

## SECTION 3

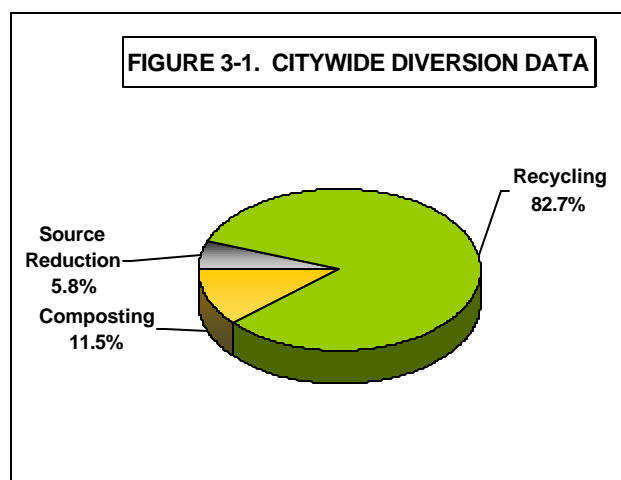
### DIVERSION STUDY

#### 3.1 SUMMARY OF FINDINGS

Diversion data was compiled from a number of different sources, and analyzed to determine the quantity of materials diverted in the City of Los Angeles in 2000. The data was compiled by sector (residential, commercial and industrial), material type, and program type (see **Figure 3-1**). The data was adjusted to eliminate double counting of materials reported at processing facilities and double counting due to responses from facilities that receive materials from the City's curbside recycling program. The net diversion resulting from the diversion survey, City Departments, and other survey instruments, after all adjustments for double counting is 5,359,943 tons for the year 2000.

#### 3.2 APPROACH AND METHODOLOGY

An analysis of waste diversion activities was conducted for the purpose of estimating the quantities and composition of materials being recycled and reduced within the City of Los Angeles during calendar year 2000. The City utilized a comprehensive, multi-faceted approach in its diversion analysis. The diversion analysis consisted of the following elements:



Surveys of facilities to determine the quantity and composition of materials received and recycled:

- Processing facilities.
- Landfills.

Surveys of various generator sectors to determine the quantity and composition of materials recycled:

- City government.
- Other government.
- Commercial businesses.
- Construction and demolition (C&D) companies.
- Landscapers and gardeners.

Data was also collected from the California Department of Conservation on the types and quantities of materials that qualify for California Redemption Value (CRV) in California.

In addition, haulers were surveyed to identify materials collected and transported to recycling facilities. The data identified the quantity of source separated materials collected from the

residential, commercial and industrial sectors, as well as source separated construction and demolition debris, green waste, and wood waste.

All of this data was compiled to determine the quantity and composition of materials diverted through source reduction, recycling, and composting, and as special waste.

### **3.2.1 Processing Facilities Surveys**

A survey of processing facilities was conducted for the purpose of estimating the quantities of materials being processed for recycling that were generated within the City of Los Angeles in calendar year 2000.

The methods and procedures for the processor survey were similar to those used in a processor survey conducted to document diversion for 1995<sup>1</sup>. The survey methodology involved the compilation of a list of businesses and organizations in the recycling infrastructure, the preparation and mailing of a survey instrument, telephone follow-up, and the eventual compilation of the data received from the respondents.

The survey was prepared with the following goals in mind:

*Maximizing participation* -- As was the case in 1990 and 1995, recyclers were not compelled by law to respond to the City's 2000 diversion survey. To maximize response to the survey, the survey form was designed to be short and simple to complete. This served not only to increase the probability of a response, by minimizing the time required by the business to complete the survey form, but also to increase the likelihood that the form would be completed accurately.

*Ensuring confidentiality* – The City guaranteed that the survey would be conducted in strict confidence. An independent contractor prepared the mailing list, mailed the surveys, received the completed forms, conducted the follow-up calls, and analyzed the data. In addition, the survey form was designed such that any business identification could be deleted prior to submittal of the completed forms to the City.

*Avoiding double counting* – The survey form was designed such that respondents would indicate the quantity of a material category that was recycled during 2000, the percentage of that material that was marketed to another recycling facility, and the name of the recycling facility(ies) that received the material. If the recycling facility named on the form had also completed a survey form, that quantity was not counted towards diversion.

*Documenting diversion* – In documenting 2000 diversion, a very conservative approach was used, i.e., a survey process that would yield accurate results and minimizes the potential of over-reporting diversion. In the survey form, facilities were instructed to:

1. Report only quantities generated within the city of Los Angeles.
2. Report only quantities of restricted materials that were an increase or decrease from recycling levels in 1990, or that were the result of new programs since 1990, unless they were received from City departments.
3. Exclude CRV materials reported to the California Department of Conservation.

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<sup>1</sup> 1995 Annual Report on Diversion & Disposal in the City of Los Angeles, prepared by the City of Los Angeles, October 1997.

In addition, during data analysis, the following steps were taken to avoid over-reporting:

1. Only documented diversion data was used. Reported quantities were not extrapolated to account for non-respondents.
2. City generated biosolids, whether composted or land applied, were not counted.
3. Quantities that seemed unrealistically high were either verified or excluded.

### ***Database Compilation***

In order to ensure that as many recycling facilities as possible were surveyed, and thus maximize the potential for receiving responses from a wide range of businesses, the first task was to develop a comprehensive current list of recycling facilities. The survey list was compiled from a variety of sources including the following:

- The mailing list used for the 1995 diversion survey.
- Informational materials prepared by the City since 1995 listing recycling locations:
  - C&D facilities.
  - Directory of Donations Opportunities for Los Angeles Businesses and Residents (L.A. Resource Program).
  - Recycling in L.A.'s Multi-Family Complexes.
  - Commercial Textile Recycling Directory.
  - C&D companies and Food Banks.
  - Hard to Recycle Items.
  - Trade Associations and Business Coalitions – AB939 Outreach.
  - Electronics.
- California Integrated Waste Management Board – California Construction & Demolition Recyclers Database, and California Waste Facilities, Sites, & Operations Database.
- California Department of Conservation – Operators of Certified Recycling Centers and Certified Processors.
- ABI database for Los Angeles of companies with the following SIC codes: 2448, 2621, 2679, 4953, 5015, 5093, 5932, and 7534.

Using information from the sources listed in the previous paragraph, a mailing list consisting of 1,635 businesses and organizations was compiled.

The 2000 survey placed additional focus on businesses involved in reuse activities (e.g., thrift shops, antiques stores, and used book dealers). In addition, the 2000 processor survey did not

target gas stations and oil processors because information on oil recycling is available from the CIWMB, nor did it target packaging and shipping businesses (e.g., Mailboxes Etc.) because of potential overlap with the generator survey.

### ***Conducting the Survey***

A survey package was prepared which consisted of the following:

- Cover letter from the City of Los Angeles indicating the rationale for the survey and requesting the assistance and cooperation of the business or organization in completing the form.
- Letter from the contractor, explaining the survey methodology and giving instructions for completion, a due date for submittal, and contact information in case assistance was needed.
- Survey form (one page, double sided).
- Postage-paid business reply envelope.

Although the survey form was similar in many ways to the form used for the 1995 survey, some changes were incorporated into the 2000 survey. The modifications were made to allow the collection of data needed by other facets of the diversion study and to simplify the collection of data regarding double accounting. The year 2000 survey form differed from the one used in 1995 in the following ways:

- Expansion of the number of business categories, especially reuse businesses.
- Addition of questions related to the nature and size of business (description of business activities, SIC code, number of employees).
- Addition of a question regarding in-house recycling.
- Modification of columns pertaining to double counting.
- Addition of questions related to the entity's finances (revenue and payroll).

A copy of the survey form is included in ***Appendix F***. Information was solicited on the type of business or organization (including SIC code and number of employees), quantity of materials from Los Angeles recycled in 2000 (broken down by 6 material categories and 31 material subtypes), and the entity's revenue and payroll.

After elimination of survey packages due to bad addresses, duplication, or for other reasons, the net number of survey packages sent was 1,201. Follow-up telephone calls were made to facilities that had not responded to the survey in order to solicit responses, and to some facilities that had submitted survey forms in order to clarify responses.

### ***Survey Response and Data Entry***

Of the 1,201 potential respondents, 512 surveys were received via either mail, fax, or over the telephone, representing a response rate of 43%. For data entry, a format was prepared using

Microsoft Access that was similar to the survey form. This allowed data to be entered with a minimum of errors. After completion of data entry and quality control, the file was converted to Microsoft Excel for data analysis.

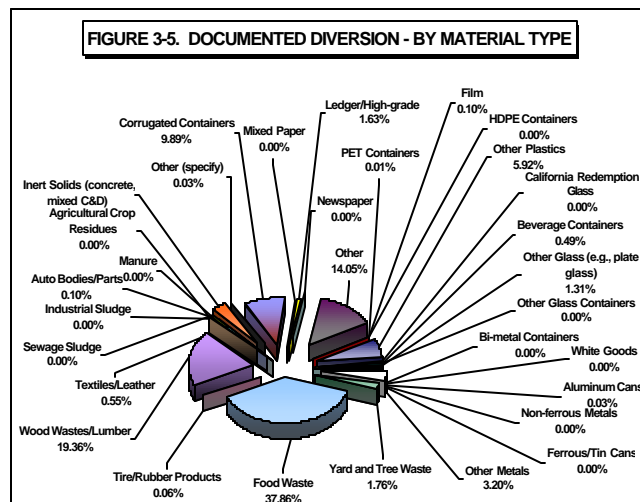
**Conversion of Volume-Based Data**

Although facilities were requested to provide data on a weight basis (i.e., in tons/year), in a number of cases respondents reported data in units other than weight. Some examples include cubic yards and number of items. Data reported in non-weight units were converted to a weight basis using appropriate conversion factors.

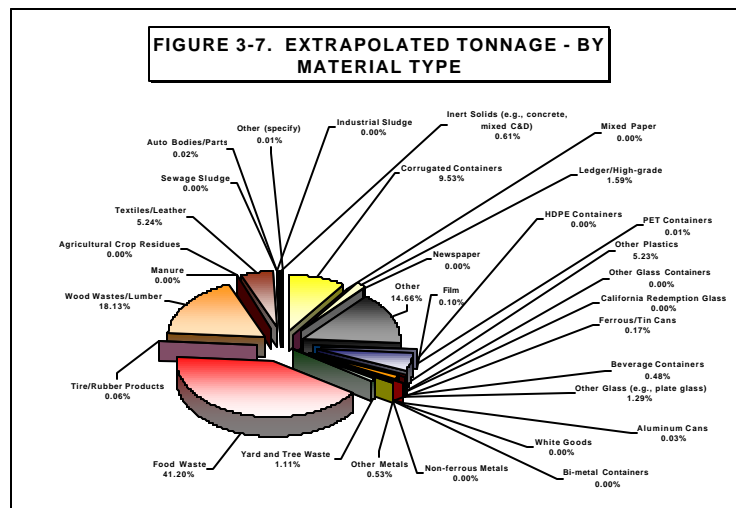
**Survey Results**

The data was compiled for each of the 31 material types (including the incorporation of volume data converted to weight) and subsequently adjusted for double counting. The unadjusted (i.e., gross) compiled quantity is 4,168,049 tons.

An analysis of the responses indicated that 882,604 tons of materials were reported as being sent to a processing facility from which data was obtained. Thus, adjusting the gross quantity for the double accounting reported on the survey forms, resulted in 3,285,445 tons of diversion reported by processing facilities.



The results were further adjusted to eliminate double accounting due to responses from facilities that receive materials from the City’s curbside recycling program. The net diversion resulting from the diversion survey, after all adjustments for double accounting, is 3,181,190 tons. A breakdown of the quantities by material category is given in **Figure 3-2**.



**CRV Diversion**

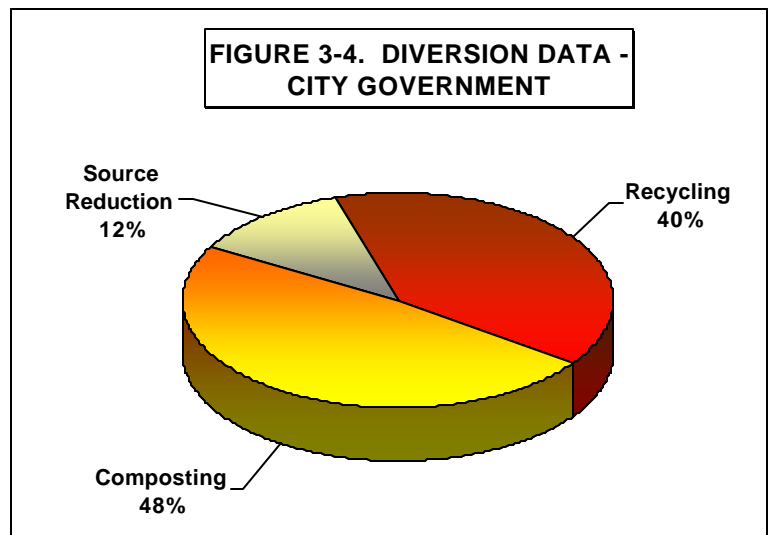
Facilities were asked in the survey to exclude CRV materials that were submitted to the California Department of Conservation (DOC). In order to include CRV materials in the diversion analysis, data was obtained from the DOC on the quantities of materials diverted within the City of Los Angeles. The diversion reported by the DOC is 128,685 tons. A breakdown of the percentages by material type is given in **Figure 3-3**.

### 3.2.2 City Government

Each of the 47 City Government agencies were contacted in September 2000 with a letter requesting that diversion and disposal data for the year 2000, along with a written assessment of programs, be submitted to the Bureau of Sanitation on April 2, 2001. In February 2001, Executive Directive No. 2001-33 was issued by the Mayor, including a direction that all City agencies designate a high level Recycling Coordinator and submit a report to the AB 939 program manager on April 2<sup>nd</sup> of each year.

Nine City Departments or Bureaus manage the waste stream generated by all City agencies. Section 5 of this report outlines the City agency diversion programs. Findings for the City Departments are as follows (see **Figure 3-4**):

- City Government documented 1,216,035 tons through diversion activities in the year 2000.
- Of this total, 145,023 tons were documented as source reduction, with the majority being grass-cycling at City parks.
- 482,201 tons of material were recycled through the Bureau of Sanitation's curbside program, the City Facilities Recycling Program, and in-house recycling programs in many agencies, including asphalt re-use by the Bureau of Street Services.



- 588,811 tons of material were composted or mulched, mainly through the Bureau of Sanitation's curbside yard trimmings program, reuse by Recreation and Parks, and mulching of tree trimmings by the Street Tree Division of the Bureau of Street Services.

### 3.2.3 Other Government

A survey of Other Government agencies was conducted as part of the City's AB 939 Year 2000 project. "Other Government" consists of government agencies, except City of Los Angeles, that maintain facilities within the City's physical boundaries. Similar studies were conducted in 1991, 1992, and 1995. For the original SRRE, the City conducted a comprehensive disposal and diversion study of Other Government facilities. Because of budget constraints, the City's 1995 study of these facilities was limited to mail and telephone surveying.

Other Government agencies are divided into the following categories:

- County government.
- State government.
- Federal government.
- International government.
- Regional government.

### ***Database Compilation***

The list of Other Government facilities was obtained from telephone directories, Internet, and City records. The City used PC-based software to compile the list including agency names, contacts, addresses, phone numbers and other information. Separate files were kept for county, state, federal, international, and regional facilities. An ID number identifies each agency location. The City then verified that each facility is located within the City boundaries through its Geographic Information System (GIS). Other Government facilities not located within the City boundaries were removed. An attempt was made to identify every agency office located in each building. Information on County facilities was obtained from the County's recycling program database.

The County Government category includes 459 facilities, the State Government includes 190 facilities, the Federal Government includes approximately 309 facilities, the International Government includes 60 facilities and the Regional Government includes approximately 22 facilities. For purposes of this survey, the Regional Government consists of buildings and/or facilities of the Metropolitan Transportation Authority (MTA) and the Metropolitan Water District (MWD).

### ***Conducting the Survey***

A total of 1,233 questionnaires were mailed to other government agencies. The mailed surveys consisted of an introductory letter explaining AB 939 requirements, a two-page survey and a stamped addressed return envelope. The survey package is included in **Appendix E**. Respondents had the option of returning the survey by mail or by fax. Facility locations were researched for those surveys that were returned as non-deliverable. Facilities who did not respond were given a follow-up phone call to obtain information. Employees were asked to complete the survey over the phone or return the survey via fax or mail. Three attempts were made to contact each non-responding facility. A phone survey and log were used to document contacted facilities. Over 45% of facilities received a follow-up phone call. The overall survey response rate was 50%.

### ***Data Analysis***

The survey asked information on the number of employees, disposal and diversion bins and tonnages, grasscycling, and source reduction activities. Disposal tonnages were calculated based on information regarding the number, size and frequency of collection of waste bins located at a facility. If available, information regarding use of compactors was also accounted for in the calculation. Although many facilities reported having diversion programs, the majority could not quantify diversion tonnages. Only documented diversion information is included in the data.

### **Activity Types**

Survey responders were asked to designate, by percentage, the type of activity(ies) performed at their location. This information is useful in determining the types and amounts of waste and recyclables generated by each activity type. Based on the survey results, the facilities were divided into the major use or activity undertaken at the location. The types of services conducted at Other Government facilities include the following:

- Administration - Any facility whose primary function is administrative, record keeping, or document and data processing. The majority of facilities had some type of administrative activities at their location.
- Golf Courses - Consists of regulation nine-hole and 18-hole golf courses and their associated putting areas and driving ranges. Clubhouses and concessions were included as part of the survey. The County operates four golf courses within the City. State and Federal agencies do not operate any golf courses. The 1990, 1995, and 2000 surveys documented over 99% of golf course diversion was from grasscycling. Grasscycling was the largest diverted material out of all materials diverted by Other Government facilities.
- Repair and Maintenance - Consists of facilities that repair and maintain public works and public transportation equipment and vehicles. Also included in this function are water treatment and storage facilities. All County, State, Federal and Regional agencies have repair or maintenance facilities. The majority of the Other Government locations did not quantify diversion amounts for repair and maintenance activities.
- Hospitals - Includes both short-term care and long-term care facilities. There are two County hospital facilities in the City: The Los Angeles County/USC Medical Center and its associated facilities; and the Olive View Medical Center. No State, Federal, or Regional hospitals are located within the City boundaries.
- Beaches - Consists of Pacific Ocean beaches and shorelines. There are three County beaches in the City including Will Rogers Beach, Venice Beach and Dockweiler Beach. Concession stands are included as part of the survey. Federal and State agencies do not operate any beaches in the City boundaries. Employees did not document disposal and diversion; therefore, tonnage information was not input in the database. The County implemented a plastic and aluminum recycling program prior to 1995, but the program proved unsuccessful and was discontinued.
- Cultural Facilities - Includes museums, playhouses and performing arts centers. Five County cultural facilities, two State cultural facilities and one Federal cultural facility are located in the City of Los Angeles.
- Warehouse/Storage - Consists of facilities whose primary function is inventory control or storage of supplies, materials, electronic equipment, and weapons. This category excludes water storage facilities. County, State, and Federal agencies all have warehouse/storage facilities.
- Clinics/Laboratories - Includes walk-in medical facilities or rehabilitation facilities. Laboratories consist of chemical and agriculture analysis facilities. It also includes law enforcement and environmental regulatory agency analytical laboratories as well as their sample retention and/or storage facilities.
- Parks - Consists of designated wilderness areas, recreation parks and designated open space. Parks do not include greenbelt areas surrounding roads and highways. Three County parks, two State parks and one Federal park are either partly or wholly located within the City. The majority of diversion is from grasscycling activities. Tonnage diversion totals in 2000 declined from 1990 and 1995 levels because not all parks responded to the survey and/or the park administration did not quantify totals.

- Prisons - Primary functions include penitentiary facilities that are designed for long term incarceration, reformatories, and jail facilities. However, it does not include temporary holding facilities such as those of the County Sheriff, Highway Patrol, or City police. Three County prisons and two Federal prisons are located within City limits. No State prisons are located within City boundaries.
- Parking - Includes any parking lots, parking garages or parking structures. Many facilities did not report direct diversion from parking lot activities.

**Disposal and Diversion Results**

The 2000 disposed, diverted, and generated tons for each category of Other Government agencies are summarized in **Table 3-1**. Over 76% of the waste generated by Other Government facilities originates from County Government facilities, however these facilities reported diverting less than 1% of their wastes. State facilities generated 18% of the total wastestream of this group, and diverted 28% of their wastes. The State agencies diversion rate can be attributed to recycling programs at State Community Colleges. Federal facilities contributed 4% of the waste generated, and achieved a diversion rate of almost 60%. The majority of the Federal Government diversion can be attributed to the United States Postal Service, which has an extensive recycling program.

**TABLE 3-1. OTHER GOVERNMENT WASTE GENERATION DATA**

Category	Disposed Tons	Diverted Tons	Generated Tons
County	196,881	641	197,522
State	34,216	13,377	47,593
Regional	1,038	3	1,041
Federal	4,779	6,322	11,101
International	323	15	338
Total	237,237	20,358	257,595

**Significant Findings**

- Other Government facilities disposed of 237,237 tons of waste. This represents 6.4% of the City’s total disposed waste stream.
- Other Government facilities diverted 20,358 tons, yielding a diversion rate of 8%. However, many facilities did not quantify diversion tons and actual diversion may be higher. The City has counted only documented diversion, and no data was extrapolated.
- 48% of Other Government diversion resulted from grasscycling.
- Other Government agencies do not have uniform diversion programs.
- Many successful diversion programs exist in Other Government that can serve as models for both the public and private sector.
- Other Government agencies, because of their significant purchasing power, can influence vendors, suppliers, and businesses with which they contract, to meet certain source reduction and recycling standards, such as minimizing shipping packaging, recycling construction and demolition debris, and using recycled content products.

### **3.2.4 Generator Surveys**

The purpose of these surveys was to identify existing waste disposal and diversion practices for representative businesses from the 130,000 private businesses located in the City, and to utilize the information to identify potential future diversion programs. In order to allow for direct comparison of data, the Year 2000 project utilized a methodology to select and survey private generators similar to the study conducted by the City in 1995.

The objective of the surveys was to obtain the following information from commercial generators:

- Business physical data, such as business type and SIC code, address, contact person and telephone/email, number of employees, square footage and major products.
- Description of current waste management and recycling services received, including volume and frequency of service, and estimate of total waste generation.
- Quantification of existing waste reduction and recycling activities by material type, using CIWMB approved conversion factors.
- Identification of new or improved programs, activities, or processes that could serve to increase waste diversion.
- Estimate of waste diversion potential (by material type and weight) that could result from new programs.

#### ***Methodology***

The survey involved a four-step methodology to determine the business categories from which to randomly select entities for surveying:

1. Classification of Groups into Subpopulations and Targets - To select the categories for the 2000 study, the City relied on the 1995 study methodology and the CIWMB business waste composition database methodology. These methodologies consolidated 83 SIC codes to 29 business groupings, based on the approach that similar businesses have similar waste streams. The City developed a cross-index of these groupings to allow for consistency for both internal uses and external reporting. Consideration was given to the estimated amount of waste generated within each category, and the amount of readily available recyclables that could be contained in their waste streams.
2. Develop List of Generators - The list of generators was developed using an American Business Information (ABI) database purchased for the project. The database includes business names, addresses, SIC code, number of employees and sales. This information was supplemented with data from the Planning Department's County Tax Assessors File, a rent registration file from the Housing Department, and a Building Permit File from the Department of Building and Safety.
3. Develop Sampling Plan - The number of entities to be surveyed in each target group was determined by stratifying each business subpopulation into small, medium, and large (by number of employees), and applying the 80/20 rule, which states that 80% of the waste will be generated by the 20% largest businesses. A detailed table by category

was created which included subpopulation name and SIC codes and the number of entities to be targeted within each subpopulation for waste surveys and sampling.

4. Selection of Sites - The businesses selected for surveys were selected based on the above sampling plan, and targeted the same group as the waste characterization study. By using the same group, the data could be extrapolated for both waste disposal and diversion. A total of 500 sites were selected for on-site surveys, and an additional 300 sites were selected for telephone surveys.

### ***Conducting the Surveys***

The generator survey consisted of performing both on-site and telephone waste surveys of private commercial generators. The approach for conducting each type of survey is described below.

#### **On-Site Surveys**

For the on-site surveys, the City utilized a data collection field form and supplemental questions designed to capture information during the on-site visit. Copies of these survey forms are included in **Appendix D**. City staff were trained to conduct the on-site surveys and were accompanied by the trainers during their first three initial surveys.

In order to schedule and complete the on-site surveys in the 2-month allotted time frame, a protocol was established for scheduling, conducting and completing the data entry and quality control. This protocol is outlined below:

- Each Bureau of Sanitation (Bureau) staff person signed up to conduct on-site waste surveys for 7 days during the months of November and December.
- The sign-ups were incorporated into a master site visit calendar.
- Each Bureau staff person was assigned a trainer. The trainer was responsible for coordinating with their assigned staff member.
- The trainer reviewed staff specialty area assignments for targeted generators, and matched staff to their assigned specialty area.
- Using the database, trainers looked up the list of appropriate business types in the project database, and identified the business randomly selected for contacting and made the initial contact to schedule a site visit and recruit for waste sampling.
- Trainers made the initial phone contact with the business to set up appointments for site visits and recruit for waste sampling at the same time. If successful, audit date and time was entered into the database. If unable to make an appointment, the date of attempt was entered into the database, and tagged for future contact. The next business was then contacted. Site visits were scheduled for one week in advance, when possible.
- For audits to be conducted by Bureau staff, trainers e-mailed site visit schedules to City staff and project managers, and verified receipt of site visit schedules.
- Depending on assignment, either Bureau staff conducted the site visit or the trainer conducted the site visit.

- Following completion of the site visit, the auditor (either Bureau staff or trainer) entered data into the project database.
- For audits conducted by Bureau staff, the Bureau staff informed the trainer that data had been entered, and forward to the trainer a copy of the field notes.
- The trainer reviewed the waste audit form completed by Bureau staff, and performed QA/QC on the audit data. The trainer then discussed the findings with Bureau staff. If necessary, the database input was revised.
- QA/QC was completed on audit data, and verified in the database.

### **Telephone Surveys**

The objective of the telephone survey portion of the generator study was to obtain the same information as the on-site interview, over the telephone. Trained auditors experienced in performing recycling and disposal telephone surveys performed the telephone surveys. The auditors performed a “virtual” survey over the phone with businesses, walking them through a survey similar to the on-site surveys. Following completion of each telephone survey, the data was entered into the project database and subjected to the same QA/QC as the on-site surveys. A total of 300 telephone surveys were conducted as part of this phase of the project.

### ***Database Compilation***

A custom database was designed specifically for this project. The ABI business information was downloaded into the project database, and additional screens were created to be utilized for the recruiting of businesses for the waste characterization sampling, the on-site waste surveys, and the telephone surveys, as well as data entry for the waste surveys. Using an online format, project staff simultaneously updated the database as businesses were recruited for sampling and surveying. The database allows for entry of disposal and diversion data. Diversion information is entered by material type, frequency of generation, quantity (volume or weight), and incorporated conversion factors for calculating annual quantities. The database also tracks the diversion program, either source reduction, recycling, or composting. The database also incorporates information on potential diversion, by allowing the user to enter data on types and quantities of materials that presently are not being diverted. This information will be utilized by the City for future program planning purposes. Queries were written into the database to report on existing diversion by generator and material types, as well as potential diversion. Following completion of the data entry process, the information was verified for accuracy via error-checking logic incorporated into the database program.

### ***Survey Results***

Bureau and consultant staff completed 581 random generator surveys of commercial businesses in the City. The business surveys documented 528,747 tons of diversion in the City. Based the extrapolation methodology described below, we have estimated that the City’s business sector diverted 3,026,156 tons in 2000.

The business surveys were essential to understanding the business sector's true diversion. Many businesses in the City participate in private recycling programs and practice waste prevention techniques not usually tracked by the City. The business surveys were valuable in both documenting the City's diversion and identifying service voids.

**Figures 3-5** through **3-8** show the results of the generator survey. Documented diversion from the generator surveys, by material type and by program type, is shown in Figures 3-5 and 3-6, respectively. Extrapolated tonnage amounts are shown in Figures 3-7 and 3-8, by material type and program type, respectively.

### **Restricted Wastes**

No restricted waste were included in the waste generation study except for the following materials:

- Inert materials diversion activities, including concrete, asphalt, soils, and mixed construction and demolition debris, which have been implemented since 1990. These programs qualify under Public Resource Code Section 41781.2 as diverting new tonnages since 1990 and may be included in the new base year.
- Scrap metal programs, including those developed by private businesses, which have been implemented since 1990. These programs qualify under Public Resource Code Section 41781.2 as diverting new tonnages since 1990 and may be included in the new base year.

All of the diversion data was screened to validate the applicability of any restricted materials for calculation of the 2000 diversion rate.

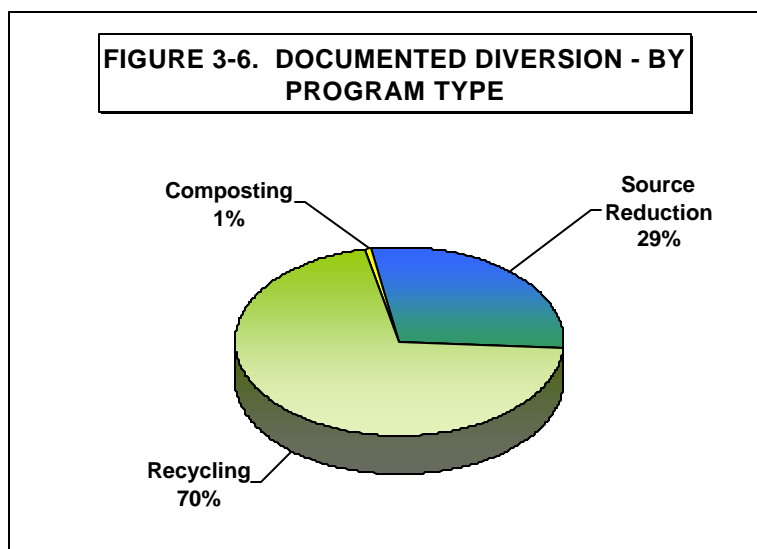
### **Conversion Factors**

All conversion factors used in the solid waste generation study are those identified in Appendix J of the CIWMB Diversion Study Guide.

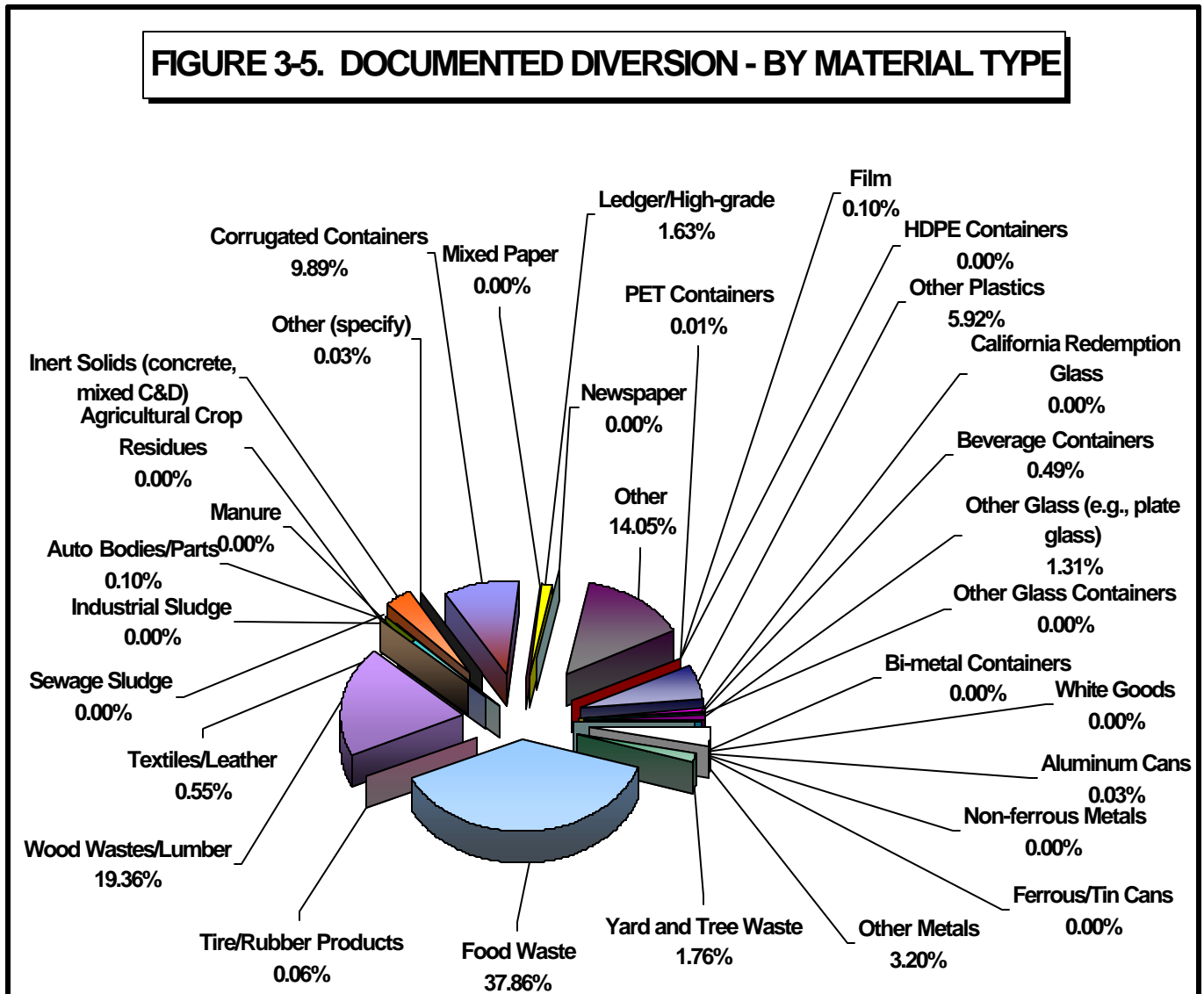
### **Extrapolation of Data**

For the random business survey, the total tonnage diverted was extrapolated using the following methodology:

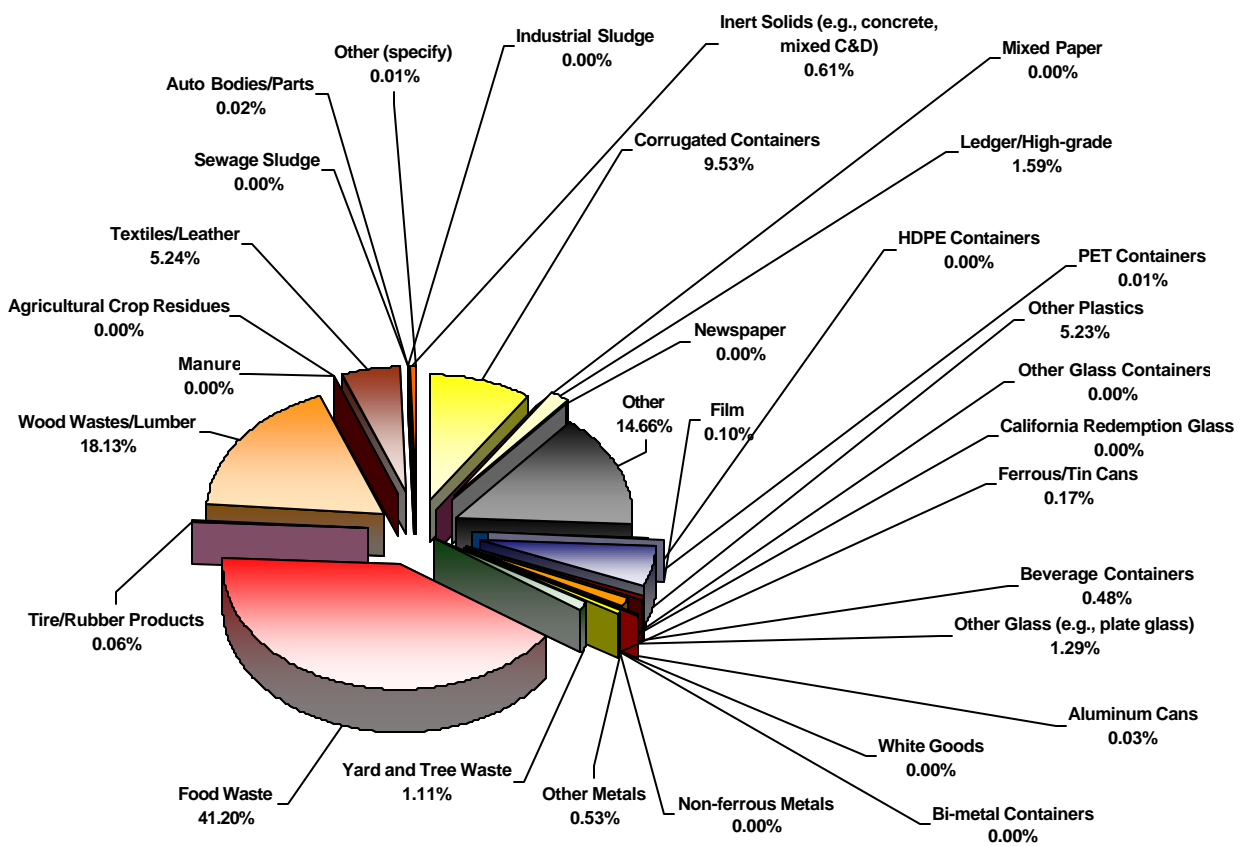
- Total number of samples included in the survey - 1,245 businesses were contacted out of 124,334 potential businesses.
- Number of non-respondents and respondents - Of the 1,245 businesses contacted, 581 businesses, representing 151,671 employees, completed the survey. We assumed no diversion for the non-respondents.



**FIGURE 3-5. DOCUMENTED DIVERSION - BY MATERIAL TYPE**



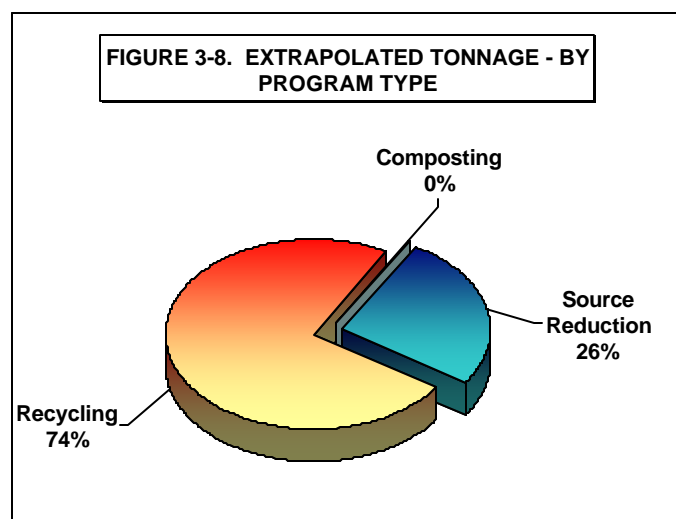
**FIGURE 3-7. EXTRAPOLATED TONNAGE - BY MATERIAL TYPE**



- Total population - Total population for the random business survey was 124,334 businesses, representing 1,943,054 employees.
- Relation of sample size to total population - In determining the sample size for the study, we relied on the standard formula presented in Appendix K of the CIWMB Diversion Study Guide. For an infinitely large population (at a 90% confidence level), the formula determines a minimum sample size of 271 samples.
- Survey data collection tools and approaches - The surveys were conducted by Bureau and consultant staff. The staff was trained in survey methods as described in the Diversion Study Guide. The survey instrument used to gather data from the random business surveys is included in **Appendix D**.
- Confidence level and margin of error for the sampled population - As described in Appendix K of the Diversion Study Guide, the confidence interval for the sampled population is 90% with a plus or minus 5% precision level.
- Outliers. An outlier analysis was performed on the survey samples - The businesses were stratified by population into large and small strata (80/20 split) and the outlier analysis was performed using two times the standard deviation plus the mean to identify the outliers. All outliers were then removed from the extrapolation calculation. Further outlier analysis was conducted to account for restricted materials. All of the audit data was reviewed for restricted materials. All tonnage for restricted materials was subtracted prior to extrapolation. Once the extrapolation was completed, the restricted materials were added back in to estimate jurisdiction-wide diversion. No diversion correlative factor was used for any restricted materials.

### **Extrapolation Method**

- Basis of extrapolation. For the large and small business strata, a weighted average recycling, source reduction, and composting tonnage amount was calculated per employee to determine the recycling diversion, source reduction and composting correlative factors. The correlative factors were multiplied by the total number of employees in the population (excluding those from the outliers) to obtain total recycling, source reduction and composting amounts.
- Appropriateness of method. This extrapolation method (using weighted averages and excluding outliers) is conservative and estimates that there are approximately 1.7 tons diverted for every employee in the survey population.
- Sources of information used for extrapolation. Employment numbers were obtained for each business from the City of Los Angeles ABI database.



### **3.2.5 Construction and Demolition Surveys**

Diversion data from construction and demolition activities was gathered separately, as this data was not readily available from either the disposal site sampling or generator audits/sampling. The objective for this effort was to obtain complete, current and accurate data to quantify construction and demolition diversion activities in the City.

#### ***Methodology***

In order to account for diversion of construction and demolition material for the year 2000, three sources of data were used. First, data was obtained from landfills where material is either reused on site, or shipped off site for recovery. Second, information was obtained from the Bureau of Contract Administration on recovery through City contracts. All City contractors are required to send a monthly report on diversion activities. Third, a database from Building and Safety for all projects that required permits in the year 2000 was reviewed.

#### ***Conducting the Surveys***

To obtain information about landfill activities, a telephone survey was conducted to identify if C&D material was accepted from the City. If so, the facility was asked to quantify the material disposed and beneficially reused on site, or processed and recycled off site.

The Bureau of Contract Administration supplied the City construction project data for all City construction projects during the year 2000.

The list of contractor/owner builders obtaining permits in 2000 was narrowed to include all projects with a reported cost over \$200,000. More than 1,200 surveys were sent out to the contractor/owner builder listed on the permit application. The contractors were asked to identify what types of activities were undertaken to recover C&D materials either on site or where they were taken off site for recovery. Only those contractors that could verify actual tonnage were included in the study results.

#### ***Survey Results***

The total diversion documented through these efforts was 532,766 tons. The landfill surveys result in the documentation of 195,329 tons of materials reused or diverted. The results of the C&D surveys indicated that for City projects, 21,000 tons plus 224,000 cubic yards of material were reused onsite or at another site. For private projects, 2,550 tons of diversion were documented. Of the 2,550 tons reported, 200 tons of asphalt were disposed in inert fills; 2,000 tons of asphalt was taken to an inert backfill site; 200 tons of concrete was disposed in inert fills; 70 tons of concrete were taken to an inert backfill site; and 280 tons of soil-base type material were taken to an inert backfill site.

### **3.2.6 Yard Trimmings Surveys**

Similar to the construction and demolition material, not all yard trimmings reuse was captured through the survey process. Therefore, three separate processes were used to gather additional yard trimmings reuse information.

#### ***Methodology***

Three sources of data were used to gather the diversion information for year 2000. First, a mail and telephone survey of landfill sites was used to gather reuse information. This data was carefully filtered to avoid double counting with City Department programs. Second, a mail

survey followed by phone calls of 369 landscapers within the City was conducted. Third, a list was compiled of potential large organics recyclers such as private golf courses, cemeteries, and equestrian centers, to obtain data on specific sites.

### **Survey Results**

The landfill survey identified a total of 96,826 tons of yard trimmings that were diverted on-site through processing and reuse or as Alternative Daily Cover. These numbers do not include the Bureau of Sanitation curbside collection program. The landscaper surveys yielded 1,028 tons of grasscycling, 6 cubic yards of grasscycling, 200 tons of composting, 199 cubic yards of composting, and 126 acres of grasscycling for the year 2000. Most of the responses, however, were either negative or indicated that no records of diversion activities were kept. Approximately 6,300 tons of additional diversion were documented. The data received from surveying specific sites for organics diversion activities totaled 14,220 tons of materials, as indicated in **Table 3-2**.

**TABLE 3-2. ORGANICS DIVERSION SURVEY**

<b>Category</b>	<b>Diverted On-Site (tons)</b>	<b>Diverted Off-Site (tons)</b>	<b>Total (tons)</b>
Private Golf Courses	8,973	444	9,417
Cemeteries	865	1,171	2,036
Equestrian Centers	0	2,767	2,767
<b>Total</b>	<b>9,838</b>	<b>4,382</b>	<b>14,220</b>