

SECTION 2

DISPOSAL STUDY

2.1 SUMMARY OF FINDINGS

The total quantity of wastes disposed by the City of Los Angeles (City) in 2000 is reported as 3,750,281 tons. The source of this disposal data, the Disposal Reporting System, includes records of disposed and transformed wastes from facilities reporting as receiving tonnage generated from within the City.

As part of the AB 939 Year 2000 Annual Report project, the City collected disposal data from a number of sources/studies, the results of which will be compared with the Disposal Reporting System data to determine the most accurate disposal quantity for the City. These supplemental studies included a survey of private haulers. Results of this survey indicated that private haulers responding to the survey collected over two million tons of the disposed waste in the City. Data from City collected waste included the nine agencies that generate the majority of the wastestream for the City. These nine agencies managed over one million tons of the disposed waste stream.

The disposal study also includes a comprehensive waste characterization and quantification study (WCQS) of waste disposed by private generators. This massive undertaking included three sampling sessions in two seasons, where crews collected almost 1,500 samples of disposed waste and sorted them to determine exactly what is still being disposed in the City. The summer sampling was completed in July 2001, and the data from this effort will be available in Fall 2001. This data will be used to cross check the Disposal Reporting System information to make sure that our disposal for the year 2000 is as accurate as possible, but the Disposal Reporting System figure will be submitted as the City's disposal for the year 2000.

2.2 APPROACH AND METHODOLOGY

The 2000 project includes a comprehensive evaluation of waste disposed in the City. The objectives of the study were:

- To verify disposal data as reported by the County Disposal Reporting System.
- To determine the types and quantities of materials disposed in the City, in order to identify potential diversion opportunities.

The study includes surveys of waste collected by the City and by private haulers, waste disposed from City departments, and waste disposed from private generators. This data is then used as a cross check for disposal facility data to determine the most accurate disposal quantity for the City.

2.3 DISPOSAL REPORTING SYSTEM DATA

The Disposal Reporting System (DRS) data represents a compilation of all records of disposal that were identified as originating from the City of Los Angeles. As required by the State reporting system, each disposal facility tracks the origin of waste, and submits this information

to the county in which it is located. The county, in turn, compiles the data and supplies to each jurisdiction a quarterly report.

The quarterly report breaks down the data into the following categories:

- Received – total waste reported at the gate originating from the City.
- Salvaged/diverted – materials separated at the landfill and diverted, such as white goods, bulky items and clean dirt.
- Alternative daily cover – material used for daily landfill cover, such as clean green waste or inerts.
- Landfilled – materials disposed.
- Transformed – materials disposed/diverted at the transformation facilities.

2.3.1 Year 2000 Disposal Reporting System Data

In 2000, the City of Los Angeles received DRS data from a number of counties, including Los Angeles, Kern, Orange, Riverside, San Bernardino, San Joaquin, Shasta, Stanislaus and Ventura Counties.

In previous years, the Los Angeles County facilities conducted quarterly surveys based on a one-week survey period. The data from the weekly survey was extrapolated out for the quarter, based on the percentage of waste disposed at the facility for the entire quarter. Due to problems with this method, the system was revised, and by 2000, the disposal facilities in Los Angeles County had converted to a daily or continuous reporting system. Data is still reported on a quarterly basis, but daily disposal reports are used to calculate the jurisdictions quarterly tonnage.

A summary of the DRS data from Los Angeles and other counties that receive City of Los Angeles waste is included in **Table 2-1**. The total amount reported as disposed from the City is 3,750,281 tons. Of this total, 3,668,421 tons were disposed at landfills and 81,860 tons were delivered to the two permitted transformation facilities.

2.3.2 Comparative DRS 1995-2000

A comparison of disposal reporting system disposal data for the years 1995 through 2000 is presented in **Figure 2-1**. The disposal data includes materials landfilled and transformed.

2.4 HAULER SURVEY

The City of Los Angeles' Solid Resources Citywide Recycling Division (SRCRD) has conducted the private waste hauler survey every year since 1990, with the exception of 1991. The purpose of this survey is threefold: to obtain disposal and diversion tonnages; to gather information on disposal and diversion practices; and to obtain information that can be used as a cross-check of data from the Los Angeles County Disposal Reporting System and other SRCRD surveys.

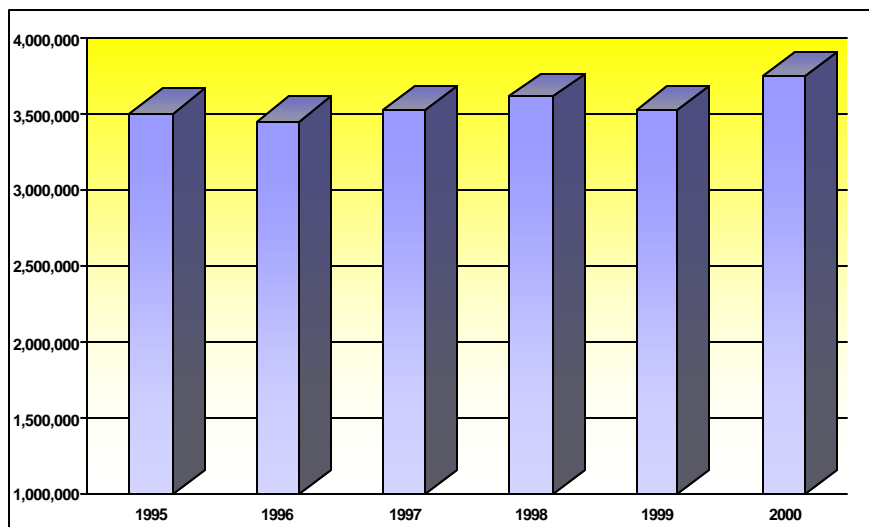
**TABLE 2-1. CITY OF LOS ANGELES DISPOSED TONS FOR 2000:
BASED ON COUNTY DISPOSAL REPORTING SYSTEM LANDFILLED AND TRANSFORMED TONS**

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Annual Totals
A. UNADJUSTED CITY TONS AS REPORTED BY LOS ANGELES COUNTY DISPOSAL REPORTING SYSTEM					
<i>Landfilled/Transformed Tons Disposed in County of Los Angeles as Reported by County Disposal Reporting System</i>					
BKK Landfill	0	0	0		0
Calabasas Landfill	31,923	40,276	39,781	37,344	149,324
Chiquita Canyon Landfill	161,815	154,433	172,063	156,052	644,363
Lancaster Landfill	0	0	0	0	0
Lopez Landfill	0	0	0		0
Azusa Land Reclamation Landfill	9,015	9,004	13,926	10,533	42,478
Bradley Landfill	340,799	397,599	342,824	332,522	1,413,744
Nu-Way Live Oak Landfill (Inert Landfill)	51,354	81,423	14,430	6,534	153,741
Peck Road Landfill (Inert Landfill)	3,322	1,475	698	162	5,657
Puente Hills Landfill	4,484	2,248	2,231	3,938	12,901
Reliance Pit Landfill (Inert Landfill)	619	2,458	4,759	5,231	13,067
Savage Canyon Landfill	12	0	0		12
Scholl Canyon Landfill	9	4	87	38	138
Spadra Landfill	5	0	0	0	5
Sunshine Canyon Landfill	235,705	270,252	273,319	289,885	1,069,161
Commerce Refuse-To-Energy (WTE)	8,641	7,409	7,207	6,760	30,017
Southeast Resource Recovery Facility (WTE)	0	15,306	18,053	18,484	51,843
Total City Tons Landfilled/Transformed in L.A. County	847,703	981,887	889,378	867,483	3,586,451
B. ADJUSTMENTS TO CITY TONS DUE TO TONS REPORTED BY OTHER COUNTIES					
<i>Landfilled/Transformed Tons Disposed in Other Counties as Reported by Their Disposal Reporting Systems</i>					
Kern County	2,588	1,082	885	674	5,229
Orange County	27,713	44,208	20,161	18,756	110,838
Riverside County					0
San Bernardino County			35	3	38
San Joaquin County	0	0	0	0	0
Shasta County					0
Stanislaus County	24	27	3	9	63
Ventura County	11,346	12,218	12,170	11,928	47,662
Total City Tons Landfill/Transformed Outside L.A. County	41,671	57,535	33,254	31,370	163,830
Total Landfilled/Transformed Tons (All Counties)	889,374	1,039,422	922,632	898,853	3,750,281

2.4.1 Survey Instrument

At the beginning of 2000, the previous year's survey was reviewed and revised. The changes made to the 1999 survey consisted of updating the list of landfills and recycling facilities, adding new materials for quantification under recycling, and adding a question regarding the recycling activities at the hauler's place of business. The surveys were mailed with self-addressed stamped envelopes to encourage responses. All of the surveys were mailed at the end of January 2001, and follow-up phone calls began the week of February 12, 2001. The final survey is attached as **Appendix C**.

FIGURE 2-1. DISPOSAL REPORTING SYSTEM



The mailing list for the 2000 survey was compiled from the following sources: SRCRD's 1999 survey mailing list; City of Los Angeles' City Clerk Tax and Permit list of waste haulers; and the Greater Los Angeles Wastes Management Association (GLASWMA) member roster. A list of 212 haulers was compiled from these sources to complete the 2000 survey.

2.4.2 Survey Responses

Out of 212 surveys mailed for 2000, 124 surveys can be accounted for. Of these, 66 haulers reported having disposed of City waste, 41 reported that they did not collect any waste from the City, and 3 surveys were returned as undeliverable and updated information could not be obtained. Fourteen are out of business or are not solid waste haulers. The remaining 88 haulers did not respond and either refused to respond or could not be contacted for follow-up. **Table 2-2** shows responses for the 2000 survey.

TABLE 2-2. HAULER SURVEY RESPONSES

Survey Responses	Number of Responses	Percentage of Responses
Did Dispose of LA Waste	66	31.13%
Did Not Dispose of LA Waste	41	19.34%
Returned as Undeliverable	3	1.42%
No Response	88	41.51%
Out of Business	14	6.60%
Total	212	100.00%

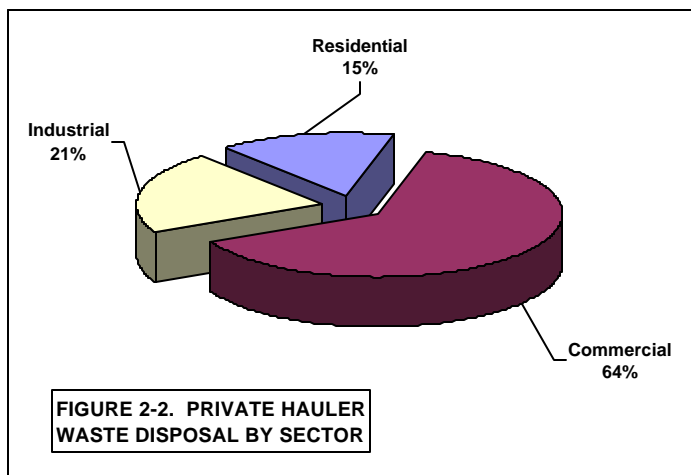
There are several factors that contributed to non-response. Two haulers refused to complete the survey, citing being too busy to comply. Many haulers were reluctant to complete the survey since it is not mandatory. Others complained of an inability to give any good information, as they do not keep track of jurisdictional origin. Others still were unable to be reached to provide any follow-up to the original mailing.

2.4.3 Disposal

The total amount of waste disposed, as reported by the haulers, was 2,011,822 tons. The majority of waste (49.4%) was handled through a transfer station prior to final disposal. Direct haul to landfill accounted for 47% of the disposed waste stream. Only 3% of the waste was disposed by transformation. **Table 2-3** (below) shows the distribution of disposal facility use as reported by the haulers.

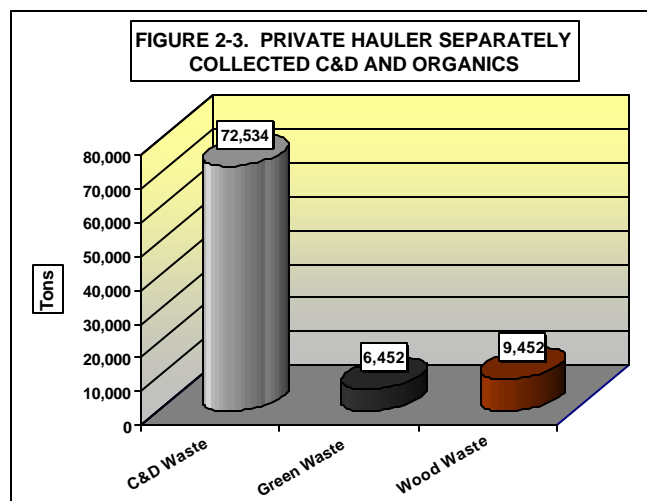
Disposal by Sector

The majority of waste collected for disposal originated from the commercial sector. However, it is important to note that not all haulers keep records of their collection by sector. The residential portion collected by private haulers represents multi-family units.



2.4.4 Construction and Demolition Debris and Organics

A number of haulers reported collecting construction and demolition waste, green waste, or wood waste. This data is presented in **Figure 2-3**.



2.4.5 Recycling

In 2000, the haulers reported a total of 271,013.02 tons of recyclable material collected in the City. The majority of the recycled materials were collected from the commercial sector. This can be attributed to the fact that the private haulers service primarily commercial accounts in the City.

Recycling Material Types

The haulers were asked to identify the materials that are collected for recycling. These materials included aluminum, computer paper, concrete and concrete block, corrugated/kraft paper, food waste,

furniture/bulky items, glass, high-grade white and colored paper, magazines, mixed office paper, newspaper, phone books, film plastic, plastics, scrap metal, textiles, tires, used oil, white goods, wood, and green waste. For the 2000 survey, the "plastics" designation was broken down into separate questions for #1, #2, and #3-7 plastic. Film plastic was added, as well as C&D material.

TABLE 2-3. DISPOSAL FACILITIES USED BY PRIVATE HAULERS

Facility	Reported Tonnage	Percent of Facility Type	Percent of Total Disposed Tonnage
<i>Direct Haul to Landfill</i>			
Bradley West	417,411	43.8%	20.8%
Calabasas	58,905	6.2%	2.9%
Chiquita Canyon	2,076	0.2%	0.1%
NuWay	23,757	2.5%	1.2%
Peck Road	2,827	0.3%	0.1%
Puente Hills	64,934	6.8%	3.2%
Reliance Pit	0	0.0%	0.0%
Scholl Canyon	10,496	1.1%	0.5%
Simi Valley	29,817	3.1%	1.5%
Sunshine Canyon	287,899	30.2%	14.3%
Other	55,257	5.8%	2.8%
Subtotal	953,380	100.0%	47.4%
<i>Transformation</i>			
Commerce	40,442	62.7%	2.0%
SERFF	23,148	35.9%	1.1%
Other	966	1.5%	0.1%
Subtotal	64,556	100.0%	3.2%
<i>Transfer</i>			
Action	287,382	28.9%	14.3%
Athens	120	0.01%	0.01%
BelArt	60,586	6.1%	3.0%
BFI	57,444	5.8%	2.9%
Burrtec	664	0.07%	0.03%
Carson	72,326	7.3%	3.6%
Central LA	28,821	2.9%	1.4%
CRR	10	0.0%	0.0%
DART	4,850	0.5%	0.3%
Degarmo (Crown)	183,696	18.5%	9.2%
Falcon	19,381	2.0%	1.0%
Innovative	41,722	4.2%	3.0%
Paramount RR	35,540	3.6%	1.8%
Rainbow	30	0.0%	0.0%
So. Cal. Disposal	30,479	3.1%	1.5%
Southgate	14,260	1.4%	0.7%
WTR	94,195	9.5%	4.7%
Other	62,379	6.3%	3.2%
Subtotal	993,885	100.0%	49.4%
Total	2,011,822	100.0%	100.0%

C&D Recycling

The haulers were asked to identify if they collected C&D material for recycling. The number of haulers collecting these materials are shown in **Table 2-4**.

TABLE 2-4. PRIVATE HAULERS RECYCLING C&D MATERIALS

Material	Number of Haulers Collecting*
Asphalt	34
Concrete, Concrete Block	44
Wood, Green Waste	40
Scrap Metal	38
Gypsum	5
Drywall	7
Paint	2
Other ⁺	6

* = Actual responses.

+ = Mattresses, dirt, and plastic were listed.

2.5 WASTE CHARACTERIZATION AND QUANTIFICATION STUDY

In order to determine the types and quantities of wastes disposed in the City, a generator-based waste characterization and quantification study was conducted. This study included sampling of wastes from businesses, from City and other government agencies, and from multi-family residences.

The approach to the study focused on characterizing the waste disposed by 29 individual generator groups. The groups are based on the California Integrated Waste Management Board's industry groupings as defined by Standard Industry Code (SIC). Twenty-five samples were allocated to each generator group in which members were believed to generate substantially similar waste, while 40 samples were allocated to each group where waste generation was expected to be diverse. To comply with the standard protocol, the study was conducted over two seasons (winter and summer). In order to ensure adequate representation of each industry grouping, half the samples from each group were assigned to each season.

2.5.1 Selection of Businesses

Specific businesses were selected randomly using the following approach:

- A list of all business sites in the zip codes corresponding to the City of Los Angeles was purchased from American Business Information (ABI).
- The business sites belonging to each generator group were segregated according to the range of numbers of employees at each site. Based on information provided by ABI about the number of employees at each site, the business sites within each group were designated as either "large," "medium," or "small," compared to other members of the

same group. Employment information was later verified for each business site that was actually recruited to participate in the study.

- For each generator group, the distribution of participating sites was approximately 33% for each of the small, medium, and large employment sizes. This is similar to the distribution in the 1995 waste characterization study.
- Specific information about each business site was placed in a database and used as a contact list. Business sites within each generator group and size designation were then placed in a random order, and they were recruited in that random order for participation in the study.

Due to the large number of businesses required for the Study, approximately 10,000 candidate businesses were selected randomly as described above. Extra business names were obtained to account for ones which were no longer in existence, had recently moved, could not be reached by phone, or were eliminated through a further screening process. Each candidate then received a letter from the City explaining that they had been selected for generator sampling, and a fact sheet explaining the purpose and objectives of the study. The letter included a brief questionnaire regarding their business operations and waste collection schedule. Businesses were asked to mail or fax the completed questionnaire to the City. Copies of the letter, fact sheet and questionnaires are included in **Appendix B**.

A representative of each candidate business site was contacted to confirm the following information, at a minimum:

- The number and size of dumpsters at the site.
- The days and times of waste pick-up.
- The physical address.
- The procedure for accessing the dumpsters or obtaining a waste sample through other means.

The information was used to plan and schedule sampling and to quantify waste generation at each individual business site. The recruitment process continued until more than the required numbers of business sites had been secured for each industry and size grouping. As businesses were recruited, the data was entered into the generator recruitment database.

During the contact process, businesses were screened out of the study if:

- Dumpster space was shared with other businesses belonging to different SIC groupings or with any residences, and it was not possible to design an alternative way of getting a sample of waste only from the candidate business.
- Dumpsters were not accessible to the sampling crew.
- The business refused to permit sampling of its waste.
- The City's contractor was unable to obtain enough information (such as dumpster size, location, time and frequency of pick-up), to estimate the volume or tonnage of waste

generated at the business site on a weekly basis. However this information was sometimes available from waste haulers.

If a business site was screened out, the next randomly selected business in that category was contacted, until the proper number of generators was identified for each industry group. Contingency business sites were obtained in case the sampling crew was unable to access the dumpsters at a selected business site.

Targets were established for each seasonal sorting period, based on the total number of samples to be accomplished within each generator group. Approximately half of the samples in each group were obtained in the winter, and half in the summer.

The next step in this process was to schedule sampling days for each of the participating generators. Generators were assigned to days on or just before the firm's normal collection day to ensure that there was an adequate amount of waste for sorting and that sufficient waste had accumulated in dumpsters to permit extrapolation of the volume of waste generated at each site.

A final list of business sites was provided to the field crew along with instructions or maps showing how to get to each business site. If the business denied permission to enter the property, or if the dumpsters were locked or inaccessible the field crew proceeded to the next site. Missed samples were replaced with business sites from the contingency list.

Sampling

The sampling activities included collecting samples from businesses, measuring volume and densities (for quantity calculations), transferring samples to a central location, and sorting to determine the composition of waste for each business group. Custom data-collection forms were used for the daily list of sites to be visited, for instructions to the sampling crew regarding each site, and for recording the composition of each sample.

Four teams, consisting of a driver and helper, collected samples based on schedules and locations as dictated by the participants' regular garbage collection schedules. At each business, 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 bin. The targeted size of the sample was (in order of priority) 150 pounds, two cubic yards, or all of the waste in the bin if less than either of those amounts was present. At each business site, the crew measured total dumpster capacity and estimated the total volume of waste present in each container.

The volume of each dumpster was recorded in cubic yards, based on actual measurements of the dimensions of dumpsters. The actual volume of waste contained in each dumpster was measured with a tape measure. Volume was calculated based on the product of dumpster length, dumpster width, and the height of the waste inside the dumpster. Later this volume was used, in combination with the amount of time that the waste had accumulated in the dumpster, to project the volume of waste generated on a weekly basis.

If a business site was believed to generate more than one type of waste (i.e., if it had multiple waste streams), then a sample was obtained for each waste stream. Dumpster measurements and waste measurements were assigned to individual waste streams as appropriate. Data from these "multiple" samples were then combined to get an overall composition estimate for the business site.

Sorting

After collection at the generator site, the waste was segregated, labeled, and transported to the Central Los Angeles transfer station for sorting. Waste from each individual generator was then sorted by hand into the 57 CIWMB material categories, and the weight of material in each category was recorded on the sample composition data form. Materials were sorted into the specified material types so that the amount of indistinguishable fines or miscellaneous categories was minimized.

Database Compilation

The generator recruitment database was used to produce the lists of businesses and instructions for collection of each sample. After the material weights for each sample were entered into the waste composition database, the waste composition records were matched with the recruitment records using their common index numbers. After the recruiting and sampling information was combined, it was possible to sort and filter the datasets that were fed into the statistical analysis programs.

Analysis of Sampling Data

Using calculations similar to those outlined in the CIWMB standard method, the average composition, estimated tonnage and confidence intervals at the 90% confidence level for each business grouping are being calculated. After calculating the composition and variance for each of the business groups, weighted averages will be performed to calculate results for the overall commercial waste stream. The average tons disposed per employee for each business group will also be calculated.

The summer season waste sort was conducted in July. The data analysis for both the winter and summer season sorts will be conducted simultaneously, and is expected to be completed during Fall 2001. Following completion of the analysis, a more accurate 2000 disposal number may be identified. At that point, the City will determine whether to apply to modify their base year.