%
Major Appliances	0.1%	0.2%	0.0%	0.1%
Used Oil Filters	0.0%	0.0%	0.0%	0.0%
Other Ferrous	1.4%	1.4%	0.0%	0.6%
Aluminum Cans	0.1%	0.1%	0.8%	0.5%
Other Non-Ferrous	0.3%	0.3%	0.0%	0.1%
Remainder/Composite Metal	1.3%	1.0%	0.0%	0.5%
Plastic	**16.0%**		**10.1%**	**12.5%**
PETE & HDPE Bottles, Buckets, & Containers	1.1%		0.2%	0.6%
PETE Bottles	*0.2%*	*0.1%*		
Other PETE Containers	*0.0%*	*0.0%*		
HDPE Natural Bottles	*0.2%*	*0.3%*		
HDPE Colored Bottles	*0.0%*	*0.0%*		
HDPE 5-gallon Buckets — food	*0.5%*	*0.8%*		
HDPE 5-gallon Buckets — non-food	*0.0%*	*0.0%*		
Other HDPE Containers	*0.0%*	*0.0%*		
#3-#7 Bottles & Containers	0.3%		0.0%	0.1%
#3-#7 Bottles	*0.0%*	*0.0%*		
#3-#7 Other Containers	*0.3%*	*0.3%*		
Plastic Film	7.3%		1.2%	3.7%
Plastic Trash Bags	*0.9%*	*0.7%*		
Plastic Grocery & Other Merchandise Bags	*0.1%*	*0.0%*		
Non-Bag Comm. & Indust. Packg Film	*3.1%*	*2.0%*		
Film Products	*0.2%*	*0.3%*		
Other Film	*3.0%*	*2.5%*		
Durable Plastic Items	1.2%	0.6%	8.6%	5.5%
Remainder/Composite Plastic	6.2%	3.0%	0.0%	2.6%

Table 7, continued: Non-Durable Wholesale Distributors: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Electronics	**2.6%**		**0.0%**	**1.1%**
Brown Goods	1.9%	2.9%	0.0%	0.8%
Computer-related Electronics	0.0%	0.0%	0.0%	0.0%
Other Small Consumer Electronics	0.0%	0.0%	0.0%	0.0%
Televisions & Other Items with CRTs	0.7%	1.1%	0.0%	0.3%
Organics	**32.7%**		**6.6%**	**17.4%**
Food	27.5%	9.8%	6.6%	15.2%
Leaves, Grass, Prunings, & Trimmings	3.9%		0.0%	1.6%
Leaves & Grass	*1.9%*	*2.4%*		
Prunings & Trimmings	*2.0%*	*3.3%*		
Branches & Stumps	0.0%	0.0%	0.0%	0.0%
Agricultural Crop Residues	0.0%	0.0%	0.0%	0.0%
Manures	0.0%	0.0%	0.0%	0.0%
Textiles	0.7%	0.6%	0.1%	0.3%
Carpet	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Organics	0.6%	0.4%	0.0%	0.2%
Construction & Demolition	**18.4%**		**32.5%**	**26.7%**
Concrete	4.3%	7.1%	0.0%	1.8%
Asphalt Paving	0.0%	0.0%	0.0%	0.0%
Asphalt Roofing	0.0%	0.0%	0.0%	0.0%
Lumber & Treated Wood Waste	10.2%		32.5%	23.3%
Lumber	*10.2%*	*5.5%*		
Treated Wood Waste	*0.0%*	*0.1%*		
Gypsum Board	1.8%	3.0%	0.0%	0.8%
Rock, Soil, & Fines	0.4%	0.5%	0.0%	0.2%
Remainder/Composite C & D	1.6%	2.0%	0.0%	0.7%
Household Hazardous	**0.0%**		**0.2%**	**0.1%**
Paint	0.0%	0.0%	0.0%	0.0%
Vehicle & Equipment Fluids	0.0%	0.0%	0.0%	0.0%
Used Oil	0.0%	0.0%	0.2%	0.1%
Batteries	0.0%	0.0%	0.0%	0.0%
Remainder/Composite HHW	0.0%	0.0%	0.0%	0.0%
Special Waste	**0.1%**		**0.0%**	**0.0%**
Ash	0.0%	0.0%	0.0%	0.0%
Sewage Solids & Industrial Sludge	0.0%		0.0%	0.0%
Sewage Solids	*0.0%*	*0.0%*		
Industrial Sludge	*0.0%*	*0.0%*		
Treated Medical Waste	0.0%	0.1%	0.0%	0.0%
Bulky Items	0.0%	0.0%	0.0%	0.0%
Tires	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Special Waste	0.0%	0.0%	0.0%	0.0%
Mixed Residue	**0.0%**		**0.0%**	**0.0%**
Mixed Residue	0.0%	0.0%	0.0%	0.0%
Total:	100.0%		100.0%	100.0%
Total Pounds per Employee:	2,861		4,070	6,931
Number of Samples:	26		29	

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

Findings for Large Hotels

Disposal, diversion, and total generated waste composition results for large hotels are detailed in Table 8. Large hotels on average generate 5,049 pounds of waste material per employee per year. Of the total waste generation, less than 25 percent, or 1,145 pounds, is diverted per employee per year.

While large hotels divert approximately 412 pounds of paper per employee per year, they dispose of over 945 pounds of paper per employee per year that could be recycled, most of which is newspaper. An additional 308 pounds of remainder/composite paper is disposed of per employee per year, some of which is believed to be divertible through a composting program.

On average, large hotels divert almost a third of the total amount of glass generated, and they dispose of approximately 183 pounds of glass per employee per year. Nearly all of the disposed glass (172 pounds per employee per year) is easily recyclable bottles and containers.

Large hotels participate in very little metal diversion activities. On average, nine pounds of metal per employee per year is diverted, compared to over 145 pounds of metal disposed per employee per year.

Like most industry groups, large hotels divert very little plastic materials. Approximately 379 pounds of plastic per employee per year is disposed (9.7 percent of disposed materials). Of the disposed plastic material 1 percent is recyclable plastic film (about 39 pounds per employee per year), none of which is being diverted.

Annually, 1,421 pounds of food waste per employee is disposed at large hotels. Less than a third of all the food that is generated as waste is being diverted (562 pounds per employee per year).

A small number of large hotels participate in lumber and treated wood diversion. On average 21 pounds per employee per year is diverted. Most large hotels are disposing of a sizable quantity of wood waste that could be diverted (144 pounds per employee per year).

Figure F represents the portion of the waste stream that is currently being diverted, as well as what could easily be diverted or potentially be diverted, and the remaining disposed portion.

Reasons These Sites Divert Waste

Approximately 82 percent of the large hotels surveyed about their diversion practices had some type of diversion program in place. Businesses were asked about their reasons for participating or not participating in a recycling/diversion program. The range of responses is presented below:

Participants said:

- The city has a recycling program that is easy to participate in.
- They participate because they believe it is a good thing to do.
- They would recycle more, but costs are prohibitive.

Non-participants said:

- They felt recycling was too expensive.
- There is limited space to store recyclables.
- They do not have enough time for recycling.
- They don't recycle because they haven't set up a recycling program.

Figure F: Large Hotels: Diverted and Divertible Waste Material, 2005

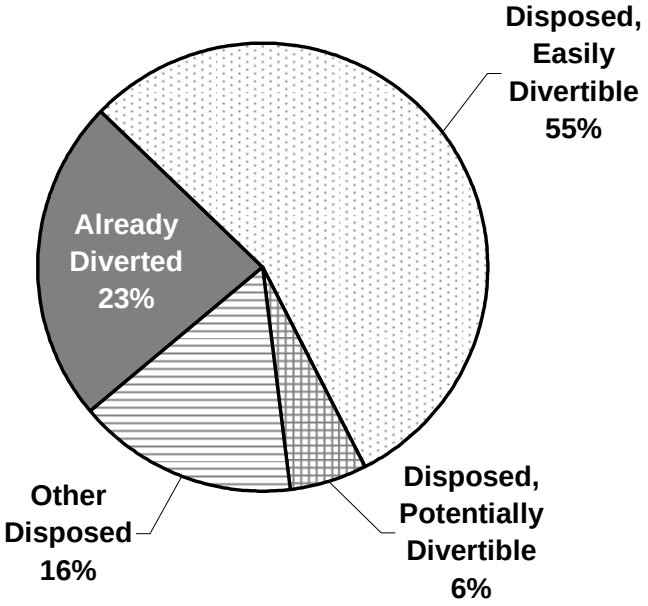

Table 8: Large Hotels: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Paper	**32.3%**		**36.0%**	**33.2%**
Uncoated Corrugated Cardboard	3.2%	0.9%	18.9%	6.8%
Paper Bags/Kraft	0.3%	0.1%	0.0%	0.3%
Newspaper	9.0%	2.1%	10.5%	9.4%
White Ledger	2.2%	1.2%	6.5%	3.2%
Other Office Paper & Colored Ledger Paper	2.7%		0.0%	2.1%
Colored Ledger	*0.1%*	*0.1%*		
Other Office Paper	*2.7%*	*2.5%*		
Computer Paper	0.3%	0.4%	0.0%	0.3%
Magazines & Catalogs	1.0%	0.5%	0.0%	0.7%
Phone Books & Directories	0.1%	0.1%	0.0%	0.1%
Other Miscellaneous Paper	5.5%	1.3%	0.0%	4.3%
Remainder/Composite Paper	7.9%	1.6%	0.0%	6.1%
Glass	**4.7%**		**7.5%**	**5.3%**
Glass Bottles & Containers (colors not specified)	4.4%		7.5%	5.1%
Clear Glass Bottles & Containers	*2.0%*	*0.5%*		
Green Glass Bottles & Containers	*1.4%*	*0.5%*		
Brown Glass Bottles & Containers	*0.9%*	*0.3%*		
Other Colored Glass Bottles & Containers	*0.0%*	*0.0%*		
Flat Glass	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Glass	0.3%	0.2%	0.0%	0.2%
Metal	**3.8%**		**0.8%**	**3.1%**
Tin/Steel Cans	0.5%	0.2%	0.0%	0.4%
Major Appliances	0.4%	0.6%	0.0%	0.3%
Used Oil Filters	0.0%	0.0%	0.0%	0.0%
Other Ferrous	0.6%	0.6%	0.0%	0.5%
Aluminum Cans	0.2%	0.1%	0.8%	0.3%
Other Non-Ferrous	0.1%	0.1%	0.0%	0.1%
Remainder/Composite Metal	2.0%	1.7%	0.0%	1.5%
Plastic	**9.7%**		**1.2%**	**7.8%**
PETE & HDPE Bottles, Buckets, & Containers	1.6%		1.2%	1.5%
PETE Bottles	*0.8%*	*0.3%*		
Other PETE Containers	*0.1%*	*0.0%*		
HDPE Natural Bottles	*0.3%*	*0.1%*		
HDPE Colored Bottles	*0.1%*	*0.0%*		
HDPE 5-gallon Buckets — food	*0.0%*	*0.1%*		
HDPE 5-gallon Buckets — non-food	*0.1%*	*0.2%*		
Other HDPE Containers	*0.2%*	*0.1%*		
#3-#7 Bottles & Containers	0.5%		0.0%	0.4%
#3-#7 Bottles	*0.0%*	*0.0%*		
#3-#7 Other Containers	*0.5%*	*0.2%*		
Plastic Film	3.7%		0.0%	2.9%
Plastic Trash Bags	*1.7%*	*0.4%*		
Plastic Grocery & Other Merchandise Bags	*0.3%*	*0.1%*		
Non-Bag Comm. & Indust. Packg Film	*0.2%*	*0.1%*		
Film Products	*0.2%*	*0.4%*		
Other Film	*1.3%*	*0.2%*		
Durable Plastic Items	1.0%	0.8%	0.0%	0.8%
Remainder/Composite Plastic	2.8%	0.9%	0.0%	2.2%

Table 8, continued: Large Hotels: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Electronics	**0.4%**		**0.0%**	**0.3%**
Brown Goods	0.3%	0.5%	0.0%	0.2%
Computer-related Electronics	0.0%	0.0%	0.0%	0.0%
Other Small Consumer Electronics	0.0%	0.0%	0.0%	0.0%
Televisions & Other Items with CRTs	0.0%	0.0%	0.0%	0.0%
Organics	**44.2%**		**49.1%**	**45.3%**
Food	36.4%	6.6%	49.1%	39.3%
Leaves, Grass, Prunings, & Trimmings	4.2%		0.0%	3.2%
Leaves & Grass	*3.9%*	*3.7%*		
Prunings & Trimmings	*0.2%*	*0.3%*		
Branches & Stumps	0.0%	0.0%	0.0%	0.0%
Agricultural Crop Residues	0.0%	0.0%	0.0%	0.0%
Manures	0.0%	0.0%	0.0%	0.0%
Textiles	1.1%	0.6%	0.0%	0.9%
Carpet	0.4%	0.5%	0.0%	0.3%
Remainder/Composite Organics	2.0%	0.7%	0.0%	1.6%
Construction & Demolition	**4.8%**		**5.4%**	**5.0%**
Concrete	0.0%	0.0%	0.0%	0.0%
Asphalt Paving	0.0%	0.0%	0.0%	0.0%
Asphalt Roofing	0.0%	0.0%	0.0%	0.0%
Lumber & Treated Wood Waste	3.7%		1.8%	3.3%
Lumber	*3.0%*	*2.9%*		
Treated Wood Waste	*0.7%*	*1.2%*		
Gypsum Board	0.0%	0.0%	0.0%	0.0%
Rock, Soil, & Fines	0.3%	0.4%	0.0%	0.2%
Remainder/Composite C & D	0.8%	0.9%	3.6%	1.5%
Household Hazardous	**0.1%**		**0.0%**	**0.1%**
Paint	0.0%	0.0%	0.0%	0.0%
Vehicle & Equipment Fluids	0.0%	0.0%	0.0%	0.0%
Used Oil	0.0%	0.0%	0.0%	0.0%
Batteries	0.0%	0.0%	0.0%	0.0%
Remainder/Composite HHW	0.0%	0.0%	0.0%	0.0%
Special Waste	**0.0%**		**0.0%**	**0.0%**
Ash	0.0%	0.0%	0.0%	0.0%
Sewage Solids & Industrial Sludge	0.0%		0.0%	0.0%
Sewage Solids	*0.0%*	*0.0%*		
Industrial Sludge	*0.0%*	*0.0%*		
Treated Medical Waste	0.0%	0.0%	0.0%	0.0%
Bulky Items	0.0%	0.0%	0.0%	0.0%
Tires	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Special Waste	0.0%	0.0%	0.0%	0.0%
Mixed Residue	**0.0%**		**0.0%**	**0.0%**
Mixed Residue	0.0%	0.0%	0.0%	0.0%
Total:	100.0%		100.0%	100.0%
Total Pounds per Employee:	3,903		1,145	5,049
Number of Samples:	33		33	

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

Findings for Building Material and Garden Stores

Two types of building material and garden (BMG) stores were examined in this study, big-box BMG stores and other BMG stores. Results for each group are detailed below.

Building Material and Garden, Big-Box Stores

Disposal, diversion, and total generated waste composition results for building material and garden, big-box stores are detailed in Table 9. Big-box BMG stores on average generate 9,031 pounds of waste material per employee per year. Of the total waste generation about 30 percent or 2,689 pounds, is diverted per employee per year.

Most of these stores have fairly successful cardboard recycling programs, diverting almost 2,000 pounds per employee per year on average, but there is almost no recycling of other paper materials. Over 640 pounds of recyclable paper, including cardboard, is disposed of per employee per year.

Big-box BMG stores divert almost no glass or plastic materials. Yet these businesses generate about 120 pounds of glass and about 160 pounds of recyclable plastic materials per employee per year. Of the disposed recyclable plastic, plastic film accounts for nearly 140 pounds of that per employee per year.

On average, big-box BMG employees each dispose of over 525 pounds per year of metal. Of the disposed metals, about 285 pounds per employee per year could be diverted, in addition to the nearly 180 pounds per employee per year of metal that is already diverted.

Most big-box BMG stores do not divert compostable organic material and dispose of nearly 200 pounds per employee per year of food, leaves, grass, prunings and trimmings, and branches and stumps.

Over 250 pounds of carpet is disposed per year for each employee in this industry group.

While some businesses divert lumber, (14.5 percent of diversion, or 390 pounds per employee per year), there is still over 2,100 pounds per employee per year of lumber and wood waste that is disposed, which accounts for approximately 33 percent of all disposed waste.

Figure G represents the portion of the waste stream that is currently being diverted, as well as what could easily be diverted or potentially be diverted, and the remaining disposed portion.

Reasons These Sites Divert Waste

Approximately 90 percent of the BMG, big-box stores surveyed about their diversion practices had some type of diversion program in place. Businesses were asked about their reasons for participating or not participating in a recycling/diversion program. The range of responses is presented below:

Participants said:

- They recycle HHW because they are required to by law.

Non-participants said:

- They do not see a reason to recycle more than what they are legally required to recycle.
- There is limited space to store recyclables.
- They do not have enough time for recycling.

Figure G: BMG, Big-Box Stores: Diverted and Divertible Waste Material, 2005

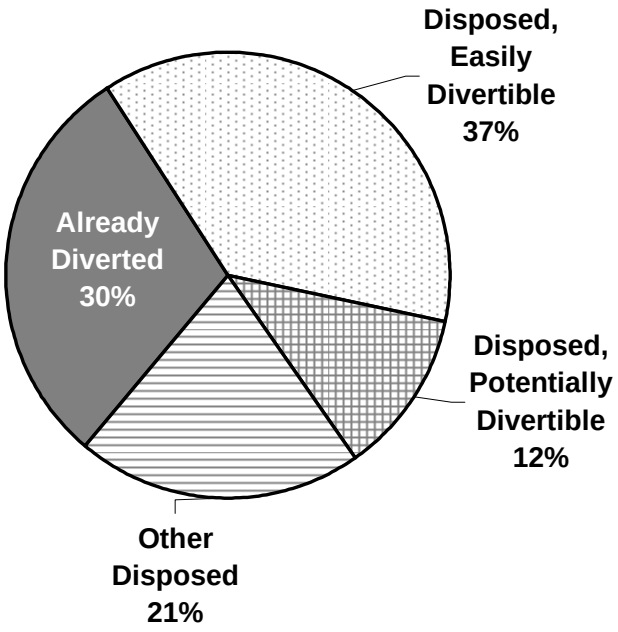

Table 9: BMG, Big-Box Stores: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Paper	**12.2%**		**74.4%**	**30.7%**
Uncoated Corrugated Cardboard	5.8%	3.4%	74.3%	26.2%
Paper Bags/Kraft	0.4%	0.2%	0.0%	0.3%
Newspaper	0.5%	0.4%	0.0%	0.4%
White Ledger	0.6%	0.4%	0.0%	0.4%
Other Office Paper & Colored Ledger Paper	0.3%		0.0%	0.2%
Colored Ledger	*0.0%*	*0.0%*		
Other Office Paper	*0.3%*	*0.3%*		
Computer Paper	0.0%	0.0%	0.0%	0.0%
Magazines & Catalogs	0.2%	0.1%	0.0%	0.1%
Phone Books & Directories	0.1%	0.1%	0.0%	0.1%
Other Miscellaneous Paper	2.3%	1.0%	0.0%	1.6%
Remainder/Composite Paper	2.1%	0.9%	0.0%	1.5%
Glass	**1.9%**		**0.0%**	**1.3%**
Glass Bottles & Containers (colors not specified)	0.2%		0.0%	0.1%
Clear Glass Bottles & Containers	*0.1%*	*0.1%*		
Green Glass Bottles & Containers	*0.0%*	*0.0%*		
Brown Glass Bottles & Containers	*0.0%*	*0.0%*		
Other Colored Glass Bottles & Containers	*0.0%*	*0.0%*		
Flat Glass	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Glass	1.7%	2.7%	0.0%	1.2%
Metal	**8.3%**		**6.7%**	**7.8%**
Tin/Steel Cans	0.1%	0.1%	0.0%	0.1%
Major Appliances	0.0%	0.0%	6.4%	1.9%
Used Oil Filters	0.0%	0.0%	0.0%	0.0%
Other Ferrous	4.3%	2.9%	0.1%	3.0%
Aluminum Cans	0.1%	0.0%	0.1%	0.1%
Other Non-Ferrous	0.0%	0.0%	0.2%	0.1%
Remainder/Composite Metal	3.8%	4.1%	0.0%	2.7%
Plastic	**7.1%**		**0.0%**	**5.0%**
PETE & HDPE Bottles, Buckets, & Containers	0.3%		0.0%	0.2%
PETE Bottles	*0.2%*	*0.1%*		
Other PETE Containers	*0.0%*	*0.0%*		
HDPE Natural Bottles	*0.0%*	*0.0%*		
HDPE Colored Bottles	*0.0%*	*0.0%*		
HDPE 5-gallon Buckets — food	*0.0%*	*0.0%*		
HDPE 5-gallon Buckets — non-food	*0.1%*	*0.1%*		
Other HDPE Containers	*0.0%*	*0.0%*		
#3-#7 Bottles & Containers	0.0%		0.0%	0.0%
#3-#7 Bottles	*0.0%*	*0.0%*		
#3-#7 Other Containers	*0.0%*	*0.0%*		
Plastic Film	2.8%		0.0%	2.0%
Plastic Trash Bags	*0.2%*	*0.1%*		
Plastic Grocery & Other Merchandise Bags	*0.1%*	*0.1%*		
Non-Bag Comm. & Indust. Packg Film	*2.0%*	*0.7%*		
Film Products	*0.1%*	*0.1%*		
Other Film	*0.4%*	*0.2%*		
Durable Plastic Items	1.1%	0.6%	0.0%	0.7%
Remainder/Composite Plastic	2.9%	1.4%	0.0%	2.0%

Table 9, continued: BMG, Big-Box Stores: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Electronics	**1.2%**		**0.0%**	**0.9%**
Brown Goods	0.0%	0.0%	0.0%	0.0%
Computer-related Electronics	0.0%	0.0%	0.0%	0.0%
Other Small Consumer Electronics	1.2%	1.8%	0.0%	0.9%
Televisions & Other Items with CRTs	0.0%	0.0%	0.0%	0.0%
Organics	**8.0%**		**4.3%**	**6.9%**
Food	1.6%	0.9%	0.0%	1.1%
Leaves, Grass, Prunings, & Trimmings	1.5%		0.0%	1.1%
Leaves & Grass	*1.3%*	*1.8%*		
Prunings & Trimmings	*0.2%*	*0.3%*		
Branches & Stumps	0.0%	0.0%	0.0%	0.0%
Agricultural Crop Residues	0.0%	0.0%	0.0%	0.0%
Manures	0.0%	0.0%	0.0%	0.0%
Textiles	0.3%	0.3%	0.0%	0.2%
Carpet	4.1%	5.9%	0.0%	2.9%
Remainder/Composite Organics	0.5%	0.4%	4.3%	1.6%
Construction & Demolition	**60.1%**		**14.5%**	**46.5%**
Concrete	9.0%	7.9%	0.0%	6.3%
Asphalt Paving	0.0%	0.0%	0.0%	0.0%
Asphalt Roofing	4.1%	6.7%	0.0%	2.9%
Lumber & Treated Wood Waste	33.4%		14.5%	27.7%
Lumber	*23.4%*	*8.4%*		
Treated Wood Waste	*10.0%*	*6.9%*		
Gypsum Board	5.9%	8.1%	0.0%	4.1%
Rock, Soil, & Fines	1.6%	2.6%	0.0%	1.1%
Remainder/Composite C & D	6.1%	4.6%	0.0%	4.3%
Household Hazardous	**0.4%**		**0.0%**	**0.3%**
Paint	0.0%	0.0%	0.0%	0.0%
Vehicle & Equipment Fluids	0.0%	0.0%	0.0%	0.0%
Used Oil	0.0%	0.0%	0.0%	0.0%
Batteries	0.1%	0.1%	0.0%	0.1%
Remainder/Composite HHW	0.3%	0.3%	0.0%	0.2%
Special Waste	**0.8%**		**0.0%**	**0.6%**
Ash	0.0%	0.0%	0.0%	0.0%
Sewage Solids & Industrial Sludge	0.0%		0.0%	0.0%
Sewage Solids	*0.0%*	*0.0%*		
Industrial Sludge	*0.0%*	*0.0%*		
Treated Medical Waste	0.0%	0.0%	0.0%	0.0%
Bulky Items	0.0%	0.0%	0.0%	0.0%
Tires	0.1%	0.2%	0.0%	0.1%
Remainder/Composite Special Waste	0.7%	1.1%	0.0%	0.5%
Mixed Residue	**0.0%**		**0.0%**	**0.0%**
Mixed Residue	0.0%	0.0%	0.0%	0.0%
Total:	100.0%		100.0%	100.0%
Total Pounds per Employee:	6,343		2,689	9,031
Number of Samples:	20		21	

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

Building Material and Garden, Other Stores

Disposal, diversion, and total generated waste composition results for building material and garden, other stores are detailed in Table 10. Building material and garden, other stores on average generate 4,599 pounds of waste material per employee per year. Of the total waste generation, about 24 percent or 1,118 pounds, is diverted per employee per year.

Almost a quarter of material diverted by BMG other stores is cardboard and white ledger paper (273 pounds per employee per year). Close to 400 pounds of recyclable paper material, including cardboard, is disposed per employee per year.

This type of store typically diverts about 65 pounds per employee per year of glass, metal, and plastic materials combined. On average each employee at these businesses annually disposes 146 pounds of glass, 118 pounds of metal, and approximately 70 pounds of plastic that could be diverted. Of the recyclable plastic that is disposed, 52 pounds is recyclable plastic film.

Some other BMG stores divert leaves, grass, prunings, and trimmings and branches and stumps (157 pounds per employee per year) through composting programs. Over twice that amount of food, leaves, grass, prunings, and trimmings, and branches and stumps is disposed of annually by these businesses (383 pounds per employee).

While some other BMG stores divert lumber (379 pounds per employee per year), there is still approximately 971 pounds per employee per year of lumber and wood waste that is disposed.

Additionally, it is important to note that three of the businesses that were visited diverted large quantities of particular materials that were specifically related to the nature of those businesses. These businesses were not included in the diversion calculations reflected in Table 10, below, because the consultant team believed their inclusion would skew the findings related to diversion and overall waste generation. The three businesses that were removed from the diversion analysis diverted large amounts of carpet (from two carpet stores, 22,895 pounds and 1,418 pounds per employee per year) and lumber (73,431 pounds per employee per year from a lumber yard). This is explained in more detail in the methodology in Appendix A.

Figure H represents the portion of the waste stream that is currently being diverted, as well as what could easily be diverted or potentially be diverted, and the remaining disposed portion.

Reasons These Sites Divert Waste

Approximately 79 percent of the BMG, other stores surveyed about their diversion practices had some type of diversion program in place. Businesses were asked about their reasons for participating or not participating in a recycling/diversion program. The range of responses is presented below:

Participants said:

- No responses.

Non-participants said:

- They felt there was no convenient opportunity to recycle.
- There is limited space to store recyclables.
- They don't believe there is a need to divert material from the landfill.
- They were not interested in recycling.

Figure H: BMG, Other Stores: Diverted and Divertible Waste Material, 2005

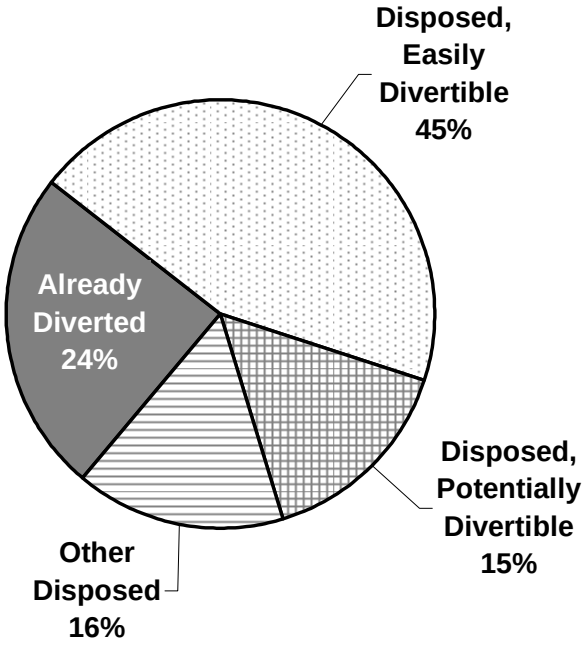

Table 10: BMG, Other Stores: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Paper	**13.4%**		**24.4%**	**16.1%**
Uncoated Corrugated Cardboard	3.0%	1.4%	12.8%	5.4%
Paper Bags/Kraft	0.6%	0.3%	0.0%	0.5%
Newspaper	1.2%	0.8%	0.0%	0.9%
White Ledger	1.8%	2.5%	11.5%	4.1%
Other Office Paper & Colored Ledger Paper	1.6%		0.1%	1.2%
Colored Ledger	*0.0%*	*0.0%*		
Other Office Paper	*1.5%*	*1.0%*		
Computer Paper	0.4%	0.5%	0.0%	0.3%
Magazines & Catalogs	0.3%	0.3%	0.0%	0.2%
Phone Books & Directories	0.0%	0.0%	0.0%	0.0%
Other Miscellaneous Paper	2.5%	1.6%	0.0%	1.9%
Remainder/Composite Paper	2.0%	1.0%	0.0%	1.5%
Glass	**5.3%**		**2.1%**	**4.5%**
Glass Bottles & Containers (colors not specified)	0.2%		2.1%	0.7%
Clear Glass Bottles & Containers	*0.2%*	*0.1%*		
Green Glass Bottles & Containers	*0.0%*	*0.1%*		
Brown Glass Bottles & Containers	*0.0%*	*0.0%*		
Other Colored Glass Bottles & Containers	*0.0%*	*0.0%*		
Flat Glass	4.0%	3.7%	0.0%	3.0%
Remainder/Composite Glass	1.1%	1.2%	0.0%	0.8%
Metal	**3.9%**		**3.7%**	**3.9%**
Tin/Steel Cans	1.5%	2.2%	0.0%	1.1%
Major Appliances	0.0%	0.0%	0.0%	0.0%
Used Oil Filters	0.0%	0.0%	0.0%	0.0%
Other Ferrous	1.9%	1.0%	3.0%	2.2%
Aluminum Cans	0.1%	0.0%	0.6%	0.2%
Other Non-Ferrous	0.1%	0.1%	0.0%	0.0%
Remainder/Composite Metal	0.5%	0.5%	0.0%	0.4%
Plastic	**7.1%**		**0.1%**	**5.4%**
PETE & HDPE Bottles, Buckets, & Containers	0.2%		0.1%	0.2%
PETE Bottles	*0.1%*	*0.0%*		
Other PETE Containers	*0.0%*	*0.0%*		
HDPE Natural Bottles	*0.0%*	*0.0%*		
HDPE Colored Bottles	*0.0%*	*0.0%*		
HDPE 5-gallon Buckets — food	*0.0%*	*0.0%*		
HDPE 5-gallon Buckets — non-food	*0.1%*	*0.1%*		
Other HDPE Containers	*0.0%*	*0.0%*		
#3-#7 Bottles & Containers	0.3%		0.0%	0.3%
#3-#7 Bottles	*0.0%*	*0.0%*		
#3-#7 Other Containers	*0.3%*	*0.4%*		
Plastic Film	2.1%		0.0%	1.6%
Plastic Trash Bags	*0.3%*	*0.3%*		
Plastic Grocery & Other Merchandise Bags	*0.1%*	*0.0%*		
Non-Bag Comm. & Indust. Packg Film	*1.2%*	*0.6%*		
Film Products	*0.2%*	*0.2%*		
Other Film	*0.4%*	*0.2%*		
Durable Plastic Items	0.7%	0.6%	0.0%	0.5%
Remainder/Composite Plastic	3.8%	2.1%	0.0%	2.9%

Table 10, continued: BMG, Other Stores: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Electronics	**1.9%**		**0.0%**	**1.5%**
Brown Goods	0.0%	0.0%	0.0%	0.0%
Computer-related Electronics	0.1%	0.1%	0.0%	0.0%
Other Small Consumer Electronics	0.4%	0.6%	0.0%	0.3%
Televisions & Other Items with CRTs	1.5%	2.4%	0.0%	1.1%
Organics	**18.6%**		**14.0%**	**17.5%**
Food	5.4%	5.6%	0.0%	4.1%
Leaves, Grass, Prunings, & Trimmings	5.5%		14.0%	7.6%
Leaves & Grass	*3.2%*	*3.1%*		
Prunings & Trimmings	*2.3%*	*3.5%*		
Branches & Stumps	0.1%	0.1%	0.0%	0.1%
Agricultural Crop Residues	0.0%	0.0%	0.0%	0.0%
Manures	0.0%	0.0%	0.0%	0.0%
Textiles	0.3%	0.2%	0.0%	0.2%
Carpet	7.2%	8.4%	0.0%	5.5%
Remainder/Composite Organics	0.1%	0.1%	0.0%	0.1%
Construction & Demolition	**47.4%**		**55.7%**	**49.4%**
Concrete	8.0%	7.8%	0.0%	6.1%
Asphalt Paving	0.0%	0.0%	0.0%	0.0%
Asphalt Roofing	0.1%	0.1%	0.0%	0.0%
Lumber & Treated Wood Waste	27.9%		33.9%	29.3%
Lumber	*22.6%*	*9.0%*		
Treated Wood Waste	*5.3%*	*4.3%*		
Gypsum Board	5.2%	5.6%	8.1%	5.9%
Rock, Soil, & Fines	1.1%	1.3%	13.8%	4.2%
Remainder/Composite C & D	5.1%	3.3%	0.0%	3.9%
Household Hazardous	**0.8%**		**0.0%**	**0.6%**
Paint	0.8%	1.4%	0.0%	0.6%
Vehicle & Equipment Fluids	0.0%	0.0%	0.0%	0.0%
Used Oil	0.0%	0.0%	0.0%	0.0%
Batteries	0.0%	0.0%	0.0%	0.0%
Remainder/Composite HHW	0.0%	0.0%	0.0%	0.0%
Special Waste	**1.4%**		**0.0%**	**1.1%**
Ash	0.0%	0.0%	0.0%	0.0%
Sewage Solids & Industrial Sludge	0.0%		0.0%	0.0%
Sewage Solids	*0.0%*	*0.0%*		
Industrial Sludge	*0.0%*	*0.0%*		
Treated Medical Waste	0.0%	0.0%	0.0%	0.0%
Bulky Items	1.4%	1.6%	0.0%	1.0%
Tires	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Special Waste	0.0%	0.1%	0.0%	0.0%
Mixed Residue	**0.1%**		**0.0%**	**0.1%**
Mixed Residue	0.1%	0.1%	0.0%	0.1%
Total:	100.0%		100.0%	100.0%
Total Pounds per Employee:	3,481		1,118	4,599
Number of Samples:	24		24	

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

Findings for Retail Stores

Two types of retail stores were examined in this study, retail big-box stores and other retail stores. Results for both groups are detailed below.

Retail, Big-Box Stores

Disposal, diversion, and total generated waste composition results for retail big-box stores are detailed in Table 11. Retail big-box stores on average generate 7,798 pounds of waste material per employee per year. Of the total waste generation about 63 percent or 4,932 pounds, is diverted per employee per year.

Approximately 93 percent of the material diverted by retail big-box stores is cardboard, amounting to over 4,595 pounds per employee per year. There is approximately 170 pounds per employee per year of cardboard still disposed. There is almost no diversion of any other types of paper, which account for nearly 16 percent of what is disposed, or nearly 450 pounds per employee per year.

Retail big-box stores divert about 25 pounds per employee per year of glass, metal, and plastic materials combined. On average, each employee in this industry group disposes over 15 pounds of glass, over 90 pounds of metal, and over 35 pounds of plastic per year that could be diverted through traditional recycling programs. In addition, the typical employee disposes approximately 70 pounds of recyclable plastic film per year.

Retail big-box stores divert less than 25 pounds of food waste per employee per year. On average each employee disposes over 500 pounds of food and 95 pounds of other organic waste per year that could be diverted through a composting program.

Many retail, big-box stores divert a large amount of lumber (mostly pallets). However, almost 60 percent of lumber and treated wood waste that is generated is disposed, or about 430 pounds per employee per year.

Additionally, it is important to note that one business diverted large quantities of a particular material that was unique to that business. This business was not included in the diversion calculations reflected in Table 11, below, because the consultant team believed their inclusion would skew the findings related to diversion and overall waste generation. This business that was removed from the diversion analysis diverted large amounts of food (13,299 pounds per employee per year). This practice is explained in more detail in the methodology in Appendix A.

Figure I represents the portion of the waste stream that is currently being diverted, as well as what could easily be diverted or potentially be diverted, and the remaining disposed portion.

Reasons These Sites Divert Waste

Approximately 92 percent of the retail, big-box stores surveyed about their diversion practices had some type of diversion program in place. Businesses were asked about their reasons for participating or not participating in a recycling/diversion program. The range of responses is presented below:

Participants said:

- They recycle because it is cost effective.

Non-participants said:

- The do not recycle because they only follow city orders.
- There are no city-provided recycling containers.

Figure I: Retail, Big-Box Stores: Diverted and Divertible Waste Material, 2005

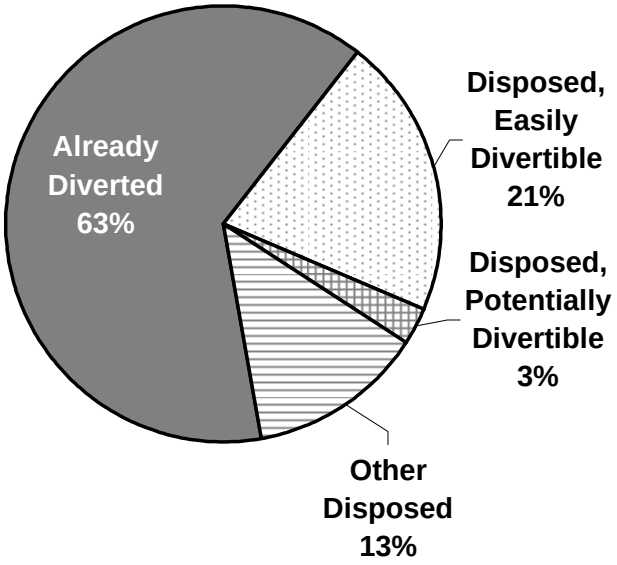

Table 11: Retail, Big-Box Stores: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Paper	**21.7%**		**93.8%**	**67.3%**
Uncoated Corrugated Cardboard	6.0%	1.9%	93.2%	61.1%
Paper Bags/Kraft	0.3%	0.2%	0.0%	0.1%
Newspaper	1.2%	0.6%	0.0%	0.4%
White Ledger	1.3%	0.9%	0.6%	0.8%
Other Office Paper & Colored Ledger Paper	0.8%		0.0%	0.3%
Colored Ledger	*0.3%*	*0.5%*		
Other Office Paper	*0.5%*	*0.2%*		
Computer Paper	0.2%	0.2%	0.0%	0.1%
Magazines & Catalogs	0.6%	0.6%	0.0%	0.2%
Phone Books & Directories	0.0%	0.0%	0.0%	0.0%
Other Miscellaneous Paper	5.5%	2.1%	0.0%	2.0%
Remainder/Composite Paper	5.9%	2.1%	0.0%	2.2%
Glass	**1.1%**		**0.0%**	**0.4%**
Glass Bottles & Containers (colors not specified)	0.4%		0.0%	0.2%
Clear Glass Bottles & Containers	*0.3%*	*0.2%*		
Green Glass Bottles & Containers	*0.1%*	*0.1%*		
Brown Glass Bottles & Containers	*0.0%*	*0.0%*		
Other Colored Glass Bottles & Containers	*0.0%*	*0.0%*		
Flat Glass	0.2%	0.3%	0.0%	0.1%
Remainder/Composite Glass	0.5%	0.6%	0.0%	0.2%
Metal	**5.3%**		**0.0%**	**2.0%**
Tin/Steel Cans	0.2%	0.1%	0.0%	0.1%
Major Appliances	0.0%	0.0%	0.0%	0.0%
Used Oil Filters	0.0%	0.0%	0.0%	0.0%
Other Ferrous	3.0%	2.5%	0.0%	1.1%
Aluminum Cans	0.1%	0.0%	0.0%	0.1%
Other Non-Ferrous	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Metal	2.0%	2.2%	0.0%	0.7%
Plastic	**16.0%**		**0.5%**	**6.2%**
PETE & HDPE Bottles, Buckets, & Containers	0.6%		0.0%	0.2%
PETE Bottles	*0.4%*	*0.2%*		
Other PETE Containers	*0.0%*	*0.0%*		
HDPE Natural Bottles	*0.1%*	*0.1%*		
HDPE Colored Bottles	*0.1%*	*0.1%*		
HDPE 5-gallon Buckets — food	*0.0%*	*0.0%*		
HDPE 5-gallon Buckets — non-food	*0.0%*	*0.0%*		
Other HDPE Containers	*0.0%*	*0.0%*		
#3-#7 Bottles & Containers	0.7%		0.0%	0.3%
#3-#7 Bottles	*0.0%*	*0.0%*		
#3-#7 Other Containers	*0.7%*	*0.7%*		
Plastic Film	6.9%		0.0%	2.5%
Plastic Trash Bags	*0.7%*	*0.2%*		
Plastic Grocery & Other Merchandise Bags	*0.4%*	*0.2%*		
Non-Bag Comm. & Indust. Packg Film	*1.9%*	*1.3%*		
Film Products	*0.0%*	*0.0%*		
Other Film	*3.8%*	*2.8%*		
Durable Plastic Items	2.6%	1.1%	0.3%	1.2%
Remainder/Composite Plastic	5.3%	2.1%	0.2%	2.0%

Table 11, continued: Retail, Big-Box Stores: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Electronics	**0.8%**		**0.0%**	**0.3%**
Brown Goods	0.4%	0.6%	0.0%	0.1%
Computer-related Electronics	0.0%	0.0%	0.0%	0.0%
Other Small Consumer Electronics	0.5%	0.8%	0.0%	0.2%
Televisions & Other Items with CRTs	0.0%	0.0%	0.0%	0.0%
Organics	**23.6%**		**0.5%**	**9.0%**
Food	17.7%	7.9%	0.5%	6.8%
Leaves, Grass, Prunings, & Trimmings	3.3%		0.0%	1.2%
Leaves & Grass	*2.2%*	*2.9%*		
Prunings & Trimmings	*1.1%*	*1.8%*		
Branches & Stumps	0.0%	0.0%	0.0%	0.0%
Agricultural Crop Residues	0.0%	0.0%	0.0%	0.0%
Manures	0.0%	0.0%	0.0%	0.0%
Textiles	0.7%	0.4%	0.0%	0.3%
Carpet	0.2%	0.3%	0.0%	0.1%
Remainder/Composite Organics	1.6%	0.9%	0.0%	0.6%
Construction & Demolition	**27.1%**		**5.1%**	**13.2%**
Concrete	0.0%	0.0%	0.0%	0.0%
Asphalt Paving	0.0%	0.0%	0.0%	0.0%
Asphalt Roofing	0.0%	0.0%	0.0%	0.0%
Lumber & Treated Wood Waste	15.3%		5.1%	8.9%
Lumber	*13.7%*	*8.4%*		
Treated Wood Waste	*1.6%*	*1.7%*		
Gypsum Board	1.0%	1.3%	0.0%	0.4%
Rock, Soil, & Fines	3.5%	5.7%	0.0%	1.3%
Remainder/Composite C & D	7.2%	7.1%	0.0%	2.6%
Household Hazardous	**0.1%**		**0.0%**	**0.0%**
Paint	0.0%	0.0%	0.0%	0.0%
Vehicle & Equipment Fluids	0.0%	0.0%	0.0%	0.0%
Used Oil	0.0%	0.0%	0.0%	0.0%
Batteries	0.0%	0.0%	0.0%	0.0%
Remainder/Composite HHW	0.1%	0.2%	0.0%	0.0%
Special Waste	**4.2%**		**0.0%**	**1.5%**
Ash	0.0%	0.0%	0.0%	0.0%
Sewage Solids & Industrial Sludge	0.0%		0.0%	0.0%
Sewage Solids	*0.0%*	*0.0%*		
Industrial Sludge	*0.0%*	*0.0%*		
Treated Medical Waste	0.0%	0.0%	0.0%	0.0%
Bulky Items	3.0%	2.8%	0.0%	1.1%
Tires	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Special Waste	1.2%	1.3%	0.0%	0.5%
Mixed Residue	**0.1%**		**0.0%**	**0.0%**
Mixed Residue	0.1%	0.1%	0.0%	0.0%
Total:	100.0%		100.0%	100.0%
Total Pounds per Employee:	2,866		4,932	7,798
Number of Samples:	20		26	

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

Retail, Other Stores

Disposal, diversion, and total generated waste composition results for other retail stores are detailed in Table 12. These stores on average generate 3,714 pounds of waste material per employee per year. Of the total waste generation about 54 percent or 1,995 pounds, is diverted per employee per year.

Like big-box retail stores, diversion by other retail stores is largely cardboard, accounting for approximately 87 percent of diverted material or 1,728 pounds per employee per year. An estimated 136 pounds per employee per year of cardboard is still disposed. Less than 90 pounds per employee per year of other types of recyclable paper are diverted, which account for nearly 287 pounds per employee per year, or 17 percent of all disposed material.

Other retail stores divert on average less than 30 pounds per employee per year of glass, metal, and plastic materials combined. Annually, each employee at these businesses disposes of approximately 31 pounds of glass, 88 pounds of metal, and 22 pounds of traditionally recyclable plastic that could be diverted. In addition, the typical employee disposes nearly 50 pounds of recyclable plastic film annually.

There is little or no diversion of organic materials at other retail stores. On average, these stores dispose of 225 pounds per employee per year of organic material that could be diverted to composting programs.

The second most diverted material by other retail stores is lumber (mostly pallets). As with big-box retail stores, these efforts capture less than half of the lumber that is generated. About 220 pounds per employee per year of lumber and treated wood waste is disposed.

Figure J represents the portion of the waste stream that is currently being diverted, as well as what could easily be diverted or potentially be diverted, and the remaining disposed portion.

Reasons These Sites Divert Waste

Approximately 96 percent of the retail, other stores surveyed about their diversion practices had some type of diversion program in place. Businesses were asked about their reasons for participating or not participating in a recycling/diversion program. The range of responses is presented below:

Participants said:

- They recycle because it is cost effective.

Non-participants said:

- There is limited space to store recyclables.
- They do not have enough time for recycling.
- They tried recycling before, and it did not work out. They haven’t tried again.
- It is the corporate offices’ responsibility to set up recycling programs and policies.
- Recycling does not generate much money.
- They needed more educational materials to make the program successful.

- It is too much to ask of staff to recycle anything but cardboard.

Figure J: Retail, Other Stores: Diverted and Divertible Waste Material, 2005

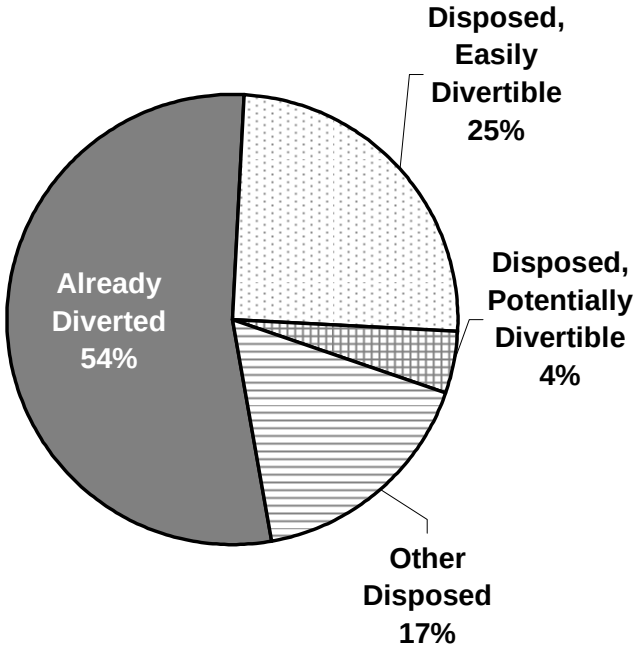

Table 12: Retail, Other Stores: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Paper	**31.8%**		**91.0%**	**63.6%**
Uncoated Corrugated Cardboard	7.9%	3.6%	86.6%	50.1%
Paper Bags/Kraft	0.4%	0.2%	0.0%	0.2%
Newspaper	3.3%	1.5%	0.0%	1.5%
White Ledger	1.7%	0.8%	4.5%	3.2%
Other Office Paper & Colored Ledger Paper	1.9%		0.0%	0.9%
Colored Ledger	*0.2%*	*0.2%*		
Other Office Paper	*1.8%*	*0.8%*		
Computer Paper	0.2%	0.1%	0.0%	0.1%
Magazines & Catalogs	2.9%	4.2%	0.0%	1.4%
Phone Books & Directories	0.1%	0.1%	0.0%	0.0%
Other Miscellaneous Paper	6.2%	1.9%	0.0%	2.9%
Remainder/Composite Paper	7.2%	2.2%	0.0%	3.3%
Glass	**6.2%**		**0.2%**	**3.0%**
Glass Bottles & Containers (colors not specified)	1.0%		0.2%	0.6%
Clear Glass Bottles & Containers	*0.6%*	*0.3%*		
Green Glass Bottles & Containers	*0.1%*	*0.2%*		
Brown Glass Bottles & Containers	*0.3%*	*0.3%*		
Other Colored Glass Bottles & Containers	*0.0%*	*0.0%*		
Flat Glass	0.8%	0.7%	0.0%	0.4%
Remainder/Composite Glass	4.4%	4.8%	0.0%	2.1%
Metal	**8.7%**		**0.3%**	**4.2%**
Tin/Steel Cans	0.2%	0.2%	0.0%	0.1%
Major Appliances	0.0%	0.0%	0.0%	0.0%
Used Oil Filters	0.0%	0.0%	0.0%	0.0%
Other Ferrous	4.6%	3.2%	0.0%	2.2%
Aluminum Cans	0.2%	0.1%	0.3%	0.2%
Other Non-Ferrous	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Metal	3.6%	2.2%	0.0%	1.7%
Plastic	**14.4%**		**0.9%**	**7.1%**
PETE & HDPE Bottles, Buckets, & Containers	1.2%		0.3%	0.7%
PETE Bottles	*0.4%*	*0.1%*		
Other PETE Containers	*0.1%*	*0.1%*		
HDPE Natural Bottles	*0.2%*	*0.1%*		
HDPE Colored Bottles	*0.4%*	*0.3%*		
HDPE 5-gallon Buckets — food	*0.0%*	*0.0%*		
HDPE 5-gallon Buckets — non-food	*0.0%*	*0.1%*		
Other HDPE Containers	*0.0%*	*0.1%*		
#3-#7 Bottles & Containers	0.1%		0.0%	0.1%
#3-#7 Bottles	*0.0%*	*0.0%*		
#3-#7 Other Containers	*0.1%*	*0.1%*		
Plastic Film	6.0%		0.5%	3.0%
Plastic Trash Bags	*0.7%*	*0.2%*		
Plastic Grocery & Other Merchandise Bags	*0.4%*	*0.2%*		
Non-Bag Comm. & Indust. Packg Film	*2.3%*	*1.3%*		
Film Products	*0.2%*	*0.3%*		
Other Film	*2.3%*	*0.9%*		
Durable Plastic Items	3.6%	2.4%	0.1%	1.7%
Remainder/Composite Plastic	3.5%	1.3%	0.0%	1.6%

Table 12, continued: Retail, Other Stores: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	Disposed Waste + / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Electronics	**0.7%**		**0.0%**	**0.3%**
Brown Goods	0.0%	0.0%	0.0%	0.0%
Computer-related Electronics	0.7%	1.0%	0.0%	0.3%
Other Small Consumer Electronics	0.0%	0.0%	0.0%	0.0%
Televisions & Other Items with CRTs	0.0%	0.0%	0.0%	0.0%
Organics	**17.5%**		**0.0%**	**8.1%**
Food	11.1%	5.5%	0.0%	5.2%
Leaves, Grass, Prunings, & Trimmings	0.5%		0.0%	0.2%
Leaves & Grass	*0.5%*	*0.5%*		
Prunings & Trimmings	*0.0%*	*0.1%*		
Branches & Stumps	1.5%	2.5%	0.0%	0.7%
Agricultural Crop Residues	0.0%	0.0%	0.0%	0.0%
Manures	0.0%	0.0%	0.0%	0.0%
Textiles	0.9%	0.5%	0.0%	0.4%
Carpet	1.7%	2.1%	0.0%	0.8%
Remainder/Composite Organics	1.7%	1.4%	0.0%	0.8%
Construction & Demolition	**15.0%**		**7.5%**	**11.0%**
Concrete	0.0%	0.0%	0.0%	0.0%
Asphalt Paving	0.0%	0.0%	0.0%	0.0%
Asphalt Roofing	0.0%	0.0%	0.0%	0.0%
Lumber & Treated Wood Waste	12.8%		7.5%	10.0%
Lumber	*11.0%*	*5.1%*		
Treated Wood Waste	*1.8%*	*2.0%*		
Gypsum Board	0.0%	0.0%	0.0%	0.0%
Rock, Soil, & Fines	0.2%	0.3%	0.0%	0.1%
Remainder/Composite C & D	2.0%	1.7%	0.0%	0.9%
Household Hazardous	**0.1%**		**0.0%**	**0.1%**
Paint	0.0%	0.0%	0.0%	0.0%
Vehicle & Equipment Fluids	0.0%	0.0%	0.0%	0.0%
Used Oil	0.0%	0.0%	0.0%	0.0%
Batteries	0.1%	0.1%	0.0%	0.0%
Remainder/Composite HHW	0.1%	0.1%	0.0%	0.0%
Special Waste	**5.4%**		**0.0%**	**2.5%**
Ash	0.0%	0.0%	0.0%	0.0%
Sewage Solids & Industrial Sludge	0.0%		0.0%	0.0%
Sewage Solids	*0.0%*	*0.0%*		
Industrial Sludge	*0.0%*	*0.0%*		
Treated Medical Waste	0.2%	0.2%	0.0%	0.1%
Bulky Items	3.8%	3.3%	0.0%	1.7%
Tires	0.0%	0.1%	0.0%	0.0%
Remainder/Composite Special Waste	1.4%	1.7%	0.0%	0.7%
Mixed Residue	**0.2%**		**0.0%**	**0.1%**
Mixed Residue	0.2%	0.1%	0.0%	0.1%
Total:	100.0%		100.0%	100.0%
Total Pounds per Employee:	1,719		1,995	3,714
Number of Samples:	23		25	

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

Findings for Shopping Malls

Results for shopping malls are presented in two categories, one for anchor stores at malls and the second for the other parts of a shopping mall including the food court, small shops, and mall offices.

Disposal and diversion are estimated based on the total square footage of floor space at the sites (expressed in per thousand square feet), instead of per employee like previous industry groups.

Anchor Stores at Shopping Malls

Disposal, diversion, and total generated waste composition results for anchor stores at shopping malls are detailed in Table 13. Anchor stores at shopping malls on average generate 3,520 pounds of waste material per thousand square feet per year. Of the total waste generation about 40 percent or 1,418 pounds, is diverted per thousand square feet per year.

The two most diverted materials by anchor stores at shopping malls, accounting for over 95 percent of diversion, are cardboard (813 pounds per thousand square feet per year) and durable plastic items, which is mostly plastic pallets (572 pounds per thousand square feet per year).

Average annual disposal, for each thousand square feet of anchor stores at shopping malls includes more than 553 pounds of recyclable paper materials, 53 pounds of recyclable metals, 57 pounds of recyclable plastic materials, and 227 pounds of food that could be diverted. Annually, nearly 36 pounds per thousand square feet of the recyclable plastic is plastic film.

It is important to note that these disposal and diversion estimates are based on very small sample sizes. The calculation for disposal quantity per thousand square feet per year is based on four stores, because two were removed as they appeared to be extreme outliers. The disposal composition percents are based on seven samples. The original study design called for including one anchor store per mall, but the majority of anchor stores at the malls that were recruited for the study were unwilling to participate.

Figure K represents the portion of the waste stream that is currently being diverted, as well as what could easily be diverted or potentially be diverted, and the remaining disposed portion.

Reasons These Sites Divert Waste

Approximately 71 percent of the anchor stores surveyed about their diversion practices had some type of diversion program in place. Anchor stores did not provide information about their reasons for participating or not participating in a recycling/diversion program.

Figure K: Anchor Stores: Diverted and Divertible Waste Material, 2005

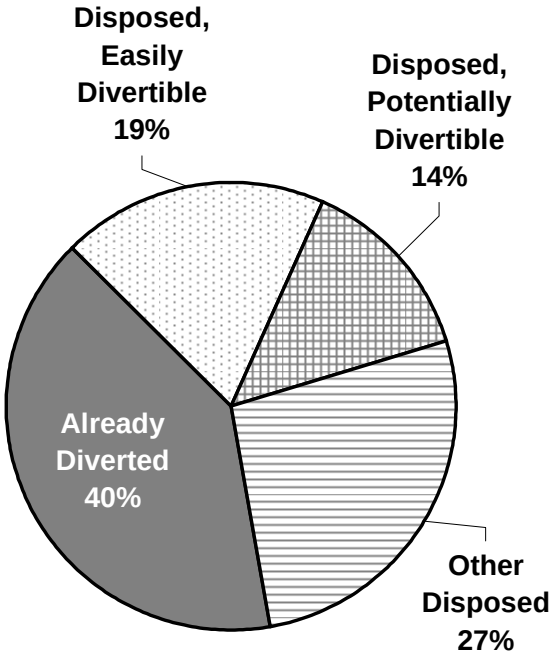

Table 13: Anchor Stores: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Paper	**37.9%**		**57.8%**	**45.9%**
Uncoated Corrugated Cardboard	7.2%	2.0%	57.3%	27.4%
Paper Bags/Kraft	0.1%	0.2%	0.0%	0.1%
Newspaper	0.6%	0.7%	0.0%	0.4%
White Ledger	1.1%	0.7%	0.6%	0.9%
Other Office Paper & Colored Ledger Paper	0.3%		0.0%	0.2%
Colored Ledger	*0.1%*	*0.1%*		
Other Office Paper	*0.2%*	*0.2%*		
Computer Paper	0.4%	0.4%	0.0%	0.2%
Magazines & Catalogs	0.7%	0.8%	0.0%	0.4%
Phone Books & Directories	0.4%	0.6%	0.0%	0.2%
Other Miscellaneous Paper	15.4%	6.8%	0.0%	9.2%
Remainder/Composite Paper	11.6%	7.2%	0.0%	6.9%
Glass	**5.0%**		**0.0%**	**3.0%**
Glass Bottles & Containers (colors not specified)	0.5%		0.0%	0.3%
Clear Glass Bottles & Containers	*0.5%*	*0.3%*		
Green Glass Bottles & Containers	*0.0%*	*0.0%*		
Brown Glass Bottles & Containers	*0.0%*	*0.0%*		
Other Colored Glass Bottles & Containers	*0.0%*	*0.0%*		
Flat Glass	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Glass	4.5%	5.0%	0.0%	2.7%
Metal	**3.0%**		**0.6%**	**2.0%**
Tin/Steel Cans	0.0%	0.0%	0.0%	0.0%
Major Appliances	0.0%	0.0%	0.0%	0.0%
Used Oil Filters	0.0%	0.0%	0.0%	0.0%
Other Ferrous	2.3%	3.6%	0.0%	1.4%
Aluminum Cans	0.2%	0.1%	0.6%	0.3%
Other Non-Ferrous	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Metal	0.5%	0.5%	0.0%	0.3%
Plastic	**28.8%**		**41.4%**	**33.9%**
PETE & HDPE Bottles, Buckets, & Containers	0.7%		0.0%	0.4%
PETE Bottles	*0.6%*	*0.4%*		
Other PETE Containers	*0.1%*	*0.1%*		
HDPE Natural Bottles	*0.0%*	*0.0%*		
HDPE Colored Bottles	*0.1%*	*0.1%*		
HDPE 5-gallon Buckets — food	*0.0%*	*0.0%*		
HDPE 5-gallon Buckets — non-food	*0.0%*	*0.0%*		
Other HDPE Containers	*0.0%*	*0.0%*		
#3-#7 Bottles & Containers	0.3%		0.0%	0.2%
#3-#7 Bottles	*0.0%*	*0.0%*		
#3-#7 Other Containers	*0.3%*	*0.2%*		
Plastic Film	10.4%		1.1%	6.6%
Plastic Trash Bags	*1.9%*	*0.7%*		
Plastic Grocery & Other Merchandise Bags	*1.5%*	*1.4%*		
Non-Bag Comm. & Indust. Packg Film	*0.2%*	*0.2%*		
Film Products	*0.0%*	*0.0%*		
Other Film	*6.8%*	*3.6%*		
Durable Plastic Items	2.1%	2.9%	40.3%	17.5%
Remainder/Composite Plastic	15.3%	10.0%	0.0%	9.1%

Table 13, continued: Anchor Stores: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Electronics	**0.1%**		**0.0%**	**0.0%**
Brown Goods	0.0%	0.0%	0.0%	0.0%
Computer-related Electronics	0.0%	0.0%	0.0%	0.0%
Other Small Consumer Electronics	0.1%	0.1%	0.0%	0.0%
Televisions & Other Items with CRTs	0.0%	0.0%	0.0%	0.0%
Organics	**15.5%**		**0.0%**	**9.3%**
Food	10.8%	10.3%	0.0%	6.5%
Leaves, Grass, Prunings, & Trimmings	2.2%		0.0%	1.3%
Leaves & Grass	*1.1%*	*1.7%*		
Prunings & Trimmings	*1.2%*	*1.9%*		
Branches & Stumps	0.0%	0.0%	0.0%	0.0%
Agricultural Crop Residues	0.0%	0.0%	0.0%	0.0%
Manures	0.0%	0.0%	0.0%	0.0%
Textiles	1.1%	1.4%	0.0%	0.6%
Carpet	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Organics	1.4%	1.4%	0.0%	0.8%
Construction & Demolition	**9.1%**		**0.2%**	**5.5%**
Concrete	0.0%	0.0%	0.0%	0.0%
Asphalt Paving	0.0%	0.0%	0.0%	0.0%
Asphalt Roofing	0.0%	0.0%	0.0%	0.0%
Lumber & Treated Wood Waste	1.1%		0.2%	0.7%
Lumber	*1.1%*	*1.3%*		
Treated Wood Waste	*0.0%*	*0.0%*		
Gypsum Board	5.9%	9.7%	0.0%	3.5%
Rock, Soil, & Fines	1.3%	2.2%	0.0%	0.8%
Remainder/Composite C & D	0.9%	1.4%	0.0%	0.5%
Household Hazardous	**0.5%**		**0.0%**	**0.3%**
Paint	0.0%	0.0%	0.0%	0.0%
Vehicle & Equipment Fluids	0.0%	0.0%	0.0%	0.0%
Used Oil	0.0%	0.0%	0.0%	0.0%
Batteries	0.5%	0.7%	0.0%	0.3%
Remainder/Composite HHW	0.0%	0.0%	0.0%	0.0%
Special Waste	**0.0%**		**0.0%**	**0.0%**
Ash	0.0%	0.0%	0.0%	0.0%
Sewage Solids & Industrial Sludge	0.0%		0.0%	0.0%
Sewage Solids	*0.0%*	*0.0%*		
Industrial Sludge	*0.0%*	*0.0%*		
Treated Medical Waste	0.0%	0.0%	0.0%	0.0%
Bulky Items	0.0%	0.0%	0.0%	0.0%
Tires	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Special Waste	0.0%	0.0%	0.0%	0.0%
Mixed Residue	**0.0%**		**0.0%**	**0.0%**
Mixed Residue	0.0%	0.0%	0.0%	0.0%
Total:	100.0%		100.0%	100.0%
Total Pounds per 1,000 Square Feet:	2,103		1,418	3,520
Number of Samples:	7		7	

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

Other Parts of Shopping Malls

Disposal, diversion, and total generated waste composition results for other parts of shopping malls are detailed in Table 14. Other parts of shopping malls on average generate 2,499 pounds of waste material per thousand square feet per year. Of the total waste generation, around 19 percent, or 471 pounds, is diverted per thousand square feet per year.

The top three materials diverted by the non-anchor store parts of shopping malls account for nearly 98 percent of diversion. These three materials are cardboard (392 pounds per thousand square feet per year), leaves, grass, prunings and trimmings (32 pounds per thousand square feet per year), and wood and treated lumber waste (36 pounds per thousand square feet per year).

In comparison, the top three types of disposed materials that could be diverted account for nearly 55 percent of what is disposed per year at other parts of shopping malls. These three types of materials are recyclable paper (398 pounds per thousand square feet per year), recyclable plastic materials (81 pounds per thousand square feet per year), and food (629 pounds per thousand square feet per year).

It is believed that a large portion of the remainder/ composite paper that is disposed annually (266 pounds per thousand square feet) is associated with the food courts at malls. This material could be diverted through composting programs, because much remainder/composite paper is classified as such as a result of food contamination.

There is approximately 99 pounds per thousand square feet per year of lumber waste disposed that could be diverted.

Figure L represents the portion of the waste stream that is currently being diverted, as well as what could easily be diverted or potentially be diverted, and the remaining disposed portion.

Reasons These Sites Divert Waste

Approximately 96 percent of the other parts of shopping malls surveyed about their diversion practices had some type of diversion program in place. Businesses were asked about their reasons for participating or not participating in a recycling/diversion program. The range of responses is presented below:

Participants said:

- They participate for the cost savings, but have to constantly educate to keep program working.

Non-participants said:

- High turnover makes it difficult to have a recycling program.
- Lack of support from management prohibits recycling.
- Tenants in the mall don’t participate in recycling programs.
- There is limited space to store recyclables.
- Recycling programs get a lot of contamination.

Figure L: Other Parts of Shopping Malls: Diverted and Divertible Waste Material, 2005

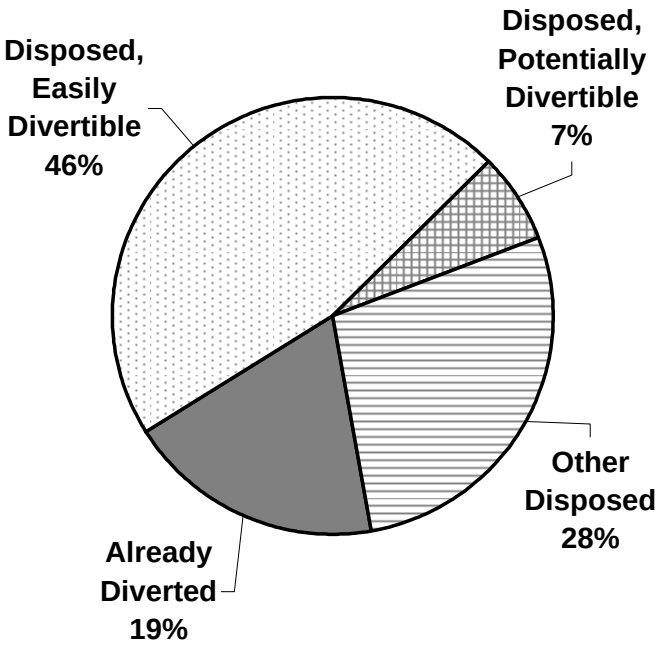

Table 14: Other Parts of Shopping Malls: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Paper	**32.7%**		**83.8%**	**42.8%**
Uncoated Corrugated Cardboard	8.2%	1.6%	83.2%	22.9%
Paper Bags/Kraft	0.5%	0.4%	0.0%	0.4%
Newspaper	1.6%	0.8%	0.0%	1.3%
White Ledger	1.2%	0.4%	0.6%	1.1%
Other Office Paper & Colored Ledger Paper	1.1%		0.0%	0.9%
Colored Ledger	*0.1%*	*0.1%*		
Other Office Paper	*1.0%*	*0.6%*		
Computer Paper	0.0%	0.0%	0.0%	0.0%
Magazines & Catalogs	0.3%	0.2%	0.0%	0.3%
Phone Books & Directories	0.1%	0.1%	0.0%	0.1%
Other Miscellaneous Paper	6.6%	1.6%	0.0%	5.3%
Remainder/Composite Paper	13.1%	2.5%	0.0%	10.5%
Glass	**1.8%**		**1.3%**	**1.7%**
Glass Bottles & Containers (colors not specified)	1.4%		1.3%	1.4%
Clear Glass Bottles & Containers	*0.9%*	*0.3%*		
Green Glass Bottles & Containers	*0.4%*	*0.6%*		
Brown Glass Bottles & Containers	*0.1%*	*0.1%*		
Other Colored Glass Bottles & Containers	*0.0%*	*0.0%*		
Flat Glass	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Glass	0.4%	0.3%	0.0%	0.3%
Metal	**2.3%**		**0.0%**	**1.9%**
Tin/Steel Cans	0.4%	0.2%	0.0%	0.3%
Major Appliances	0.0%	0.0%	0.0%	0.0%
Used Oil Filters	0.0%	0.0%	0.0%	0.0%
Other Ferrous	0.4%	0.2%	0.0%	0.3%
Aluminum Cans	0.2%	0.1%	0.0%	0.2%
Other Non-Ferrous	0.1%	0.0%	0.0%	0.1%
Remainder/Composite Metal	1.3%	1.5%	0.0%	1.0%
Plastic	**19.6%**		**0.1%**	**15.8%**
PETE & HDPE Bottles, Buckets, & Containers	1.1%		0.1%	0.9%
PETE Bottles	*0.7%*	*0.2%*		
Other PETE Containers	*0.1%*	*0.1%*		
HDPE Natural Bottles	*0.2%*	*0.1%*		
HDPE Colored Bottles	*0.1%*	*0.1%*		
HDPE 5-gallon Buckets — food	*0.0%*	*0.0%*		
HDPE 5-gallon Buckets — non-food	*0.0%*	*0.0%*		
Other HDPE Containers	*0.2%*	*0.1%*		
#3-#7 Bottles & Containers	0.5%		0.0%	0.4%
#3-#7 Bottles	*0.0%*	*0.0%*		
#3-#7 Other Containers	*0.5%*	*0.2%*		
Plastic Film	11.3%		0.0%	9.1%
Plastic Trash Bags	*2.6%*	*0.3%*		
Plastic Grocery & Other Merchandise Bags	*0.4%*	*0.1%*		
Non-Bag Comm. & Indust. Packg Film	*1.0%*	*0.7%*		
Film Products	*1.0%*	*1.6%*		
Other Film	*6.3%*	*2.2%*		
Durable Plastic Items	1.2%	0.8%	0.0%	1.0%
Remainder/Composite Plastic	5.4%	1.7%	0.0%	4.4%

Table 14, continued: Other Parts of Shopping Malls: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Electronics	**0.2%**		**0.0%**	**0.2%**
Brown Goods	0.1%	0.1%	0.0%	0.1%
Computer-related Electronics	0.1%	0.1%	0.0%	0.1%
Other Small Consumer Electronics	0.1%	0.1%	0.0%	0.1%
Televisions & Other Items with CRTs	0.0%	0.0%	0.0%	0.0%
Organics	**35.9%**		**7.2%**	**30.5%**
Food	31.0%	6.8%	0.2%	25.2%
Leaves, Grass, Prunings, & Trimmings	2.3%		6.9%	3.2%
Leaves & Grass	*0.8%*	*0.8%*		
Prunings & Trimmings	*1.5%*	*1.8%*		
Branches & Stumps	0.0%	0.0%	0.0%	0.0%
Agricultural Crop Residues	0.0%	0.0%	0.0%	0.0%
Manures	0.0%	0.0%	0.0%	0.0%
Textiles	0.8%	0.5%	0.0%	0.6%
Carpet	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Organics	1.8%	0.8%	0.0%	1.5%
Construction & Demolition	**5.3%**		**7.6%**	**5.7%**
Concrete	0.1%	0.2%	0.0%	0.1%
Asphalt Paving	0.0%	0.0%	0.0%	0.0%
Asphalt Roofing	0.0%	0.0%	0.0%	0.0%
Lumber & Treated Wood Waste	4.9%		7.6%	5.4%
Lumber	*4.9%*	*4.1%*		
Treated Wood Waste	*0.0%*	*0.0%*		
Gypsum Board	0.0%	0.0%	0.0%	0.0%
Rock, Soil, & Fines	0.0%	0.1%	0.0%	0.0%
Remainder/Composite C & D	0.2%	0.2%	0.0%	0.2%
Household Hazardous	**0.1%**		**0.0%**	**0.1%**
Paint	0.0%	0.0%	0.0%	0.0%
Vehicle & Equipment Fluids	0.0%	0.0%	0.0%	0.0%
Used Oil	0.0%	0.0%	0.0%	0.0%
Batteries	0.0%	0.0%	0.0%	0.0%
Remainder/Composite HHW	0.1%	0.1%	0.0%	0.1%
Special Waste	**1.8%**		**0.0%**	**1.5%**
Ash	0.6%	0.7%	0.0%	0.5%
Sewage Solids & Industrial Sludge	0.0%		0.0%	0.0%
Sewage Solids	*0.0%*	*0.0%*		
Industrial Sludge	*0.0%*	*0.0%*		
Treated Medical Waste	0.0%	0.0%	0.0%	0.0%
Bulky Items	1.2%	1.4%	0.0%	1.0%
Tires	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Special Waste	0.0%	0.0%	0.0%	0.0%
Mixed Residue	**0.1%**		**0.0%**	**0.1%**
Mixed Residue	0.1%	0.1%	0.0%	0.1%
Total:	100.0%		100.0%	100.0%
Total Pounds per 1,000 Square Feet:	2,028		471	2,499
Number of Samples:	24		23	

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

Findings for Public Venues and Events

Disposal and diversion are estimated based on the total number of visitors per venue or event (expressed in hundreds of visitors), instead of a per employee or square foot basis.

Disposal, diversion, and total generated waste composition results for public venues and events are detailed in Table 15. Public venues and events on average generate 244 pounds of waste material per hundred visitors. Of the total waste generation, about 29 percent or 72 pounds, is diverted per hundred visitors.

Four materials comprise over 75 percent of all diverted materials. They include cardboard (18 pounds per hundred visitors), manures (21 pounds per hundred visitors), leaves, grass, prunings, and trimmings (12 pounds per hundred visitors), and metal (4 pounds per hundred visitors). Typically, around three pounds of glass and plastic combined is diverted per hundred visitors.

Compostable materials make up the largest portion of the disposed waste stream at nearly 30 percent (51 pounds per hundred visitors). Recyclable paper, glass, and plastic materials contribute approximately 29 percent to the disposed waste stream (31 pounds, 9 pounds, and 9 pounds per hundred visitors, respectively).

It is important to note that two of the venues that were visited diverted large quantities of particular materials that were specifically related to the nature of those venues. These venues were not included in the diversion calculations reflected Table 15, below, because the consultant team believed their inclusion would skew the findings related to diversion and overall waste generation. The two venues that were removed from the diversion analysis both diverted large amounts of other ferrous metal (3392 tons and 800 tons respectively). This is explained in more detail in the methodology in Appendix A. A list of the types of venues and events included in the study can be found in Appendix B.

Figure M represents the portion of the waste stream that is currently being diverted, as well as what could easily be diverted or potentially be diverted, and the remaining disposed portion.

NOTE: Some of the venues that were sampled in this study dispose of manure. None of this material was captured in the random waste samples and thus is not reflected in the disposed waste composition estimates for public venues and events.

Reasons These Sites Divert Waste

Approximately 82 percent of the public venues and events surveyed about their diversion practices had some type of diversion program in place. Businesses were asked about their reasons for participating or not participating in a recycling/diversion program. The range of responses is presented below:

Participants said:

- No responses.

Non-participants said:

- They don’t recycle because they haven’t set up a recycling program.
- They do not have enough time for recycling.

Figure M: Public Venues and Events: Diverted and Divertible Waste Material, 2005

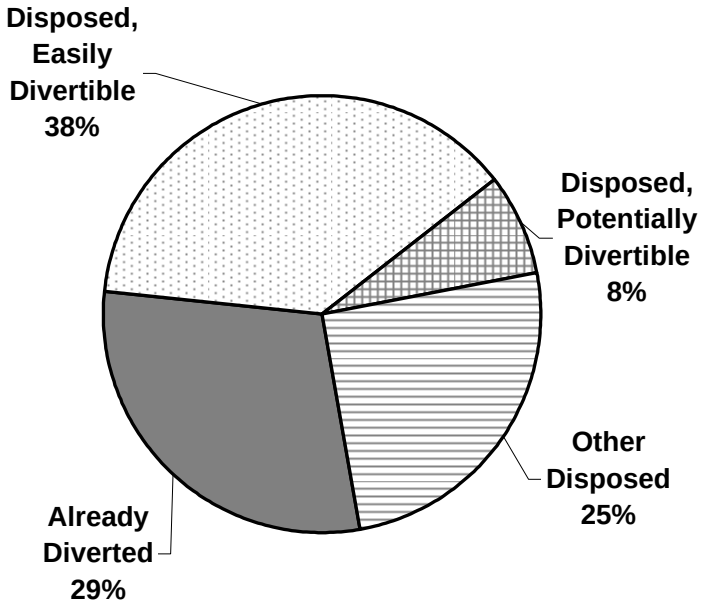

Table 15: Public Venues and Events: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Paper	**42.0%**		**31.6%**	**38.9%**
Uncoated Corrugated Cardboard	4.2%	2.0%	25.2%	10.4%
Paper Bags/Kraft	0.3%	0.2%	0.0%	0.2%
Newspaper	2.9%	1.3%	0.1%	2.1%
White Ledger	1.0%	0.8%	1.9%	1.3%
Other Office Paper & Colored Ledger Paper	0.5%		2.9%	1.2%
Colored Ledger	*0.3%*	*0.1%*		
Other Office Paper	*0.2%*	*0.2%*		
Computer Paper	0.3%	0.4%	0.0%	0.2%
Magazines & Catalogs	2.5%	2.5%	0.1%	1.8%
Phone Books & Directories	0.2%	0.2%	0.0%	0.1%
Other Miscellaneous Paper	6.3%	2.4%	1.3%	4.8%
Remainder/Composite Paper	23.8%	11.9%	0.0%	16.8%
Glass	**5.5%**		**3.2%**	**4.8%**
Glass Bottles & Containers (colors not specified)	4.2%		3.2%	3.9%
Clear Glass Bottles & Containers	*1.0%*	*0.4%*		
Green Glass Bottles & Containers	*2.3%*	*2.0%*		
Brown Glass Bottles & Containers	*0.8%*	*0.6%*		
Other Colored Glass Bottles & Containers	*0.1%*	*0.2%*		
Flat Glass	1.0%	1.6%	0.0%	0.7%
Remainder/Composite Glass	0.3%	0.2%	0.0%	0.2%
Metal	**1.8%**		**5.8%**	**3.0%**
Tin/Steel Cans	0.6%	0.7%	0.0%	0.5%
Major Appliances	0.0%	0.0%	0.0%	0.0%
Used Oil Filters	0.0%	0.0%	0.0%	0.0%
Other Ferrous	0.4%	0.2%	5.6%	1.9%
Aluminum Cans	0.5%	0.2%	0.2%	0.4%
Other Non-Ferrous	0.1%	0.1%	0.0%	0.1%
Remainder/Composite Metal	0.1%	0.0%	0.0%	0.0%
Plastic	**14.8%**		**1.2%**	**10.8%**
PETE & HDPE Bottles, Buckets, & Containers	2.4%		0.9%	2.0%
PETE Bottles	*2.0%*	*0.7%*		
Other PETE Containers	*0.2%*	*0.1%*		
HDPE Natural Bottles	*0.1%*	*0.1%*		
HDPE Colored Bottles	*0.1%*	*0.0%*		
HDPE 5-gallon Buckets — food	*0.0%*	*0.0%*		
HDPE 5-gallon Buckets — non-food	*0.0%*	*0.1%*		
Other HDPE Containers	*0.1%*	*0.1%*		
#3-#7 Bottles & Containers	1.6%		0.0%	1.1%
#3-#7 Bottles	*0.0%*	*0.0%*		
#3-#7 Other Containers	*1.6%*	*0.9%*		
Plastic Film	6.1%		0.1%	4.4%
Plastic Trash Bags	*2.8%*	*0.7%*		
Plastic Grocery & Other Merchandise Bags	*0.1%*	*0.1%*		
Non-Bag Comm. & Indust. Packg Film	*0.2%*	*0.3%*		
Film Products	*0.9%*	*0.9%*		
Other Film	*2.1%*	*0.6%*		
Durable Plastic Items	1.1%	0.6%	0.0%	0.8%
Remainder/Composite Plastic	3.5%	0.9%	0.2%	2.5%

Table 15, continued: Public Venues and Events: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Electronics	**0.0%**		**0.2%**	**0.1%**
Brown Goods	0.0%	0.0%	0.0%	0.0%
Computer-related Electronics	0.0%	0.0%	0.1%	0.0%
Other Small Consumer Electronics	0.0%	0.0%	0.0%	0.0%
Televisions & Other Items with CRTs	0.0%	0.0%	0.0%	0.0%
Organics	**34.0%**		**48.1%**	**38.2%**
Food	25.4%	6.1%	1.7%	18.4%
Leaves, Grass, Prunings, & Trimmings	4.4%		17.2%	8.1%
Leaves & Grass	*3.7%*	*4.1%*		
Prunings & Trimmings	*0.7%*	*0.9%*		
Branches & Stumps	0.0%	0.0%	0.0%	0.0%
Agricultural Crop Residues	0.0%	0.0%	0.0%	0.0%
Manures *(see NOTE in text)*	0.0%	0.0%	29.2%	8.6%
Textiles	1.9%	2.2%	0.1%	1.4%
Carpet	0.6%	1.0%	0.0%	0.4%
Remainder/Composite Organics	1.7%	1.0%	0.0%	1.2%
Construction & Demolition	**0.7%**		**9.1%**	**3.2%**
Concrete	0.2%	0.4%	0.0%	0.2%
Asphalt Paving	0.0%	0.0%	0.0%	0.0%
Asphalt Roofing	0.0%	0.0%	0.0%	0.0%
Lumber & Treated Wood Waste	0.4%		3.8%	1.4%
Lumber	*0.2%*	*0.2%*		
Treated Wood Waste	*0.2%*	*0.2%*		
Gypsum Board	0.0%	0.0%	0.0%	0.0%
Rock, Soil, & Fines	0.0%	0.1%	0.0%	0.0%
Remainder/Composite C & D	0.0%	0.0%	5.3%	1.6%
Household Hazardous	**0.0%**		**0.1%**	**0.0%**
Paint	0.0%	0.0%	0.0%	0.0%
Vehicle & Equipment Fluids	0.0%	0.0%	0.0%	0.0%
Used Oil	0.0%	0.0%	0.0%	0.0%
Batteries	0.0%	0.0%	0.0%	0.0%
Remainder/Composite HHW	0.0%	0.0%	0.0%	0.0%
Special Waste	**1.2%**		**0.8%**	**1.1%**
Ash	0.0%	0.0%	0.0%	0.0%
Sewage Solids & Industrial Sludge	0.0%		0.0%	0.0%
Sewage Solids	*0.0%*	*0.0%*		
Industrial Sludge	*0.0%*	*0.0%*		
Treated Medical Waste	0.0%	0.0%	0.0%	0.0%
Bulky Items	0.0%	0.0%	0.8%	0.2%
Tires	1.0%	1.6%	0.0%	0.7%
Remainder/Composite Special Waste	0.2%	0.2%	0.0%	0.1%
Mixed Residue	**0.0%**		**0.0%**	**0.0%**
Mixed Residue	0.0%	0.0%	0.0%	0.0%
Total:	100.0%		100.0%	100.0%
Total Pounds per 100 Visitors:	172		72	244
Number of Samples:	31		27	

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

Findings for Large Office Buildings

Disposal and diversion are estimated based on the total square footage of floor space at office buildings (expressed in thousands of square feet), instead of per employee like most industry groups. Additionally, disposal findings for large office buildings are limited to what is collected through the janitorial cleaning service and do not include diversion activities initiated and carried out by building tenants.

Disposal, diversion, and total generated waste composition results for large office buildings are detailed in Table 16. Large office buildings on average generate 1,998 pounds of waste material per thousand square feet per year. Of the total waste generation approximately 7 percent or 132 pounds, is diverted per thousand square feet per year.

Large office buildings on average only divert three types of materials, cardboard (52 pounds per thousand square feet per year), white ledger paper (79 pounds per thousand square feet per year), and lumber and treated wood waste (1 pound per thousand square feet per year).

Annually, nearly 34 percent (639 pounds per thousand square feet) of all materials disposed could be diverted through expanded paper recycling programs.

Almost 116 pounds of glass, metal, and plastic per square foot is disposed of per year that could be diverted. Approximately 60 pounds of this is recyclable plastic, of which 9 pounds is recyclable plastic film.

Approximately 353 pounds per thousand square feet of compostable materials are disposed of per year by large office buildings, which could be diverted through a compost program.

There is approximately 78 pounds per thousand square feet per year of lumber and treated wood waste disposed that could be diverted.

Figure N represents the portion of the waste stream that is currently being diverted, as well as what could easily be diverted or potentially be diverted, and the remaining disposed portion.

Reasons These Sites Divert Waste

Approximately 32 percent of large office buildings surveyed about their diversion practices had some type of diversion program in place. Large office buildings did not provide information about their reasons for participating or not participating in a recycling/diversion program.

Figure N: Large Office Buildings: Diverted and Divertible Waste Material, 2005

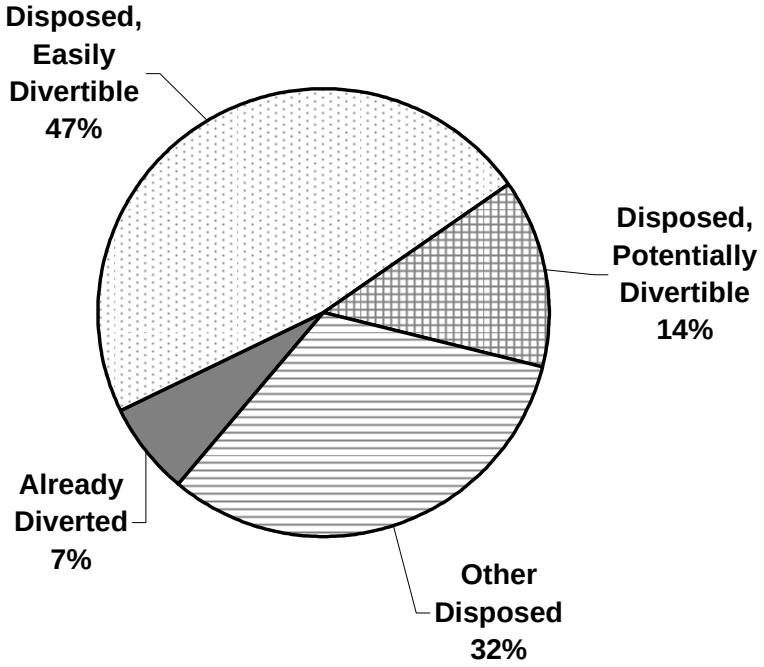

Table 16: Large Office Buildings: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Paper	**50.3%**		**99.0%**	**53.5%**
Uncoated Corrugated Cardboard	2.6%	1.3%	39.2%	5.0%
Paper Bags/Kraft	0.5%	0.2%	0.0%	0.5%
Newspaper	3.8%	1.1%	0.0%	3.5%
White Ledger	7.7%	2.5%	59.8%	11.1%
Other Office Paper & Colored Ledger Paper	7.3%		0.0%	6.9%
Colored Ledger	*0.4%*	*0.2%*		
Other Office Paper	*6.9%*	*4.2%*		
Computer Paper	0.3%	0.2%	0.0%	0.3%
Magazines & Catalogs	2.5%	1.3%	0.0%	2.3%
Phone Books & Directories	0.2%	0.2%	0.0%	0.2%
Other Miscellaneous Paper	9.4%	2.1%	0.0%	8.7%
Remainder/Composite Paper	16.0%	3.8%	0.0%	15.0%
Glass	**1.8%**		**0.0%**	**1.7%**
Glass Bottles & Containers (colors not specified)	1.7%		0.0%	1.6%
Clear Glass Bottles & Containers	*1.2%*	*0.3%*		
Green Glass Bottles & Containers	*0.3%*	*0.2%*		
Brown Glass Bottles & Containers	*0.2%*	*0.1%*		
Other Colored Glass Bottles & Containers	*0.0%*	*0.0%*		
Flat Glass	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Glass	0.1%	0.1%	0.0%	0.1%
Metal	**1.6%**		**0.0%**	**1.5%**
Tin/Steel Cans	0.3%	0.1%	0.0%	0.3%
Major Appliances	0.0%	0.0%	0.0%	0.0%
Used Oil Filters	0.0%	0.0%	0.0%	0.0%
Other Ferrous	0.5%	0.3%	0.0%	0.4%
Aluminum Cans	0.4%	0.1%	0.0%	0.3%
Other Non-Ferrous	0.1%	0.0%	0.0%	0.1%
Remainder/Composite Metal	0.3%	0.3%	0.0%	0.3%
Plastic	**12.5%**		**0.0%**	**11.7%**
PETE & HDPE Bottles, Buckets, & Containers	1.4%		0.0%	1.3%
PETE Bottles	*0.9%*	*0.2%*		
Other PETE Containers	*0.0%*	*0.0%*		
HDPE Natural Bottles	*0.1%*	*0.1%*		
HDPE Colored Bottles	*0.2%*	*0.1%*		
HDPE 5-gallon Buckets — food	*0.0%*	*0.0%*		
HDPE 5-gallon Buckets — non-food	*0.2%*	*0.3%*		
Other HDPE Containers	*0.0%*	*0.0%*		
#3-#7 Bottles & Containers	1.3%		0.0%	1.2%
#3-#7 Bottles	*0.2%*	*0.2%*		
#3-#7 Other Containers	*1.1%*	*0.3%*		
Plastic Film	5.0%		0.0%	4.6%
Plastic Trash Bags	*2.8%*	*0.6%*		
Plastic Grocery & Other Merchandise Bags	*0.2%*	*0.1%*		
Non-Bag Comm. & Indust. Packg Film	*0.2%*	*0.2%*		
Film Products	*0.1%*	*0.1%*		
Other Film	*1.6%*	*0.3%*		
Durable Plastic Items	0.4%	0.1%	0.0%	0.4%
Remainder/Composite Plastic	4.5%	1.7%	0.0%	4.2%

Table 16, continued: Large Office Buildings: Waste Disposal, Diversion, and Total Generation Composition, 2005

Material	Disposed Waste Est. Percent	+ / -	Diverted Waste Est. Percent	Total Generated Waste Est. Percent
Electronics	**0.1%**		**0.0%**	**0.0%**
Brown Goods	0.0%	0.0%	0.0%	0.0%
Computer-related Electronics	0.0%	0.0%	0.0%	0.0%
Other Small Consumer Electronics	0.0%	0.0%	0.0%	0.0%
Televisions & Other Items with CRTs	0.0%	0.0%	0.0%	0.0%
Organics	**24.4%**		**0.0%**	**22.7%**
Food	18.3%	4.5%	0.0%	17.1%
Leaves, Grass, Prunings, & Trimmings	0.6%		0.0%	0.5%
Leaves & Grass	*0.5%*	*0.4%*		
Prunings & Trimmings	*0.1%*	*0.1%*		
Branches & Stumps	0.0%	0.0%	0.0%	0.0%
Agricultural Crop Residues	0.0%	0.0%	0.0%	0.0%
Manures	0.0%	0.0%	0.0%	0.0%
Textiles	0.8%	1.0%	0.0%	0.8%
Carpet	4.3%	7.0%	0.0%	4.0%
Remainder/Composite Organics	0.5%	0.2%	0.0%	0.4%
Construction & Demolition	**8.3%**		**1.0%**	**7.9%**
Concrete	0.0%	0.0%	0.0%	0.0%
Asphalt Paving	0.0%	0.0%	0.0%	0.0%
Asphalt Roofing	0.0%	0.0%	0.0%	0.0%
Lumber & Treated Wood Waste	4.2%		1.0%	4.0%
Lumber	*1.2%*	*1.9%*		
Treated Wood Waste	*3.1%*	*5.0%*		
Gypsum Board	0.1%	0.1%	0.0%	0.1%
Rock, Soil, & Fines	0.0%	0.0%	0.0%	0.0%
Remainder/Composite C & D	4.0%	4.3%	0.0%	3.8%
Household Hazardous	**0.2%**		**0.0%**	**0.2%**
Paint	0.0%	0.0%	0.0%	0.0%
Vehicle & Equipment Fluids	0.0%	0.0%	0.0%	0.0%
Used Oil	0.0%	0.0%	0.0%	0.0%
Batteries	0.0%	0.0%	0.0%	0.0%
Remainder/Composite HHW	0.1%	0.2%	0.0%	0.1%
Special Waste	**0.9%**		**0.0%**	**0.9%**
Ash	0.0%	0.0%	0.0%	0.0%
Sewage Solids & Industrial Sludge	0.0%		0.0%	0.0%
Sewage Solids	*0.0%*	*0.0%*		
Industrial Sludge	*0.0%*	*0.0%*		
Treated Medical Waste	0.0%	0.0%	0.0%	0.0%
Bulky Items	0.8%	1.3%	0.0%	0.7%
Tires	0.0%	0.0%	0.0%	0.0%
Remainder/Composite Special Waste	0.2%	0.3%	0.0%	0.2%
Mixed Residue	**0.0%**		**0.0%**	**0.0%**
Mixed Residue	0.0%	0.0%	0.0%	0.0%
Total:	100.0%		100.0%	100.0%
Total Pounds per 1,000 Square Feet:	1,866		132	1,998
Number of Samples:	26		28	

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

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Abbreviations and Acronyms

BMG — Building Material and Garden

CIWMB — California Integrated Waste Management Board

CRV — California Redemption Value

FTE — Full-time Equivalent

HHW — Household Hazardous Waste

MSW — Municipal Solid Waste

SIC — Standard Industrial Classification

TPEPY — Tons Per Employee Per Year

Glossary of Terms

Big Box — generally refers to retail stores with one or more of the below characteristics. For the purpose of this study, big box stores were identified based on their belonging to certain retail chains that had been identified during the design phase.

- The amount of floor space is much greater than for traditional retailers in the same industry sector.
- The retail building consists of a free-standing, windowless, rectangular, single story construction, with a high ceiling.
- There are expansive open-air surface parking lots and general orientation to automobile-driving consumers, as opposed to pedestrians.
- The stores are located in suburban or rural areas, often in proximity to freeways, as opposed to downtown shopping districts.
- Inventory is kept somewhere on the retail floor, often on high shelves accessed by forklift.

Compostable — describes organic waste material that under the right conditions can be turned into soil amendment (compost).

Disposal — refers to waste materials that are sent to landfills.

Diversion — refers to waste materials that are diverted from the landfills through recycling, reuse, material reduction, composting, or similar activities.

Diversion Rate — the percent of all waste materials (disposed plus diverted) that are diverted from the landfill. To calculate the diversion rate, the amount of diverted material is divided by the total amount of waste generation (disposed plus diverted material).

Easily Divertible — This designation of waste materials includes those for which source reduction programs or methods, or collection programs and recycling infrastructure are present in California communities, either broadly or in "forefront communities." See Appendix C for a list of the materials that are included in this category.

Full-Time Equivalents (FTE) — a unit of measurement of the effective number of employees working full-time at a business. For example, an employee working half time would have the value of 0.5 FTE.

Generation — refers to all wastes materials generated at a site (or by industry group), regardless of whether they are disposed or diverted.

Generator — a single business, venue, event, or site included in this study.

Industry Groups — commercial sectors grouped by type of business activity.

Municipal Solid Waste (MSW) — means all solid wastes generated by residential, commercial, and industrial sources, and all solid waste generated at construction and demolition sites, at food-processing facilities, and at treatment works for water and waste water, which are collected and transported under the authorization of a jurisdiction or are self-hauled.

Potentially Divertible — This includes materials for which methods and/or technology exist for recycling, reuse, or other beneficial uses, although programs to collect and process the materials are rare or nonexistent. See Appendix C for a list of the materials that are included in this category.

Recyclable — refers to waste materials that can be reprocessed into new usable products.

Substream — refers to a portion of the disposal waste stream at a specific business. At a site, all disposal substreams together make up the entire disposal waste stream for that site. For example, a shopping mall may have two disposal substreams, if waste from the food court is collected in a different container and on a different schedule than waste from the offices and retail stores.

Waste Density — unit of measurement calculated by dividing the weight of waste material by the volume of waste material and expressed in pounds/cubic yards.

Waste Stream — generally refers to the disposed waste stream at a specific site.

Appendix A:
Detailed Methodology

Industry Groups

The industry groups examined in this study were chosen based on three criteria.

1. They are major sources of disposed waste, thus representing large opportunities for diversion. Industry groups that are major sources of waste were identified using the 1999 California statewide waste characterization study.
2. The types of businesses or waste generators are common and present in nearly every city in California.
3. Data reflecting typical disposal and recycling practices for the industry groups was not already available.

As a result of discussions based on these criteria, the following industry groups were selected: restaurants, food stores, wholesale distributors of durable goods, wholesale distributors of non-durable goods, large hotels, “big-box” and “other” building material and garden stores, “big box” and “other” retail stores, “anchor stores” and “other parts” of shopping malls, public venues, and large office buildings. Definitions of these industry groups can be found in Appendix B.

Selection of Regions and Study Areas

This study collected data from generator sites belonging to each of the targeted industry groups in the four largest metropolitan areas in California: the San Francisco Bay Area, greater Los Angeles, greater Sacramento, and greater San Diego. One disposal facility was chosen in each metropolitan area where samples of disposed waste collected from generators were to be taken and sorted. Disposal facilities were selected based on the willingness of their management to cooperate with the study and based on their having sufficient space to permit the temporary storage of waste samples and the activity associated with sorting waste samples. The selected facilities for the study areas were:

San Francisco Bay Area ..... Tri-Cities Landfill in the City of Fremont

Greater Los Angeles ..... Central Los Angeles Recycling Center and Transfer Station in the City of Los Angeles

Greater Sacramento ..... North Area Transfer Station in the City of North Highlands

Greater San Diego ..... Otay Landfill in the City of Chula Vista

During the recruitment of generator sites, a screening criterion was imposed that each site should be no more than 15 miles from the selected disposal facility. Those circumferences were drawn on maps, and the zip codes corresponding to the desired areas were determined by CIWMB staff. Lists of all generator sites that lay within those areas and that belonged to the targeted industry groups (identified by SIC code) were purchased from the data clearinghouse *infoUSA*.

Seasons and Schedule

Study activities were divided between two seasons. The activities for each season are listed below:

SEASON 1

August – September 2004	Preparation of generator site recruitment lists, recruitment and data collection protocols, recruitment coordination database
September - November 2004	Recruitment of generator sites
October – December 2004	Site visits to measure disposal and quantify and characterize diversion
January – February 2005	Site visits to obtain disposal samples and sorting of disposal samples, with approximately one week assigned to each geographic area (for a total of four weeks of sampling)

SEASON 2

March – May 2005	Recruitment of generator sites
May – July 2005	Site visits to measure disposal and quantify and characterize diversion
July – August 2005	Site visits to obtain disposal samples and sorting of disposal samples, with approximately one week assigned to each geographic area (for a total of four weeks of sampling)

Planned and Actual Numbers of Sites, Disposal Samples, and Diversion Audits

The study included site visits to 371 individual generator sites belonging to the targeted industry groups. When a site appeared to produce multiple substreams of disposed waste (e.g., cafeteria waste, office waste, etc.) that were collected on different schedules or managed in different ways, more than one sample was allocated to that site. Therefore, within a given industry group, the number of sites visited for the purpose of sampling disposed waste may not equal the number of waste samples obtained. In addition, several generator sites did not comply fully with the research team's data requests. Complete data was obtained separately for disposal quantities, disposal characterization, and diversion quantification and characterization from a site. Some generator sites contributed to only one or two of the three possible data sets.

Table 17 below presents the planned and actual number of sites visited for disposal samples, the numbers of samples of disposed waste that were characterized, and numbers of sites for which diversion audits were performed, by region.

The number of sites included for disposal and diversion data do not match exactly, because some sites declined to participate after completing only part of the study. Nevertheless, disposal and diversion data were obtained from enough sites to ensure that each data set is representative of each industry group, with the exception of anchor stores, where there were not enough willing participants to form a truly representative sample pool.

Table 17: Planned Versus Actual Number of Sites, Disposal Samples, and Diversion Audits

Industry Group	Planned Site Visits		Disposal Sites Sampled					Disposal Samples					Diversion Audit Sites				
			LA	SD	Bay	Sac	Total	LA	SD	Bay	Sac	Total	LA	SD	Bay	Sac	Total
Restaurants																	
Small Fast-Food Restaurants	11	**45**	3	2	2	3	**45**	4	2	3	4	**45**	4	2	4	4	**51**
Large Fast-Food Restaurants	12		3	2	4	3		2	2	3	2		3	2	3	2	
Small Full-Service Restaurants	12		3	3	3	3		3	3	3	3		4	4	3	3	
Large Full-Service Restaurants	10		2	3	3	3		2	3	3	3		4	3	3	3	
Food Stores	30	**30**	7	8	7	8	**30**	9	8	7	9	**33**	7	7	7	9	**30**
Durable Wholesale Distributors																	
Small Durable Wholesale	8	**25**	1	2	3	5	**24**	1	2	3	5	**24**	2	3	2	8	**33**
Medium Durable Wholesale	9		2	2	1	4		2	2	1	4		2	2	3	7	
Large Durable Wholesale	8		2	1	1	0		2	1	1	0		2	1	1	0	
Non-Durable Wholesale Distributors																	
Small Non-Durable Wholesale	8	**25**	1	2	2	3	**26**	1	1	2	3	**26**	1	4	2	3	**29**
Medium Non-Durable Wholesale	8		2	2	1	4		2	4	1	5		3	3	2	4	
Large Non-Durable Wholesale	9		2	1	3	3		2	0	3	2		2	0	3	2	
Large Hotels	30	**30**	7	8	8	10	**33**	7	8	8	10	**33**	8	8	9	8	**33**
Building Material & Garden (BMG)																	
Big-Box BMG Stores	23	**45**	5	4	7	4	**44**	5	4	7	4	**45**	5	4	7	5	**45**
Other BMG Stores	22		5	5	6	8		5	5	7	8		5	5	5	9	
Retail Stores																	
Big-Box Retail Stores	21	**45**	7	5	4	4	**43**	7	5	4	4	**43**	8	5	6	7	**51**
Other Retail Stores	24		5	6	6	6		5	6	6	6		5	8	6	6	
Shopping Malls																	
Anchor Stores	25	**25**	0	2	3	2	**7**	0	2	3	2	**7**	0	2	2	3	**7**
Other Parts of Mall	25	**25**	5	6	7	6	**24**	9	11	11	15	**46**	6	6	7	4	**23**
Public Venues & Events	25	**25**	3	5	13	10	**31**	5	7	17	10	**39**	4	3	10	10	**27**
Large Office Buildings	25	**25**	3	5	13	5	**26**	3	5	13	5	**26**	4	7	12	5	**28**
Totals	345	**345**	68	74	97	94	**333**	76	81	106	104	**367**	79	79	97	102	**357**

Recruitment of Sites to Participate in the Study

Recruitment of participating generator sites was a complex process that involved selection of sites, initial contact to solicit site management participation, and several follow-up contacts to schedule site visits and obtain data. The process was facilitated by the creation of a shared recruitment database that was accessible to recruiters in different office locations via the internet. The general process for recruitment is described below.

Lists of Potential Participants

For all industry groups except shopping malls, large office buildings, and public venues, a list of business locations was purchased from *infoUSA*, a national provider of mailing and marketing lists. The list included all known sites that matched the SIC codes corresponding to the chosen industry groups and that lay within the selected geographic area near the solid waste facilities used to sort waste samples. Records for certain industry groups were further sorted into groups reflecting the expected size of each business, in terms of numbers of employees. Business sites that did not meet minimum employment size criteria were screened out. For shopping malls, public venues, and large office buildings, other sources of lists were sought. These included phone directories, commercial real estate resources, and internet searches.

Recruitment Database

A shared recruitment database, accessible to all members of the research team via the internet, contained a record of each generator site that was a potential participant in the study. The records were kept in a pre-established random order. For each industry group, recruiters preceded through the database records in order, contacting an employee at each site in turn to determine eligibility and interest in participating in the study. The database included fields where the recruiter recorded specific information about the nature, location, and waste handling practices at each generator site. The database was structured to present a specific sequence of data entry forms and fields to the recruiter, in order to prompt the recruiter to ask certain questions to gather needed information about each participating site. Images of the forms and fields used in the recruitment database are presented in Appendix D.

As recruitment progressed, approximately every two weeks the records of recruited sites were reviewed by the project manager for completeness. Items verified included information about the site, information about the collection schedule for disposed waste, and information about the logistics of conducting site visits to measure the accumulation of disposed waste and to obtain samples of disposed waste.

Criteria Used to Determine Suitability of Recruited Sites

During the calling process, a business site was screened out of the study if any of the following conditions were met:

- The business refused to participate in the disposal/recycling audit or refused to permit sampling of its waste.
- The business did not cooperate by providing important pieces of information necessary for the scheduling of site visits or the analysis of collected data.
- It was not possible to obtain the required information on dumpster size, location, time, and frequency of pick-up, or dumpster access procedures.
- The business was not within the selected geographic area.
- The primary activity of the business did not match what was expected for the targeted industry group.
- The business shared dumpster space with another business belonging to a different industry group.
- The business shared dumpster space with another business belonging to the same industry grouping, but it was impossible to obtain data reflecting the amount of waste generated by the targeted business.
- Its dumpsters were not accessible to the audit team and/or the sampling crew at times appropriate for measuring the amount of waste disposed or acquiring a sample of disposed waste.
- It was not possible to obtain accurate measurements or records about the quantity of waste disposed by the business over a representative period of time.

If the recruiter needed to discard the candidate site for any reason, or could not obtain the necessary information, the next business on the list for that industry group and size tier was contacted. Recruitment for each industry group continued until recruitment goals were met. A recruiter would follow up with a business up to three times before rejecting that business. A small number of contingency businesses were recruited within each industry group to provide alternate sites in case some businesses became ineligible for the study or dropped out after having been recruited.

Recruitment Procedure

Working from a shared database, several individuals in various locations in California and Washington recruited California businesses and institutions to participate in the study. Recruitment was accomplished through the following steps, although the steps may have varied in sequence for particular candidates.

Step 1: Verify that the site was within geographic boundaries. Before contacting the site, the recruiter verified that it was within 15 miles of the solid waste facility that was chosen as a central base in each of the four metropolitan areas. Sites that were outside the designated radius were discarded, with the exception of certain public venues and events and shopping malls. For public venues and events, due to limitations imposed by the sampling schedule and the dates on which public events were planned, it was necessary at times to exceed the geographic boundaries. Additionally in some areas there were not enough malls willing to participate, and thus malls outside the boundaries were recruited.

Step 2: Gain permission to participate in study. The recruiter would attempt to speak with a manager or supervisor who could give permission for the site to participate in the study. The study was described as consisting of three parts: (1) a brief telephone interview, (2) a site visit to measure disposed and diverted waste, and (3) another site visit to obtain a sample of the site's trash. If the contact refused any of these three steps, the site was discarded.

Step 3: Obtain information about the site. In the phone interview the recruiter verified the address, name of the supervisor, name of person in charge of waste, name of the person who could provide waste and business data, contact phone numbers and extensions, name of the business/institution, type of business/institution, hours and days of operation, number of employees, and if applicable other correlative data (i.e. square footage, number of hotel rooms, and visitors per year). Based on this information, the database record for the business was updated, and the site's size designation (i.e., small, medium, or large) was updated as necessary. The number of employees was based on Full-Time Equivalents (FTE). For example, two half-time employees were considered equal to one full-time employee.

Step 4: Obtain information about the handling of trash. Obtaining information about trash handling at the site often required speaking with someone other than the original supervisor or manager contact. This was attempted during the initial phone interview, and information was confirmed or completed during the site visit. Information necessary for sampling included the numbers, sizes and locations of dumpsters or bins, the hauler name, the day and time of normal trash pick-up, the time(s) of day trash is taken to containers, and the procedure for accessing the containers.

If the site had a compactor and had tonnage figures from the waste hauler, the recruiter used those figures for waste disposal rate information. If the site did not have information about their waste disposal rate for a compactor, the recruiter contacted the hauler to try to get the information.

Another function of this step was to determine whether different kinds of trash at the site were sent to different containers. In such situations, obtaining waste measurements or samples from only one container might lead to data that was not representative of the site's entire waste disposal practices. In this situation, a site was considered to produce multiple “substreams” of waste, and data was collected for each substream. The recruiter created additional waste substream records as necessary in the recruiting database, and specific sampling arrangements were established for each waste substream at the site.

If trash handling information was not available, the site was excluded from sampling.

Step 5: Conduct the site visits to quantify and characterize disposed waste and diverted materials. In most cases, data collection consisted of two phases: (1) a site visit to quantify disposed waste and to quantify and characterize recycled/recovered waste, and (2) an additional site visit to obtain a sample of disposed waste that was sorted and characterized. These processes are described in greater detail in the sections below.

Quantifying and Characterizing Diversion

Data Collection Methods

At each site, a member of the data collection team met with key personnel to discuss and document waste management practices and existing recycling, composting, or other diversion practices. When possible, the team member examined receipts from recyclers and invoices from waste haulers in order to obtain data reflecting material quantities.

The next step in the onsite assessment was for the team member to tour the facility to observe existing recycling and disposal practices. The tour concentrated on shipping and receiving areas, waste collection and disposal operations, food service, administration, and other operational aspects of the businesses.

During these site visits recruiters also collected data for quantifying disposed materials, described in more detail below.

To quantify and characterize the diverted waste, the team member interviewed site operators and examined the methods of recycling and waste diversion. Through this interview process, the recruiter obtained information regarding materials recycled, the frequency of pick-up for each material, and the means by which materials were diverted (scavenging, bringing to recycling facility, donation, reuse, etc.). If the on-site contact did not know quantities diverted, they were asked to estimate based on shipments and purchasing records.

At some facilities recyclables were collected commingled in a single bin. If no documentation was available on the types and quantities of recyclables recovered from these facilities, it was necessary to complete a visual recycling composition assessment. This was conducted by determining the bin size and fullness, and estimating the types and percentages of materials included in the bin. The form used to record diversion data on-site is shown in Appendix D.

The team member also toured the business site where materials were generated to identify other possible diversion activities that the contact forgot to mention or was unaware that it was considered as diversion.

Estimates of quantities recycled are usually less precise than corresponding estimates for disposal, because few businesses keep records of the amounts of specific materials that are recycled. In addition, unlike disposal, diverted materials were quantified and characterized based on a kind of accounting method instead of a statistical sampling program. An exception to this pattern, however, is cardboard. For certain industry groups – notably retailers, wholesale distributors, and food stores – cardboard recycling is tracked carefully by most sites, and the quantity estimates for cardboard diverted by those groups are believed to be fairly precise.

The team member determined the quantity of each material that was diverted by the site during a representative time period. This was done for 56 material categories. When the volume of material(s) was known, conversion factors were used to translate the material volumes to weights.

Then, the team member made appropriate adjustments to the data collected for the representative time period, such that the final estimates reflected the amount of each material diverted during a typical year. Appropriate adjustments involved "scaling up" from the study time period to a year-long period.

Shortly after completing the initial site visit, the team member reviewed the notes, and if necessary, they contacted the facility personnel to resolve any questions or inconsistent information. Furthermore, if the facility did not have information available onsite (e.g. recycling invoices or receipts) the team member followed up with a phone call to obtain the data. In some cases it was necessary to contact headquarters for chain stores when local branches did not maintain recycling and diversion records.

Calculation Methods

After the site visit, the team member updated a recycling database with the information gathered during the visit. The database tracked all diverted materials and assisted in calculating weights necessary for estimating the average pounds per employee of each diverted material.

Below are the steps that produced the per employee diversion estimates for each industry group.

1. **Diversion weights**: The database allowed the recruiters to enter exact weights if they were able to acquire them from the site or hauler.
2. **Diversion volumes**: When weights were not available, the recruiters would enter an estimated volume of material and frequency of collection. Using industry standard volume-to-weight conversion factors from sources such as U.S. EPA, Tellus Institute, FEECO, and CIWMB, the volumes were converted to weights and multiplied by the frequency of collection to get to *total tons per year*.
3. **Annual diverted material**: *Total tons per year* for each of the 56 material types diverted from a site were summed by industry group. This was converted to pounds, resulting in a *total pounds diverted* of each material by industry group.
4. **Annual pounds per employee**: Annual diverted material per employee was calculated for each industry group by taking the *total pounds diverted* of each material by industry group and dividing by the sum of the total number of employees for those businesses sampled. This resulted in *total pounds per employee per year* of diverted waste by material type for each industry group. For shopping malls and office buildings, square footage was used instead of employees. For public venues, number of visitors was used instead of employees.

For industry groups where sites were recruited by size category based on employment (restaurants and wholesale distributors), a different method was used to generate the *total pounds per employee per year* of diverted waste for the whole industry group. First, California employment data was gathered for these industry groups (see Table 22 in Appendix B). Next, the number of employees for each size group within an industry sector was multiplied by the average *total pounds per employee per year* (for that size group) of each of the 56 diverted materials. The results were summed together to generate a *total pounds per industry group per year*. The *total pounds per industry group per year* was then divided by the total number of employees in that industry group to calculate the *weighted total pounds per employee per year* for the industry group. Below is an example calculation for one of the 56 materials from the nondurable wholesale goods distributors industry group.

Industry Size Groups	Pounds of Cardboard per Employee per Year		Number of Employees Statewide		Pounds of Cardboard per Year
Large	890	x	79,048	=	70,352,720
Medium	2161	x	87,983	=	190,131,263
Small	2160	x	67,538	=	145,882,080
				Total Pounds per Industry Group	406,366,063 lbs.
				Divided by Total # of Industry FTE	÷ 234,569
				Weighted Total Pounds per Employee per Year	= 1,732 lbs. per employee
					= 0.87 tons per employee

The above calculation was completed for all 56 material categories used in the diversion portion of the study. The sum of those 56 calculated amounts represented the estimate of *total pounds per employee per year* of all diverted material.

5. **Adjusting for Outliers**: Results were examined to determine if any businesses were diverting unusually large quantities of specific materials and skewing the averages. Once identified, these businesses were either removed from the calculations for *total pounds per employee per year* or their diversion was adjusted for better accuracy. Table 18 below lists the businesses that were removed from this calculation.

Table 18: Sites Not Used in Diverted Tons per Employee per Year Calculations

Business Type	Industry Group	Outlying Material Diverted	Pounds/ Employee/ Year
Lumber yard	Durable Wholesale Goods Distributors, Large	Remainder/ Composite Organics (sawdust)	7,800
Tire Distributor	Durable Wholesale Goods Distributors, Small	Tires	39,375
Stone and marble tables/counters	Durable Wholesale Goods Distributors, Small	Remainder/ Composite Construction & Demolition	76,267

Table 18, continued: Sites Not Used in Diverted Tons per Employee per Year Calculations

Business Type	Industry Group	Outlying Material Diverted	Pounds/ Employee/ Year
Manufacture/ distribute plastic lab supplies	Non-Durable Wholesale Goods Distributors, Large	Remainder/ Composite Plastic	35,739
Snacks manufacturer	Non-Durable Wholesale Goods Distributors, Medium	Plastic Film	25,430
Lumber supplies	BMG, Other Stores	Lumber & Treated Wood Waste	73,431
Carpet Sales	BMG, Other Stores	Carpet	22,895
Carpet Sales	BMG, Other Stores	Carpet	1,418
Bulk warehouse	Retail, Big-Box Stores	Food	13,299
Flea market	Public Venues and Events	Other Ferrous Metal	14.14 pounds per 100 visitors
Fair grounds	Public Venues and Events	Other Ferrous Metal	0.589 pounds per 100 visitors

Quantifying Disposed Waste

To calculate the waste composition estimates for each industry group, researchers first needed to calculate an annual tonnage per employee by industry group. For this calculation, the researchers obtained disposal volumes or weights from all sites. The volume data were converted into weights using information gathered during sampling. Below is a description of the process used for collecting necessary data and performing the calculations.

Data Collection Approach and Methods

During the site visit the team member also recorded measurements of the dimensions of the dumpsters and their contents in order to quantify waste disposal. Generally, site visits were scheduled to occur shortly before a scheduled hauler pick-up, in order to get a more accurate measurement for estimating the waste disposal rate. Estimating disposal based on measurements that reflect a small part of the waste generation cycle is less reliable than estimating based on measuring accumulation near the end of a complete waste generation cycle. For example, the rate of waste disposal is better understood when the waste is measured at the end of several days of accumulation, as opposed to being measured during the first hours of accumulation. For each disposal substream, the team member determined and recorded the information described below. Field forms used to collect this data are shown in Appendix D.

- The dimensions of disposed waste in each dumpster or waste container.
- The days and hours during which material in the stream is generated, and the day and time of the most recent trash pickup.
- Where compactors are used, records revealing the amount of waste disposed over a representative time period.

During recruitment, team members described each distinct substream of disposed waste associated with the generator. A stream of disposed waste has the following characteristics:

1. The cycles during which the material is taken to each waste container are similar, and the cycles of waste collection from each container by the hauler are all similar, such that the entire stream can be quantified together.
2. Every cubic yard of waste generated as part of the stream will have an equal chance of being included in a randomly chosen sample of waste.
3. Regardless of which container is used to provide a waste sample, waste from all sources (departments, divisions, operations, etc.) at the generator site has a chance of being represented in that sample.

If any of the conditions described above were not met, then it was likely that more than one stream of disposed waste existed at the site. In such cases, recruiters collected information and data for each stream separately.

For each stream, recruiters collected the information described below. The information was recorded on the designated form in the shared database.

- The number, location, and description of each waste container (can, dumpster, box, compactor, pile, etc.) that receives material from the stream.
- The days and hours during which material in the stream is generated – for example, the days and hours that the site is open and operating and is generating waste.
- The days and times that material is taken from the worksite to each container.
- The days and times that each container is emptied or collected by the waste hauler.

Based on the information that was gathered by the recruiters, a specific approach was developed for quantifying the disposed material that was associated with each container.

- Usually, the approach provided for explicit measurement of the dimensions of the material that had accumulated in the container, in a manner sufficient for later calculation of the volume of material, and a measurement of the time during which material had accumulated in the container. The approach identified the appropriate time window(s) during which representative measurements could be made of material accumulation. In cases where waste is compacted, recruiters tried to determine the weight of material disposed over a time period, rather than the volume of material. The above information was inputted to a form in the shared database.
- In cases where records of the amounts of material collected by the hauler were expected to provide more accurate quantification of the stream than direct measurement, quantity data from records were used instead. This information was inputted into the shared database.

Shortly after completing the initial site visit, the team member reviewed the notes, and if necessary, they contacted the facility personnel to resolve any questions or inconsistent information.

Scheduling Data Collection Visits

Days and times for each type of visit were scheduled with each generator through one or more follow-up phone calls. Several factors were considered when timing visits: waste collection schedules, when the business takes the waste to the container(s), the hours of waste generation at the business, and the times when the container was accessible. It was important to schedule the

visit after an adequate time had passed since the last waste collection, but not so close to the next collection as to risk arriving just after a pick-up.

The following examples illustrate the considerations that go into timing an audit visit that involves measuring the amount of disposed waste in dumpsters. Separate considerations were given to each stream of disposed waste at each generator site.

SCENARIO 1:

Trash taken to dumpster:	Continuously, 6am – 5pm
Trash pick-up schedule:	Monday, Wednesday, Friday at 6am
Hours the dumpster is accessible:	8am to 5pm

In this scenario, the recruiter would conclude that the appropriate window for measurement is Tuesday or Thursday late afternoon, between 3pm and 5pm.

SCENARIO 2:

Trash taken to dumpster:	Every night at 10pm
Trash pick-up schedule:	Monday, Wednesday, Friday at 6am
Hours the dumpster is accessible:	8am to 5pm

In this scenario, the recruiter would attempt to have the business take their trash out earlier on the day in question, and assign the observed amount of trash to the number of hours that the business had been in operation on that day.

SCENARIO 3:

Trash taken to dumpster:	5pm every day
Trash pick-up schedule:	Every Wednesday morning
Hours the dumpster is accessible:	8am to 5pm

In this scenario, it would be acceptable to record the amount of waste in the dumpster on Sunday, Monday, or Tuesday while noting whether the measurement included waste taken to the dumpster on the measurement day or not.

SCENARIO 4:

Trash taken to dumpster:	Continuously, 6am – 11pm
Trash pick-up schedule:	Every day at 10am <u>and</u> 4pm
Hours the dumpster is accessible:	8am – 11pm

In this scenario, it would be necessary to take the waste disposal measurements shortly before one of the two pick-ups on any given day.

CALCULATION METHODS TO QUANTIFY DISPOSED WASTE

Annual disposed waste tonnage for each industry group was estimated based on actual measurement of the amount of waste at a selected site shortly before the regular pick-up by the hauler. The procedure for measuring waste and calculating disposal per employee for a typical

site in each industry group is described below. Figure O following the explanation provides a graphical illustration of this process.

1. **Disposed Waste Volume Measurements**: Researchers were sent out before sampling to get measurements and determine the characteristics of the disposed waste stream for the sampling crew. During this first site visit, measurements were recorded for all disposed waste in dumpsters or bins at each site for each identified disposed waste substream. Measurements included length, width, and height to the nearest inch. The *volume of the disposed waste* was calculated, in cubic inches, as the sum of all volumes for each waste container for each substream.

2. **Disposed Waste Accumulation Time**: During the initial site visit, researchers asked the responsible party at the site for the business operating hours, the time the waste containers were last collected by the hauler (or regular collection schedule), and when trash is regularly taken out to containers to determine accumulation time. This information was used to calculate (1) the hours of accumulation for the observed disposed waste volume and (2) the total hours of disposed waste accumulation time per year. These two numbers were used to calculate the *percent of the annual waste generation* that was observed during the measurement.

3. **Annual Disposed Waste Volume**: The *volume of the disposed waste* was divided by the *percent of the annual waste generation* during the observed period to determine the *annual disposed waste volume*. This was calculated in cubic yards per year for each site.

   To confirm the accuracy of the measurements, the calculated *annual disposed waste volume* was compared to a volume estimate based on the regular hauler collection schedule. When the *annual disposed waste volume* based on research measurements was more than 150 percent of the volume based on the hauler's collection schedule, the estimate based on measurements were replaced with the estimated volume based on the hauler collection schedule.

4. **Reported Disposed Waste Tons**: When a site used a compactor for its disposed waste, researchers determined the annual tonnage at a site by (1) asking the person responsible for the data at the site or (2) using hauler records. Tonnage data was obtained in tons per time period. Some sites were able to provide tonnage data for dumpsters or roll-off containers. In these cases the tonnage data was used instead of the volume estimates.

5. **Volume of Sample**: The volume of a sample was measured in one of three ways:

   a) Measurements of waste in the dumpster were taken before and after removing waste for a sample to calculate volume of removed waste.

   b) When accessing the container was not possible, as was the case with compactors, volume measurements were recorded in gallons based on the amount of material that was deposited in the containers that were used to transport the disposed waste sample from the site to the sorting facility (see description of using rolling containers to collect samples below).

   c) If neither of the methods described above could be used, the researchers would measure the volume of the sample after it was dumped on the sorting floor.

   All *sample volume* measurements were converted into cubic yards. Samples and *sample volume* measurements were taken for all identified disposed waste substreams at a given site.

6. **Weight of Sample**: The *sample weight* was calculated as the sum of all the sorted components.

7. **Average Density of Disposed Waste**: The *average disposed waste density* was calculated for each industry group by dividing the sum of all *sample weights* for a given industry group by the sum of all *sample volumes* for that industry group. See Table 19 for waste densities used for each industry group.

$$\text{Average Density}_g = \frac{\sum_i w_{i,g}}{\sum_i v_{i,g}}$$

where:

g represents a given industry group

i denotes each individual sample

$w_{i,g}$ represents the weight of sample i in industry group g

$v_{i,g}$ represents the volume of sample i in industry group g

Table 19: Waste Densities, by Industry Group

Industry Group	Average Pounds per Cubic Yard
Full-Service Restaurants	132
Fast-Food Restaurants	100
Food Stores	94
Durable Goods Wholesale Distributors	92
Non-Durable Goods Wholesale Distributors	73
Large Hotel	82
Building Material & Garden, Big Box Stores	93
Building Material & Garden, Other Stores	93
Retail, Big Box Stores	67
Retail, Other Stores	67
Shopping Malls	76
Anchor Stores at Shopping Malls	41
Public Venues & Events	138
Large Office Buildings	84

8. **Annual Waste Disposal Rate per Site**: The *average disposed waste density* for each industry group was used to convert *annual disposed waste volume* measurements for each site into annual tons. Also, at this stage, all *disposed waste tonnage* figures were converted into annual disposed waste tons. Together these two figures generated a common unit of measurement of tons per year for the *annual waste disposal rate* at each site.

For sites with multiple disposed waste substreams, each substream was measured separately, then added together to calculate a total *annual waste disposal rate* for each site.

Sites within each industry group were reviewed to find possible data errors or outliers. Data collected for businesses that were extreme outliers was confirmed. If data was determined inaccurate, the specific site was not used in the tons per employee per year (TPEPY) calculation (described below) for their industry group. The sites that were not used are listed below in Table 20. Numbers with an asterisk (*) by them are based on square footage instead of number of employees.

Table 20: Individual Sites Excluded from Disposed Tons per Employee per Year (TPEPY) Calculations

Business Type	Industry Group	TPEPY	Reason Excluded
Grocery Store	Food Stores	20.80	Disposed tonnage appears too high and FTE too low, business wouldn't provide accurate info
Grocery Store	Food Stores	8.67	High disposed tonnage
Pallet Supplier	Durable Wholesale Distributors, Small	8.08	Very low FTE
Food Distributors	Non-Durable Wholesale Distributors, Small	37.14	Very low FTE
Wholesale Fruit and Produce	Non-Durable Wholesale Distributors, Medium	6.14	High disposed tonnage
Hotel	Large Hotels	8.57	Volume measurements inaccurate
Lumber Supplies	BMG, Other Stores	11.02	High disposed volume estimate
Door Distributor	BMG, Other Stores	17.33	High disposed tonnage
Office Building	Large Office Buildings	12.17*	High disposed tonnage
Office Building	Large Office Buildings	18.14*	High disposed tonnage
Office Building	Large Office Buildings	14.74*	High disposed tonnage
Office Building	Large Office Buildings	23.77*	High disposed tonnage
Department Store	Anchor Stores	29.71*	Disposed tonnage appears too high, business wouldn't provide accurate info
Department Store	Anchor Stores	16.86*	Disposed tonnage appears too high, business wouldn't provide accurate info

* expressed in pounds per square foot, not per employee

9. **Tons per Employee per Year**: Information was gathered from each site regarding the number of employees, expressed as Full Time Equivalents (FTEs). The annual waste disposal rate for each site was divided by the FTE figure for that site to calculate a *tons per employee per year* (TPEPY) figure for each site. The average of all individual sites was used to generate the TPEPY for that industry group. The TPEPY figures that were obtained for each industry group are listed in Table 21.

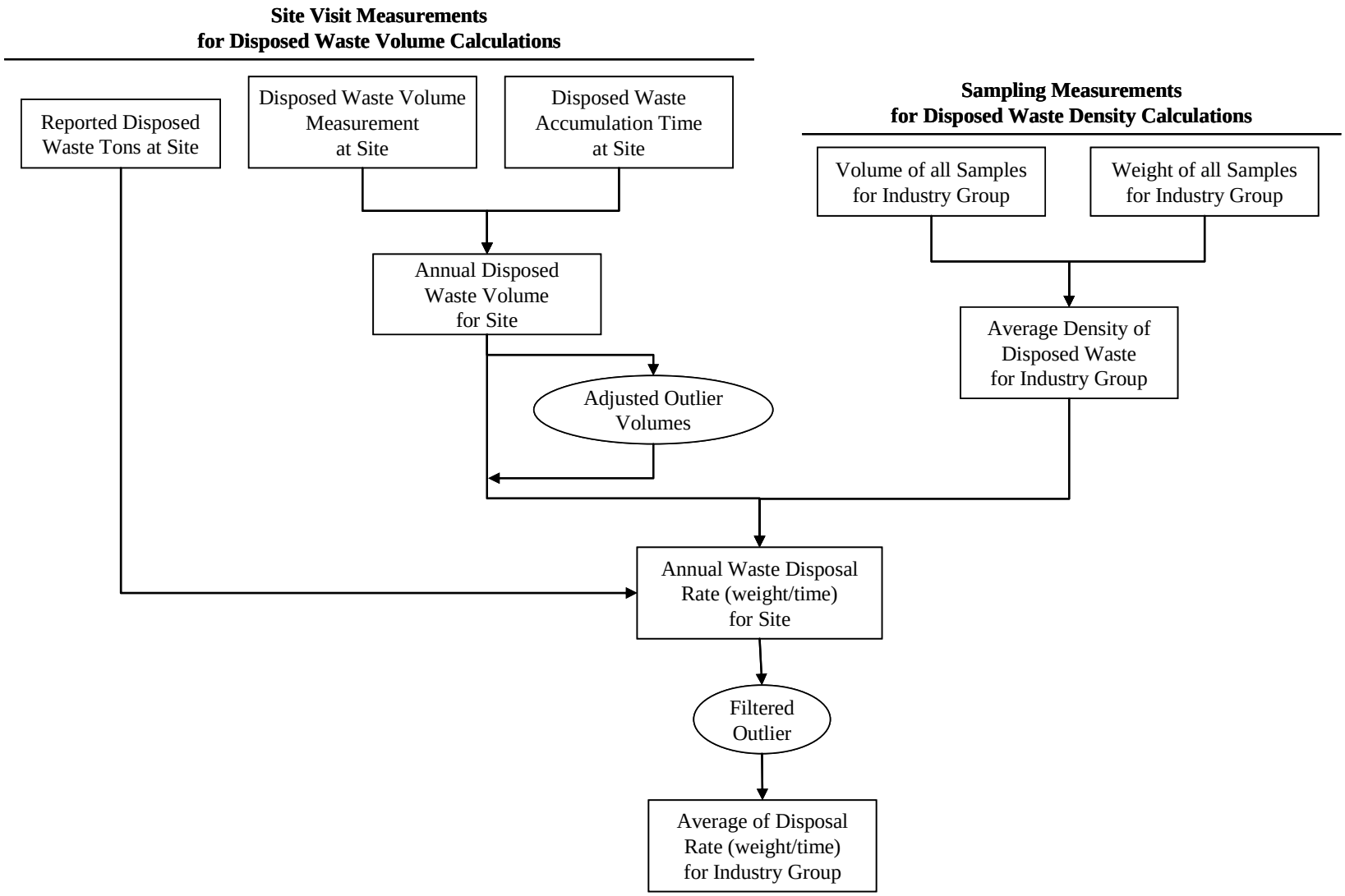
   TPEPY was used for the majority of the sites, although for some sites it was more appropriate to use calculations based on material disposed or diverted per thousand square feet of building space. For public venues, calculations were on a per-visitor basis. As an additional exercise, disposal was correlated with numbers of seats for restaurants and numbers of rooms for hotels.

Table 21: Annual Tons Disposed, by Industry Group

	Annual Tons per Employee		Annual Tons per Seat		Annual Tons per Room		Annual Pounds per Sq. Ft.		Annual Pounds per Visitor	
	Mean	StDv	Mean	StDv	Mean	StDv	Mean	StDv	Mean	StDv
Fast Food Restaurants	2.13	1.24	0.99	0.83						
Full Service Restaurants	2.20	1.47	0.41	0.33						
Food Stores	2.38	1.69								
Durable Wholesale Goods Distributors	1.23	1.24								
Non-Durable Wholesale Goods Distributors	1.43	1.22								
Large Hotels	1.95	1.55			0.92	0.95				
Building Material & Garden, Big Box Stores	3.17	1.74								
Building Material & Garden, Other Stores	1.74	1.34								
Retail, Big Box Stores	1.43	1.00								
Retail, Other Stores	0.86	0.59								
Shopping Malls							2.03	1.31		
Anchor Stores at Shopping Malls *							2.10	1.09		
Public Venues & Events									1.72	2.58
Large Office Buildings							1.87	1.56		

*Based on only 4 samples. See Table 1 for sample numbers for each industry group.

Figure O: Quantifying Waste Process



Characterizing Disposed Waste

Samples of disposed waste were obtained from the waste containers (usually dumpsters or compactors) at sites belonging to each targeted industry group. This section describes the process of obtaining and characterizing samples of disposed waste, as well as the calculation methods that were used to estimate average composition of disposed waste for each industry group.

Obtaining Samples of Disposed Waste

During the recruitment process, the recruiter and other members of the research team used note fields in the shared project database to plan and document all steps necessary for the waste sampling/sorting crew to visit the generator site and obtain one or more representative samples of disposed waste. The notes addressed all logistical steps required by the sampling crew, specifying when and where the crew was to obtain each sample, how the crew was to overcome any barriers to sampling (e.g., locked gates, closed facilities, locked dumpsters, enclosed compactors, etc.), permissible time windows during which it was possible for the crew to obtain a representative sample, and contact information for a person on-site who could assist with waste sampling.

Many of these details were identical to the considerations used when planning the measurement visits. In some cases though, where the trash was inaccessible, unique arrangements were required for the sample collection visit to proceed. For example, if the generator site used a compactor, the recruiter generally arranged with the business for the waste to be deposited in a set of rolling containers which the research team supplied for one or more days. The material that accumulated in the rolling containers was then taken as the waste sample.

Identifying Appropriate Times to Obtain Samples of Disposed Waste

For each data collection season, a weekly schedule was constructed for all sampling visits.

Approximate day and time windows for sampling visits were identified for each business through one or more follow-up phone calls. Several factors were considered when choosing possible times for visits: waste collection schedules, when the business takes the waste to the container(s), the hours of waste generation at the business, and the times when the container was accessible. It was important to perform the visit after an adequate time had passed since the last waste collection, but not so close to the next collection as to risk arriving just after a pick-up.

The following examples illustrate the considerations that go into timing a sampling visit that involves capturing a sample of disposed waste. Separate considerations were given to each stream of disposed waste at each generator site.

Scenario 1:

Trash taken to dumpster:	Continuously, 6am – 5pm
Trash pick-up schedule:	Monday, Wednesday, Friday at 6am
Hours the dumpster is accessible:	8am to 5pm

In this scenario, the sampling team would conclude that the appropriate window for sampling is Tuesday or Thursday late afternoon, between 3pm and 5pm.

SCENARIO 2:

Trash taken to dumpster:	Every night at 10pm
Trash pick-up schedule:	Monday, Wednesday, Friday at 6am
Hours the dumpster is accessible:	8am to 5pm

In this scenario, the sampling team would have to make arrangements for one of the following:

- have the business take their trash out earlier on the day in question
- have the business make special arrangements to allow the sampling team to visit and take their sample sometime between 10pm and 6am.

SCENARIO 3:

Trash taken to dumpster:	5pm every day
Trash pick-up schedule:	Every Wednesday morning
Hours the dumpster is accessible:	8am to 5pm

In this scenario, it would be acceptable to collect a waste sample on Sunday, Monday, or Tuesday.

SCENARIO 4:

Trash taken to dumpster:	Continuously, 6am – 11pm
Trash pick-up schedule:	Every day at 10am <u>and</u> 4pm
Hours the dumpster is accessible:	8am – 11pm

In this scenario, it would be necessary to take the waste sample shortly before one of the two pick-ups on any given day.

PERFORMING SITE VISITS TO OBTAIN SAMPLES OF DISPOSED WASTE

At most participating sites, a single, randomly chosen waste container was selected to provide the refuse for the sample associated with each waste stream. In cases where there were two or more distinct waste substreams at a site, multiple samples were taken.

Samples were removed from dumpsters so that a vertical cross section, or “slice”, was taken that included waste from the top to the bottom of the container. When possible, the sampling crew obtained samples that were either 200 pounds or 1.5 cubic yards.

Each waste sample was segregated, labeled, and transported to a designated solid waste facility for hand sorting into the required material categories. A photograph of each sample was taken prior to sorting.

ESTIMATE OF WASTE VOLUME THAT WAS TAKEN

In most cases, the volume of the sampled material was measured indirectly. First, the sampling team measured the amount of material in the dumpster that produced the sample, recording the three dimensions of the material (length, width, height) in inches. Then, after the sample was removed, the team repeated the measurements. The difference between the two calculated

volumes represented the *sample volume*. This approach was done in order to produce the best estimate of the volume of "undisturbed" waste as it exists in a dumpster.

In cases where it was unsafe or the sampling team was unable to take measurements of trash inside their original containers, other volume measurements were taken by either (1) recording the volume of the sample in gallons, based on the size of the rolling containers that were used to transport the sample to the sorting facility, or (2) by measuring the dimensions of the sample after it was tipped onto the sorting floor.

CONTINGENCY PLANS

If a waste sample could not be obtained from the designated generator site for any reason (e.g. because the management of the business refused to cooperate, or because of scheduling conflicts), an alternate generator site belonging to the same industry group was visited. In most cases, this was accomplished by having "back-up" sites recruited and ready before the sampling visits occurred. However, in some cases, this required recruiting a new site and including it in the sampling schedule on a subsequent day.

SORTING SAMPLES OF DISPOSED WASTE

The sampling crew included four experienced waste sorters and a manager. Prior to the start of sampling, the crew familiarized themselves with the material list and definitions. At the sorting site, the sorting crew placed the sample on a tarp and sorted the material by hand into the prescribed 74 material categories. Plastic laundry baskets were used to contain the separated components. The sorting crew members typically specialized in groups of materials, such as papers or plastics, and sort from the baskets containing their specialty.

The manager of the sorting crew monitored the homogeneity of the component baskets as they accumulated, rejecting materials that were improperly classified. Open laundry baskets allowed the manager to see the material at all times. The manager also verified the purity of each component as it was weighed, before recording the weight into the database or on field sheets. The materials were sorted to the greatest reasonable level of detail by hand, until no more than a small amount of homogeneous fine material (“mixed residue”) remained. The overall goal was to sort each sample directly into component categories in order to reduce the amount of indistinguishable fines.

The manager of the sorting crew recorded composition weights on paper forms, examples of which are presented in Appendix D. Copies were made of the forms produced on each sorting day, and the originals were shipped to the office for entry into a database. Random spot checks were conducted to ensure the accuracy of the data entry process.

Before fieldwork began, all members of the field crew participated in training that identified and discussed all of the unique hazards, emergency procedures, and operational restrictions that existed at the particular site.

Calculating the Composition of Disposed Waste

This section describes the general calculation approach that was used when producing the following:

- estimated composition of disposed waste, on a mean percentage basis
- estimated composition of disposed waste, on a weighted average percentage basis

Details of the calculation method may vary slightly among the industry groups studied, since there will inevitably be irregularities and unexpected situations reflected in the data.

MEAN PERCENT ESTIMATES

For a given industry group, the composition estimate denoted by r_j represents the ratio of the material's weight to the total weight of all the samples in the stratum. It is derived by summing each material's weight across all of the selected samples belonging to a given industry group and dividing by the sum of the total weight of waste for all of the samples from that industry group, as shown in the following equation:

$$r_j = \frac{\sum_i c_{ij}}{\sum_i w_i}$$

where:

c = weight of particular material

w = sum of all material weights

for i = 1 to n, where n = number of selected samples

for j = 1 to m, where m = number of materials

The confidence interval for this estimate will be derived in two steps. First, the variance around the estimate will be calculated, accounting for the fact that the ratio included two random variables (the material and total sample weights). The variance of the ratio estimator equation follows:

$$\mathrm{Var}(r_j) \approx \left(\frac{1}{n}\right)\left(\frac{1}{\overline{w}^2}\right)\left(\frac{\sum_i \left(c_{ij} - r_j w_i\right)^2}{n-1}\right)^*$$

where:

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

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* For more information regarding the variance calculation, please refer to William G. Cochran, *Sampling Techniques, 3rd Edition*, John Wiley & Sons, Inc., Indianapolis, Indiana, 1977.

Second, precision levels at the 90 percent confidence level will be calculated for a material's mean as follows:

$$r_j \pm \left(z\sqrt{\mathrm{Var}(r_j)}\right)$$

where z = the value of the z-statistic (1.645) corresponding to a 90 percent confidence level

WEIGHTED AVERAGES

For certain industry groups, data were gathered from sub-groups defined by the size of the businesses. (These groups and subgroups are described in Table 22 in Appendix B.) The disposal characterization data for the subgroups were combined for the subgroups in a weighted fashion, described below.

For an industry group that was made up of smaller size sub-groups, the mean percent estimate for a material reflected a weighted average of the percent estimates for the size subgroups. The estimated numbers of employees in the State of California corresponding to each size subgroup were used as relative weighting factors.

In the equation below, O_j represents the mean percent estimate for material j in the waste disposed by an industry group that is made up of multiple size subgroups, which are numbered 1, 2, 3, etc.. The relative weighting factors for each size subgroup, expressed as percentages of the entire employee population for the industry group statewide, are represented by the variables p_1, p_2, p_3, etc. The mean estimate of the percent of the disposed waste stream corresponding to the material j for each size subgroup is represented by the variables r_{j1}, r_{j2}, r_{j3}, etc.

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

where:

p = the proportion of employees contributed by the noted size groups

r = ratio of material weight to total waste weight in the noted size groups

for j = 1 to m, where m = number of materials

For example, business locations belonging to a particular industry group might be identified as having two size categories, with the "small" locations corresponding to 100,000 employees in the region, and the "large" locations including 150,000 employees. From the waste sampling data, the percentage of cardboard in the disposed waste may be different for the two size categories – 6 percent at the small locations and 2 percent at the large locations. The weighted combination of the composition findings would be performed as follows:

Proportion of employees from small establishments:

$$p_{\text{small}} = \frac{100{,}000}{100{,}000 + 150{,}000} = 0.4$$

Proportion of employees from large establishments:

$$p_{\text{large}} = \frac{150{,}000}{100{,}000 + 150{,}000} = 0.6$$

Overall percentage calculation for cardboard at both types of establishments:

$$O_{\text{cardboard}} = (0.4 \times 6\%) + (0.6 \times 2\%) = 3.6\%$$

The variance of the weighted average is calculated:

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

where:

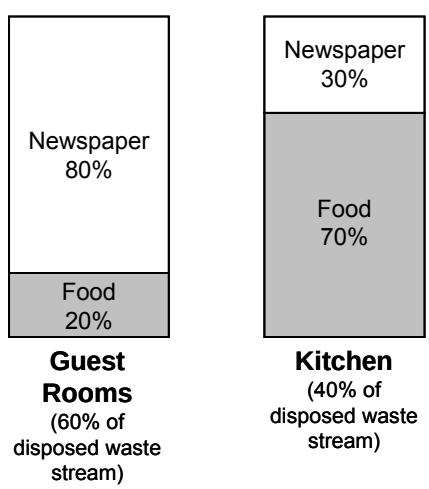
$\hat{V}_{r_j}$ = the variance of the composition estimate for the material in the indicated size group

Addressing Sites with More than One Disposed Waste Stream

For sites that provided more than one sample of disposed waste, data from the multiple samples were combined using a weighted calculation process to create a composite sample that reflected the composition of all streams of disposed waste at the site. The example below indicates how this was done.

For a hypothetical hotel with two disposed waste substreams, the first one is the guest rooms waste representing 60 percent of all of the hotel's disposed waste, and the second substream is the kitchen waste substream representing the other 40 percent of waste disposed at the hotel. Assuming there are only two types of disposed materials at this hotel an illustration of the waste materials for each substream is below.

Figure P: Example Scenario for Addressing Sites with Multiple Waste Streams



To form the composite sample that reflects the waste stream for the hotel as a whole, the material portions of each sample were multiplied by the portion of the corresponding annual disposed waste stream. In our example, the food portion of the waste from guest rooms is 20 percent, and the guest rooms contribute 60 percent of the hotel's entire disposed waste stream. Thus, the food from guest rooms represents 20% x 60%, or 12% of the hotel's entire disposed waste stream. Similarly, the food from the kitchen represents 70% x 40%, or 28% of the hotel's entire disposed waste stream. Together, the food from guest rooms and kitchen comprise 12% + 28%, or 40% of the hotel's disposed waste stream. A similar set of calculations was done for all other materials measured in a disposal sample. In our example, the only other material, newspaper, represents 60 percent of the entire hotel's disposed waste stream.

The resulting sets of material composition percentages were used to construct a "composite sample" for the entire hotel. In order to keep the composite sample in proportion to other samples in the data set, the constructed sample was "scaled" to represent a total sample weight similar to the weights of other samples that were obtained from other sites during the study. Specifically, the total weight of the materials in the composite sample was set to equal the average weight of the actual waste samples that were obtained and sorted from the specific site.

In the hotel example, if the actual guest room waste sample weighed 250 pounds, and the actual kitchen waste sample weighed 230 pounds, then the material weights in the calculated composite sample would total the average of those two figures, or 240 pounds. This average weight is then multiplied by the composite sample material percentages to calculate a new set of sample weights for the composition analysis (described above). The material weight for food in the composite sample is 40 percent of 240 pounds, or 96 pounds. The material weight for newspaper in the composite sample is 60% x 240 pounds, or 144 pounds.

Calculating Waste Generation

Total waste generation was calculated for each industry group using the total pounds per employee per year figures for diversion and disposal of each composition material for each industry group (pounds per thousand square foot or pounds per hundred visitors where applicable). The total waste generation for each material type and by industry group overall was calculated by adding these two figures together.

To calculate the estimated material percents of total waste generation, the pounds per employee per year figure for a specific material type was divided by the total pounds per employee per year for that industry group (pounds per thousand square foot or pounds per hundred visitors where applicable).

For example, for Fast Food Restaurants, the average cardboard disposal was calculated to be 4.6 percent of 4,262 pounds per employee per year, or approximately 196 pounds of cardboard per employee per year. Similarly, the average cardboard diversion for this industry group was calculated to be 1,743 pounds per employee per year. Adding the disposed and diverted cardboard figures together produces a calculated average of 1,939 pounds of cardboard generated per employee per year. A similar process was used for all other materials, resulting in estimates of the amount of each material generated, as well as a summed estimate of the total amount of all waste generation (disposal plus diversion). The generation figure for cardboard, 1,939 pounds per employee per year, was divided by the total generation figure for Fast Food Restaurants, 6,528 pounds per employee per year, to produce the estimate that cardboard represents 29.7 percent of all generated waste for this industry group.

Quality Control Procedures

Verification procedures were built into the processes for gathering and recording data during each phase of the study. These processes were discussed with each team member responsible for collecting or entering data, to ensure that data were managed consistently throughout the study.

Obtaining Information from Generator Sites

Initially, a set of candidate business sites was obtained from the vendor. The list was screened to ensure that the dataset was drawn from the correct geographical areas and included commercial sites from the correct industry groups. Information about the commercial sites was then placed in the database that was to be shared among the researchers online.

As the recruitment of participants proceeded, the numbers of recruits in each industry group and size group was checked periodically to ensure that the study was adhering to the numbers of sites and allocation of samples specified in the study design. In addition, Cascadia staff reviewed the information that was gathered from each recruited site to ensure that all necessary data had been collected to permit ready access to the waste for sampling and to permit extrapolation of quantities of disposed and diverted materials. If all the required information was not present in a record for a generator site, the responsible member of the research team was contacted and asked to obtain, correct or verify the data.

After each generator site was visited for the purpose of quantifying disposed waste and quantifying and characterizing diverted materials, the lead consultant checked several aspects of the data for consistency. Among these verification steps were:

- ensuring that the reported number of days per week that had been identified as waste pick-up days matched the actual pick-up schedule that had been provided by the generator site;
- clarifying take-out times and pick-up times for disposed waste;
- ensuring that the written notes about the generator site confirmed the recorded number of waste streams and waste containers;
- verifying that the correct contact person was documented for the purpose of the sampling visit (the next step with each generator site);

In addition, prior to each disposal sampling visit, the lead consultant contacted the generator site to verify the site's hours of operation, waste collection schedule, and access procedures.

During the characterization of disposed waste samples, material weights obtained during the sorting process were recorded on paper forms in the field. Each weight was read at the scales by the person doing the weighing, and the value was read back aloud by the person recording the weight.

All data reflecting the contact information, logistical details, and measurements associated with a particular generator site were recorded and kept in the recruitment database that was shared online among team members. The record for each generator site included a unique identifying number, which was used throughout the study for tracking and quality control purposes. Likewise, the data from all sampling visits, including the data that resulted from characterizing waste samples, was entered into a customized database and was linked to the relevant generator sites using the same unique identifying numbers.

Appendix B:
Definitions of Industry Groups

Restaurants

A list of restaurants that were candidates for inclusion in the study was found by determining all eligible businesses that belong to SIC 58. This industry group was divided into two subgroups:

Full-Service

This group included retail establishments selling prepared foods and drinks for consumption on the premises. The customer generally orders and is served at the table.

Fast Food

This group includes retail establishments selling prepared foods and drinks for consumption on the premises or to be taken away; and also lunch counters and refreshment stands selling prepared foods and drinks for immediate consumption. Generally, customers order and pick up food at the counter.

Food Stores

A list of food stores that are candidates for inclusion in the study was found by determining all eligible businesses that belong to SIC 54. This group includes retail stores primarily engaged in selling food for home preparation and consumption. Food stores that have approximately 15 full-time employees or more are eligible to participate.

Durable Wholesale Distributors

A list of durable goods wholesalers that are candidates for inclusion in the study was found by determining all eligible businesses that belong to SIC 50. This group includes establishments primarily engaged in the wholesale distribution of durable goods and do not serve customers on a walk-in basis. Examples of durable goods include equipment, appliances, and furniture.

Non-Durable Wholesale Distributors

A list of non-durable goods wholesalers that are candidates for inclusion in the study was found by determining all eligible businesses that belong to SIC 51. This group includes establishments primarily engaged in the wholesale distribution of non-durable goods and do not serve customers on a walk-in basis. Examples of non-durable goods include paper, candles, food, and paint.

Large Hotels

A list of hotels that are candidates for inclusion in the study was found by determining all eligible businesses that belong to SIC 70. This group includes commercial establishments engaged in furnishing lodging and possibly meals. Hotels with approximately 30 full-time employees or more are eligible to participate.

Building Material and Garden

This major group includes retail establishments primarily engaged in selling lumber and other building materials; paint, glass, and wallpaper; hardware; nursery stock; lawn and garden supplies. It includes lumber and other building materials dealers selling to the general public, even if sales to construction contractors account for a larger proportion of total sales. Stores with approximately 15 full-time employees or more are eligible to participate. A list of stores that are candidates for inclusion in this group was found by determining all eligible businesses that belong to SIC 52. This industry group was divided into two subgroups:

Big Box Stores

This category generally includes Lowe’s, Home Depot, Dixieline Lumber, Orchard Supply Hardware, and other large chain stores.

OTHER STORES

Building material and garden stores other than above selected name brand stores (i.e., they are not large chain stores).

RETAIL

This group includes retail stores primarily engaged in selling apparel and accessories, home furnishings, and other miscellaneous products other than building material and garden products. These stores are not located in a mall. Stores with approximately 20 full-time employees or more are eligible to participate. A list of stores that are candidates for inclusion in this group were found by determining all eligible businesses that belong to SIC categories 53, 56, 57, and 59. This industry group was divided into two subgroups:

BIG BOX STORES

Includes Big Lots, Costco, Factory 2-U, Fry's Electronics, Good Guys, Kmart, Office Depot, Office Max, Sam's Club, Staples, Target, Wal-Mart.

OTHER STORES

Retail stores other than above selected name brand stores.

SHOPPING MALLS

A group of retail and other commercial establishments that are planned, developed, owned, and managed as a single property. On-site parking is provided. Malls typically are enclosed, with a climate-controlled walkway between two facing strips of stores. Malls recruited for this study generally will have at least 200,000 square feet of retail space. A mall may include one or more anchor stores, food courts, retail stores, restaurants, grounds and parking lots, and entertainment services, such as bowling alleys or movie theaters. This industry group was divided into two sections:

ANCHOR STORES

Usually large department stores, such as J C Penny, Macy’s, Robinsons-May, Mervyn’s.

OTHER PARTS OF MALL

Includes all parts of the mall other than the anchor store(s).

PUBLIC VENUES AND EVENTS

This group includes convention centers, stadiums, theme parks, performing arts centers, movie theaters, fairgrounds, special event sites (parade, marathon/sporting event, civic event, or festival), and miscellaneous venues (zoos, museums, race tracks, or golf tournaments). Sites were generally chosen that met the criteria of a large venue or event described in California statute (Public Resources Code, Section 42648).

LARGE OFFICE BUILDINGS

Office buildings that may also contain retail space or restaurants. For inclusion in this category, the lower limit for square feet of occupied office space is 30,000 sq ft.

SIZE SUBGROUPS

The data in Table 22 was used to calculate weighted composition results for the industry groups listed below. See Appendix A for calculation methods.

Table 22: California Employment Data for Restaurants and Wholesale Distributors, 2004

	Size Group	Employment Range	Percent of Employees per Size Group in CA	Number of Employees per Size Group in CA
Full Service Restaurants				
	Large	≥ 20	73%	302,113
	Small	< 20	27%	111,882
Fast Food Restaurants				
	Large	≥20	73%	389,150
	Small	<20	27%	144,114
Durable Wholesale Distributors				
	Large	≥100	27%	91,004
	Medium	20-99	40%	133,468
	Small	<20	33%	109,192
Non-Durable Wholesale Distributors				
	Large	≥100	34%	79,048
	Medium	20-99	38%	87,983
	Small	<20	29%	67,538

Source: California Employment Development Department, 2004 figures

Appendix C:
List and Definitions of Material Types

Classification of Disposed Waste according to 74 Material Types

California's standard list of material types contains 67 categories, as defined in the 2004 Statewide Study. This list was modified somewhat to capture data on specific categories for this study only. All the modified types can be re-combined to be consistent with the 67 standard types.

List of Material Types

Material ID #	Material Type Name
	PAPER
1	Uncoated Corrugated Cardboard
2	Paper Bags/Kraft
3	Newspaper
4	White Ledger
5	Colored Ledger
6	Computer Paper
7	Other Office Paper
8	Magazines and Catalogs
9	Phone Books and Directories
10	Other Miscellaneous Paper
11	Remainder/ Composite Paper
	GLASS
12	Clear Glass Bottles and Containers
13	Green Glass Bottles and Containers
14	Brown Glass Bottles and Containers
15	Other Colored Glass Bottles and Containers
16	Flat Glass
17	Remainder/ Composite Glass
	METAL
18	Tin/Steel Cans
19	Major Appliances
20	Used Oil Filters
21	Other Ferrous
22	Aluminum Cans
23	Other Non-Ferrous
24	Remainder/ Composite Metal
	ELECTRONICS
25	Brown Goods
26	Computer-related Electronics
27	Other Small Consumer Electronics
28	Televisions and Other Items with CRTs

Material ID #	Material Type Name
	PLASTIC
29	PETE Bottles
30	Other PETE Containers
31	HDPE Natural Bottles
32	HDPE Colored Bottles
33	HDPE 5-gallon Buckets — food
34	HDPE 5-gallon Buckets — non-food
35	Other HDPE Containers
36	#3–#7 Bottles
37	#3–#7 Other Containers
38	Plastic Trash Bags
39	Plastic Grocery and Other Merchandise Bags
40	Non-Bag Commercial and Industrial Packaging Film
41	Film Products
42	Other Film
43	Durable Plastic Items
44	Remainder/ Composite Plastic
	ORGANICS
45	Food
46	Leaves and Grass
47	Prunings and Trimmings
48	Branches and Stumps
49	Agricultural Crop Residues
50	Manures
51	Textiles
52	Carpet
53	Remainder/ Composite Organics
	CONSTRUCTION & DEMOLITION
54	Concrete
55	Asphalt Paving
56	Asphalt Roofing
57	Lumber
58	Treated Wood Waste
59	Gypsum Board
60	Rock, Soil, and Fines
61	Remainder/ Composite Construction and Demolition
	HOUSEHOLD HAZARDOUS
62	Paint
63	Vehicle and Equipment Fluids
64	Used Oil
65	Batteries

Material ID #	Material Type Name
66	Remainder/ Composite Household Hazardous
	SPECIAL WASTE
67	Ash
68	Sewage Solids
69	Industrial Sludge
70	Treated Medical Waste
71	Bulky Items
72	Tires
73	Remainder/ Composite Special Waste
	MIXED RESIDUE
74	Mixed Residue

Definitions of Material Types

ID #	Material Type Name	Material Definition
PAPER		
1	Uncoated Corrugated Cardboard	Uncoated Corrugated Cardboard usually has three layers. The center wavy layer is sandwiched between the two outer layers. It does not have any wax coating on the inside or outside. Examples include entire cardboard containers, such as shipping and moving boxes, computer packaging cartons, and sheets and pieces of boxes and cartons. This type does not include chipboard.
2	Paper Bags/Kraft	Paper Bags means bags and sheets made from Kraft paper. Examples include paper grocery bags, fast food bags, department store bags, and heavyweight sheets of Kraft packing paper.
3	Newspaper	Newspaper means paper used in newspapers. Examples include newspaper and glossy inserts, and all items made from newsprint, such as free advertising guides, election guides, plain news packing paper, stapled college schedules of classes, and tax instruction booklets.
4	White Ledger	White Ledger means uncolored bond, rag, or stationary grade paper. It may have colored ink on it. When the paper is torn, the fibers are white. Examples include white photocopy, white laser print, and letter paper.
5	Colored Ledger	Colored Ledger means colored bond, rag, or stationery grade paper. When the paper is torn, the fibers are colored throughout. Examples include colored photocopy and letter paper. This type does not include fluorescent dyed paper or deep-tone dyed paper such as goldenrod colored paper.
6	Computer Paper	Computer Paper means paper used for computer printouts. This type usually has a strip of form feed holes along two edges. If there are no holes, then the edges show tear marks. This type can be white or striped. Examples include computer paper and printouts from continuous feed printers. This type does not include "white ledger" used in laser or impact printers, nor computer paper containing groundwood.

ID #	Material Type Name	Material Definition
7	Other Office Paper	Other Office Paper means other kinds of paper used in offices. Examples include manila folders, manila envelopes, index cards, white envelopes, white window envelopes, white or colored notebook paper, carbonless forms, and junk mail. This type does not include "white ledger", "colored ledger", or "computer paper".
8	Magazines and Catalogs	Magazines and Catalogs means items made of glossy coated paper. This paper is usually slick, smooth to the touch, and reflects light. Examples include glossy magazines, catalogs, brochures, and pamphlets.
9	Phone Books and Directories	Phone Books and Directories means thin paper between coated covers. These items are bound along the spine with glue. Examples include whole or damaged telephone books, "yellow pages", real estate listings, and some non-glossy mail order catalogs.
10	Other Miscellaneous Paper	Other Miscellaneous Paper means items made mostly of paper that do not fit into any of the above types. Paper may be combined with minor amounts of other materials such as wax or glues. This type includes items made of chipboard, groundwood paper, and deep-toned or fluorescent dyed paper. Examples include cereal and cracker boxes, unused paper plates and cups, goldenrod colored paper, school construction paper/butcher paper, milk cartons, ice cream cartons and other frozen food boxes, unopened junk mail, colored envelopes for greeting cards, pulp paper egg cartons, unused pulp paper plant pots, and hardcover and softcover books.
11	Remainder/ Composite Paper	Remainder/Composite Paper means items made mostly of paper but combined with large amounts of other materials such as wax, plastic, glues, foil, food, and moisture. Examples include waxed corrugated cardboard, aseptic packages, waxed paper, tissue, paper towels, blueprints, sepia, onion skin, fast food wrappers, carbon paper, self-adhesive notes, and photographs.
GLASS		
12	Clear Glass Bottles and Containers	Clear Glass Bottles and Containers means clear glass beverage and food containers with or without a California Redemption Value (CRV) label. Examples include whole or broken clear soda and beer bottles, fruit juice bottles, peanut butter jars, and mayonnaise jars.
13	Green Glass Bottles and Containers	Green Glass Bottles and Containers means green-colored glass containers with or without a CRV label. Examples include whole or broken green soda and beer bottles, and whole or broken green wine bottles.
14	Brown Glass Bottles and Containers	Brown Glass Bottles and Containers means brown-colored glass containers with or without a CRV label. Examples include whole or broken brown soda and beer bottles, and whole or broken brown wine bottles.
15	Other Colored Glass Bottles and Containers	Other Colored Glass Bottles and Containers means colored glass containers and bottles other than green or brown with or without a CRV label. Examples include whole or broken blue or other colored bottles and containers.
16	Flat Glass	Flat Glass means clear or tinted glass that is flat. Examples include glass windowpanes, doors, and tabletops, flat automotive window glass (side windows), safety glass, and architectural glass. This type does not include windshields, laminated glass, or any curved glass.

ID #	Material Type Name	Material Definition
17	Remainder/ Composite Glass	Remainder/Composite Glass means glass that cannot be put in any other type. It includes items made mostly of glass but combined with other materials. Examples include Pyrex, Corningware, crystal and other glass tableware, mirrors, non-fluorescent light bulbs, and auto windshields.
METAL		
18	Tin/Steel Cans	Tin/Steel Cans means rigid containers made mainly of steel. These items will stick to a magnet and may be tin-coated. This type is used to store food, beverages, paint, and a variety of other household and consumer products. Examples include canned food and beverage containers, empty metal paint cans, empty spray paint and other aerosol containers, and bimetal containers with steel sides and aluminum ends.
19	Major Appliances	Major Appliances means discarded major appliances of any color. These items are often enamel-coated. Examples include washing machines, clothes dryers, hot water heaters, stoves, and refrigerators. This type does not include electronics, such as televisions and stereos.
20	Used Oil Filters	Used Oil Filters means metal oil filters used in motor vehicles and other engines, which contain a residue of used oil.
21	Other Ferrous	Other Ferrous means any iron or steel that is magnetic or any stainless steel item. This type does not include "tin/steel cans". Examples include structural steel beams, metal clothes hangers, metal pipes, stainless steel cookware, security bars, and scrap ferrous items.
22	Aluminum Cans	Aluminum Cans means any food or beverage container made mainly of aluminum. Examples include aluminum soda or beer cans, and some pet food cans. This type does not include bimetal containers with steel sides and aluminum ends.
23	Other Non-Ferrous	Other Non-Ferrous means any metal item, other than aluminum cans, that is not stainless steel and that is not magnetic. These items may be made of aluminum, copper, brass, bronze, lead, zinc, or other metals. Examples include aluminum window frames, aluminum siding, copper wire, shell casings, brass pipe, and aluminum foil.
24	Remainder/ Composite Metal	Remainder/Composite Metal means metal that cannot be put in any other type. This type includes items made mostly of metal but combined with other materials and items made of both ferrous metals and non-ferrous metal combined. Examples include small non-electronic appliances such as toasters and hair dryers, motors, insulated wire, and finished products that contain a mixture of metals, or metals and other materials, whose weight is derived significantly from the metal portion of its construction.
ELECTRONICS		
25	Brown Goods	Brown Goods means generally larger, non-portable electronic goods that have some circuitry. Examples include microwaves, stereos, VCRs, DVD players, radios, audio/visual equipment, and non-CRT televisions (such as LCD televisions).

ID #	Material Type Name	Material Definition
26	Computer-related Electronics	Computer-related Electronics means electronics with large circuitry that is computer-related. Examples include processors, mice, keyboards, laptops, disk drives, printers, modems, and fax machines.
27	Other Small Consumer Electronics	Other Small Consumer Electronics means portable non-computer-related electronics with large circuitry. Examples include personal digital assistants (PDAs), cell phones, phone systems, phone answering machines, computer games and other electronic toys, portable CD players, camcorders, and digital cameras.
28	Televisions and Other Items with CRTs	Televisions and Other Items with CRTs. Examples include televisions, computer monitors, and other items containing a cathode ray tube (CRT).
PLASTIC		
29	PETE Bottles	PETE Bottles means clear or colored PETE (polyethylene terephthalate) bottles and jars. Generally, these containers are narrower at the top than at the bottom. When marked for identification, it bears the number 1 in the center of the triangular recycling symbol and may also bear the letters PETE or PET. The color is usually transparent green, clear or amber. A PETE bottle usually has a small dot left from the manufacturing process, not a seam. It does not turn white when bent. Examples include soft drink and water bottles, some liquor bottles, cooking oil bottles, and aspirin bottles, some food jars, tennis ball containers and similar items.
30	Other PETE Containers	Other PETE Containers means PETE (polyethylene terephthalate) containers (other than bottles and jars). When marked for identification, it bears the number 1 in the center of the triangular recycling symbol and may also bear the letters PETE or PET. A PETE container usually has a small dot left from the manufacturing process, not a seam. Examples include opaque black trays used for frozen food packaging and non-food clamshell packaging.
31	HDPE Natural Bottles	HDPE Natural Bottles means natural HDPE (high-density polyethylene) bottles and jars. Generally, these containers are narrower at the top than at the bottom. This plastic is cloudy white, allowing light to pass through it. When marked for identification, it bears the number 2 in the triangular recycling symbol. Examples include milk jugs, water jugs, and some juice bottles.
32	HDPE Colored Bottles	HDPE Colored Bottles means colored HDPE (high-density polyethylene) bottles and jars. Generally, these containers are narrower at the top than at the bottom. This plastic is a solid color, preventing light from passing through it. When marked for identification, it bears the number 2 in the triangular recycling symbol. Examples include detergent bottles, some shampoo and hair-care bottles, empty motor oil, empty antifreeze, and other empty vehicle and equipment fluid bottles, and some food containers such as for coffee and non-dairy creamer.
33	HDPE 5-gallon Buckets — food	HDPE 5-gallon Buckets – food means all types of HDPE (high-density polyethylene) 5-gallon buckets that can be determined to have contained food. This plastic is usually a solid color, preventing light from passing through it (colored). When marked for identification, it bears the number 2 in the triangular recycling symbol on the bottom of the bucket.

ID #	Material Type Name	Material Definition
34	HDPE 5-gallon Buckets — non-food	HDPE 5-gallon Buckets – non-food means all types of HDPE (high-density polyethylene) 5-gallon buckets other than ones that could be determined to have contained food. This plastic is usually a solid color, preventing light from passing through it (colored). When marked for identification, it bears the number 2 in the triangular recycling symbol on the bottom of the bucket.
35	Other HDPE Containers	Other HDPE Containers means all types of HDPE (high-density polyethylene) containers not included above. When marked for identification, it bears the number 2 in the triangular recycling symbol. Examples include some margarine, cottage cheese, and yogurt tubs.
36	#3–#7 Bottles	#3-#7 Bottles means plastic bottles and jars made of types of plastic other than HDPE (high-density polyethylene) or PETE (polyethylene terephthalate). Generally, these containers are narrower at the top than at the bottom. Items may be made of PVC (polyvinyl chloride), LDPE (low-density polyethylene), PP (polypropylene), PS (polystyrene), or mixed resins. When marked for identification, these bottles bear the number 3, 4, 5, 6, or 7 in the triangular recycling symbol. Examples include bottles for some salad dressings, vegetable oils, juices, syrup, shampoo, and vitamins. In the past this category has been called “Miscellaneous Plastic Containers.”
37	#3–#7 Other Containers	#3-#7 Other Containers means plastic containers (other than bottles and jars) made of types of plastic other than HDPE (high-density polyethylene) or PETE (polyethylene terephthalate). Items may be made of PVC (polyvinyl chloride), LDPE (low-density polyethylene), PP (polypropylene), PS (polystyrene), or mixed resins. When marked for identification, these items bear the number 3, 4, 5, 6, or 7 in the triangular recycling symbol. Examples include food containers such as flexible and brittle yogurt cups, some margarine tubs, microwave food trays, clamshell-shaped fast food or muffin containers, and foam egg cartons. In the past this category has been called “Miscellaneous Plastic Containers.”
38	Plastic Trash Bags	Plastic Trash Bags means plastic bags sold for use as trash bags, for both residential and commercial use. Does not include other plastic bags like shopping bags that might have been used to contain trash.
39	Plastic Grocery and Other Merchandise Bags	Plastic Grocery And Other Merchandise Bags means plastic shopping bags used to contain merchandise to transport from the place of purchase, given out by the store with the purchase. Includes dry-cleaning plastic bags intended for 1-time use.
40	Non-Bag Commercial and Industrial Packaging Film	Non-Bag Commercial And Industrial Packaging Film means film plastic used for large-scale packaging or transport packaging. Examples include shrink-wrap, mattress bags, furniture wrap, and film bubble wrap.
41	Film Products	Film Products means plastic film used for purposes other than packaging. Examples include agricultural film (films used in various farming and growing applications, such as silage greenhouse films, mulch films, and wrap for hay bales), plastic sheeting used as drop cloths, and building wrap.

ID #	Material Type Name	Material Definition
42	Other Film	Other Film means all other plastic film that does not fit into any other type. Examples include other types of plastic bags (sandwich bags, zipper-recloseable bags, newspaper bags, produce bags, frozen vegetable bags, bread bags), food wrappers such as candy-bar wrappers, mailing pouches, bank bags, X-ray film, metallized film (wine containers and balloons), and plastic food wrap.
43	Durable Plastic Items	Durable Plastic Items means all other plastic objects other than containers, or film plastic. Examples include mop buckets, plastic outdoor furniture, plastic toys, large paint/food buckets, CD's, plastic stay straps, sporting goods, and plastic house wares such as dishes, cups, and cutlery. This type also includes building materials such as house siding, window sashes and frames, housings for electronics (such as computers, televisions and stereos), fan blades, impact-resistance cases (e.g. tool boxes, first aid boxes, tackle boxes, sewing kits, etc.), and plastic pipes and fittings.
44	Remainder/ Composite Plastic	Remainder/Composite Plastic means plastic that cannot be put in any other type. They are usually recognized by their optical opacity. This type includes items made mostly of plastic but combined with other materials. Examples include auto parts made of plastic attached to metal, plastic drinking straws, foam drinking cups, produce trays, foam meat and pastry trays, foam packing blocks, packing peanuts, foam plates and bowls, plastic strapping, plastic lids, some kitchen ware, toys, new plastic laminate (e.g., Formica), vinyl, linoleum, plastic lumber, insulating foams, imitation ceramics, handles and knobs, plastic string (such as is used for hay bales), and plastic rigid bubble/foil packaging (as for medications).
ORGANIC		
45	Food	Food means food material resulting from the processing, storage, preparation, cooking, handling, or consumption of food. This type includes material from industrial, commercial, or residential sources. Examples include discarded meat scraps, dairy products, egg shells, fruit or vegetable peels, and other food items from homes, stores, and restaurants. This type includes grape pomace and other processed residues or material from canneries, wineries, or other industrial sources.
46	Leaves and Grass	Leaves and Grass means plant material, except woody material, from any public or private landscapes. Examples include leaves, grass clippings, sea weed, and plants. This type does not include woody material or material from agricultural sources.
47	Prunings and Trimmings	Prunings and Trimmings means woody plant material up to 4 inches in diameter from any public or private landscape. Examples include prunings, shrubs, and small branches with branch diameters that do not exceed 4 inches. This type does not include stumps, tree trunks, or branches exceeding 4 inches in diameter. This type does not include material from agricultural sources.
48	Branches and Stumps	Branches and Stumps means woody plant material, branches, and stumps that exceed four inches in diameter from any public or private landscape.

ID #	Material Type Name	Material Definition
49	Agricultural Crop Residues	Agricultural Crop Residues means plant material from agricultural sources. Examples include orchard and vineyard prunings, vegetable by-products from farming, residual fruits, vegetables, and other crop remains after usable crop is harvested. This type does not include processed residues from canneries, wineries, or other industrial sources.
50	Manures	Manures means manure and soiled bedding materials from domestic, farm, or ranch animals. Examples include manure and soiled bedding from animal production operations, racetracks, riding stables, animal hospitals, and other sources.
51	Textiles	Textiles means items made of thread, yarn, fabric, or cloth. Examples include clothes, fabric trimmings, draperies, and all natural and synthetic cloth fibers. This type does not include cloth-covered furniture, mattresses, leather shoes, leather bags, or leather belts.
52	Carpet	Carpet means flooring applications consisting of various natural or synthetic fibers bonded to some type of backing material. Does not include carpet padding.
53	Remainder/ Composite Organics	Remainder/Composite Organics means organic material that cannot be put in any other type or subtype. This type includes items made mostly of organic materials but combined with other materials. Examples include leather items, cork, hemp rope, garden hoses, rubber items, hair, carpet padding, cigarette butts, diapers, feminine hygiene products, wood products (popsicle sticks and toothpicks), sawdust, and animal feces.
CONSTRUCTION & DEMOLITION		
54	Concrete	Concrete means a hard material made from sand, gravel, aggregate, cement mix, and water. Examples include pieces of building foundations, concrete paving, and cinder blocks.
55	Asphalt Paving	Asphalt Paving means a black or brown, tar-like material mixed with aggregate used as a paving material.
56	Asphalt Roofing	Asphalt Roofing means composite shingles and other roofing material made with asphalt. Examples include asphalt shingles and attached roofing tar and tar paper.
57	Lumber (non-treated)	Lumber (non-treated) means non-treated processed wood for building, manufacturing, landscaping, packaging, and non-treated processed wood from demolition. Examples include dimensional lumber, lumber cutoffs, engineered wood such as plywood and particleboard, wood scraps, pallets, wood fencing, wood shake roofing, and wood siding.
58	Treated Wood Waste	Treated Wood Waste means wood that has been treated with a chemical preservative for purposes of protecting the wood against attacks from insects, microorganisms, fungi, and other environmental conditions that can lead to decay of the wood and the chemical preservative is registered pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. Sec. 136 and following). This includes wood that has been pressure treated, chemically treated (with copper etc.) or treated with creosote (e.g. railroad ties, marine timbers and pilings, landscape timbers, and telephone poles).

ID #	Material Type Name	Material Definition
59	Gypsum Board	Gypsum Board means interior wall covering made of a sheet of gypsum sandwiched between paper layers. Examples include used or unused, broken or whole sheets of sheetrock, drywall, gypsum board, plasterboard, gypboard, gyproc, and wallboard.
60	Rock, Soil, and Fines	Rock, Soil and Fines means rock pieces of any size and soil, dirt, and other matter. Examples include rock, stones, sand, clay, soil, and other fines. This type also includes non-hazardous contaminated soil.
61	Remainder/ Composite Construction and Demolition	Remainder/Composite Construction and Demolition means construction and demolition material that cannot be put in any other type. This type may include items from different categories combined, which would be very hard to separate. Examples include brick, ceramics, tiles, toilets, sinks, dried paint not attached to other materials, and fiberglass insulation. This type may also include demolition debris that is a mixture of items such as plate glass, wood, tiles, gypsum board, and aluminum scrap.
HOUSEHOLD HAZARDOUS		
62	Paint	Paint means containers with paint in them. Examples include latex paint, oil based paint, and tubes of pigment or fine art paint. This type does not include dried paint, empty paint cans, or empty aerosol containers.
63	Vehicle and Equipment Fluids	Vehicle and Equipment Fluids means containers with fluids used in vehicles or engines, except used oil. Examples include used antifreeze and brake fluid. This type does not include empty vehicle and equipment fluid containers.
64	Used Oil	Used Oil means the same as defined in Health and Safety Code section 25250.1(a). Examples include spent lubricating oil such as crankcase and transmission oil, gear oil, and hydraulic oil.
65	Batteries	Batteries means any type of battery including both dry cell and lead acid. Examples include car, flashlight, small appliance, watch, and hearing aid batteries.
66	Remainder/ Composite Household Hazardous	Remainder/Composite Household Hazardous means household hazardous material that cannot be put in any other type. This type also includes household hazardous material that is mixed. Examples include household hazardous waste which if improperly put in the solid waste stream may present handling problems or other hazards, such as pesticides, caustic cleaners, and fluorescent light bulbs.
SPECIAL WASTE		
67	Ash	Ash means a residue from the combustion of any solid or liquid material. Examples include ash from structure fires, fireplaces, incinerators, biomass facilities, waste-to-energy facilities, and barbecues.
68	Sewage Solids	Sewage Solids means residual solids and semi-solids from the treatment of domestic waste water or sewage. Examples include biosolids, sludge, grit, screenings, and septage. This type does not include sewage or waste water discharged from the sewage treatment process.
69	Industrial Sludge	Industrial Sludge means sludge from factories, manufacturing facilities, and refineries. Examples include paper pulp sludge, and water treatment filter cake sludge.

ID #	Material Type Name	Material Definition
70	Treated Medical Waste	Treated Medical Waste means medical waste that has been processed in order to change its physical, chemical, or biological character or composition, or to remove or reduce its harmful properties or characteristics, as defined in Section 25123.5 of the California Health and Safety Code.
71	Bulky Items	Bulky Items means large hard to handle items that are not defined separately, including furniture, mattresses, and other large items. Examples include all sizes and types of furniture, mattresses, box springs, and base components.
72	Tires	Tires means vehicle tires. Examples include tires from trucks, automobiles, motorcycles, heavy equipments, and bicycles.
73	Remainder/ Composite Special Waste	Remainder/Composite Special Waste means special waste that cannot be put in any other type. Examples include asbestos-containing materials, such as certain types of pipe insulation and floor tiles, auto fluff, auto-bodies, trucks, trailers, truck cabs, untreated medical waste/pills/hypodermic needles, and artificial fireplace logs.
MIXED RESIDUE		
74	Mixed Residue	Mixed Residue means material that cannot be put in any other type in the other categories. This type includes mixed residue that cannot be further sorted. Examples include clumping kitty litter and residual material from a materials recovery facility or other sorting process that cannot be put in any of the previous remainder/composite types.

Characterization of Disposed Materials Divertibility

DISPOSED, EASILY DIVERTIBLE MATERIALS

ID #	Material Type
	PAPER
1	Uncoated Corrugated Cardboard
2	Paper Bags/Kraft
3	Newspaper
4	White Ledger
5	Colored Ledger
6	Computer Paper
7	Other Office Paper
8	Magazines and Catalogs
9	Phone Books and Directories
	GLASS
12	Clear Glass Bottles & Containers
13	Green Glass Bottles & Containers
14	Brown Glass Bottles & Containers
15	Other Colored Glass Bottles & Containers
	METAL
18	Tin/Steel Cans
19	Major Appliances
20	Used Oil Filters
21	Other Ferrous
22	Aluminum Cans
23	Other Non-Ferrous
	ELECTRONICS
25	Brown Goods
26	Computer-related Electronics
27	Other Small Consumer Electronics
28	TV & Other Items with CRTs
	PLASTIC
29	PETE Bottles
30	Other PETE Containers
31	HDPE Natural Bottles
32	HDPE Colored Bottles
33	HDPE 5-gallon Buckets (food)
34	HDPE 5-gallon Buckets (non-food)
35	Other HDPE Containers
36	#3-#7 Bottles
37	#3-#7 Other Containers
39	Plastic Grocery & Merchandise Bags
40	Non-Bag Comm. & Industrial Packaging Film

ID #	Material Type
	ORGANICS
45	Food
46	Leaves and Grass
47	Prunings and Trimmings
48	Branches and Stumps
49	Agricultural Crop Residues
50	Manures
	CONSTRUCTION & DEMOLITION
54	Concrete
55	Asphalt Paving
57	Lumber
60	Rock, Soil, and Fines
	HOUSEHOLD HAZARDOUS
64	Used Oil
	SPECIAL WASTE
68	Sewage Solids
72	Tires

DISPOSED, POTENTIALLY DIVERTIBLE MATERIALS

ID #	Material Type
	PAPER
10	Other Miscellaneous Paper
	GLASS
16	Flat Glass
	PLASTIC
41	Film Products
	ORGANICS
51	Textiles
52	Carpet
	CONSTRUCTION & DEMOLITION
56	Asphalt Roofing
59	Gypsum Board
	HOUSEHOLD HAZARDOUS
62	Paint
63	Vehicle and Equipment Fluids
65	Batteries

OTHER DISPOSED MATERIALS

ID #	Material Type
	PAPER
11	R/C Paper
	GLASS
17	R/C Glass
	METAL
24	R/C Metal
	PLASTIC
38	Plastic Trash Bags
42	Other Film
43	Durable Plastic Items
44	R/C Plastic
	ORGANICS
53	R/C Organics
	CONSTRUCTION & DEMOLITION
58	Treated Wood Waste
61	R/C C & D
	HOUSEHOLD HAZARDOUS
66	R/C HHW
	SPECIAL WASTE
67	Ash
69	Industrial Sludge
70	Treated Medical Waste
71	Bulky Items
73	R/C Special Waste
	MIXED RESIDUE
74	Mixed Residue

Classification of Diverted Material According to 56 Material Types

Material types used to classify diverted materials are slightly less detailed than those used for disposed waste. This was done because the method for characterizing and quantifying diverted materials did not permit distinction among certain material types, such as different resin types for plastic bottles, different colors of glass containers, and different types of plastic film.

ID #	Material Type Name (74 materials)		New ID #	New Material Type Name (56 materials)
	PAPER			
1	Uncoated Corrugated Cardboard		1	Uncoated Corrugated Cardboard
2	Paper Bags/Kraft		2	Paper Bags/Kraft
3	Newspaper		3	Newspaper
4	White Ledger		4	White Ledger
6	Computer Paper		6	Computer Paper
5	Colored Ledger		5	Other Office Paper & Colored Ledger Paper
7	Other Office Paper			
8	Magazines & Catalogs		7	Magazines and Catalogs
9	Phone Books & Directories		8	Phone Books & Directories
10	Other Miscellaneous Paper		9	Other Miscellaneous Paper
11	Remainder/ Composite Paper		10	Remainder/ Composite Paper
	GLASS			
12	Clear Glass Bottles and Containers		11	Glass Bottles & Containers (colors not specified)
13	Green Glass Bottles and Containers			
14	Brown Glass Bottles and Containers			
15	Other Colored Glass Bottles & Containers			
16	Flat Glass		12	Flat Glass
17	Remainder/ Composite Glass		13	Remainder/ Composite Glass
	METAL			
18	Tin/Steel Cans		14	Tin/Steel Cans
19	Major Appliances		15	Major Appliances
20	Used Oil Filters		16	Used Oil Filters
21	Other Ferrous		17	Other Ferrous
22	Aluminum Cans		18	Aluminum Cans
23	Other Non-Ferrous		19	Other Non-Ferrous
24	Remainder/ Composite Metal		20	Remainder/ Composite Metal
	ELECTRONICS			
25	Brown Goods		21	Brown Goods
26	Computer-related Electronics		22	Computer-related Electronics
27	Other Small Consumer Electronics		23	Other Small Consumer Electronics
28	Televisions & Other Items with CRTs		24	Televisions & Other Items with CRTs

	PLASTIC			
29	PETE Bottles		25	PETE & HDPE Bottles, Buckets, & Containers
30	Other PETE Containers			
31	HDPE Natural Bottles			
32	HDPE Colored Bottles			
33	HDPE 5-gallon Buckets - food			
34	HDPE 5-gallon Buckets – non-food			
35	Other HDPE Containers			
36	#3-#7 Bottles		26	#3-#7 Bottles & Containers
37	#3-#7 Other Containers			
38	Plastic Trash Bags		27	Plastic Film
39	Plastic Grocery & Other Merchandise Bags			
40	Non-Bag Commercial & Industrial Packaging Film			
41	Film Products			
42	Other Film			
43	Durable Plastic Items		28	Durable Plastic Items
44	Remainder/ Composite Plastic		29	Remainder/ Composite Plastic
	ORGANICS			
45	Food		30	Food
46	Leaves & Grass		31	Leaves, Grass, Prunings, & Trimmings
47	Prunings & Trimmings			
48	Branches & Stumps		32	Branches & Stumps
49	Agricultural Crop Residues		33	Agricultural Crop Residues
50	Manures		34	Manures
51	Textiles		35	Textiles
52	Carpet		36	Carpet
53	Remainder/ Composite Organics		37	Remainder/ Composite Organics
	CONSTRUCTION & DEMOLITION			
54	Concrete		38	Concrete
55	Asphalt Paving		39	Asphalt Paving
56	Asphalt Roofing		40	Asphalt Roofing
57	Lumber		41	Lumber & Treated Wood Waste
58	Treated Wood Waste			
59	Gypsum Board		42	Gypsum Board
60	Rock, Soil, and Fines		43	Rock, Soil, and Fines
61	Remainder/ Composite Construction & Demolition		44	Remainder/ Composite Construction & Demolition

	HOUSEHOLD HAZARDOUS			
62	Paint		45	Paint
63	Vehicle and Equipment Fluids		46	Vehicle and Equipment Fluids
64	Used Oil		47	Used Oil
65	Batteries		48	Batteries
66	Remainder/ Composite Household Hazardous		49	Remainder/ Composite Household Hazardous
	SPECIAL WASTE			
67	Ash		50	Ash
68	Sewage Solids		51	Sewage Solids & Industrial Sludge
69	Industrial Sludge			
70	Treated Medical Waste		52	Treated Medical Waste
71	Bulky Items		53	Bulky Items
72	Tires		54	Tires
73	Remainder/ Composite Special Waste		55	Remainder/ Composite Special Waste
	MIXED RESIDUE			
74	Mixed Residue		56	Mixed Residue

Appendix D:
Field Forms and Databases Used During the Study

Recruitment and Site Information Form

Summer 2005 | **California Waste Generator Study** | 1 of 3

Data Collection Form

Business ID #: _____ **Auditor:** _____

Region: _____ **Recruiter:** _____

1. Contact Information

Business name *(as it appears on sign outside)* Name: _____

Street address Address: _____

_____

☐ Special instructions, if necessary *(ex. no sign, look for a brick buildling)*

Hours of operation Days & Hours: _____

Senior manager who has given permission Name: _____

☐ You have explained all aspects of the study to the senior manager Title: _____

Phone #:

Person who can provide data *(operating hours, square footage, # of employees, etc.)* Name: _____

Phone #:

Manager of trash disposal &/or janitorial employees Name: _____

☐ This person is aware they will be contacted after your site visit to set up a sampling time Phone #: _____

Office hours:

Hauler contact info Company: _____

Phone #:

Verify business industry group is correct Indusrty Group: _____

Description of Business

2. Screening Criteria

☐ Business has agreed to participate in all parts of the study

☐ Business does not share dumpster with other business _____

(if dumpster is shared explain how you are planning to deal with this) _____

☐ Waste can be accessed for sampling

☐ Waste quantities can be obtained *(i.e. tonnage records are accessible for compactors, you are able to measure waste in dumpster)*

☐ Each waste stream is expected to produce at least 200 pounds of waste for sampling

☐ Business is within geographic area defined for sampling

3. Correlative Factors

All Businesses:

Square feet of building space Sq. Ft.

# of employees Employees

Hotels:

# of rooms _____ Rooms

Average % occupied year round _____ % occupied

Average % occupied during measurement period _____ % occupied

# of rooms occupied during measurement _____ Rooms

Restaurants:

# of seats _____ Seats

Venues:

# of visitor-days annually _____ days/year

# of visitor-days annually during measurement period _____ days/year

If found please contact: 206-343-9759

Business ID #: _____

4. Sampling Visit

List barriers, locks, gates, and times they are enforced — Barriers: _____ Times: _____

When can we get access to containers?
(i.e. during or after business hours, other constraints, etc.) _____

5. Waste Generation and Collection

Days and hours waste is generated — Days & Hours: _____

Days and times trash is taken TO the container
(be specific, ex. After closing or after lunch crowd at 2pm)
☐ Continuously, or
Times: _____

When is trash picked up by hauler — Days & Times: _____

☐ Verified collection times with hauler

6. Waste Streams & Measurements

Number of waste streams : Waste streams

List all waste streams

1st Waste Stream — Name/description: _____
Number of dumpsters, compactors, etc.
Location(s) of conatiners — Location: _____

2nd Waste Stream — Name/description: _____
Number of dumpsters, compactors, etc.
Location(s) of conatiners — Location: _____

3rd Waste Stream — Name/description: _____
Number of dumpsters, compactors, etc.
Location(s) of conatiners — Location: _____

4th Waste Stream — Name/description: _____
Number of dumpsters, compactors, etc.
Location(s) of conatiners — Location: _____

Recruitment Notes

Notes:

If found please contact: 206-343-9759

Business ID #: _____

7. Waste Container Measurements

1st Container **Waste Stream Name:** _____

Type of Container:

Container description *(if necessary)* _____

Location of container *(if not the same as all others in this waste stream)* _____

☐ Waste generation time is the same as in Section 5, *explain if different* _____

☐ Waste is taken TO container the same as in Section 5, *explain if different* _____

☐ Hauler collection times are the same as in Section 5, *explain if different* _____

Tons of trash generated _____ tons/per _____ *(time frame)*

Source of this information _____

--- ***OR*** ---

Container measurements, ***measured from inside wall to inside wall***

Side to Side measurement Length: _____ inches

Front to Back measurement Depth: _____ inches

Height of Trash measurement Height: _____ inches

☐ Approximately how full was this container full ¾ ½ ¼ empty *(circle one)*

Time of last trash collection before measurement Day: _____, _____ am / pm

Time of measurement Day: _____, _____ am / pm

Notes:

2nd Container **Waste Stream Name:** _____

Type of Container:

Container description *(if necessary)* _____

Location of container *(if not the same as all others in this waste stream)* _____

☐ Waste generation time is the same as in Section 5, *explain if different* _____

☐ Waste is taken TO container the same as in Section 5, *explain if different* _____

☐ Hauler collection times are the same as in Section 5, *explain if different* _____

Tons of trash generated _____ tons/per _____ *(time frame)*

Source of this information _____

--- ***OR*** ---

Container measurements, ***measured from inside wall to inside wall***

Side to Side measurement Length: _____ inches

Front to Back measurement Depth: _____ inches

Height of Trash measurement Height: _____ inches

Approximately how full was this container full ¾ ½ ¼ empty *(circle one)*

Time of last trash collection before measurement Day: _____, _____ am / pm

Time of measurement Day: _____, _____ am / pm

Notes:

If found please contact: 206-343-9759

Diversion Audit Form

CIWMB
Waste Audit

☐ Reviewed ☐ Entered

Surveyor Initials _____

Date of Survey: _____ Time of Survey: _____ BusID _____

Company Name: _____ Contact Name: _____

Address: _____ Phone Number: _____

Zip: _____ Email: _____

Type of Business & Hours: _____ Major Products: _____

TRASH INFORMATION FROM MEASUREMENTS

Hauler _____

Bin Location & Description	Bin #	Wastestream (where gen.)	Trash Length (in)	Trash Width (in)	Trash Height (in)	When was the last pick-up? (day & time)	Pick up Days & Times

Notes on set out (frequency), irregular dumpster shape (e.g., not rectangular), etc. _____

TRASH INFORMATION FROM RECORDS

Bin Location & Description	Bin #	Hauler	Wastestream (where gen.)	Pounds	Elapsed Time

Notes on records, etc. _____

RECYCLING INFORMATION

Hauler	Bin Location	Material(s) Collected	# Bins	Bin Size	Days of Pickups	Pick up Time of Day	Fullness

List items in trash that can potentially be recycled, by material type:

Material	Material

Bins Shared? Yes / No If yes, who shares the bins? _____

Baler? Yes / No If yes, what is baled? _____ How many & how often? _____

CIWMB
Waste Audit

	Hotels	Restaurants	Wholesale	Food Stores	Retail and BMG	Malls	Office Buildings	Venues
Number of employees (FTE)								
Ft^2 for entire business								
Number of rooms								
Percent occupied year-round								
Percent of rooms occupied during measurement period								
Number of rooms occupied during measurement period								
Number of seats								
Annual table turns								
Annual gross sales								
Gross sales during measurement period								
Ft^2 for retail space								
Ft^2 of office space								
Number of annual visitor-days								
Number of visitor-days during measurement period								

Recycling Questions

If they don't recycle, why not?

If they do recycle, why?

If they do recycle, why not more?

Is this a good candidate for a future case study? Yes No

Notes:

CIWMB
Waste Audit

How is landscape waste generated at your facility handled?

- ☐ No landscape waste produced
- ☐ In dumpster along with other garbage
- ☐ Clippings left on grass
  - Size of turf area _____ acres / sq. feet (Circle One)
- ☐ Other (please identify) _____
- ☐ Waste composted, chipped, or otherwise used onsite
  - Amount used _____ tons / cy (Circle One)
  - Timeframe _____ (per month, year)
- ☐ Hauled by landscaping service to be composted, chipped, or mulched
  - Amount hauled _____ tons / cy (Circle One)
  - Timeframe _____ (per month, year)

SOURCE REDUCTION

	Amount?				
	Pounds	Cubic Yards	List Items Donated or Sold	Other Quantity (please specify, eg. per unit)	Timeframe (per week, month, etc)
Participating in a waste exchange					
Donating used equipment					
Donating food					
Returning Inkjet Cartridges					
Returning Laser Cartridges					
Converting from paper towels to hand dryers					
Reusing pallets					
Switching to reusable shipping containers					
Other (specify)					

RECYCLING

		How is it Recycled? (enter applicable)[1]	Amount Recycled?				
					Other Quantity		
			Pounds	Cubic Yards	Number	Unit of measure (eg. per unit)	Timeframe (times per week, month, etc)
PAPER	Cardboard / Bags						
	Newspaper						
	White / Colored Ledger						
	Mixed Office Paper						
	Magazines / Catalogs						
	Books (hard / soft)						
	Directories						
	Mixed Paper						
	Other Paper						
PLASTIC	CRV PET - lg / sm						
	Non-CRV PET						
	CRV #2 Nat'l - lg / sm						
	CRV #2 Color - lg / sm						
	CRV #3-7						
	Other Containers						
	Film _____						
	5-gal Buckets						
	Durable						
	Other Plastic						

[1] Enter one: (S)cavenger, (C)ompost, (R)ecycling Facility, (M)ailback, Collected by (H)auler, (R)euse, to (D)istribution Center, or write in (O)ther method

CIWMB
Waste Audit

		How is it Recycled? (enter applicable)[1]	Amount Recycled?				
					Other Quantity		
			Pounds	Cubic Yards	Number	Unit of measure (eg. per unit)	Timeframe (times per week, month, etc)
GLASS	Clear CRV - lg / sm						
	Green CRV Bottles - lg/sm						
	Brown CRV Bottles - lg/sm						
	Other CRV lg / sm						
	Non-CRV _____						
	Flat Glass						
	Other Glass						
METAL	CRV Aluminum Cans						
	Non-CRV Aluminum Cans						
	Other Non-Ferrous						
	CRV Bimetal						
	Non-CRV Tin Cans						
	Major Appliances						
	Used Oil Filters						
	Other Ferrous						
ELEC	Brown Goods						
	Computer Related Elec.						
	Other Small Cons. Elec.						
	CRTs						
ORGANIC	Food / Grease						
	Grass / Leaves						
	Prunings / Branches						
	Crop Residue / Compost						
	Carpet / Padding						
	Textiles						
	Tires & Rubber						
	Other Organic						
C&D	Aggregates / Inerts						
	Lumber						
	Gypsum						
	Other Demo						
FURN							
HHW	Paint						
	Vehicle / Equip. Fluids						
	Oil						
	Batteries						
	R/C HHW						
OTHER							

[1] Enter one: (S)cavenger, (C)ompost, (R)ecycling Facility, (M)allback, Collected by (H)auler, (R)euse, to (D)istribution Center, or write in (O)ther method

Notes:

Venue Audit Form

Supplemental Venue and Event Waste Audit Questions

Venue Background

- Annual attendance? Special Event?
- Number of employees including volunteers at the event?
- Average # of employees per operation day?
- Parking lot size and activities?
- Number of days open per year?
- What professional association/s do you belong to?

Waste Reduction Planning

- Does your organization have a formal overall plan for waste reduction, or do you deal with issues as opportunities arise?
- Does your organization have an official waste reduction policy that is part of the job description for all employees?
- Does your organization make waste reduction part of the employee training program?
- Do you keep records on waste reduction/recycling results and share them with staff and visitors?
- Do you use biodegradable serviceware?
- What percentage of serviceware is reusable or disposal?

Waste Reduction Practices Checklist

Use the list below to guide discussion of the operations that generate waste and practices which reduce, conserve, or recycle materials. Modify to fit the specific activities at the site.

Operations	Waste Reduction Practices			
	Source Reduction	**Formal Recycling**	**Informal Reuse and Recycling**	**Other**
Grounds care	Minimize amount of landscape material, grasscycling	Green waste pickup by hauler, on-site composting	Chip for plant mulch	Purchase compost made from recycled materials,
Construction / decoration / craft and repair workshops	Changes in project design to minimize material, reusable stages, signage, and decorations	C&D materials recycling, donate surplus C&D materials equipment and furniture to charity	Stockpiling of salvaged materials on-site for reuse	Purchase of recycled-content materials, and, low toxic supplies
Receiving and storage	Changes in procedure, take-back packaging, bulk containers	Packaging/pallets recycling, surplus/obsolete materials to charity	Pallet repair / reuse, scavenging of OCC	NA
Gift and souvenir concession sales	Put minimum packaging specs in product bids	Recycle packaging material, give surplus materials to charity	Reuse of packaging materials, scavenging of OCC	Put mandatory recycling in bid specs and contracts for concessionaire
Food purchase and preparation	Changes in procedure – menu redesign, buy in-bulk, pre-trimmed, use just in time delivery	Recycle packaging, compost trimmings, and give surplus, leftovers to food bank	Leftover food given to employees	NA
Animal care	Changes in procedure	Recycle feed bags, bedding materials, packaging, manure composting	Feed bag reuse for trash collection, use food scraps as feed	Purchasing of recycled-content material for bedding, bulk purchasing
Food and drink service concessions	Bulk purchasing, menu redesign, CRV plastic bottles, strategic purchasing	Reusable or compostable serviceware, donation of unserved food to charity	Employees take recyclable materials home, scavenging	Put mandatory recycling in bid specs and contracts
Office	On-line sales and ticketing, e-mail messaging, double-sided copies, redesign for purchasing for minimum waste	Office paper and packaging recycling	Scavenging of OCC	Purchase of recycled-content papers, printer cartridges, and longer lasting machines
Walkways and event areas	Use compostable products serviceware and packaging only	Recycle ticket stubs, brochures and programs, bowl-pick plastic CRV bottles compost floor sweepings	Scavenging of CRV containers	NA
Restrooms	Switch to cloth roll service or air dryers, bulk-size paper roll dispensers	Compost paper towels	NA	Purchase of recycled-content papers, and low- toxic cleaning supplies
Classes and tours	Internet virtual tours, on-line paperless reservations	Recycle ticket stubs, brochures and programs	Reuse programs or brochures	Purchase of recycled-content papers and low toxic class supplies
Security and first aid	Purchase for low packaging	Office paper and packaging recycling	Mulching, and composting	NA
Parking lots and internal roadways	NA	Collect bottles and cans from tailgaters, compost lot sweepings	Scavenging of CRV bottles and cans	Use recycled materials for grading, and rubberized asphalt
Site rental and special events contracts	Provide list of pre-approved services / suppliers that reduce waste	Put mandatory recycling in contracts	NA	NA
Outside services contracts	Pre-qualify services / suppliers that reduce waste	Put mandatory recycling in bid specs and contracts	NA	NA

Waste Sampling Instruction Form

17903
SD
1 page(s)

24 **ABC Store**
Retail, other

123 1st Ave

San Diego **92056**

On-site Contact: **Mary Smith** , **Manager**
Phone: **(619) 555-1234**
Other contacts:
Permission: James Brown , Owner
(619) 555-1234
Data: Mary Smith , Manager
(619) 555-1234
General Phone: (619) 555-1234

Check in with Mary when you get there. She will direct you around back to the dumpsters.

# of samples: **1**

Hours of operation:
Mon-Sat 10am-9pm; Sun 11am-7pm

When to go:
Tues or Thurs afternoons or weekend

Recruited by: Karin Olefsky
Visited by: Joanne Situ 10/5/05

Substream General Waste

Container # **1** Description: **3cy** Location: **Behind Store**

Type: **Dumpster**

Sampling Window: T/Th/Sun/Sat

Locked? ☐

Access Procedures: Check in with Mary when you get there

Trash is picked up: 3 times per week
MWF, 9am
Trash is taken out: continuous

Before sampling: inches
Width Length Height

After sampling: inches
Width Length Height **17903**

Waste Sample Characterization Form

Site ID Number: _____ **Name of Site:** _____ **Substream Designation:** _____ **Date:** _____

PAPER			
Cardboard			
Paper Bags/Kraft			
Newspaper			
White Ledger			
Colored Ledger			
Computer Paper			
Other Office Paper			
Magazines/Catalogs			
Phone Book/Directory			
Other Misc. Paper			
R/C Paper			

GLASS			
Clear			
Green			
Brown			
Other Color			
Flat Glass			
R/C Glass			

METAL			
Aluminum Cans			
Tin/Steel Cans			
Other Non-Ferrous			
Major Appliances			
Used Oil Filters			
Other Ferrous			
R/C Metal			

PLASTIC			
PETE Bottles			
Other PETE			
HDPE Natural Bottles			
HDPE Colored Bottles			
HDPE 5-gallon (Food)			
HDPE 5-gallon (Non-food)			
Other HDPE			
#3-#7 Bottles			
Other #3-#7			
Plastic Trash Bags			
Grocery/Merch. Bags			
Non-bag Packaging Film			
Film Products			
Other Film			
Durable Plastic Items			
R/C Plastic			

E-WASTE			
Brown Goods			
Computer-related			
Other Small Consumer			
TV's & Other CRTs			

ORGANIC			
Food			
Leaves and Grass			
Prunings & Trimmings			
Branches & Stumps			
Agricultural Crop			
Manures			
Textiles			
Carpet			
R/C Organics			

C&D			
Concrete			
Asphalt Paving			
Asphalt Roofing			
Lumber			
Treated Wood Waste			
Gypsum Board			
Rock, Soil, Fines			
R/C C&D			

HHW			
Paint			
Vehicle & Equip. Fluids			
Used Oil			
Batteries			
R/C HHW			

SPECIAL			
Ash			
Sewage Solids			
Industrial Sludge			
Treated Medical Waste			
Bulky Items			
Tires			
R/C Special Waste			
Mixed Residue			

Screens for the shared recruitment database are shown on the following pages. Data for the generator sites recruited for this study were organized in the following way. Each eligible generator site, regardless of whether it was actually recruited or was merely a candidate for recruitment, had a *site record* in the shared database. For each site that was recruited, one or more *material stream records* were created to reflect each distinct stream of disposed waste at the site. Then, for each disposed waste substream, there were individual records for each waste container (e.g. each dumpster and each compactor) associated with the particular disposed waste substream.

Screens for entering data for generator site records:

Site Information Form

Site ID: 114
Site Name: [redacted]
Region: Sac
Recruiter: Anne Lynch
Auditor: Leslie Lukacs

Business has agreed ☑ | SCS identified all material streams ☑ | SCS scheduled the first site visit ☑ | SCS completed the first site visit ☑ | SCS input all recycling findings ☑ | SCS input all disposal data ☑ | SCS Requires Follow-up ☐ | Cascadia calculated disp. quantities ☐ | Cascadia completed the sampling visit ☑ | All pending issues resolved ☑ | Discard ☐

Primary Site Information | Other Contact Information | Waste Generation Factors

Industry Group: Food stores
Primary Phone (update if necessary): [redacted]
Employment Range: 100 to 249

Mail Address 1: [redacted]
Mail Address 2:
Mail City: Sacramento
Mail State: CA
Mail Zip: 95831

Copy >>

Physical Address 1: [redacted]
Physical Address 2:
Physical City: Sacramento
Physical State: CA
Physical Zip: 95831

Your brief description of the business and what they do: grocery store
2-digit SIC (please update if necessary): 54
Complete SIC (for your reference): 541105

Recruitment Notes (Put newest notes at top):
Ask for Todd Barby and tell him

Spoke to Bill Cannon 11/10/04
OCC goes back to warehouse

11/15 Data entered by Joanne

Notes about pending data collection issues (newest at top):
6/6 three containers confirmed w/ Todd

5/11/05 Data received.

1/28 - Still need to get square feet

1/6 - Leslie - Manager Bill said to conduct

Days & Hours of Operation: 6-11 Monday to Sun

Thomas Guide page and grid: 9

Scheduled date for 1st site visit
Date: Jan 11
Time: 1 pm

☐ Sample 1st Season

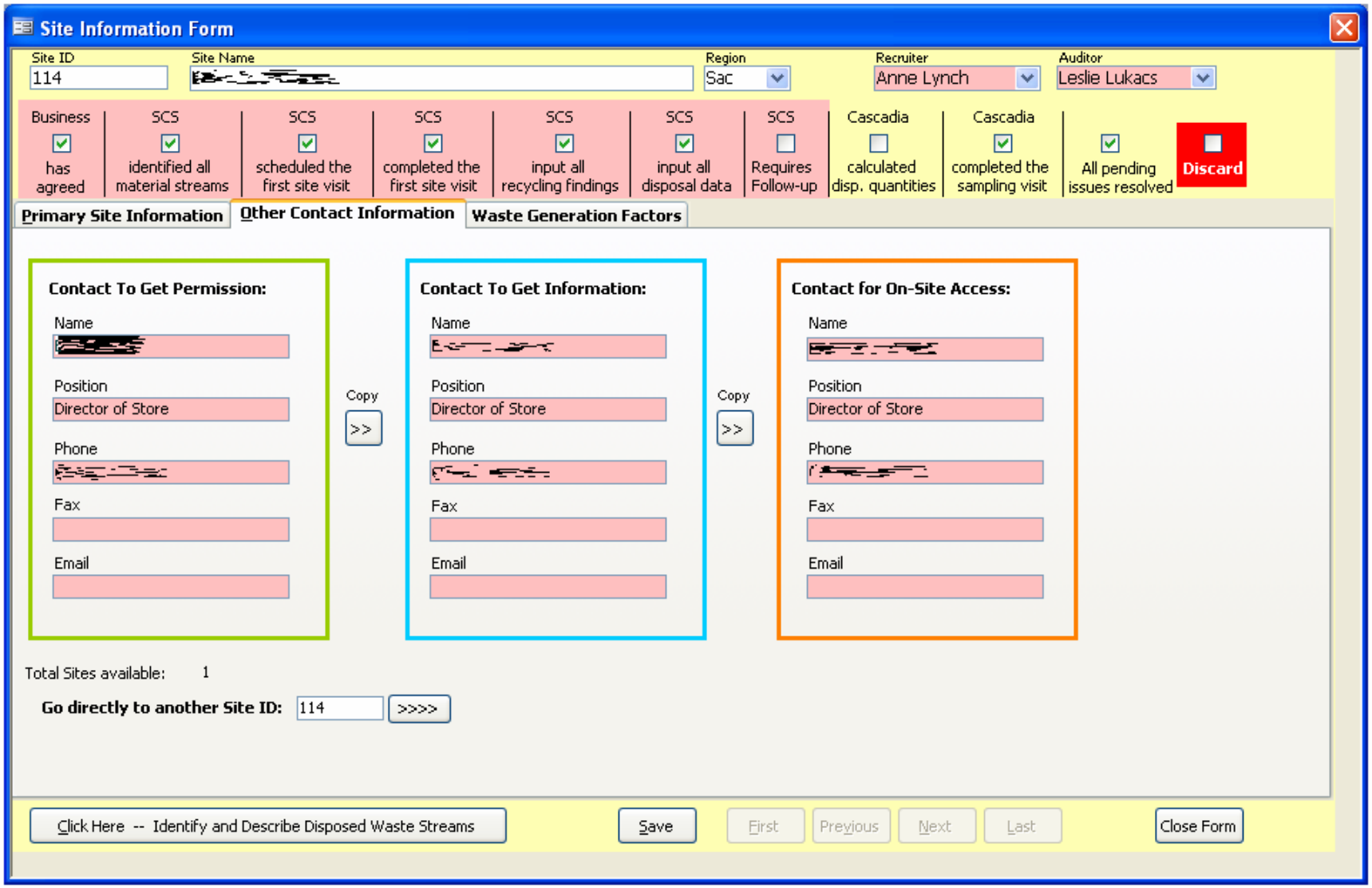
☐ QueueTentative

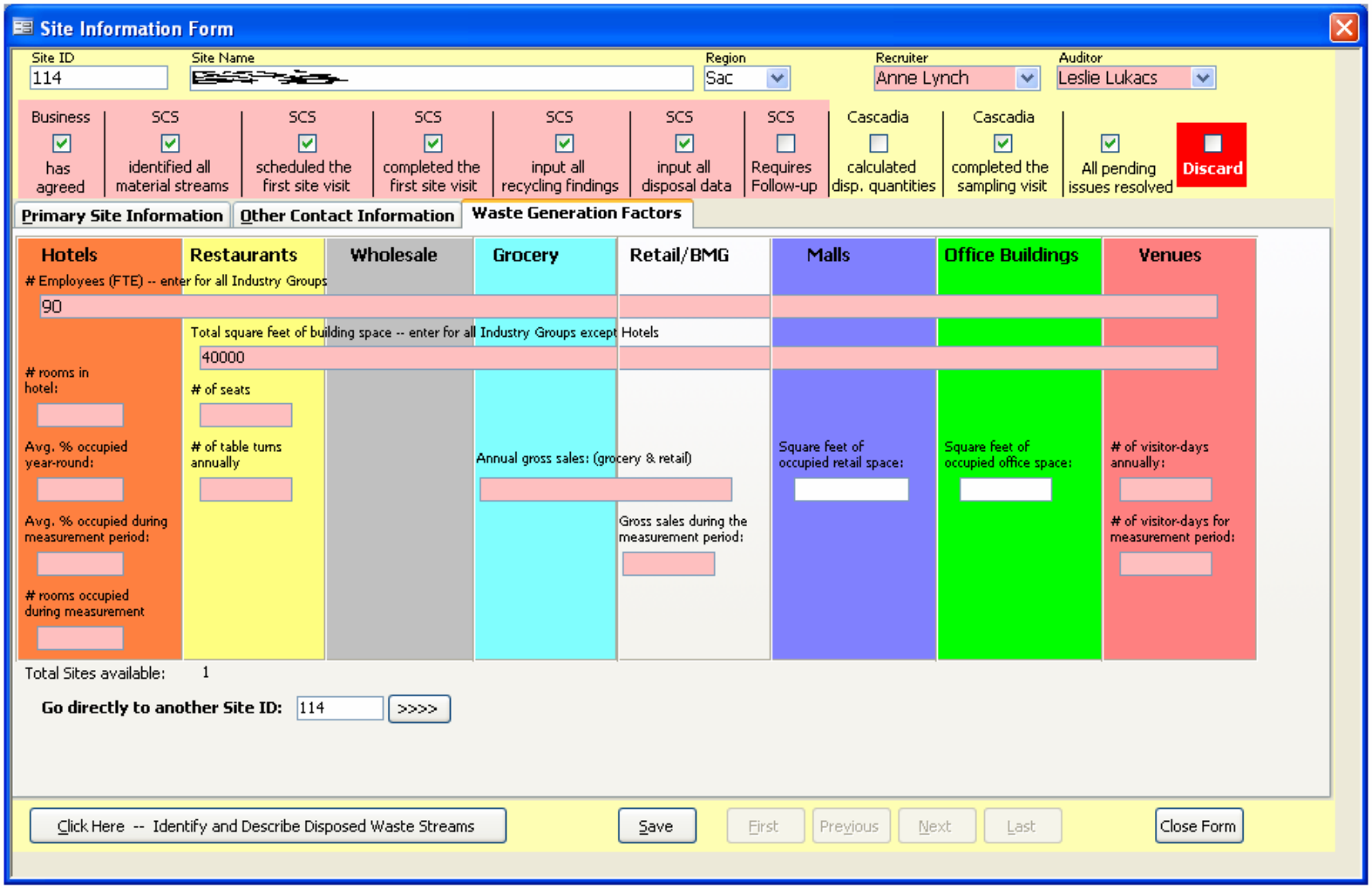
Total Sites available: 1

Go directly to another Site ID: 114 >>>>

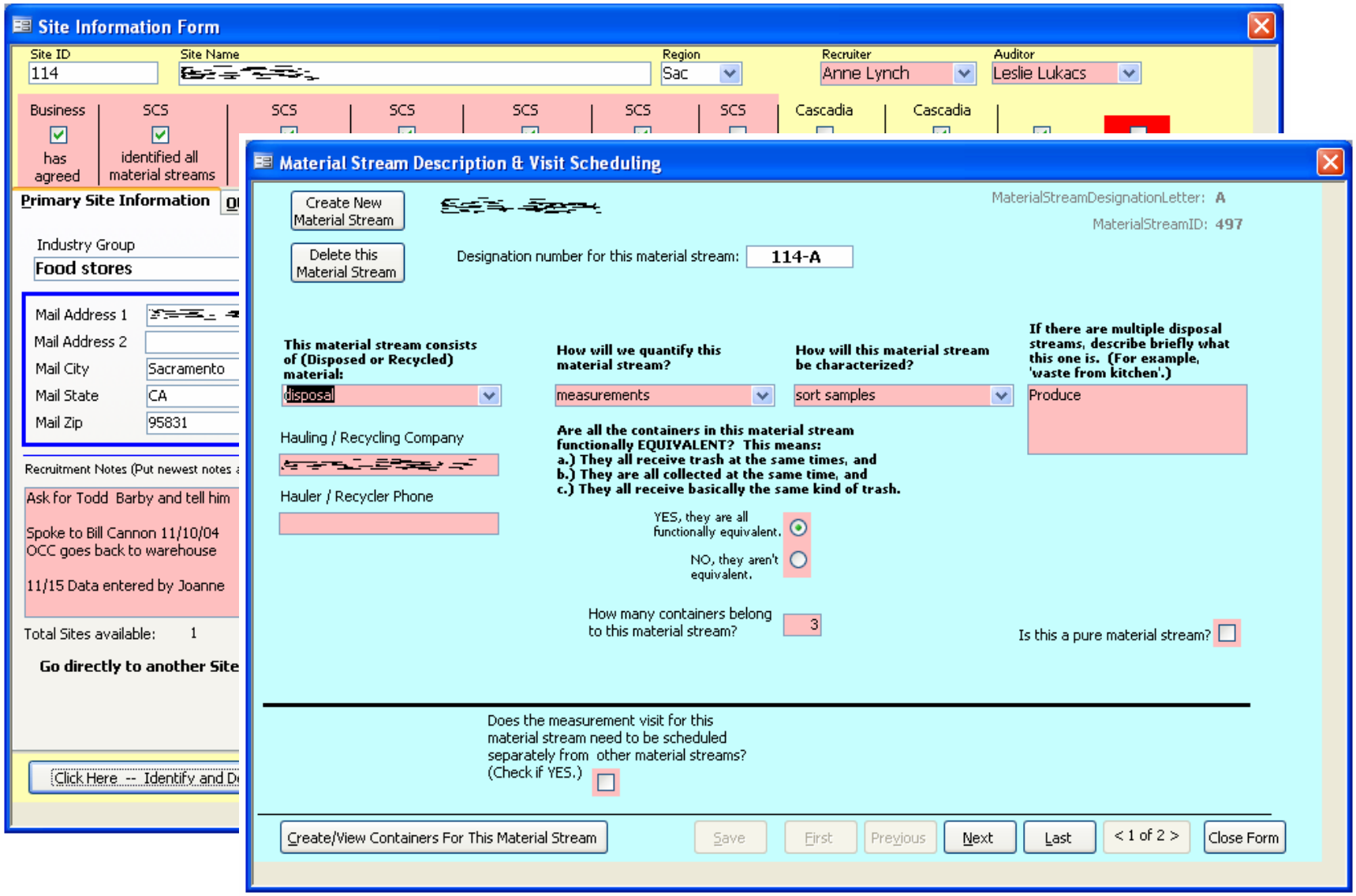
Please give a thorough description of the days & hours that the business generates trash. (This may be different from the days and hours they are officially "open.")

Click Here -- Identify and Describe Disposed Waste Streams | Save | First | Previous | Next | Last | Close Form

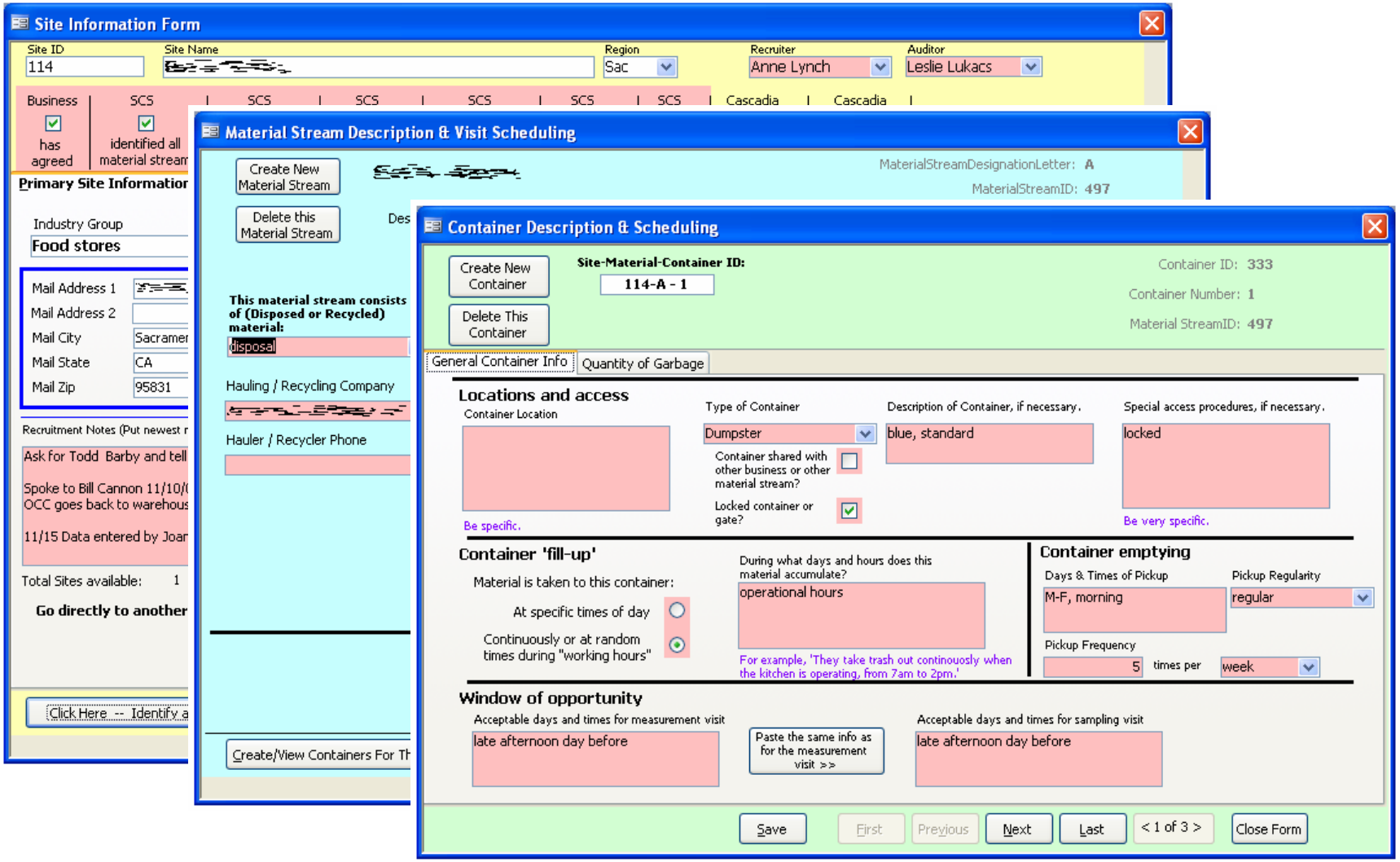

Site Information Form
Site ID
114
Site Name
Region
Sac
Recruiter
Anne Lynch
Auditor
Leslie Lukacs
Business has agreed
SCS identified all material streams
SCS scheduled the first site visit
SCS completed the first site visit
SCS input all recycling findings
SCS input all disposal data
SCS Requires Follow-up
Cascadia calculated disp. quantities
Cascadia completed the sampling visit
All pending issues resolved
Discard
Primary Site Information
Other Contact Information
Waste Generation Factors
Contact To Get Permission:
Name
Position
Director of Store
Phone
Fax
Email
Copy
>>
Contact To Get Information:
Name
Position
Director of Store
Phone
Fax
Email
Copy
>>
Contact for On-Site Access:
Name
Position
Director of Store
Phone
Fax
Email
Total Sites available: 1
Go directly to another Site ID: 114
>>>>
Click Here -- Identify and Describe Disposed Waste Streams
Save
First
Previous
Next
Last
Close Form

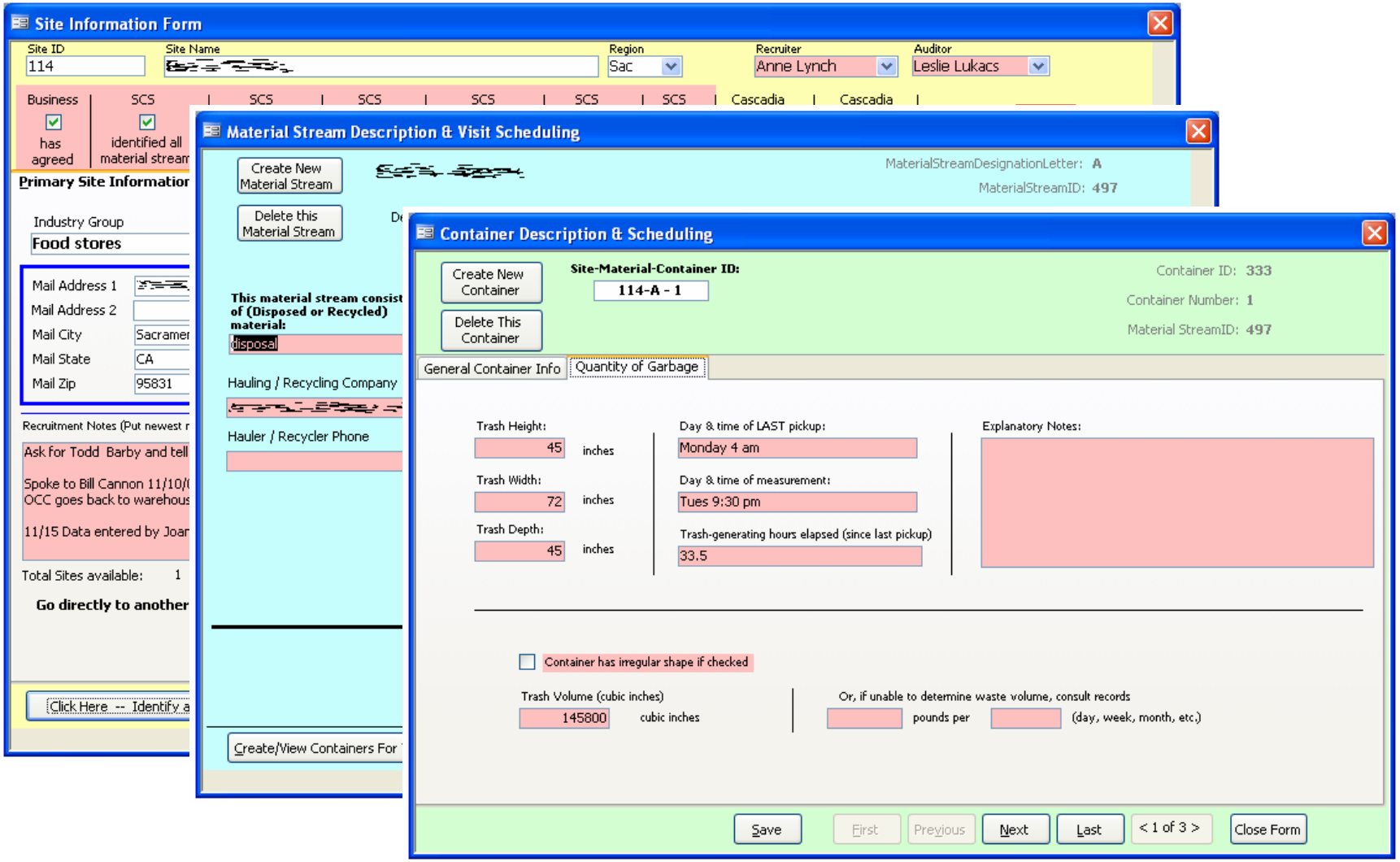

Site Information Form
Site ID
114
Site Name
Region
Sac
Recruiter
Anne Lynch
Auditor
Leslie Lukacs
Business has agreed
SCS identified all material streams
SCS scheduled the first site visit
SCS completed the first site visit
SCS input all recycling findings
SCS input all disposal data
SCS Requires Follow-up
Cascadia calculated disp. quantities
Cascadia completed the sampling visit
All pending issues resolved
Discard
Primary Site Information
Other Contact Information
Waste Generation Factors
Hotels
Restaurants
Wholesale
Grocery
Retail/BMG
Malls
Office Buildings
Venues
Employees (FTE) -- enter for all Industry Groups
90
Total square feet of building space -- enter for all Industry Groups except Hotels
40000
rooms in hotel:
of seats
Avg. % occupied year-round:
# of table turns annually
Annual gross sales: (grocery & retail)
Square feet of occupied retail space:
Square feet of occupied office space:
# of visitor-days annually:
Avg. % occupied during measurement period:
Gross sales during the measurement period:
# of visitor-days for measurement period:
rooms occupied during measurement
Total Sites available: 1
Go directly to another Site ID: 114
>>>>
Click Here -- Identify and Describe Disposed Waste Streams
Save
First
Previous
Next
Last
Close Form

Screen for entering data for waste substreams:



Screens for entering data for individual waste containers:




Site Information Form
Site ID
114
Site Name
Region
Sac
Recruiter
Anne Lynch
Auditor
Leslie Lukacs
Business
has agreed
SCS
identified all material stream
Cascadia
Primary Site Information
Industry Group
Food stores
Mail Address 1
Mail Address 2
Mail City
Sacramen
Mail State
CA
Mail Zip
95831
Recruitment Notes (Put newest r
Ask for Todd Barby and tell
Spoke to Bill Cannon 11/10/
OCC goes back to warehous
11/15 Data entered by Joar
Total Sites available: 1
Go directly to another
Click Here -- Identify a
Material Stream Description & Visit Scheduling
Create New Material Stream
Delete this Material Stream
MaterialStreamDesignationLetter: A
MaterialStreamID: 497
This material stream consist of (Disposed or Recycled) material:
disposal
Hauling / Recycling Company
Hauler / Recycler Phone
Create/View Containers For
Container Description & Scheduling
Create New Container
Delete This Container
Site-Material-Container ID:
114-A - 1
Container ID: 333
Container Number: 1
Material StreamID: 497
General Container Info
Quantity of Garbage
Trash Height:
45
inches
Trash Width:
72
inches
Trash Depth:
45
inches
Day & time of LAST pickup:
Monday 4 am
Day & time of measurement:
Tues 9:30 pm
Trash-generating hours elapsed (since last pickup)
33.5
Explanatory Notes:
Container has irregular shape if checked
Trash Volume (cubic inches)
145800
cubic inches
Or, if unable to determine waste volume, consult records
pounds per
(day, week, month, etc.)
Save
First
Previous
Next
Last
< 1 of 3 >
Close Form