TEXAS DEPARTMENT OF TRANSPORTATION / TUERFF-DAVIS ENVIROMEDIA INC.

2005
VISIBLE LITTER STUDY

Final Report

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NuStats

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EXECUTIVE SUMMARY

NuStats, in cooperation with Tuerff-Davis EnviroMedia Inc. and the Texas Department of Transportation (TxDOT), conducted a follow-up to the 2001 Visible Litter Study (VLS) to estimate the amounts and types of litter that are deposited on Texas roadways. The 2005 VLS involved collecting litter data from 136 research segments across Texas, each consisting of a 750-foot long stretch of TxDOT-maintained roadway. Specific information on the study objectives, methods, sampling, and other study details begins in the section of this report titled Introduction.

STUDY HIGHLIGHTS

Below are the highlights of the findings from the 2005 VLS:

Cigarette butt litter, still the most commonly found litter item on Texas roadways, decreased 10 percent between 2001 and 2005[1].

- Other litter items frequently found during the 2005 VLS were tissues/towels/napkins (5 percent), snack wrap (5 percent), beer cans (5 percent), beverage cups (4 percent), and cigarette packs (4 percent).

Since 2001, overall litter decreased 33 percent on the Texas-maintained highway system[2].

- The results of the 2005 VLS indicate that approximately 827,000,000 items accumulate annually on the Texas-maintained highway system (comprised of Interstate Highways, US Highways, State Highways and Farm-to-Market roads). In comparison, approximately 1,237,000,000 items accumulated in 2001.

Litter decreased on all road types since 2001.

- State Highways saw the largest reduction in litter, from about 333 million items in 2001 to just over 170 million items in 2005. The other roads types saw decreases in the following order: Farm-to-Market Roads, US Highways, and Interstate Highways.

Potential litter sources increase amounts of roadside litter.

- The data suggests a statistically significant relationship (correlation) between litter amounts and the proximity of convenience stores, shopping malls and fast food restaurants.

More traffic volume equates to more litter.

- Previous litter studies confirmed heavily traveled roads are "dirtier" than less traveled roads – increased traffic equals increased litter.[3] The 2005 VLS results support these findings.

Tobacco products, food-related and non-alcohol items comprise 75 percent of all litter.

- One third (33 percent) was tobacco-related litter. Items in this category include cigarette butts, cigarette packs, snuff cans, chewing tobacco pouches, etc.
- More than one-fourth (29 percent) of all litter items were food related. Items in the category range from fast food items (beverage cups, food napkins, condiment packs, fast food wraps – all specific to a fast food establishment) to candy wrappers.

[1] Not statistically significant. See recalibration of cigarette butt litter on page 12.
[2] Not statistically significant.
[3] The 2001 Litter Study suggested a significant correlation (r=.467, P=.01) between litter density and traffic volume.

- One in ten items (11 percent) were non-alcohol related. Items in this category include soft drink cans, soft drink bottles, straws and cup lids.
- Seven litter use categories (in descending order: construction/industrial, printed, alcoholic beverage, household personal, automotive, agriculture/garden, and other) comprised the other 27 percent of litter collected.

Most Texas litter (61 percent) is identifiable by brand name.

- The most commonly found identifiable litter brands were Marlboro Light® (18 percent) and Marlboro® (13 percent). Other common brand names included Texas Lottery® (3 percent), McDonalds® (3 percent), Bud Light® (2 percent), Coca-Cola® (2 percent), Burger King® (2 percent) and Dr. Pepper® (2 percent).

More than 95 percent of Texas litter is paper, plastic or metal.

- Almost two-thirds (61 percent) of all items were made of paper and paperboard. These items ranged from paper grocery bags to miscellaneous pieces of cardboard.
- One-fourth (25 percent) of collected items were plastic.
- One-tenth (10 percent) of the items were classified as metal.

INTRODUCTION

This report documents the survey design, sampling, data collection methodology, implementation and results of the 2005 Visible Litter Study (VLS) conducted by NuStats under subcontract to Tuerff-Davis EnviroMedia Inc. The statewide study, sponsored by the Texas Department of Transportation (TxDOT), was a follow-up to the 2001 VLS. A Visible Litter Study measures how fast litter accumulates and how much litter accumulates on different types of roadway segments. A roadway segment is both sides of a road, approximately 750 feet in length.

The report presents the following:

- Quantitative measurement of statewide roadside litter.
- Relationships between roadside litter and variables suspected of influencing roadside litter amounts.
- Conclusions and recommendations.

The organizational layout of the report is as follows: Introduction, Background, Methodology, Data Collection, Data Results, Conclusions and Recommendations, Appendices.

Throughout this report, comparative analysis between the 2001 VLS and 2005 VLS provide an understanding of roadside litter in Texas and any differences between the two studies.

STUDY OBJECTIVES

The Visible Litter Study (VLS) is a rigorous data collection effort that quantifies the amount and types of litter disposed of along Texas roadways. While there are many uses for the VLS data, one is to measure the Don't Mess with Texas (DMWT) litter prevention campaign's effectiveness in altering littering behavior (thereby resulting in a reduction of litter accumulating along Texas roadways). The comparative value between the 2001 and 2005 VLS data provides TxDOT with one mechanism for evaluating the effectiveness of its litter prevention efforts.

The specific study objectives for the 2005 VLS include:

- To produce a reliable statewide volumetric measurement of roadway litter to include the number of items, type of items, weight of items, volume of items, and, if possible, brand name of items.
- To provide an analysis of roadside litter accumulation rates that will allow TxDOT to model roadside litter accumulation rates across Texas.
- To compare the current data against the 2001 data to derive a measure of the differences in quantities and / or types of litter.
- To ascertain whether geographic (e.g., urban or rural) or location-based (e.g., proximity to a park or recreation area, food service facility, or school) factors contribute to more or less litter accumulations.

BACKGROUND

THE LITTER SURVEY

Since the mid 1970s, litter surveys have been used with increasing frequency by several government and private agencies to quantify roadside litter. Both full-scale litter and visible litter surveys helped these agencies determine:

- The rate at which roadside litter is deposited;
- The effectiveness of litter prevention programs and legislation;
- The composition of litter;
- The factors that affect litter deposition; and
- The progress achieved in reducing overall amounts of roadside litter.

Full-scale surveys differ from visible litter surveys in that the former measures both fresh and accumulated litter, whereas the later measures only accumulated litter. The full-scale variety captures litter data that is more detailed than that obtained in the visible litter survey. While the full-scale survey is an effective tool in the management of roadside litter, it is generally very expensive to conduct. However, the visible litter survey provides valuable information in a shorter period of time and at a lower cost.

Litter surveys often vary according to the unit of measure. While a number of measures have been used to quantify litter, none have proved to be more reproducible and consistent than the item count. Here, the items are simply removed from the sample site and counted. Area measurement, where the items are placed on a grid of known area and the aggregate area recorded, has also proved useful. Other measures such as weight and volume measurement, although useful, exhibit a lower level of reproducibility and a higher level of site-to-site variability. For this reason, primary emphasis is generally placed on the item count when drawing conclusions or making comparisons between other surveys, as was the case during both the 2001 and 2005 surveys.

LITTER PREVENTION / REDUCTION EFFORTS

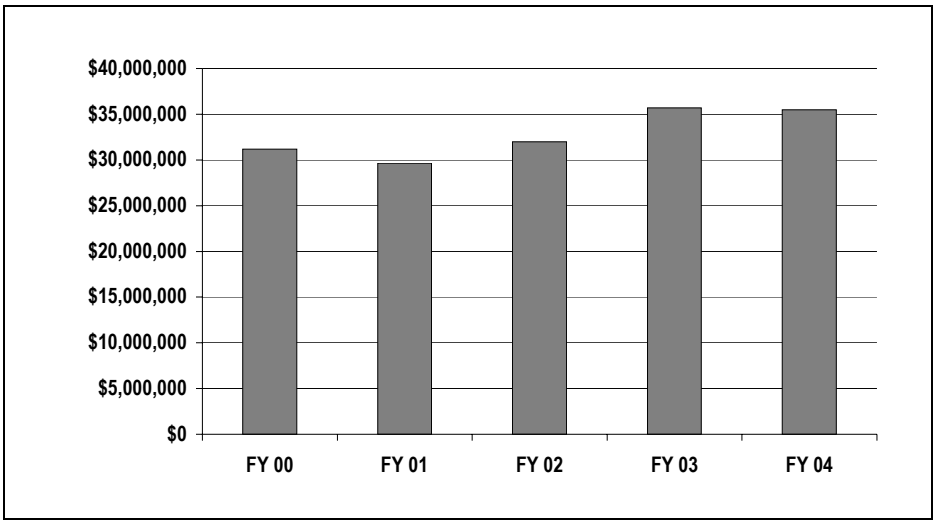
In an attempt to reduce litter amounts and preserve the beauty of Texas Highways, TxDOT is actively engaged in several litter prevention programs.

- The well-known Adopt-a-Highway (AAH) program, conceived in the TxDOT Tyler District in 1985, began when a civic group accepted a challenge to "adopt" a two-mile stretch of roadway. As of 2005, this program had grown to encompass more than 3,577 volunteer groups responsible for more than 7,639 miles of roadway statewide, approximately 10 percent of all TxDOT maintained centerline miles.
- The "Don't Mess with Texas" (DMWT) public education campaign has a long history of success in the state both for its use of well-known spokespersons, and for its tough stance on litter. In addition to promoting public awareness, the campaign includes such programs as the annual Don't Mess with Texas Trash-Off and the Don't Mess with Texas Partners. Recent survey findings suggest that this campaign is successful in reducing the percentage of all Texans that admit to littering.

Despite these litter prevention efforts, TxDOT is faced with an ever-increasing amount of roadway for which it is responsible. According to the 2000 Texas Department of Transportation District and County Statistics (DISCOS), TxDOT is responsible for the maintenance of over 79,535 centerline miles of road. This represents 1,100,000 acres of right of way.

As demonstrated in Figure 1, TxDOT currently spends approximately $35 million annually in litter cleanup expenditures.

FIGURE 1: TXDOT ANNUAL LITTER EXPENDITURES 2000-2004



Source: Texas Department of Transportation

METHODOLOGY

THE 2005 TEXAS VISIBLE LITTER SURVEY

This report contains the results of data collected during a two-phased Visible Litter Survey. The study was broken into phases so as to replicate the seasonal data collection methodology utilized in 2001. Phase I began in late November 2004 and culminated in late January 2005. Phase II began immediately following the end of Phase I and was completed during April 2005. The results presented in this report data are based on quantitative and qualitative litter data collected from 129 study sites throughout Texas.[4]

SAMPLE DESIGN

A critical component of this study was the formulation of a sampling plan that would yield data indicative of the litter accumulation on Texas highways. Since a primary objective of this survey was to determine statewide litter projections, the sampling plan included:

- The number of samples;
- The distribution of samples; and
- The sampling stratification.

In 2001, the original sample target was 140 sites, but Phase II modifications resulted in more efficient collection of litter data; therefore the sample size was reduced to 126. The 2005 VLS project team established a sample size of 136 sites, which allowed for 10 possible "lost" sites during data collection. Lost sites could arise from several factors including mowing or litter collection by TxDOT or its contractors during the accumulation period; construction; safety hazards; and severe weather.

Since littering on private land was not an impetus for this research, the statewide litter data was collected on public roadway rights-of-way and medians. As in 2001, the four types of roadways targeted for this study (thus comprising the sampling frame) were only certain types maintained by TxDOT. These consisted of the following roads:

1) Interstate Highways (IH);
2) United States Highways (US);
3) State Highways (SH); and
4) Farm-to-Market Roads (FM).

NuStats used a disproportionate stratified sampling method to divide the state into geographic sub-regions from which replicates, or sub-samples, could be selected. Estimates for each replicate can be calculated with more precision from stratified sampling than if the entire sample frame were randomly sampled. The 25 TxDOT districts constituted these sub-regions.

To determine the number of sample sites from each region, NuStats developed a matrix of key variables. This matrix paired each of the 25 TxDOT districts with the number of Daily Vehicle Miles (DVM) driven in that district. A daily vehicle mile is defined as the average mileage driven on state-maintained roadways in one day.

[4] Seven of the original 136 sites were lost for a total of 129 Visible Litter Study segments used for the final analysis. In the 2005, lost sites were due to construction initiated between the purge and collection, mowing or litter pickup during the accumulation period, and one site where weather caused a potential safety hazard for the subcontractor.

The districts were ranked in descending order based on their respective DVM. The total state DVM on TxDOT-maintained roadways was then divided by 136, the initial target sample number, to determine how often a sample site should be selected from each district. Finally, the number of sample sites from each district was proportionately distributed by road type and traffic volume.

SAMPLE SITE SELECTION

The sample sites in each district were selected to satisfy the sampling matrix criteria mentioned in the previous section. TxDOT District Highway Traffic maps were used to select the general area in which the segment should be located. Not only did these maps serve as a geographic reference, they also provided the latest Average Daily Traffic (ADT) counts, which were utilized in computing the correlations between litter density and traffic volumes.

Using this general description as a reference, NuStats subcontractors traveled to the designated site and were instructed to locate and clearly mark each end of the sample segment. These markers consisted of flagged stakes and served as an identifier to TxDOT personnel and third party contractors. Further information regarding selection of sample segments may be found in the Visible Litter Study Field Manual (See Appendix 3).

The locations of all 136 sites were provided to each of the TxDOT districts to verify the presence of a suitable median for litter accumulation and lack of construction, both present and in the near future. Upon verification, NuStats identified the sites using general highway maps and distributed them to the subcontractor.

FIELD MANUAL

To standardize and control the fieldwork, NuStats revised the 2001 Field Manual to reflect the 2005 study parameters (See Appendix 3). The manual consists of the following sections:

- Project overview and objectives;
- Project design;
- Step-by-step procedures for the purging and inventorying of litter; and
- Site selection criteria.

The Field Manual served to:

- Inform the subcontractor about the project, their role and provide key contact information;
- Train the subcontractor on protocols for the initial purge, litter inventory and data collection; and
- Serve as an overall guide for logistics and schedules.

FIELD LABOR FORCE

One notable difference between the 2001 and 2005 studies is that several subcontractors conducted the fieldwork for the 2001 VLS, while one subcontractor conducted the 2005 fieldwork. This not only increased the level of consistency with the site selection and litter classification, but also negated the need for communication with multiple teams across the state.

DATA COLLECTION

This section presents an overview of the data collection and field process. Two separate field activities were required to determine the rate of litter accumulation at each of the 136 sites. These were (1) the initial litter purge (determination of the specific location, clean up, and characterization), and (2) the litter inventory (collecting and counting of litter items following a litter accumulation period). This section provides details on these two processes.

THE INITIAL LITTER PURGE

The study design required that litter accumulate on the research segments for different periods of time.[5] Accurately determining the rates of litter accumulation required several critical field preparation activities:

Communication

Prior to the initial purge in each phase, NuStats communicated with TxDOT maintenance supervisors in each district, who then notified highway maintenance contractors (litter collectors and mowers) about the study. The communication process provided TxDOT maintenance personnel and contractors with detailed information about the study, the location of the research segments in their districts, and information about the importance of not disturbing the study segments during the accumulation period. NuStats requested that maintenance supervisors remind contractors to not mow or collect litter on the sections of marked right-of-way for the duration of the project. Likewise, NuStats communication with district Adopt-a-Highway coordinators who notified sponsor organizations with adopted sections of roadway in close proximity to research segments. Copies of the letters are in Appendix 7.

Site Preparation

NuStats VLS litter subcontractor was required to prepare the study segments. This required marking the exact boundaries of the research plot, or segment. A segment is defined as both sides of an Interstate Highway, United States Highway, State Highway, or Farm-to-Market Road (including all medians and rights of way from between private property boundaries) and 750 feet in length.[6] To assist with sample site locations, NuStats provided the subcontractor with a general location of the sample site. The subcontractor then selected the actual segment according to the selection criteria in the Field Manual. Measuring wheels were used to verify the length and width of each segment.

When the segment was clearly marked, all litter greater than two inches in size was purged from the site.[7] Although the litter collected during this phase was not inventoried, the subcontractor observed general characteristics such as quantities of litter and length of time required to clean a sample site. During this initial visit to the segment site, the subcontractor recorded information unique to each particular segment on the Segment Data Sheet for use in subsequent analyses (e.g., geographic and ecological characteristics, proximity to potential litter sources, nearby land use).

[5] Litter accumulated ranged from 12-46 days, with an average accumulation period of 34 days.
[6] One significant change in data collection from 2001 was the reduction in length of research segments from 1,500 to 750 feet. Additionally, the width of all segments was increased from half the roadway to the full width of each roadway. This served to decrease the time spent in field and reduce the number of statistical weights applied during the analysis.
[7] In 2001, if more than 300 cigarette butts were found within the first 100 yards of the segment, the subcontractor made a note on the segment data sheet and did not collect any more on that segment. In 2005, all cigarette butts were collected (for both purge and collection), regardless of the count within the first 100 yards.

NuStats monitored the litter subcontractor weekly to obtain progress reports, resolve field issues, reconcile deviations from the project schedule, and to clearly record the exact location of the sample segments. Although TxDOT district representatives had prior knowledge of the proposed litter survey schedule, maintenance personnel and Adopt-a-Highway coordinators were contacted with updates on deviations from the project schedule and the exact locations of all sample sites within their respective district. Strict timing and synchronization of this phase was essential.

LITTER INVENTORY

The litter collection and inventory occurred an average of 32 days after the initial purge. Prior to the inventory, TxDOT district representatives were again notified of the proposed time schedule. The litter subcontractor traveled to the respective sites to collect and bag all litter within the boundaries of the research segments. Detailed litter inventory procedures are in the Field Manual (Appendix 3).

NuStats instructed the subcontractor to label each bag of litter with the specific site identification number from which it was collected, as multiple sites were targeted each day. After the litter was collected, bagged, labeled and loaded for transport, the subcontractor recorded the remaining segment-specific information on the segment data sheets.

LITTER CATEGORIZATION

NuStats utilized a litter classification system[8] established in the 2001 study. This classification system utilized a four-level process, described in more detail below:

- Level 1 – Composition;
- Level 2 – Litter Use;
- Level 3 – Item Description; and
- Level 4 – Brand Name.

In Level 1, the subcontractor first categorized all litter into general "Composition" categories. The litter within each "Composition" was then classified into Level 2 by "Litter Use". The litter within each "Litter Use" was then classified by "Item Description" (Level 3). The final classification level targeted individual pieces of litter and identified the "Brand Name" of that particular item. The Litter Sorting Procedure is in the Field Manual (Appendix 3).

Empirical litter measurements recorded included:

- Total weight of litter collected per site (pounds);
- Total volume of litter collected per site (gallons); and
- Number of litter items found per site.

Initial data collected was recorded on the Inventory Hard Copy worksheet. The litter subcontractor transferred the data into an electronic Microsoft Excel database designed by NuStats. Electronic data entry was conducted in the field, providing a quality control edit check of the information recorded on the Inventory Hard Copy. During the litter categorization process, NuStats staff met with the litter subcontractor to observe the classification procedure and offer additional instruction on litter categorization and electronic data entry.

[8] This entailed reviewing litter tally sheets from previous studies, consulting the waste characterization reports from the Texas Commission on Environmental Quality (TCEQ) Municipal Solid Waste Division, and the Environmental Protection Agency (EPA) Office of Solid Waste, as well as communication between EnviroMedia and TxDOT.

DATA RESULTS

This section describes the findings of the Visible Litter Study data analysis, characterized by projected statewide litter rates, qualitative litter characterization, and quantitative analyses between litter and variables that have the potential to affect the rates at which it is deposited on the roadside.

The Visible Litter Study data analysis sought to provide answers to the following questions.

- How much litter accumulates on the state-maintained highway system in a given amount of time in Texas?
- How much litter accumulates on each of the four types of state-maintained roadways?
- What types of litter are most commonly found on the state-maintained highway system?
- What are the most common brand names found in Texas roadside litter?
- What is the relationship between litter amounts and variables such as:
  - ✓ Traffic volume; and
  - ✓ Proximity to potential litter sources.

Throughout this section of the report, tables show data based on magnitude, therefore, the four road types are not always presented in the same order.

STATEWIDE LITTER ESTIMATES, 2005

In order to generate representative statewide litter estimates, NuStats created and applied statistical weight factors to the litter data. This detailed process required comparing the actual length of roadway sampled during the Visible Litter Study (approximately 18 centerline miles) to the entire state-maintained highway system (approximately 72,000 centerline miles). More than half of all Texas state-maintained roadways are FM roads. The sample centerline miles were stratified by road type. Likewise, the state centerline data was stratified. The sample statistics were then compared to the state statistics and weight factors were created based on the differences.

As shown in Table 1, all state-maintained roadways show a decrease in litter. State Highways saw the largest reduction, from 333.2 million items in 2001 to 170.4 million items in 2005. Interstate Highways, US Highways and Farm-to-Market Roads also saw reductions. In 2005, the majority of Texas roadway litter was generated on Farm-to-Market Roads, which is similar to the 2001 findings.

TABLE 1: NUMBER OF LITTER ITEMS BY ROAD TYPE

ROAD TYPE (CENTERLINE MILES)	LITTER PER YEAR			
	WEIGHT (TONS)	VOLUME IN CUBIC YARDS (THOUSANDS)	NUMBER OF LITTER ITEMS	
	2005	2005	2001	2005
State Highway (16,199)	2700	80	333,243,215	170,488,104
FM Roadways (40,985)	7200	185	557,664,430	430,709,842
US Highway (12,102)	2300	65	239,269,458	153,035,881
Interstate Highway (3,233)	1200	30	107,204,788	72,971,697
Total (72,519)	**13,400**	**360**	**1,237,381,891**	**827,205,524**

Projected amounts per entire state road system. Weight and volume not included for 2001 because of recalibration data. It would not be possible to provide accurate estimates for weight and volume on imputed data; therefore, little comparative value exists between 2001 and 2005.

RECALIBRATION OF 2001 CIGARETTE BUTT ESTIMATES

Statement of the Problem

The initial comparative analysis of the 2001 and 2005 data suggested an increase in the percentage of cigarette butts from 14 to 28 percent. Given the overall reduction of litter, this finding was not plausible and prompted a more detailed review of the 2001 data. The review revealed a previously undetected under-reporting of cigarette butts in the 2001 VLS due to an inconsistency in the collection and reporting by litter collection subcontractors. *The collection and reporting of all other litter types was confirmed as rigorous; only cigarette butt measures were under-reported*. NuStats determined that cigarette butts were collected on 26 percent of the 2001 research sites, as opposed to 85 percent of the 2005 sites. This information was sufficient to allow the development of an improved measure of 2001 cigarette butt litter that eliminated this source of nonresponse bias. That methodology is described below in detail.

Methodology

To correct for the under-reporting in 2001, NuStats designed a methodology that would account for the low estimates. This new methodology relies on two important data assumptions. First, we assume that the proportion of study segments on which cigarette butt litter is found is relatively constant from year to year. In other words, based on empirical data collected in 2005, we would have expected to find butts on 85 percent of the 2001 segments. Secondly, we assume that in a given year the mean number of cigarette butts found on sites of the ***same road type*** is relatively constant. Given these two plausible assumptions, we estimate that, in 2001, cigarette butts should have been found on 109 segments vs. 32. For the 77 study segments on which butts were not reported, NuStats imputed the missing values with the observed 2001 mean number of butts, by road type, that we would have expected to find if the methodology was properly implemented. Finally, we re-estimated the total number of cigarette butts (statewide) and recalculated the percent of all litter in 2001 that is comprised of cigarette butts. The revised estimates are provided below, as well as the estimate for 2005.

Results

The re-calibrated data suggests that, in 2001, a more realistic estimate of cigarette butt litter as a percent of all litter is 31 percent. When compared to the 2005 estimate of 28 percent, the re-calibrated data suggests a 10 percent reduction (three percentage points) of cigarette butt litter on Texas roadways[9].

TABLE 2: RE-CALIBRATED CIGARETTE BUTT DATA ANALYSIS RESULTS

VLS	CIGARETTE BUTTS AS A PERCENT OF ALL LITTER
2001	31%
2005	28%

[9] Not statistically significant.

DATA COMPARISON FROM 2001 TO 2005

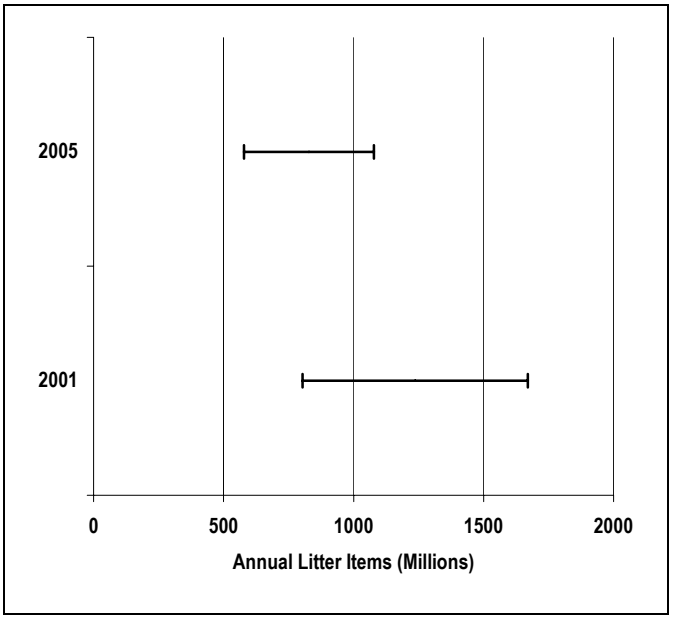
An important goal of the 2005 VLS was to generate data that could be compared to the 2001 VLS to quantify the change in statewide litter amounts over time. Both the 2001 and 2005 studies utilized a series of expansion factors for the statewide estimates.[10] Table 3 compares the results of the two studies; the data indicate a 33 percent overall reduction in litter from 2001 to 2005[11].

The annual litter estimates were created with statistical models that use empirical data to generate estimates that can be expanded to the state level. As with any statistical model based on a sample, there is a certain degree of error. It is important to consider the range of error associated with the 2001 and 2005 estimates to better understand the precision. Table 3 presents the results of calculating a 90% confidence interval for the annual litter estimates. One can state with 90% confidence that the 2005 annual litter estimate falls between 578,082,452 and 1,076,328,596 items. See Figure 2 for a better understanding.

TABLE 3: ANNUAL LITTER ESTIMATES AND ASSOCIATED 90% CONFIDENCE INTERVAL ESTIMATES

VLS	ANNUAL LITTER ESTIMATES *(MILLIONS OF ITEMS)*	ANNUAL LITTER ESTIMATES MINUS 90% CI ESTIMATE (MILLIONS OF ITEMS)	ANNUAL LITTER ESTIMATES PLUS 90% CI ESTIMATE (MILLIONS OF ITEMS)
2001	1,237	804	1,671
2005	827	578	1,076

FIGURE 2: ANNUAL LITTER ESTIMATE CONFIDENCE INTERVALS



Similar to the 2001 VLS, the confidence intervals illustrated in Figure 2 are overlapping. As such, one cannot conclude that the two estimates are statistically different. While the data suggest a 33 percent reduction in overall litter, that finding is not statistically significant.

[10] A significant change in methodology from 2001 to 2005 occurred when the decision was made to reduce the overall length of each segment from 1,500' to 750' and collect litter from the full width of the segment as opposed to collecting litter from only half the segment. This change may have refined the estimates by reducing the number of expansion factors needed to produce the statewide litter estimates.

[11] Not statistically significant.

Table 4 presents the number of items likely to accumulate on one mile of each road type on a monthly basis. When compared on a mile-per-mile basis, the Interstate Highway system contributes the largest amount of litter (1,881 items per mile of roadway per month). The US Highway ranks second at 1,054, followed closely by State Highways and Farm-to-Market Roads, at 877 and 876 items, respectively, per month per mile.

TABLE 4: MONTHLY LITTER PROJECTION BY ROAD TYPE

ROAD TYPE	MONTHLY LITTER PROJECTION	
	2001	2005
Interstate Highway	2,763	1,881
US Highway	1,646	1,054
State Highway	1,722	877
FM Roadways	1,134	876

Number of items per mile of roadway. Numbers may not reflect Table 1 totals due to rounding.

LITTER CHARACTERIZATION

This section provides an overview of the composition of litter collected during the 2005 study. These findings reflect weighted data. The data was statistically manipulated to reflect the amount of litter estimated to accumulate annually per segment if each segment is statistically expanded to one mile of roadway.

For the 129 sampled segments, the unweighted litter database contains 25,502 items of litter. The weighted litter database contains 1,957,252 items.

Litter was characterized into seven physical composition categories (plus 'other') obtained from the EPA Office of Solid Waste. As shown in Table 5, the majority of litter collected in 2005 consisted of paper and paperboard (61 percent). This was followed by plastic (25 percent) and metal (10 percent). These three categories comprised 96 percent of all litter collected.

TABLE 5: LITTER BY PHYSICAL COMPOSITION

PHYSICAL COMPOSITION	PERCENT OF TOTAL	
	2001	2005
Paper & Paperboard	68%	61%
Plastic	19%	25%
Metals	9%	10%
Glass	2%	1%
Other	1%	1%
Textiles	1%	1%
Rubber/Leather	<1%	<1%
Wood	<1%	<1%
Total	**100%**	**100%**

2001 estimates based on Phase II data only; composition data was not collected in Phase I of the 2001 VLS.

Litter was characterized into ten Use Categories. In the 2005 VLS, one-third of all litter items within the expanded database come from the Tobacco Litter Use (see Table 6). This category is closely followed by food (29 percent). Non-alcoholic beverage accounts for 11 percent of litter by use.

Comparatively, in the 2001 VLS, tobacco comprised the highest percent of all litter items (39 percent)[12], followed by Household/Personal (15 percent) and Food (14 percent). While the original 2001 VLS findings showed that food litter items comprised the highest percent, the recalibrated data indicates that food was in the top three litter use items. As illustrated in Table 6, food litter items continue to be a prevalent litter source, though tobacco comprises the highest litter use type on Texas roadways.

TABLE 6: LITTER BY USE

USE	NUMBER OF ITEMS[13]		PERCENT OF TOTAL	
	2001	2005	2001	2005
Tobacco	119,000	92,000	39%	33%
Household / Personal[14]	45,000	11,000	15%	4%
Food	42,000	79,000	14%	29%
Non-alcoholic Beverage	39,000	29,000	13%	11%
Alcoholic Beverage	19,000	18,000	6%	6%
Construction / Industrial	18,000	23,000	6%	8%
Printed	15,000	22,000	5%	8%
Other[15]	4,000	0	1%	0%
Automotive	3,000	4,000	1%	1%
Total	**304,000**	**278,000**	**100%**	**100%**

Counts rounded to nearest thousand for analytical purposes.

[12] Data based on recalibration of 2001 cigarette butt litter.
[13] Per mile of roadway per year.
[14] The large percentage point decrease in Household/Personal items from 2001 to 2005 (11-percentage point reduction) and increase in Food items (15-percentage point increase) may be due to improved litter use classification as a result of additional training.
[15] Although some items were classified as Other, there were so few, they rounded down to zero during the statistical analysis.

Table 7 provides an overview of the most common items found within each Litter Use. A more exhaustive list appears in Appendix 5.

TABLE 7: MOST COMMON ITEMS WITHIN LITTER USE CATEGORIES, 2005

USE	ITEM NAME	PERCENT WITHIN EACH LITTER USE
Tobacco	Cigarette Butt	84%
	Cigarette Pack	11%
Food	Tissue/Towel/Napkin	18%
	Snack Wrap	17%
	Beverage Cup	11%
	Food Wrap	8%
	Cup Lid	7%
Non-Alcoholic Beverage	Beverage Can	34%
	Beverage Bottle	29%
	Beverage Cup	12%
	Drinking Straw	7%
	Cup Lid	6%
	Bottle Cap	4%
Construction/Industrial	Rag	14%
	Corrugated Box	13%
	Styrofoam	9%
	Plastic Pieces	7%
	Plastic Wrap	5%
	Bag	4%
	Box Pieces	4%
Printed	Lottery Ticket	22%
	Receipt	15%
	Label	14%
	Instructions	10%
	Tag	9%
	Newspaper	6%
Alcoholic Beverage	Beer Can	71%
	Beer Bottle	22%
Household/Personal	Envelope	7%
	Carton	5%
	Medicine Container	5%
Automotive	Shop Rag	37%
	Oil Container	7%
	Carton	7%
	Container	4%
Agriculture/Garden	Feed Sacks	54%
	Shotgun Shells	37%
	Corrugated Box	9%
Other	Paper form	73%
	Hypodermic Needle	15%
	Miscellaneous	12%

The litter subcontractor was able to identify nearly 100 percent of all litter items collected in 2005. Figure 3 shows the top 20 identifiable litter items collected, regardless of litter use classification. Of all identifiable items collected, cigarette butts were the most common (28 percent), followed by snack wrap (7 percent), tissues/towels/napkins (5 percent), beer cans (5 percent), beverage cups (4 percent) and cigarette packs (4 percent). These six items account for roughly half (49 percent) of all estimated litter.

FIGURE 3: TOP 20 MOST COMMON LITTER ITEMS, 2005

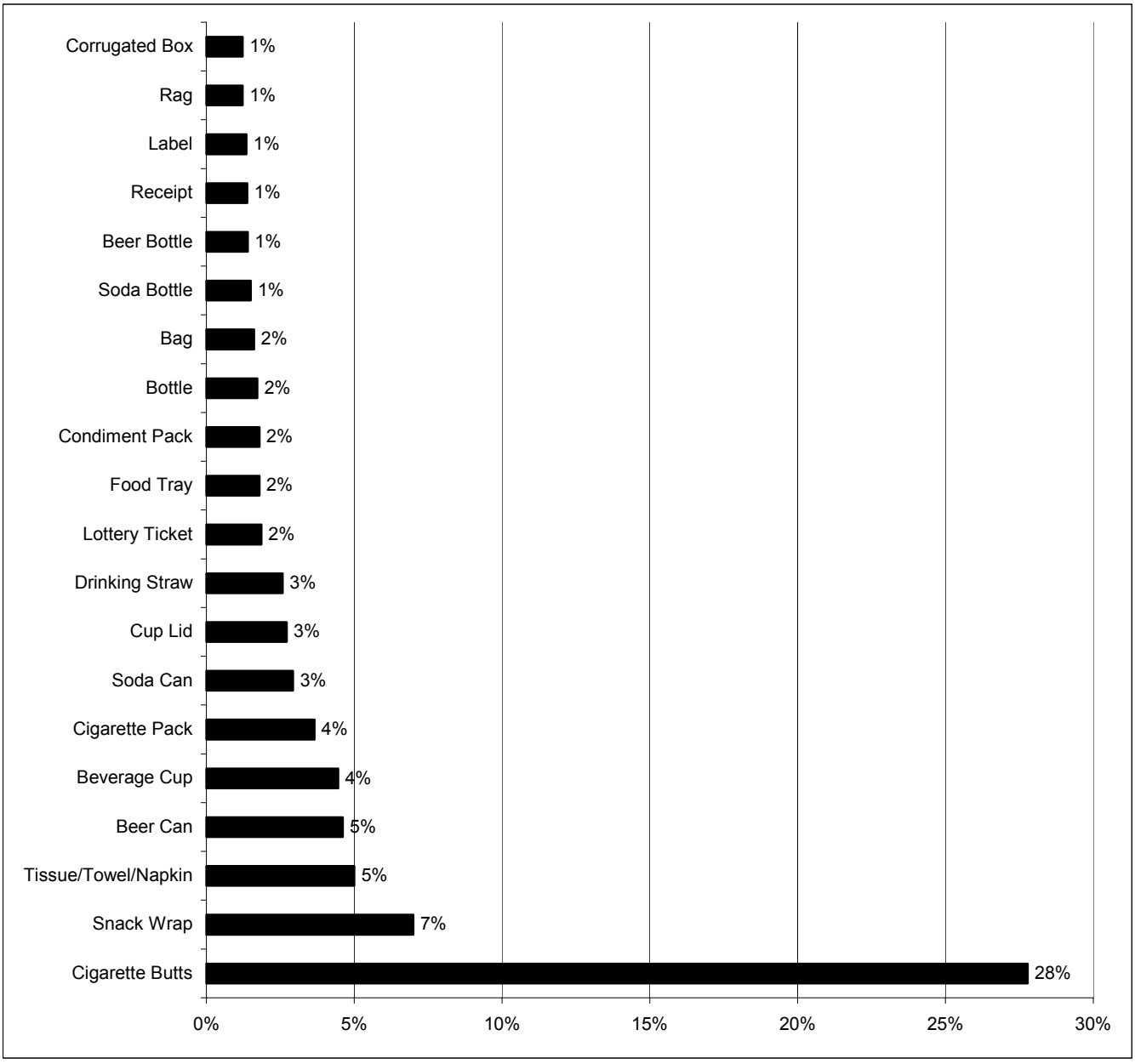


Table 8 contains a summary of the top classes of litter and the top brand names within that category identifiable by brand.

TABLE 8: TOP BRAND WITHIN EACH LITTER USE CATEGORY

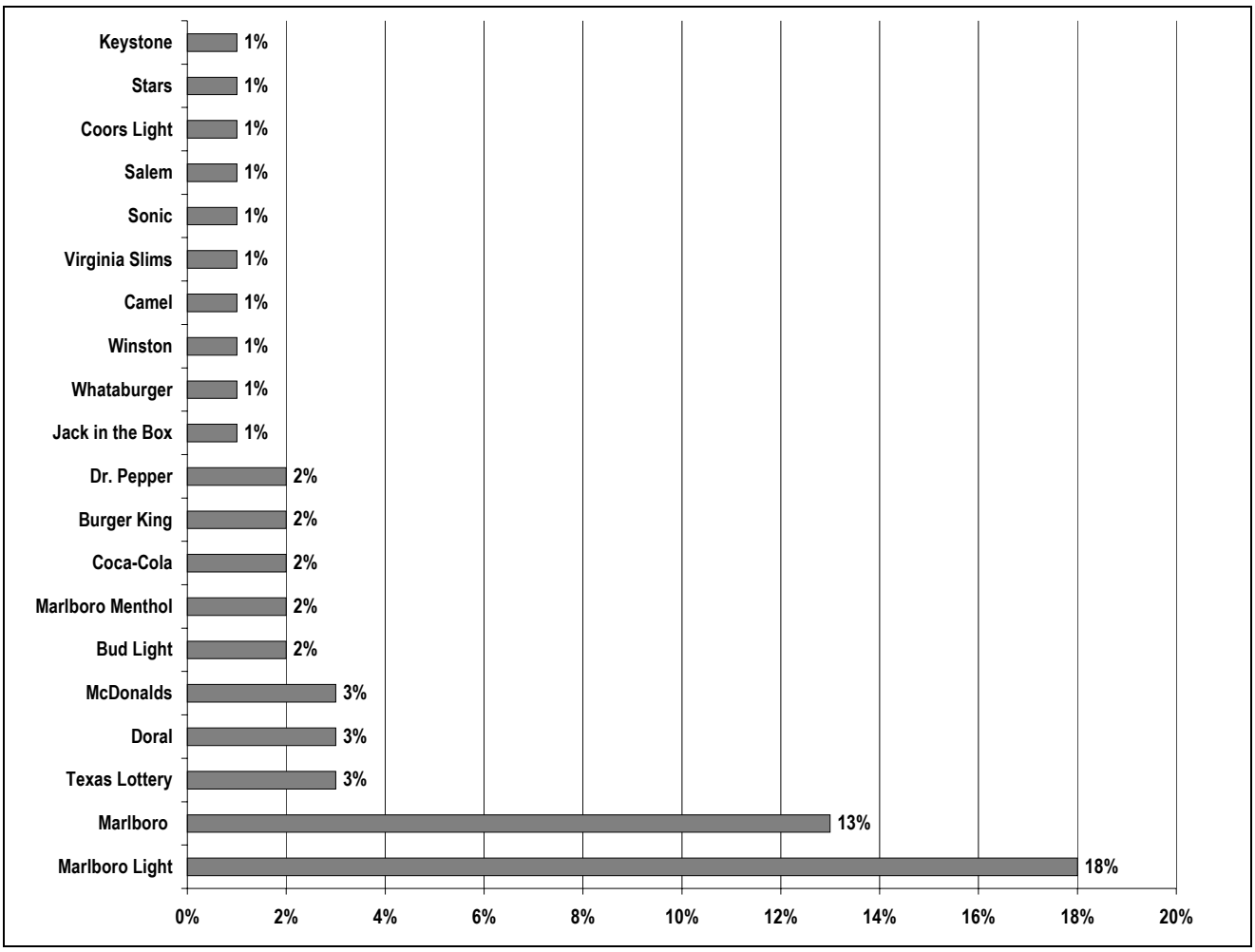
USE	BRANDS	PERCENT WITHIN EACH LITTER USE
Tobacco	Marlboro Light®	34%
	Marlboro®	24%
	Unknown	7%
	Doral®	6%
	Marlboro Menthol®	4%
	Winston®	3%
	All other brands	22%
Food	Unknown	51%
	McDonald's®	6%
	Jack in the Box®	3%
	Whataburger®	3%
	Sonic®	2%
	Taco Bell®	2%
	Frito Lay®	1%
	All other brands	32%
Non-Alcoholic Beverage	Unknown	36%
	Coca-Cola Classic®	11%
	Dr. Pepper®	10%
	Pepsi®	4%
	Mountain Dew®	2%
	Red Bull®	2%
	All other brands	35%
Construction/Industrial	Unknown	98%
	3M®	<1%
	All other brands	1%
Printed	Unknown	66%
	Texas Lottery Ticket®[16]	25%
	H-E-B®	2%
	All other brands	7%
Alcoholic Beverage	Bud Light®	24%
	Budweiser®	17%
	Coors Lite®	10%
	Keystone Lite®	9%
	Miller Lite®	8%
	Natural Lite®	6%
	All other brands	26%
Household/Personal	Unknown	82%
	All other brands	18%
Automotive	Unknown	85%
	Auto Zone®	2%

[16] Lottery Tickets

USE	BRANDS	PERCENT WITHIN EACH LITTER USE
	Armor All®	2%
	Shell®	1%
	All other brands	10%
Agriculture/Garden	Unknown	70%
	Winchester®	24%
	All other brands	6%
Other	Unknown	100%

NuStats' litter collection subcontractor identified brand names for 61 percent of all litter items in the database. The most practical and perhaps useful way to report brand names is according to litter use. Appendix 4 provides a detailed list of the items first sorted by brand name and then according to litter use. Figure 4 depicts the most commonly found identifiable brand names.

FIGURE 4: MOST COMMON LITTER BRANDS, 2005



CORRELATION BETWEEN LITTER ACCUMULATION AND OTHER VARIABLES

This section presents the correlation analyses between litter accumulation at each study segment and variables such as Annual Average Daily Traffic (AADT) and proximity to potential litter sources. Correlation analysis is used to measure the degree of linear relationship between two variables. In a perfect linear relationship, every unit increase or decrease in one variable (X) is followed by an identical unit increase or decrease in the other variable (Y). The resultant statistic, the *coefficient of simple correlation (r),* indicates how much variability in one variable can explain the variability in the other. The possible values for the coefficient of simple correlation range from +1, a perfect positive linear relationship, to –1, a perfect negative linear relationship. The *p-value* associated with each *coefficient of simple correlation* indicates the precision of the statistic.

Traffic Volume

The 2005 study suggests litter accumulation is directly related to the number of vehicle miles traveled. This is a logical assumption implying an increased number of cars traveling more miles means more litter accumulates (more cars = more litter).

NuStats designed the VLS so this relationship could be quantified. Correlation coefficients were calculated utilizing the density of litter on each site (in items per square foot) and the ADT counts as variables. The litter counts used to calculate the litter density were un-weighted and the ADT counts were obtained from 2003 District Highway Traffic Maps produced and distributed by TxDOT. The non-parametric Spearman's rho technique was utilized for all correlation analyses, as the data was not normally distributed.

The resulting correlation analysis yielded a modest but significant correlation ($r = .402$, $p = .01$) with higher litter densities associated with higher traffic volumes. This figure indicates a statistically significant positive linear relationship between traffic volume (X) and the amount of litter found on a roadway (Y). The associated *p-value* indicates that this statement can be made with 99% confidence (1-.01 = .99).

Proximity to Potential Litter Sources

Construction sites, convenience stores, fast food restaurants, gas stations, liquor stores, parks, rest stops, schools, shopping malls, and tourist shops are establishments that represent potential litter sources. Correlation coefficients were calculated utilizing the density of litter on each site and the number of potential litter sources within three miles in either direction of the sample segment as variables.

As Table 9 illustrates, modest but significant correlations exist between litter density and the number of convenience stores ($r = .298$, $p = .01$), shopping malls ($r = .270$, $p = .01$) and fast food restaurants ($r = .210$, $p = .05$) in close proximity (within six miles) of sample segments.

TABLE 9: CORRELATION COEFFICIENTS – POTENTIAL LITTER SOURCES

POTENTIAL LITTER SOURCE	CORRELATION COEFFICIENT
Convenience Store	.298**
Shopping Mall	.270**
Fast Food Restaurant	.210*
Construction Site	.142
Tourist Shop	.001
School	.000
Park	.000
Liquor Store	-.032
Other	-.069
Rest Stop	-.084
Gas Station	-.004

** - Indicates significance at .05 level*

*** - Indicates significance at .01 level*

CONCLUSIONS AND RECOMMENDATIONS

SUMMARY OF FINDINGS

This section summarizes the key points and findings of the TxDOT 2005 Visible Litter Study.

2005 Litter Snapshot

- ***Cigarette butt litter, still the most common litter item on Texas roadways, went down 10 percent between 2001 and 2005***[17].
- ***Overall litter decreased 33 percent from 2001 to 2005.***[18]
- ***All road types show a decrease in litter from 2001 to 2005.***
- ***Convenience stores, shopping malls and fast food restaurants correlate to the density of litter found at each site, e.g. those establishments contribute to roadway litter.***
- ***Tobacco-related litter is the most common litter use (33 percent).***
- ***The most commonly found identifiable litter brands were Marlboro Light® (18 percent) and Marlboro® (13 percent).***
- ***Most litter in Texas (96 percent) is paper, plastic or metal.***

Comparison of 2001 to 2005

This section summarizes the differences between the 2001 and 2005 Visible Litter Studies.

Not only did food continue to be a prevalent litter use, there was a significant increase from 2001 to 2005. Also, tobacco products continued to rank highest in terms of litter use.

TABLE 10: LITTER USE RANK COMPARISONS

2001 VLS USE RANK	2005 VLS USE RANK
Tobacco (39%)	Tobacco (33%)
Household / Personal (15%)	Food (29%)
Food (14%)	Nonalcoholic Beverage (11%)
Nonalcoholic Beverage (13%)	Construction / Industrial (8%)
Alcoholic Beverage (6%)	Printed (8%)
Construction / Industrial (6%)	Alcoholic Beverage (6%)
Printed (5%)	Household / Personal (4%)
Other (1%)	Automotive (1%)
Automotive (1%)	Other (0%)
Agriculture / Garden (<1%)	Agriculture / Garden (0%)

[17] Not statistically significant.
[18] Not statistically significant.

Cigarette butts continue to be the number one litter item found on Texas roadways. The 2005 VLS shows a 10 percent reduction in cigarette butts from 2001[19].

TABLE 11: TOP 10 LITTER ITEM DESCRIPTION RANK COMPARISONS

2001 VLS ITEM RANK	2005 VLS ITEM RANK
Cigarette Butts (31%)	Cigarette Butts (28%)
Wrap (10%)	Wrap (7%)
Cardboard (7%)	Tissues/towels/napkins (5%)
Beer Cans (5%)	Beer Can (5%)
Beverage Cups (5%)	Beverage Cup (4%)
Tissue/Towel (4%)	Cigarette Pack (4%)
Cigarette Pack (3%)	Soda Can (3%)
Soda Can (3%)	Cup Lid (3%)
Paper Pieces (3%)	Drinking Straw (3%)
Bags (2%)	Lottery Ticket (2%)

Marlboro Light brand litter increased 9 percentage points between 2001 and 2005, making it the top brand name litter on Texas roadways.

TABLE 12: LITTER BRAND NAME RANK COMPARISONS

2001 VLS BRAND RANK	2005 VLS BRAND RANK
Marlboro® (12%)	Marlboro Light® (18%)
Doral® (4%)	Marlboro® (13%)
Salem® (3%)	Texas Lottery® (3%)
Bud Light® (3%)	Doral® (3%)
Coca Cola® (3%)	McDonald's® (3%)
Texas Lottery® Tickets (3%)	Bud Light® (2%)
Marlboro Light® (3%)	Marlboro Menthol® (2%)
Dr. Pepper® (3%)	Coca-Cola® (2%)
Budweiser® (3%)	Burger King® (2%)
McDonald's® (3%)	Dr. Pepper® (2%)

2001 Data based on non-recalibrated cigarette butt litter.

[19] Not statistically significant.

RECOMMENDATIONS

Based on the findings from the 2005 Visible Litter Study, NuStats recommends the following:

MARKETING / COMMUNICATIONS

For the past several years, the TxDOT "Don't Mess with Texas" litter prevention campaign utilized outdoor media buys primarily on Interstate and major State Highways. The 2005 VLS data suggests the effect of targeting Interstate and State Highways was positive, given the decrease in litter on those roadway types.

- Continue media placement along the most heavily traveled roadways.

The DMWT campaign targeted specific litter items over the past few years, notably cigarette butts ("Keep yer butts in the car"). The reductions observed in cigarette butts over the past four years suggest that targeting tobacco users is effective in reducing litter. Future campaigns should continue this trend.

- Consider campaign strategies that target specific potential litter sources, especially convenience stores, malls and fast food restaurants. This could result in partnerships with these vendors / owners to distribute in-vehicle litter bags, to place more litter receptacles in parking lots at potential litter sources, or possibly to develop and implement their own targeted marketing campaign.
- Establish or improve relationships with companies with the brand names of litter most commonly found on Texas roadways, e.g., Marlboro Light®, Marlboro® and Doral®. Suggest that those companies don't want to be known as creating the most identifiable litter brands. Put the burden on those companies to conduct litter prevention marketing.

Another success of DMWT is its witty appeal to Texans to not mess with their mother (i.e., our state). These spots emphasize respect and responsibility.

- Future campaigns may consider a humorous emotional appeal that connects respect for our roads and responsibility for littering behavior associated with activities at potential litter sources, e.g., after visiting a fast food restaurant or convenience store.

STUDY DESIGN

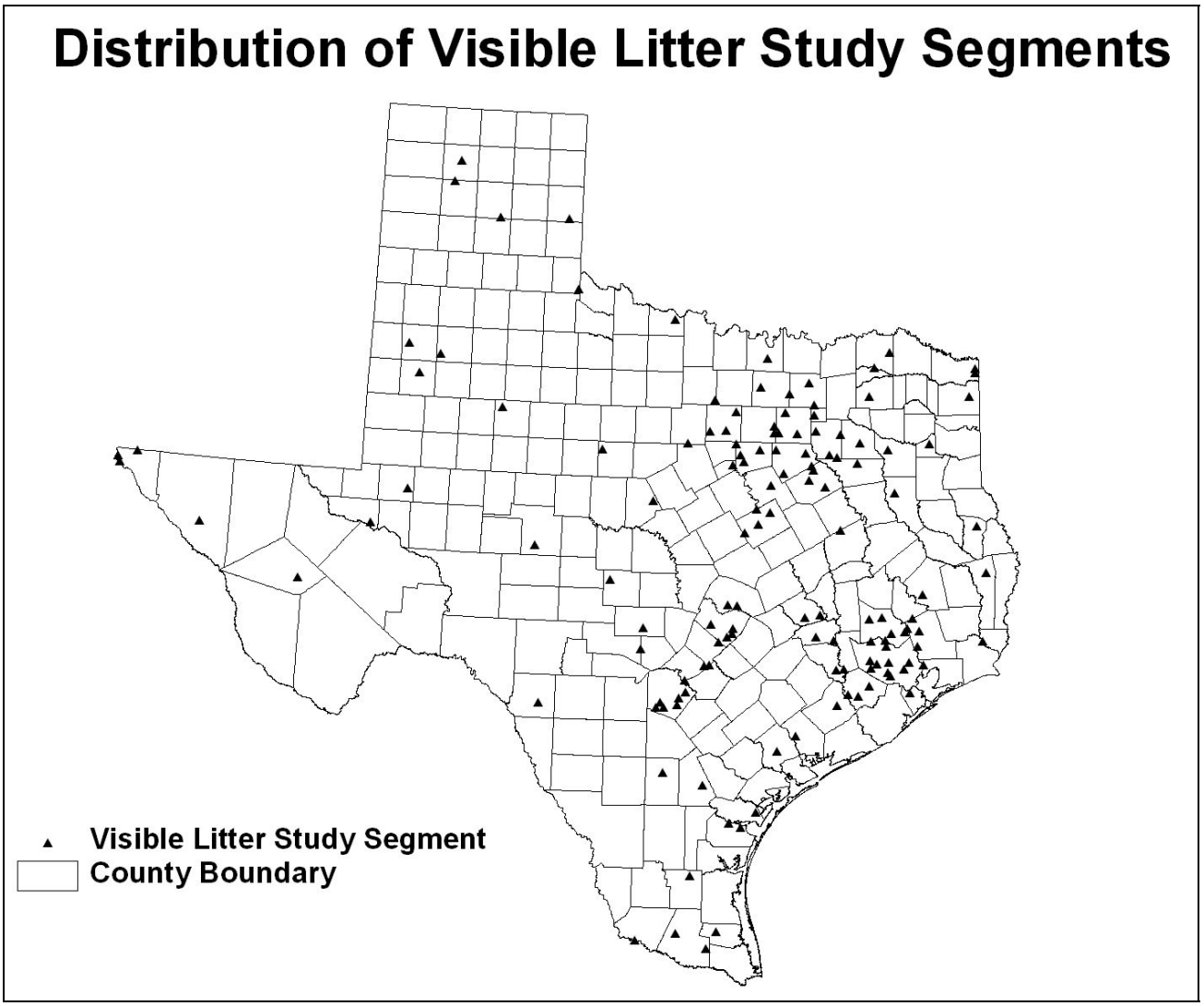
- Increase the number of study segments to provide for more precise statewide statistical results indicative of a greater geographic area.
- Additional study segments will also reduce the size of the confidence intervals associated with annual litter estimates, as shown in Figure 2 in this report. Smaller confidence intervals will greatly improve the ability to cite statistically significant changes in statewide litter amounts over time.
- The methodological enhancements introduced in the 2005 Visible Litter Study increased the precision of the data and, in turn, allowed NuStats to produce statewide estimates that were statistically superior to their 2001 VLS counterparts (see Table 3 and Figure 2). While the 2001 estimates included in this report are statistically valid and representative of litter quantity and quality found on TxDOT maintained roadways, they are subject to substantial sampling variability. By using 2001 as a baseline, future trends analyses would have limited ability to detect significant differences relative to the 2005 data (which is substantially more precise). In consequence, NuStats recommends using the 2005 estimates as the baseline for this ongoing project.

An additional recommendation is:

- Utilization of "on-site" Automated Traffic Recorders (ATRs) for collection of traffic volume data.

APPENDICES

APPENDIX 1: MAP OF STUDY SEGMENTS



APPENDIX 2: SEGMENT SELECTION MATRIX

SEGMENT ID	DISTRICT	ROAD TYPE**	COUNTY	DESCRIPTION
ABL 01	ABILENE	1	CALLAHAN	IH 20 AT FM 603
ABL 02	ABILENE	2	SCURRY	US 84 AT FM 612
AMR 02	AMARILLO	1	CARSON	IH 40 AT FM 2880
AMR 03	AMARILLO	2	POTTER	US 287 AT THE POTTER MOORE COUNTY LINE - SOUTH OF RAILROAD BRIDGE
AMR 04	AMARILLO	3	MOORE	SH 152 AT FM 1284
ATL 01*	ATLANTA	2	BOWIE	US 59/71 IMMEDIATELY NORTH OF SPUR 14
ATL 03	ATLANTA	3	BOWIE	SH 93 AT FM 558 NORTH OF WAGNER CREEK
ATL 05	ATLANTA	1	BOWIE	IH 30 WEST OF THE INTERSECTION OF IH 30 AND US 59
AUS 00	AUSTIN	3	GILLESPIE	SH 16 SOUTH AT FREDERICKSBURG CITY LIMIT PROCEEDING SOUTH
AUS 01	AUSTIN	4	TRAVIS	FM 2244 BEGINNING AT SH 71
AUS 04	AUSTIN	2	TRAVIS	US 183 BETWEEN FM 812 AND FM 1625
AUS 05	AUSTIN	4	TRAVIS	FM 969 BETWEEN FM 3177 AND FM 973
AUS 07	AUSTIN	1	WILLIAMSON	IH 35 AT FM 1431
AUS 08	AUSTIN	1	HAYS	IH 35 AT SH 4 LOOP
AUS 10	AUSTIN	3	TRAVIS	SH 71 EAST OF FM 973
AUS 11	AUSTIN	2	WILLIAMSON	US 79 AT FM 685
AUS 12	AUSTIN	3	MASON	SH 29 AT FM 1222
BMT 01	BEAUMONT	1	ORANGE	IH 10, EAST OF THE NECHES RIVER BRIDGE, TOWARDS VIDOR - WEST IF RIGHT OF WAY
BMT 02*	BEAUMONT	2	LIBERTY	US 59 AT THE MONTGOMERY COUNTY LINE
BMT 03	BEAUMONT	3	LIBERTY	SH 321 AT FM 1008
BMT 04	BEAUMONT	4	LIBERTY	FM 1960 AT FM 686
BMT 05	BEAUMONT	2	JASPER	US 96 NORTH OF FM 2800 (INSIDE CITY OF JASPER ETJ)
BRW 01	BROWNWOOD	2	BROWN	US 67 IMMEDIATELY WEST OF FM 1467
BRY 01	BRYAN	1	FREESTONE	IH 45 AT THE FREESTONE /LEON COUNTY LINE
BRY 02	BRYAN	4	BURLESON	FM 50 AT FM 1361
BRY 03	BRYAN	3	BURLESON	SH 36 BETWEEN FM 976 AND FM 60
BRY 04	BRYAN	2	WASHINGTON	US 290 LOOP AT FM 2447
CHL 01	CHILDRESS	2	CHILDRESS	US 287 IMMEDIATELY EAST OF FM 2875
CHL 02	CHILDRESS	1	WHEELER	IH 40 (B40) JUST EAST OF THE CITY OF SHAMROCK ETJ
COR 01	CORPUS CHRISTI	1	LIVE OAK	IH 37 IMMEDIATELY SOUTH OF FM 799
COR 02	CORPUS CHRISTI	3	NUECES	SH 358 AT IH 37
COR 03	CORPUS CHRISTI	4	SAN PATRICIO	FM 136 AT FM 3284
COR 04	CORPUS CHRISTI	2	NUECES	US 77 BETWEEN NUECES COUNTY AIRPORT AND THE CITY OF CORPUS CHRISTI ETJ
DAL 01	DALLAS	3	COLLIN	SH 121 1500' NORTH OF FM 2933
DAL 02	DALLAS	3	COLLIN	SH 78 1500' WEST OF SH 205
DAL 03	DALLAS	1	DALLAS	IH 35 EAST, 1 MILE NORTH OF LOOP 635, NORTH OF DOWNTOWN
DAL 04	DALLAS	1	DALLAS	IH 20 IMMEDIATELY WEST OF FM 1382
DAL 05A	DALLAS	1	DALLAS	IH 20 EAST OF IH 45
DAL 05	DALLAS	1	ELLIS	IH 35 EAST 1500' SOUTH OF SH 34
DAL 06	DALLAS	2	ELLIS	US 287 3000' SOUTH OF BUSINESS 67
DAL 07	DALLAS	4	ELLIS	FM 660 SOUTH OF ITS INTERSECTION WITH FM 813
DAL 08	DALLAS	1	KAUFMANN	IH 20 1500' EAST OF FM 2932
DAL 09	DALLAS	1	KAUFMANN	IH 20 1500' EAST OF FM 2965

SEGMENT ID	DISTRICT	ROAD TYPE**	COUNTY	DESCRIPTION
DAL 10	DALLAS	2	KAUFMANN	US 175 1500' SOUTH OF BUSINESS 175 NORTHWEST OF MABANK
DAL 11	DALLAS	3	KAUFMANN	SH 274 1500' SOUTH OF FM 148
DAL 12	DALLAS	1	NAVARRO	IH 45 AT FM 1126, 1500' SOUTH OF MILE POST 240
DAL 13	DALLAS	2	NAVARRO	US 287 1500' EAST OF FM 3243
DAL 14	DALLAS	3	NAVARRO	SH 22 WEST OF FM 1839
DAL 15	DALLAS	1	ROCKWALL	IH 30, 1500' WEST OF FM 740
DAL 16	DALLAS	1	ELLIS	IH 45 AT FM 1182
DAL 17	DALLAS	2	DENTON	US 380 EAST OF FM 156
DAL 18	DALLAS	4	DENTON	FM 720 EAST OF IT INTERSECTION WITH FM 423
ELP 01*	EL PASO	1	EL PASO	IH 10 IMMEDIATELY NORTH OF ITS NORTHERNMOST INTERSECTION WITH IH 20
ELP 02	EL PASO	2	EL PASO	US 54 AT TEXAS - NEW MEXICO STATE LINE
ELP 04	EL PASO	1	EL PASO	IH 20 SOUTH FO SPUR 375
ELP 05	EL PASO	3	JEFF DAVIS	SH 17 JUST NORTH OF FORT DAVIS
ELP 06	EL PASO	4	HUDSPETH	FM 1111 NORTH OF SIERRA BLANCA
FTW 01	FORT WORTH	2	JOHNSON	US 67 EAST OF FM 2331
FTW 02	FORT WORTH	3	JOHNSON	SH 171N AT JOHNSON COUNTY LINE
FTW 03	FORT WORTH	4	JOHNSON	FM 2331 AT FM 4
FTW 04	FORT WORTH	1	PALO PINTO	IH 20 AT SH 193
FTW 05	FORT WORTH	1	PARKER	IH 20 NORTHEAST OF FM 113
FTW 06	FORT WORTH	3	PARKER	SH 199 AT FM 2257
FTW 07	FORT WORTH	3	PARKER	SH 171 SOUTH OF FM 51
FTW 08	FORT WORTH	1	TARRANT	IH 30 EAST, IMMEDIATELY EAST OF SH 360, EAST OF FT. WORTH
FTW 09	FORT WORTH	1	TARRANT	IH 20 EAST, IMMEDIATELY EAST OF SH 360, EAST OF FT. WORTH
FTW 10	FORT WORTH	1	JOHNSON	IH35 WEST NORTH OF FM 917
FTW 11	FORT WORTH	2	SOMERVELL	US 67 AT FM 199
FTW 13	FORT WORTH	4	JACK	FM 2210 NORTH OF SH 199
HOU 03	HOUSTON	3	HARRIS	SH 529 WEST OF THE SH 529-SH 6 INTERSECTION
HOU 04	HOUSTON	1	HARRIS	IH 10 IMMEDIATELY WEST OF SH 6 ON THE WEST SIDE OF HOUSTON
HOU 05	HOUSTON	1	HARRIS	IH 45 BETWEEN IH LOOP 610 AND SH 249
HOU 06	HOUSTON	1	HARRIS	IH 45 BETWEEN FM 2920 AND FM 1960
HOU 07	HOUSTON	1	HARRIS	IH 10 AT HARRIS/CHAMBERS COUNTY LINE
HOU 08*	HOUSTON	2	HARRIS	US 59 BETWEEN SH 288 AND IH LOOP 610
HOU 09	HOUSTON	3	HARRIS	SH 288 BETWEEN IH LOOP 610 AND US 90A - SOUTH OF HOUSTON
HOU 11	HOUSTON	4	MONTGOMERY	FM 2854 FROM SH 105 PROCEEDING SOUTH FOR 750 FEET
HOU 12	HOUSTON	1	HARRIS	IH 10 BETWEEN IH LOOP 610 AND SH 8 - WEST OF HOUSTON
HOU 13	HOUSTON	3	HARRIS	SH 8 BETWEEN IH 10 AND US 290 - WEST OF HOUSTON
HOU 14	HOUSTON	2	HARRIS	US 90 BETWEEN SH 8 AND FM 2100 - NORTHEAST OF HOUSTON
HOU 15	HOUSTON	1	WALLER	IH 10 IMMEDIATELY EAST OF THE WALLER/AUSTIN COUNTY LINE
HOU 16	HOUSTON	2	WALLER	US 290 AT WALLER/WASHINGTON COUNTY LINE
HOU 17	HOUSTON	3	MONOGOMERY	SH 249 AT THE HARRIS/MONTGOMERY LINE
HOU 18	HOUSTON	1	MONTGOMERY	IH 45 BETWEEN THE HARRIS/MONTGOMERY LINE AND SHENANDOAH
HOU 21	HOUSTON	4	MONTGOMERY	FM 1314 AT SH 242
HOU 22*	HOUSTON	4	MONTGOMERY	FM 2090 WEST OF SPLENDORA
HOU 25	HOUSTON	3	FORT BEND	SH 36 BETWEEN FM 361 AND NEEDVILLE
HOU 26	HOUSTON	1	GALVESTON	IH 45 BETWEEN THE HARRIS COUNTY LINE AND FM 646
HOU 27	HOUSTON	1	MONTGOMERY	IH 45 BETWEEN FM 830 AND FM 1097
HOU 28	HOUSTON	2	FORT BEND	US 59 BETWEEN FM 99 AND BRAZOS RIVER
HOU 29	HOUSTON	2	FORT BEND	US 59 NORTH OF KENDLETON
LBK 01	LUBBOCK	3	HOCKLEY	SH 114 BETWEEN RM 260 AND 262, WEST OF LEVELLAND

SEGMENT ID	DISTRICT	ROAD TYPE**	COUNTY	DESCRIPTION
LBK 02	LUBBOCK	4	LUBBOCK	FM 179 AT US 82 SOUTH OF WOLFORTH
LBK 03	LUBBOCK	2	TERRY	US 385 SOUTH OF FM 2196
LDO 01	LAREDO	2	KINNEY	US 90 MILE MARKER 446-448(RM 446 APPROXIMATELLY 4.5MILES WEST OF BRACKETVILLE)
LUF 03	LUFKIN	2	SAN JACINTO	US 59 AT LIBERTY COUNTY LINE
LUF 04	LUFKIN	3	POLK	SH 146 AT THE CITY OF LIVINGSTON ETJ LINE
LUF 05	LUFKIN	4	SAN AUGUSTINE	FM 2213 AT THE CITY OF SAN AUGUSTINE ETJ LINE
ODS 01	ODESSA	1	ECTOR	IH 20 WEST OF US 385
ODS 03	ODESSA	3	WARD	SH 18 FROM FM 1219 PROCEEDING 5 MILE NORTH
PHR 01	PHARR	2	BROOKS	US 281 AT FM 3066
PHR 02	PHARR	3	HIDALGO	SH 107 FROM RM 514 TO RM 516
PHR 03	PHARR	4	HIDALGO	FM 490 FROM RM 506 TO RM 508
PHR 04	PHARR	2	STARR	US 83 WEST OF RIO GRANDE CITY AND WEST OF VILLAREALES
PHR 06	PHARR	4	WILLACY	FM 1762 BETWEEN US 77 AND BUSINESS 77
PRS 01	PARIS	2	LAMAR	US 82 AT FM 1502
PRS 02	PARIS	3	LAMAR	SH 19 NORTH OF DELTA COUNTY LINE
PRS 04	PARIS	1	HOPKINS	IH 30 WEST AT THE CITY OF SULPHUR SPRINGS ETJ
SAT 02	SAN ANTONIO	1	COMAL	IH 35 AT HAYS COUNTY LINE
SAT 03*	SAN ANTONIO	3	BEXAR	SH 16 BETWEEN IH LOOP 410 AND FM LOOP 1604
SAT 04	SAN ANTONIO	1	BEXAR	IH LOOP 410 BETWEEN US 90 AND SH 16
SAT 05	SAN ANTONIO	4	COMAL	FM 3009 FROM IH 35 TO FM 2252
SAT 06	SAN ANTONIO	2	BEXAR	US 181 SOUTH OF THE US 181/SH 122 INTERSECTION
SAT 07	SAN ANTONIO	2	BEXAR	US 87 BETWEEN FM 1628 AND IH LOOP 410
SAT 08	SAN ANTONIO	1	BEXAR	IH 35 BETWEEN FM LOOP 1604 BEXAR/ATASCOSA COUNTY LINE
SAT 09	SAN ANTONIO	1	BEXAR	IH 10 EAST BETWEEN FM 1518 AND 1604
SAT 10	SAN ANTONIO	3	GUADALUPE	SH 123 AT GUADALUPE/HAYS COUNTY LINE
SAT 11	SAN ANTONIO	1	KERR	IH 10 AT KERR COUNTY LINE BY MILE MARKER 522
SAT 12	SAN ANTONIO	3	MCMULLEN	SH 72 WEST OF ITS INTERSECTION WITH SH 16
SJT 02	SAN ANGELO	2	TOM GREEN	US 277 BETWEEN CHRISTOVAL AND FM 2235
TYL 01	TYLER	4	CHEROKEE	FM 747, 1.5 SOUTH OF US 79
TYL 02	TYLER	3	GREGG	SH 300 THREE MILES NORTH OF SPUR 281
TYL 03	TYLER	3	HENDERSON	SH 19 AT FM 2709
TYL 04	TYLER	2	SMITH	US 69 SOUTH OF IH 20
TYL 05	TYLER	1	VAN ZANDT	IH 20 IMMEDIATELY EAST OF FM 1255
WAC 03	WACO	2	MCLENNAN	US 84 BETWEEN THE MCLENNAN-CORYELL LINE AND SH 317
WAC 04	WACO	3	MCLENNAN	SH 6 BETWEEN FM 185 AND THE LAKE WACO BRIDGE
WAC 05	WACO	1	MCLENNAN	IH 35 BETWEEN FM 308 AND FM 3149
WAC 06	WACO	4	BOSQUE	FM 2490 AT THE BOSQUE-MCLENNAN COUNTY LINE
WAC07*	WACO	1	HILL	IH 35 SOUTH OF PECAN CREEK IN HILLSBORO
WTF 01	WICHITA FALLS	1	COOKE	IH 35 JUST SOUTH OF ITS INTERSCTION WITH FM 1306
WTF 02	WICHITA FALLS	2	WICHITA	US 281 FROM FM 369 PROCEEDING 750' NORTH
YOK 01	YOAKUM	2	JACKSON	US 59 AT FM 234
YOK 02	YOAKUM	3	VICTORIA	SH 185 SOUTH OF US 59 ON SOUTHEAST SIDE OF VICTORIA
YOK 03	YOAKUM	4	WHARTON	FM 102, IMMEDIATELY NORTHWEST OF US 59
YOK 04	YOAKUM	1	AUSTIN	IH 10 WEST OF SH 36 IN SEALY

** Indicates site was lost during data collection*

***Road Type 1=Interstate Highways, Road Type 2=US Highway, Road Type 3=State Highway, Road Type 4=Farm-to-Market Road*

APPENDIX 3: FIELD MANUAL

TEXAS DEPARTMENT OF TRANSPORTATION

2005 VISIBLE LITTER STUDY

Field Manual

November 2004

NuStats

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(512) 306-9065 ▪ fax (512) 306-9077 ▪ *www.nustats.com*

Contact: Chris Simek, *Task Manager*

TABLE OF CONTENTS

STUDY OBJECTIVES

- To produce a reliable statewide volumetric measurement of roadway litter to include the number of items, type of item, weight of item, volume of item, and, if possible, brand name of item.
- To compare the current volumes of visible litter on Texas roadways to the levels observed in 2001 when the survey was last performed.
- To provide an analysis of roadside litter accumulation rates that will allow us to model roadside litter accumulation rates across the State of Texas.

INTRODUCTION

The Visible Litter Study is designed to measure how fast litter accumulates and how much litter accumulates on different types of roadway segments. A roadway segment is both sides of a road, approximately 750 feet in length. As was the case in 2001, this study will be conducted in two phases. During Phase I, approximately half of the 136 total roadway segments will be sampled.

In order to accurately measure these rates of litter accumulation, it is necessary that the roads be cleaned first. Your first major task in this project involves traveling to your list of segments, identified in this Field Manual, and collecting all the litter found on these segments. The litter collected during this first "purge" will not be categorized or measured; rather, it will be discarded. You will also complete the Segment Data Sheet (included in this packet) at this time.

After all your segments have been cleaned the first time, litter will be allowed to accumulate on these segments for a specific time period, generally between 2 to 4 weeks. These time periods have already been assigned to each segment. You can look at the Segment Data Sheet for your specific segment and see how long you are to wait until the litter is collected again. You can find this information on the part titled "Litter Accumulation Period".

After the time period has passed, you will travel to your assigned segments again and pick up all the litter that has accumulated. **It is very important that you label each bag of litter with the segment number from which the litter was collected** (e.g., You collect three bags of litter from segment 10; label each bag with the number 10). After each segment has been collected and the bags labeled, you will take the litter back to your facility and separate the litter collected for each individual segment separately. The litter from each segment is to be separated into different categories of litter. These different types can be found on your "Litter Tally Sheet." Once the litter has been separated, record the weight and volume of each type of litter (cigarette butt, cigarette pack, beer can, etc.) on the litter tally sheet.

Once this has been done, look at each type of litter you have collected. Try to identify the different brand names or distributor that make up each type of litter (e.g., You have collected 50 beer cans, and of those, 10 are Coors Light, 20 are Budweiser, and 20 are Olympia). Record this information on your Litter Tally Sheet. Once all the litter from each of your segments has been collected, categorized, weighed, and measured, the litter may be discarded. Additionally, you should fill out the remainder of your Segment Data Sheet.

STEP-BY-STEP PROCEDURES

Before the First Collection

1) Make sure the Field Manual contains all sections as outlined in the "Table of Contents."
2) Check the Segment Data Sheets against the list of sites (with site locations and numbers) that are contained in the Field Manual. Make sure each one of your assigned sites has a corresponding Segment Data Sheet and several blank Segment Data Sheets in case one is lost, incorrectly completed, or some other problem arises.
3) Check to make sure that you have all the necessary equipment to successfully complete the litter collection. You should use the equipment checklist provided to verify this. *Please make sure that any equipment NuStats lends you is returned at the end of this project.*

Conducting the First Collection

4) Your schedule and the location of your segments have been sent to the TxDOT district office where you will be conducting your survey.
5) If, for any reason, you are unable to meet your schedule, or feel that you will be unable to meet your schedule, telephone the project manager in Austin. This should be done immediately.
6) Drive to the designated roadway.
7) Select the segment according to the Segment Criteria Selection Sheet. The TxDOT maintenance sections know that these sections are not to have any maintenance activities (mowing or litter collection) performed on it during this time. Adopt-a-Highway sponsor groups have been notified of your activities.
8) Once the segment has been selected, measure it and mark the end points by driving flagged stakes into the ground. Try and designate the starting point so that it coincides with a permanent fixture that is already in place at the site. Examples of such permanent fixtures include guardrails, bridges, buildings, road signs (such as the DMWT or litter fine signs present at the high intervention sites).

> **Note**: It is very important that the beginning and end points of the segment are highly visible to the TxDOT personnel. In your travels across the state, you will notice a wide variety of flagged stakes in the road medians. It is imperative that TxDOT (and others) are able to identify and differentiate our markers from others.

9) Fill out the Segment Data Sheet at this time. Be sure to draw the roadway, and label the site locations for future reference.

> **Note**: It is very important that the information on the Segment Data Sheet be accurately recorded, as this data will be used in the subsequent statistical analysis. This data should be sent to NuStats on an ongoing basis just as the litter inventory data is sent.

10) When the end points of the segment have been determined, collect all litter in the segment.

> a) **Paper less than two square inches in overall dimensions will not be collected** for this survey.
>
> b) **Cigarette butts and non-paper items of this dimension or smaller WILL be collected**.
>
> c) **Broken windshield glass is not to be collected**. The location of the glass and the area the glass covers (estimated in square feet) should be recorded on the Segment Data Sheet.
>
> d) **Large items that are too heavy to safely collect should not be collected**. Photograph the item, and note the approximate location on the Segment Data Sheet.

11) When all litter has been collected, determine the land use next to the segment and note it on the Segment Data Sheet.

12) Travel the roadway for three miles in both directions of your segment. Take note of the type and number of any "litter source" within this distance. A list of possible sources can be found on the page within your Field Manual titled "Potential Litter Sources."

13) Take note of major intersections that occur within your segment. Include these in the segment drawing you made on the Segment Data Sheet.

After the First Collection

14) After the litter on your segments has been collected for the day, take the time to write down any notes pertinent to the inventory. Make sure that all necessary tasks have been performed. Use the Sampling Checklist to verify this has been done.

15) Call the project manager each day after litter has been collected from your segments. If you get a recording, leave your name and number.

16) Should you need something that is urgent and requires immediate attention, feel free to call the alternative numbers provided.

17) The litter collected during this first litter collection should be bagged and securely fastened. It will be left on the roadside in a visible location for TxDOT collection.

Litter Accumulation Period

18) Your segments will accumulate litter for a pre-determined period of time. This accumulation period has been noted on the Segment Data Sheet. The appropriate individuals have been contacted so that during this period, no litter collections will take place on the research segments.

19) Make sure to **keep your Field Manual** in a safe place during the litter accumulation period. You will be using it again during the second litter collection.

Before the Second Collection

20) Retrieve your Field Manual and familiarize yourself once again with your segment locations.

21) Check to make sure that you have all the equipment you will need to conduct the second litter collection. Once again, you should use the Equipment Checklist to verify that all the equipment is on-hand. If you need equipment, contact the project manager and request it **at least one week prior** to the second collection.

Conducting the Second Collection

22) The appropriate officials in the TxDOT districts in which your collection is being conducted have already been notified.

23) If, for any reason, you feel that you will be unable to meet your schedule, telephone the district contact and the project manager in Austin. This should be done immediately.

24) Collect all of your necessary equipment and drive to the segment location.

25) Once you arrive at the segment location, locate the beginning and end-points of the segment.

26) When the end-points of your segment have been located, collect all the litter that has accumulated within your designated segment.

> a) **Paper less than two square inches in overall dimensions will not be collected** for this survey.
>
> b) **Cigarette butts and non-paper items of this dimension or smaller WILL be collected**.

c) **Broken windshield glass is not to be collected**. The location of the glass and the area the glass covers (estimated in square feet) should be recorded on the Segment Data Sheet.

d) **Large items that are too heavy to safely collect should not be collected**. Photograph the item, and note the approximate location on the Segment Data Sheet just as you did during the first collection.

27) Once all the litter has been collected, label the bags of litter with the segment number on which the litter was collected, load up and proceed to the next sample segment.

28) Once you have collected litter on an appropriate number of sample segments, the litter will be inventoried (which includes categorization and measurement).

Litter Categorization

29) Separate the bags of litter by segment number, so that its own unique group of litterbags represents each segment.

30) Select an individual segment and separate all the litter that has been collected for that segment only. The litter should be separated into piles. Each pile should contain a specific type of litter based on composition (e.g., paper and paperboard, glass, metals, etc.). Once the litter has been separated into piles, take weight and volumetric measurements and record this information on the Inventory Hard Copy. Not every type of litter will be found on each segment. Because of this, not every type of litter on the tally sheet will have a corresponding weight, volume, or count. This is OK.

31) Next, separate the litter into piles such that each pile contains a unique litter use (e.g., agriculture / garden, alcoholic beverage, automotive, etc.). Once the litter has been separated into piles, take weight and volumetric measurements and record this information on the Inventory Hard Copy. Not every type of litter will be found on each segment. Because of this, not every type of litter on the tally sheet will have a corresponding weight, volume, or count. This is OK.

32) **It is very important that litter from different segments is not allowed to mix**, and that all litter collected on a specific segment is only recorded on the litter tally sheet under its specific segment.

33) Now that the litter is categorized by litter use, you will separate each "use" pile into smaller piles, each representing a unique litter item (e.g., soda cans, cigarette butts, newspaper, etc.) Once each "use" pile has been separated into "item description" piles, record the number of items within each item description. Upon completion, it is very important that you keep the litter in their unique categories. Your last task will require the further investigation of these unique categories of litter.

34) At this point, you should examine the individual piles of litter very closely. Separate the individual piles of litter into pieces of litter whose brand you can identify and those that you cannot identify.

Brand Identity Example: Let's say you have collected 200 total cigarette butts within segment number 10. These 200 cigarette butts have been placed into a unique "cigarette butt" pile, and the tally has been recorded. Now, if you look closely at the 200 cigarette butts, you will notice that the butts are of different brand names. 100 butts are Marlboro; 25 are Winston; 10 are Kool – the remaining 65 butts cannot be identified by brand name or distributor. *Record this information on the litter tally sheet*. This type of brand name classification is to be used for each pile of litter that is identified on the litter tally sheet.

35) When this process has been completed for one segment, remove all the litter from that segment and begin the same process for the next segment. This same process is to be utilized for each segment until all the litter from each segment has been recorded.

36) Once the data has been recorded on the Inventory Hard Copy, enter the data onto the Excel spreadsheet. Make sure you enter each segment's worth of data on a unique spreadsheet. Save the data frequently to avoid losing your work. Upon completion, *save a backup of all the spreadsheets on the hard drive and on a separate disc*. You can then **e-mail the files to Chris Simek** at csimek@nustats.com.

APPENDIX 4: LITTER ITEMS BY BRAND NAME & USE

Litter Use	Brand Code	Item Code	Tally Count	%
Agriculture/Garden	Remmington	Shotgun Shell	8	100%
	Unknown	Feed Sack	74	76%
		Shotgun Shell	23	24%
	Winchester	Corrugated Box	13	40%
		Shotgun Shell	20	60%

Litter Use	Brand Code	Item Code	Tally Count	%
Alcoholic Beverage	Bacardi	Beer Bottle	46	79%
		Label	13	21%
	Bartels and Jam	Beer Bottle	10	100%
	Boones Farm	Beer Bottle	10	100%
	Bud Dry	Beer Bottle	10	53%
		Beer Can	9	47%
	Bud Ice	Beer Bottle	9	45%
		Beer Can	10	55%
	Bud Light	Aerosol Cap	8	0.2%
		Beer Bottle	1133	27%
		Beer Can	2690	63%
		Beer Carton	106	2.5%
		Bottle	11	0.3%
		Bottle Cap	211	5.0%
		Label	59	1.4%
		Unknown	30	0.7%
	Budweiser	Beer Bottle	756	25%
		Beer Can	2067	68%
		Beer Carton	39	1.3%
		Bottle Cap	88	2.9%
		Bottles - Broke	32	1.1%
		Label	32	1.0%
		Six Pack Contai	14	0.4%
	Busch	Beer Bottle	118	14%
		Beer Can	698	83%
		Beer Carton	8	0.9%
		Label	17	2.0%
	Busch Light	Beer Can	43	100%
	Colt 45	Bottle Cap	10	100%
	Coors	Beer Bottle	48	58%
		Beer Can	21	26%
		Bottle Cap	14	16%
	Coors Light	Beer Bottle	338	19%
		Beer Can	1360	78%
		Beer Carton	36	2.1%

Litter Use	Brand Code	Item Code	Tally Count	%
Alcoholic Beverage	Dos Equis	Beer Bottle	20	100%
	Fosters	Beer Can	10	100%
	Heineken	Beer Bottle	55	72%
		Beer Can	11	14%
		Beer Carton	11	14%
	Ice House	Beer Can	61	74%
		Bottle Cap	21	26%
	Jack Daniels	Beer Bottle	8	100%
	Kentucky Deluxe	Liquor Bottle	11	100%
	Keystone	Beer Bottle	53	3.2%
		Beer Can	1557	95%
		Beer Carton	13	0.8%
		Bottle Cap	10	0.6%
	Keystone Ice	Beer Can	24	100%
	Lone Star	Beer Bottle	20	7.6%
		Beer Can	240	92%
	Magnum	Bottle Cap	8	100%
	Malwaukee's Bes	Beer Can	14	100%
	Merit	Beer Bottle	32	100%
	Michelob	Beer Bottle	106	55%
		Beer Can	43	23%
		Beer Carton	21	11%
		Bottle Cap	21	11%
	Miller	Beer Bottle	32	33%
		Beer Can	63	67%
	Miller Genuine	Beer Bottle	14	50%
		Beer Can	14	50%
	Miller High Lif	Beer Bottle	23	12%
		Beer Can	162	84%
		Beer Carton	9	4.5%

Litter Use	Brand Code	Item Code	Tally Count	%
Alcoholic Beverage	Milwaukees Best	Beer Bottle	8	0.8%
		Beer Can	1074	98%
		Rag	10	0.9%
	Modelo	Beer Bottle	10	50%
		Beer Can	10	50%
	Natural Lite	Beer Bottle	128	11%
		Beer Can	964	86%
		Beer Carton	13	1.2%
		Bottle Cap	10	0.9%
	Odulls	Beer Bottle	31	100%
	Pabst	Beer Can	11	49%
		Unknown	12	51%
	Pearl	Beer Can	9	100%
	Power Bar	Beer Can	86	100%
	Red Dog	Beer Bottle	10	23%
		Beer Can	35	77%
	Rolling Rock	Beer Bottle	22	100%
	Salvadors	Beer Bottle	66	100%
	Schafer	Beer Can	52	100%
	Schlitz	Beer Bottle	9	9.9%
		Beer Can	79	90%
	Seagrams	Beer Bottle	43	67%
		Bottle	11	17%
		Carton	11	17%
	Shiner Bock	Beer Bottle	43	80%
		Beer Can	11	20%
	Smirnoff	Beer Bottle	116	80%
		Beer Carton	11	7.4%
		Bottle Cap	8	5.7%
		Six Pack Contai	10	7.2%
	Tecate	Beer Bottle	16	40%

Litter Use	Brand Code	Item Code	Tally Count	%
Alcoholic Beverage	Unknown	Beer Can	235	33%
		Bottle	11	1.5%
		Bottle Cap	18	2.5%
		Shop Rag	49	6.9%
		Six Pack Contai	12	1.7%
		Six Pack Ring	93	13%
		Unknown	10	1.5%
	Zima	Beer Bottle	22	68%
		Label	10	32%

Litter Use	Brand Code	Item Code	Tally Count	%
Automotive	A-1 Limo	Carton	10	100%
	Able Auto	Bag	11	100%
	Anco	Carton	14	52%
		Container	13	48%
	Armor-All	Bottle	11	16%
		Can	22	31%
		Carton	13	19%
		Container	24	35%
	Auto Zone	Bag	28	35%
		Grocery Bag	8	10%
		Receipt	44	55%
	Bosch	Spark Plug Box	11	100%
	Car Fresh	Auto Air Freshe	10	33%
		Carton	10	33%
		Package	10	33%
	Car Quest	Receipt	12	100%
	Castrol Oil	Oil Container	8	100%
	Chevron	Oil Container	20	100%
	Coastal	Oil Container	9	100%
	Cooper	Package	14	100%
	Duralast	Carton	10	100%
	Exxon	Bag	10	100%
	Ford	Book	10	100%
	Gates	Carton	12	100%
	Glad	Container	10	100%
	Golden State	Oil Container	10	100%
	Havoline	Oil Container	10	100%

Litter Use	Brand Code	Item Code	Tally Count	%
Automotive	Napa Auto Parts	Label	10	33%
		Oil Container	21	67%
	Oreily Auto	Bag	12	28%
		Form	8	20%
		Receipt	22	52%
	Quaker State	Oil Container	10	44%
		Unknown	13	56%
	RAIN-X	Bottle	9	100%
	Shell	Oil Container	45	100%
	Super Value	Oil Container	14	100%
	Turtlewax	Label	10	100%
	Unknown	Aerosol Can	9	0.3%
		Air Freshener	42	1.3%
		Air Mattress	21	0.6%
		Antenna	9	0.3%
		Audio Cassette	12	0.4%
		Auto Air Freshe	21	0.6%
		Auto Light	10	0.3%
		Auto Part	131	4.0%
		Auto Related	53	1.6%
		Auto Trim	63	1.9%
		Automotive	8	0.2%
		Bag	20	0.6%
		Bottle	104	3.2%
		Bottle Cap	33	1.0%
		Box Piece	75	2.3%
		Carton	199	6.0%
		Container	87	2.6%
		Flare	75	2.3%
		Foil	27	0.8%
		Funnel	50	1.5%
		Gas Cap	55	1.7%
		Instructions	8	0.2%
		Insulation	8	0.2%
		Label	101	3.0%
		License Plate	32	1.0%
		Lid	11	0.3%
		Oil Container	124	3.8%
		Oil Filter	25	0.8%

Litter Use	Brand Code	Item Code	Tally Count	%
Automotive	Unknown	Reflector	75	2.3%
		Rope	8	0.3%
		Rubber	9	0.3%
		Shop Rag	1224	37%
		Sign	8	0.3%
		Spark Plug Box	33	1.0%
		Sponge	8	0.2%
		Strap	10	0.3%
		Styrafoam	50	1.5%
		Tape	12	0.4%
		Tire And Rim	33	1.0%
		Tire Parts	17	0.5%
		Tube	10	0.3%
		Unknown	8	0.3%
		Vinyl	10	0.3%
		Washers	16	0.5%
	Wix	Container	13	100%

Litter Use	Brand Code	Item Code	Tally Count	%
Construction/Industrial	3M	Cardboard Piece	13	13%
		Corrugated Box	10	10%
		Mask	21	21%
		Sandpaper	32	31%
		Tape	14	13%
		Wrap	11	11%
	ACE	Corrugated Box	11	100%
	Advanced Cons.	Corrugated Box	13	100%
	Benson & Hedges	Corrugated Box	13	100%
	Gates	Package	12	100%
	General Motors	Corrugated Box	9	100%
	HEB	Carton	11	100%
	Hefty	Bag	12	100%
	Home Depot	Flag	10	56%
		Grocery Bag	8	44%
	International	Corrugated Box	12	100%
	John Boos	Duct Tape	10	50%
		Sandpaper	10	50%
	John Deere	Container	9	100%
	Kelly Moore	Label	11	100%
	Lasco	Pvc	52	100%
	Lowes	Auto Floor Mat	13	100%
	Masterlock	Lock	14	100%
	Mc Coys	Bag	11	100%
	McDonalds	Sign	9	100%
	Mid Western	Corrugated Box	28	100%
	Napa Auto Parts	Carton	10	100%

Litter Use	Brand Code	Item Code	Tally Count	%
Construction/Industrial	Stanley	Packing Materia	8	50%
	State of Texas	Road Marker	41	100%
	Sunbelt	Industrial Tape	13	100%
	Sylvania	Box Piece	9	100%
	Unknown	Aerosol Can	26	0.1%
		Aerosol Cap	68	0.3%
		Auto Light	41	0.2%
		Auto Related	13	0.1%
		Bag	777	3.5%
		Block	11	0.0%
		Bottle	32	0.1%
		Bottle Cap	87	0.4%
		Box Piece	826	3.7%
		Broom	21	0.1%
		Bubble Wrap	166	0.7%
		Bucket	66	0.3%
		Buffer Pad	11	0.0%
		Bungee Cord	80	0.4%
		Calendar	13	0.1%
		Cardboard	107	0.5%
		Cardboard Piece	391	1.8%
		Carpet	18	0.1%
		Carton	246	1.1%
		Caulk	21	0.1%
		Cellophane Stor	56	0.3%
		Clam Shell	10	0.0%
		Container	296	1.3%
		Container Piece	73	0.3%
		Cooler Lid	11	0.0%
		Corrugated Box	2876	13%
		Duct Tape	261	1.2%
		Envelope	8	0.0%
		Extension Cord	19	0.1%
		Fencing	86	0.4%
		Fiberglass	13	0.1%
		Flag	44	0.2%
		Fluff	24	0.1%
		Foam	539	2.4%
		Foam Block	27	0.1%
		Foam Rubber	14	0.1%
		Form	21	0.1%
		Funnel	23	0.1%

Litter Use	Brand Code	Item Code	Tally Count	%
Construction/Industrial	Unknown	Industrial Tape	193	0.9%
		Insulation	264	1.2%
		Invoice	11	0.0%
		Knife	14	0.1%
		Label	184	0.8%
		Lid	99	0.4%
		Lumber	21	0.1%
		Mask	17	0.1%
		Measuring Tape	11	0.0%
		Metal Shaving	8	0.0%
		Miscellaneous	141	0.6%
		News Paper	60	0.3%
		Nylon Webbing	10	0.0%
		Oil Container	8	0.0%
		Oil Rag	10	0.0%
		Package	100	0.5%
		Packing Materia	648	2.9%
		Packing Tape	78	0.4%
		Pad	405	1.8%
		Paint Can	11	0.1%
		Pallet Strap	13	0.1%
		Paper	14	0.1%
		Paper Pieces	191	0.9%
		Particle Board	10	0.0%
		Plastic	43	0.2%
		Plastic Pieces	1681	7.5%
		Plastic Sheets	50	0.2%
		Plastic Strap	12	0.1%
		Plywood	10	0.0%
		Pvc	19	0.1%
		Rag	1659	7.4%
		Reflector	13	0.1%
		Ribbon	36	0.2%
		Roofing Felt	30	0.1%
		Rope	164	0.7%
		Rubber	73	0.3%
		Sandpaper	91	0.4%
		Sheet Rock	82	0.4%
		Shop Rag	2130	9.6%
		Siding	9	0.0%
		Sign	100	0.4%
		Sponge	24	0.1%
		Steel Strap	35	0.2%
		Sticker	10	0.0%
		Strap	568	2.6%
		Styrafoam	2018	9.1%

Litter Use	Brand Code	Item Code	Tally Count	%
Construction/Industrial	Unknown	Tarp Pieces	134	0.6%
		Tie Down	206	0.9%
		Tile	54	0.2%
		Tire Parts	10	0.0%
		Tissue/Towel/Na	431	1.9%
		Toilet Paper Ro	75	0.3%
		Tools	24	0.1%
		Tube	30	0.1%
		Twine	63	0.3%
		Utility Knife	16	0.1%
		Weather Strip	21	0.1%
		Wire	23	0.1%
		Wrap	1052	4.7%

Litter Use	Brand Code	Item Code	Tally Count	%
Food	#40	Grocery Bag	21	100%
	180 Energy	Carton	21	100%
	7-Eleven	Beverage Cup	129	63%
		Cellophane Stor	29	14%
		Food Tray	21	10%
		Grocery Bag	14	6.7%
		Tissue/Towel/Na	10	5.1%
	7-Up	Snack Wrap	9	100%
	A&W	Beverage Cup	24	100%
	Act II	Carton	10	46%
		Condiment Pack	12	54%
	Airhead	Snack Wrap	149	93%
		Wrap	11	6.7%
	Albertsons	Grocery Bag	10	50%
		Wrap	10	50%
	Allsups	Beverage Cup	26	9.7%
		Condiment Pack	145	54%
		Food Wrap	36	13%
		Rag	10	3.8%
		Tissue/Towel/Na	51	19%
	Almond Joy	Food Wrap	10	9.3%
		Snack Wrap	88	81%
		Wrap	11	9.8%
	Altoids	Wrap	10	100%
	Ampact	Food Wrap	10	100%
	Anco	Bag	10	100%
	Ara Ins.	Food Wrap	10	100%
	Arbys	Beverage Cup	55	19%
		Can	11	3.8%
		Condiment Pack	142	50%
		Cup Lid	38	13%
		Food Tray	29	10%

Litter Use	Brand Code	Item Code	Tally Count	%
Food	Arizona	Food Wrap	11	100%
	Austin Quality	Food Wrap	21	53%
		Snack Wrap	19	47%
	Baskin Robins	Medicine Contai	17	68%
		Utensil	8	32%
	Bengal	Beverage Cup	8	43%
		Food Wrap	10	57%
	Bens & Jerrys	Carton	13	100%
	Bic	Beverage Cup	18	100%
	Big Red	Auto Part	18	32%
		Gum Wrap	39	68%
	Bill Miller	Beverage Cup	30	100%
	Bimbo	Snack Wrap	46	100%
	Bites	Snack Wrap	10	100%
	Blow Pop	Food Wrap	11	39%
		Gum Wrap	8	29%
		Snack Wrap	9	33%
	Blue Bell	Bowl	12	5.0%
		Carton	29	12%
		Food Tray	10	4.3%
		Food Wrap	55	23%
		Lid	11	4.4%
		Snack Wrap	105	43%
		Wrap	21	8.5%
	Blue Bird	Snack Wrap	17	100%
	Blue Bunny	Snack Wrap	82	88%
		Wrap	11	12%
	Blue Ox	Condiment Pack	31	100%
	Boones Farm	Food Tray	26	100%
	Borden	Carton	12	54[5]

Litter Use	Brand Code	Item Code	Tally Count	%
Food	Brachs	Wrap	42	30%
	Braums	Beverage Cup	10	15%
		Condiment Pack	10	15%
		Cup Lid	14	19%
		Food Tray	37	52%
	Brookshire	Bag	10	51%
		Grocery Bag	10	49%
	Bubblicious	Gum Wrap	21	100%
	Buds Best	Snack Wrap	10	100%
	Bueno	Beverage Cup	19	100%
	Bugles	Snack Wrap	26	100%
	Burger King	Bag	150	16%
		Beverage Cup	74	7.8%
		Carton	11	1.2%
		Condiment Pack	213	23%
		Cup Lid	141	15%
		Food Tray	160	17%
		Food Wrap	148	16%
		Grocery Bag	13	1.4%
		Instructions	8	0.9%
		Package	8	0.9%
		Toy	8	0.9%
		Wrap	10	1.1%
	Bush's Chicken	Food Tray	14	100%
	Butterfinger	Food Wrap	11	3.8%
		Snack Wrap	269	96%
	Carls Jr	Beverage Cup	21	25%
		Condiment Pack	52	63%
		Food Tray	10	13%
	Carta Blanca	Food Wrap	37	49%
		Grocery Bag	38	51%
	Casa Solana	Condiment Pack	14	100%
	Charms	Snack Wrap	43	80%

Litter Use	Brand Code	Item Code	Tally Count	%
Food	Chee-tos	Food Wrap	73	17%
		Snack Wrap	332	76%
		Wrap	34	7.7%
	Cheerios	Snack Wrap	21	100%
	Chesterfried	Food Tray	8	100%
	Chevron	Beverage Cup	39	100%
	Chick Fil-A	Bag	10	4.0%
		Beverage Cup	31	12%
		Condiment Pack	19	7.3%
		Coupon	12	4.5%
		Cup Lid	92	35%
		Food Tray	66	25%
		Food Wrap	21	8.1%
		Snack Wrap	10	3.7%
	Chick-O-Stick	Snack Wrap	10	100%
	Chicken Express	Beverage Cup	95	74%
		Food Tray	23	18%
		Food Wrap	10	7.9%
	Chipotle	Beverage Cup	10	100%
	Chucky Cheese	Beverage Cup	140	47%
		Food Wrap	19	6.3%
		Snack Wrap	137	46%
	Churchs Chicken	Beverage Cup	38	14%
		Condiment Pack	92	33%
		Cup Lid	29	10%
		Drinking Glass	13	4.7%
		Foil	11	3.8%
		Food Tray	77	27%
		Food Wrap	21	7.4%
	Circle K	Grocery Bag	17	100%
	Clear & Pure	Ice Bag	30	100%
	Clover	Snack Wrap	14	100%
	Coastal Corpora	Snack Wrap	13	100%

Litter Use	Brand Code	Item Code	Tally Count	%
Food	Corning	Drinking Straw	24	100%
	Cows	Grocery Bag	20	100%
	Cracker Jacks	Snack Wrap	16	100%
	Crest	Gum Wrap	10	100%
	Crown	Snack Wrap	11	100%
	Crunch	Snack Wrap	10	100%
	Crystal Clear	Ice Bag	16	100%
	Crystal Ice	Grocery Bag	12	13%
		Ice Bag	83	87%
	Cup Noodles	Container	10	100%
	Dairy Queen	Bag	13	3.1%
		Beverage Cup	262	64%
		Condiment Pack	10	2.6%
		Cup Lid	22	5.3%
		Drinking Glass	8	2.0%
		Food Tray	26	6.4%
		Food Wrap	24	5.9%
		Receipt	11	2.6%
		Utensil	32	7.8%
	David	Snack Wrap	23	100%
	Del Monte	Can	52	100%
	Deli Express	Tissue/Towel/Na	19	100%
	Dennys	Receipt	8	100%
	Dentyne	Gum Wrap	286	100%
	Diamond	Carton	12	100%
	Diamond Shamroc	Bag	10	32%
		Grocery Bag	22	68%
	Dixie	Beverage Cup	21	27%
		Cup Lid	42	55%

Litter Use	Brand Code	Item Code	Tally Count	%
Food	Dollar General	Bag	10	9.3%
		Food Wrap	52	47%
		Grocery Bag	10	9.3%
		Snack Wrap	39	35%
	Dollar Tree	Grocery Bag	26	100%
	Dolly Madison	Bowl	11	11%
		Food Tray	20	20%
		Food Wrap	11	11%
		Snack Wrap	58	58%
	Dominos	Container	13	34%
		Snack Wrap	9	23%
		Tissue/Towel/Na	17	43%
	Doritos	Bag	64	13%
		Container	11	2.2%
		Food Wrap	73	15%
		Snack Wrap	325	66%
		Tag	11	2.2%
		Wrap	11	2.2%
	Double Bubble	Grocery Bag	10	3.3%
		Gum Wrap	262	86%
		Snack Wrap	10	3.3%
		Wrap	21	7.1%
	Dr.B	Food Wrap	11	100%
	Dreyers	Carton	14	100%
	Dum Dum	Bowl	13	20%
		Snack Wrap	46	69%
		Styrafoam	8	12%
	Dunkin Donuts	Bag	13	100%
	Eagle Electric	Condiment Pack	8	100%
	Ebony	Food Tray	11	45%
		Snack Wrap	13	55%
	Eclipse	Grocery Bag	10	10%
		Gum Wrap	90	90%

Litter Use	Brand Code	Item Code	Tally Count	%
Food	Everest	Label	8	100%
	Everyday	Ice Bag	10	100%
	Exxon	Beverage Cup	38	78%
		Grocery Bag	11	22%
	Famous Star	Food Wrap	10	52%
		Snack Wrap	10	48%
	Farmers Bros.	Beverage Cup	13	100%
	Fiesta	Cup Lid	377	100%
	Frenches	Snack Wrap	9	100%
	Frigo	Food Wrap	10	55%
		Snack Wrap	9	45%
	Frito Lay	Can	11	0.9%
		Cup Lid	23	2.1%
		Food Wrap	180	16%
		Snack Wrap	883	78%
		Wrap	33	2.9%
	Fruit Rollup	Snack Wrap	29	100%
	Funyuns	Snack Wrap	33	100%
	General Mills	Snack Wrap	23	100%
	General Motors	Food Wrap	11	100%
	Glad	Food Tray	25	100%
	Golden Chick	Label	10	100%
	Good Humor	Snack Wrap	133	100%
	Goodies	Condiment Pack	8	100%
	Grandmas Cookie	Food Wrap	75	58%
		Snack Wrap	54	42%
	Grandys	Beverage Cup	29	76%
		Snack Wrap	9	24%

Litter Use	Brand Code	Item Code	Tally Count	%
Food	HEB	Food Tray	9	3.6%
		Food Wrap	10	4.3%
		Grocery Bag	117	48%
		Snack Wrap	37	15%
	Halls	Snack Wrap	10	20%
		Wrap	42	80%
	Hannahs	Snack Wrap	10	100%
	Hawaiian Punch	Grocery Bag	9	100%
	Hefty	Bag	11	14%
		Cellophane Stor	44	57%
		Food Wrap	13	16%
		Plate	10	13%
	Heinz	Condiment Pack	138	87%
		Food Wrap	21	13%
	Hersheys	Food Wrap	63	10%
		Gum Wrap	10	1.6%
		Memo	33	5.3%
		Snack Wrap	508	81%
		Wrap	11	1.7%
	Hill Country	Snack Wrap	8	100%
	Hostess	Food Wrap	11	8.0%
		Snack Wrap	124	92%
	Hot Pocket	Snack Wrap	14	100%
	Hot Tamales	Snack Wrap	13	100%
	Hunts	Condiment Pack	69	87%
		Food Tray	10	13%
	Ice	Ice Bag	56	88%
		Snack Wrap	8	12%
	Ice Breakers	Gum Wrap	34	100%
	Icee	Beverage Cup	8	100%
	Jack Links	Snack Wrap	57	100%

Litter Use	Brand Code	Item Code	Tally Count	%
Food	Jack in the Box	Condiment Pack	448	18%
		Cup Lid	320	13%
		Food Tray	68	2.7%
		Food Wrap	783	31%
		Receipt	142	5.6%
		Snack Wrap	17	0.7%
		Wrap	10	0.4%
	Jasons Deli	Beverage Cup	10	100%
	Jazzercise	Snack Wrap	10	100%
	Jell-o	Snack Wrap	14	100%
	Jolly Rancher	Bag	10	3.4%
		Card	50	16%
		Gum Wrap	42	14%
		Snack Wrap	196	63%
		Wrap	10	3.4%
	Juicy Fruit	Gum Wrap	44	100%
	Junior Mints	Carton	11	100%
	Keebler	Food Wrap	11	25%
		Snack Wrap	33	75%
	Kelloggs	Carton	39	17%
		Snack Wrap	189	83%
	Kentucky Fried	Bag	23	10%
		Beverage Cup	22	10%
		Condiment Pack	101	45%
		Food Tray	49	22%
		Food Wrap	9	4.0%
		Receipt	8	3.7%
		Snack Wrap	11	5.1%
	Kit Kat	Snack Wrap	182	94%
		Wrap	11	5.6%
	Koito	Ice Bag	74	100%
	Krackel	Snack Wrap	10	100%
	Kraft	Condiment Pack	50	57%

Litter Use	Brand Code	Item Code	Tally Count	%
Food	Kroger	Grocery Bag	13	60%
		Snack Wrap	9	40%
	Kudos	Snack Wrap	12	100%
	Lance	Food Wrap	75	23%
		Snack Wrap	236	73%
		Wrap	12	3.7%
	Lays	Food Wrap	20	10%
		Snack Wrap	181	90%
	Libbys	Can	46	66%
		Container	10	15%
		Food Tray	14	19%
	Lifesavers	Label	11	16%
		Snack Wrap	35	51%
		Wrap	23	33%
	Lipton	Package	8	100%
	Little Caesars	Condiment Pack	8	24%
		Receipt	17	51%
		Tissue/Towel/Na	8	25%
	Little Debbie	Carton	10	2.5%
		Food Tray	36	8.6%
		Food Wrap	21	5.0%
		Snack Wrap	355	84%
	Long John Silve	Beverage Cup	69	68%
		Condiment Pack	21	21%
		Snack Wrap	10	10%
	Loves	Beverage Cup	26	100%
	Lubys	Beverage Cup	8	100%
	M & M	Food Wrap	32	11%
		Snack Wrap	226	78%
		Wrap	32	11%
	Magnum	Food Tray	10	100%
	Mars	Food Wrap	11	100%

Litter Use	Brand Code	Item Code	Tally Count	%
Food	McDonalds	Condiment Pack	594	12%
		Container	13	0.3%
		Cup Lid	652	13%
		Drinking Glass	13	0.3%
		Food Tray	893	18%
		Food Wrap	869	17%
		Industrial Tape	8	0.2%
		Package	37	0.7%
		Pen	13	0.3%
		Pill Bottle	11	0.2%
		Receipt	111	2.2%
		Salt Pack	22	0.4%
		Snack Wrap	56	1.1%
		Tag	12	0.2%
		Tissue/Towel/Na	37	0.7%
		Toy	16	0.3%
		Wrap	120	2.4%
	Mickeys	Food Tray	13	100%
	Mike & Ikes	Card	10	100%
	Milky Way	Snack Wrap	89	89%
		Wrap	11	11%
	Moon Pies	Condiment Pack	13	21%
		Food Wrap	21	35%
		Snack Wrap	26	43%
	Mounds	Snack Wrap	45	100%
	Mrs. Baird	Bag	10	2.2%
		Food Tray	37	7.7%
		Food Wrap	86	18%
		Snack Wrap	334	70%
		Wrap	12	2.5%
	Mrs. Freshleys	Carton	8	19%
		Snack Wrap	37	81%
	Nabisco	Food Wrap	42	15%
		Snack Wrap	218	81%
		Wrap	11	4.0%
	Nature Valley	Snack Wrap	125	91%
		Wrap	12	8.6%

Litter Use	Brand Code	Item Code	Tally Count	%
Food	Nestea	Food Wrap	11	100%
	Nestle	Food Wrap	84	17%
		Snack Wrap	354	73%
		Wrap	46	9.5%
	Now & Later	Snack Wrap	10	49%
		Wrap	11	51%
	Nutri Grain	Snack Wrap	10	100%
	Oberto	Snack Wrap	56	100%
	Olive Garden	Beverage Cup	8	100%
	Orbit	Gum Wrap	56	100%
	Ozarka	Beverage Cup	17	100%
	Pemmican	Beverage Cup	14	100%
	Pepridge Farm	Food Tray	8	25%
		Snack Wrap	24	75%
	Pepsi	Beverage Cup	17	56%
		Glass Earpieces	13	44%
	Peter Pan	Snack Wrap	14	100%
	Peter Paul	Snack Wrap	20	100%
	Peter Piper	Beverage Cup	8	44%
		Food Wrap	11	56%
	Pillsbury	Carton	8	39%
		Snack Wrap	13	61%
	Pizza Hut	Beverage Cup	44	43%
		Card, Business	24	24%
		Food Tray	20	20%
		Unknown	13	13%
	Pizza Inn	Food Tray	8	100%
	Planters	Food Wrap	43	16%
		Snack Wrap	212	80%

Litter Use	Brand Code	Item Code	Tally Count	%
Food	Popeyes	Beverage Cup	31	20%
		Condiment Pack	19	12%
		Cup Lid	51	32%
		Drinking Straw	10	6.6%
		Drinking Straw	8	5.3%
		Food Wrap	30	19%
		Receipt	9	5.9%
	Power Bar	Beverage Cup	8	100%
	Pringles	Can	14	29%
		Container	13	27%
		Lid	11	23%
		Snack Wrap	9	20%
	Pure Ice	Food Wrap	8	27%
		Ice Bag	23	73%
	Quaker	Carton	12	13%
		Snack Wrap	81	87%
	Quiznos	Bag	10	18%
		Beverage Cup	27	47%
		Food Tray	8	13%
		Tissue/Towel/Na	13	22%
	Race Trac	Beverage Cup	24	100%
	Randalls	Bag	9	26%
		Food Tray	14	41%
		Wrap	11	33%
	Red Bull	Food Tray	21	100%
	Reddy Ice	Food Wrap	10	7.0%
		Ice Bag	127	86%
		Utensil	10	7.0%
	Reeses	Food Tray	10	1.8%
		Food Wrap	74	13%
		Snack Wrap	450	78%
		Wrap	43	7.5%
	Ring Pop	Snack Wrap	19	64%
		Wrap	11	36%

Litter Use	Brand Code	Item Code	Tally Count	%
Food	SOCO	Snack Wrap	10	100%
	Sams	Food Wrap	10	100%
	Sathers	Snack Wrap	54	100%
	Schlotzskys	Beverage Cup	10	30%
		Container	12	33%
		Food Wrap	13	37%
	Shell	Beverage Cup	53	100%
	Shepps	Food Tray	10	100%
	Shipleys Donunt	Bag	13	4.3%
		Beverage Cup	8	2.8%
		Food Wrap	21	7.0%
		Tissue/Towel/Na	260	86%
	Sierra Mist	Snack Wrap	9	100%
	Six Flags	Snack Wrap	10	100%
	Skittles	Snack Wrap	82	100%
	Slim Fast	Grocery Bag	30	69%
		Snack Wrap	14	31%
	Slim Jim	Food Wrap	114	27%
		Snack Wrap	317	73%
	Snickers	Carton	11	1.4%
		Food Wrap	147	19%
		Snack Wrap	599	76%
		Wrap	35	4.4%
	Solo	Cup Lid	155	100%
	Sonic	Bag	108	6.0%
		Beverage Cup	442	25%
		Candy	27	1.5%
		Condiment Pack	158	8.9%
		Container	10	0.6%
		Coupon	10	0.6%
		Cup Lid	407	23%
		Drinking Glass	13	0.7%

Litter Use	Brand Code	Item Code	Tally Count	%
Food	Sonic	Label	13	0.7%
		Lid With Straw	10	0.6%
		Receipt	25	1.4%
		Salt Pack	10	0.6%
		Snack Wrap	13	0.7%
		Soda Bottle	10	0.6%
		Soda Can	8	0.4%
		Wrap	42	2.4%
	Sonritos	Snack Wrap	14	100%
	Sour Patch	Snack Wrap	23	100%
	Sparkling Ice	Ice Bag	12	100%
	Sprite	Cardboard Piece	11	100%
	Starburst	Food Wrap	21	11%
		Snack Wrap	156	83%
		Wrap	11	5.7%
	Stars	Beverage Cup	8	100%
	Steak N Shake	Bag	9	47%
		Condiment Pack	10	53%
	Subway	Bag	21	2.6%
		Beverage Cup	265	32%
		Cup Lid	79	9.6%
		Food Tray	13	1.6%
		Food Wrap	124	15%
		Grocery Bag	119	15%
		Rag	20	2.5%
		Tissue/Towel/Na	176	22%
	Sun-Maid	Carton	36	77%
		Grocery Bag	10	23%
	Sunbelt	Snack Wrap	42	100%
	Sunkist	Food Wrap	11	58%
		Snack Wrap	8	43%
	Sunny Delight	Grocery Bag	17	100%
	Sunshine	Beverage Cup	13	100%

Litter Use	Brand Code	Item Code	Tally Count	%
Food	Sweet N Low	Condiment Pack	14	100%
	Sweetheart	Bag	8	1.9%
		Cup Lid	285	65%
		Drinking Straw	123	28%
		Snack Wrap	17	3.8%
		Tissue/Towel/Na	8	1.9%
	Taco Bell	Bag	36	2.9%
		Beverage Cup	228	18%
		Condiment Pack	467	38%
		Cup Pieces	10	0.8%
		Food Tray	113	9.2%
		Food Wrap	352	29%
		Receipt	14	1.1%
		Wrap	10	0.8%
	Taco Cabana	Bag	10	6.2%
		Beverage Cup	83	49%
		Condiment Pack	9	5.2%
		Cup Lid	16	9.5%
		Food Tray	10	6.0%
		Food Wrap	21	13%
		Gum Wrap	10	6.2%
		Receipt	8	4.7%
	Tang	Condiment Pack	9	100%
	Target	Beverage Cup	14	50%
		Grocery Bag	14	50%
	Three Musketeer	Food Wrap	32	28%
		Snack Wrap	82	72%
	Tic Tacs	Container	30	100%
	Toms	Food Wrap	74	20%
		Snack Wrap	271	72%
		Wrap	33	8.7%
	Tootsie Roll	Food Wrap	42	16%
		Snack Wrap	219	84%
	Totinos	Food Tray	13	100%
	Town and Countr	Beverage Cup	65	79%

Litter Use	Brand Code	Item Code	Tally Count	%
Food	Trident	Gum Wrap	117	100%
	Twix	Food Wrap	10	7.0%
		Snack Wrap	139	93%
	Twizzlers	Snack Wrap	21	100%
	Unknown	Apple	13	0.0%
		Bag	1479	3.6%
		Beverage Cup	3496	8.6%
		Box Piece	20	0.0%
		Broom	8	0.0%
		Can	78	0.2%
		Carton	108	0.3%
		Cellophane Stor	690	1.7%
		Condiment Pack	1486	3.7%
		Container	208	0.5%
		Cup Lid	2407	5.9%
		Drink Pouch	8	0.0%
		Drinking Glass	183	0.5%
		Drinking Straw	4854	12%
		Drinking Straw	155	0.4%
		Foil	1215	3.0%
		Food Tray	2344	5.8%
		Food Wrap	1733	4.3%
		Garbage Bag (Em	50	0.1%
		Garbage Bag (Fu	8	0.0%
		Grocery Bag	1745	4.3%
		Gum Wrap	421	1.0%
		Ice Bag	146	0.4%
		Label	9	0.0%
		Lid	149	0.4%
		Pad	59	0.1%
		Pizza Box	17	0.0%
		Plate	623	1.5%
		Popsicle Stick	57	0.1%
		Snack Wrap	2672	6.6%
		Tin Lid	10	0.0%
		Tissue/Towel/Na	13386	33%
		Towel Holder	12	0.0%
		Utensil	415	1.0%
		Wrap	377	0.9%
	Wal-mart	Bag	43	11%
		Beverage Cup	14	3.3%
		Can	14	3.3%

Litter Use	Brand Code	Item Code	Tally Count	%
Food	Wal-mart	Snack Wrap	23	5.5%
	Weinersnitzel	Food Tray	13	38%
		Food Wrap	9	25%
		Tissue/Towel/Na	13	38%
	Welchs	Snack Wrap	15	100%
	Wendys	Bag	85	9.4%
		Beverage Cup	241	27%
		Condiment Pack	69	7.7%
		Corrugated Box	10	1.2%
		Cup Lid	150	17%
		Drinking Glass	17	1.8%
		Food Tray	155	17%
		Food Wrap	111	12%
		Receipt	29	3.2%
		Tape	23	2.5%
		Wrap	10	1.2%
	Whataburger	Bag	292	12%
		Beverage Cup	776	32%
		Can	10	0.4%
		Condiment Pack	484	20%
		Cup Lid	328	14%
		Cup Pieces	10	0.4%
		Drinking Straw	9	0.4%
		Food Tray	270	11%
		Food Wrap	138	5.7%
		Garbage Bag (Em	8	0.4%
		Grocery Bag	25	1.0%
		Receipt	18	0.8%
		Tissue/Towel/Na	12	0.5%
		Wrap	23	0.9%
	Whoppers	Food Wrap	10	31%
		Snack Wrap	23	69%
	Wonkas	Food Wrap	10	26%
		Snack Wrap	30	74%
	Worlds Oven	Condiment Pack	10	100%
	Wrigleys	Food Wrap	11	1.9%
		Grocery Bag	66	11%
		Gum Wrap	511	84%

Litter Use	Brand Code	Item Code	Tally Count	%
Food	Yoplait	Food Tray	10	23%
		Snack Wrap	26	59%
	York	Food Wrap	10	18%
		Snack Wrap	46	82%
	Zero	Snack Wrap	31	100%
	Ziploc	Bag	79	53%
		Cellophane Stor	70	47%

Litter Use	Brand Code	Item Code	Tally Count	%
Household/Personal	A.T. Woods	Cd	10	50%
		Tape	10	50%
	Action Popcorn	Garment Bag	11	100%
	Advanced Cons.	Medicine Contai	17	100%
	Advil	Medicine Contai	13	19%
		Pill Container	54	81%
	Albertsons	Credit Card	9	18%
		Pill Bottle	10	20%
		Receipt	21	40%
		Tag	11	21%
	Aleve	Medicine Contai	25	67%
		Pill Container	13	33%
	Arm & Hammer	Carton	13	100%
	Avent	Credit Card	10	100%
	B.C. Powder	Medicine Contai	25	100%
	Band aids	Bandage	10	100%
	Bc Powder	Pill Container	12	100%
	Bealls	Credit Card	9	100%
	Benadryl	Medicine Contai	13	35%
		Pill Container	23	65%
	Best Western	Key	8	100%
	Bic	Container	17	23%
		Lighter	10	14%
		Pen	44	62%
	Blistex	Lip Balm	10	52%
		Pill Container	9	48%
	Borden	Carton	10	100%
	Bosch	Beer Can	31	100%

Litter Use	Brand Code	Item Code	Tally Count	%
Household/Personal	Carta Blanca	Pill Wrap	9	100%
	Chucky Cheese	Container	9	100%
	Clorox	Health Item	12	100%
	Coastal Corpora	Carton	11	100%
	Corona	Medicine Contai	8	100%
	Crest	Container	10	100%
	Diamond Shamroc	Match Book	9	100%
	Dollar General	Carton	10	51%
		Grocery Bag	10	49%
	Easy Mart	Lighter	11	100%
	Eckerd Drugs	Package	10	100%
	Energizer	Carton	8	100%
	Federal	Carton	10	100%
	Glad	Lid	9	100%
	HEB	Battery	17	63%
		Shorts	10	38%
	Halls	Medicine Contai	10	37%
		Wrap	17	63%
	Hanes	Bag	10	24%
		T-Shirts	11	25%
		Underwear	21	51%
	Home Depot	Bag	14	40%
		Grocery Bag	21	60%
	Igloo	Cooler Pieces	14	100%
	Kleenex	Carton	13	56%
		Wrap	10	44%
	Kodak	Carton	8	17%

Litter Use	Brand Code	Item Code	Tally Count	%
Household/Personal	Lifestyles	Condom Pack	31	100%
	Lowes	Bag	27	100%
	Max Brand	Package	10	100%
	Metabolife	Credit Card	10	100%
	Mini Ephedrine	Pill Wrap	10	46%
		Pipe	12	54%
	Minute Maid	Carton	9	100%
	Motrin	Pill Container	9	100%
	Nesquick	Magnet	14	100%
	Nike	Hat	9	50%
		Shoe Insole	9	50%
	No Doze	Pill Bottle	10	100%
	Nyquil	Medicine Contai	13	100%
	Old Navy	Container	13	100%
	Oral - B	Container	11	100%
	Panasonic	Carton	30	100%
	Phillips 66	Carton	8	100%
	Power Service	Shorts	10	100%
	Prime Protectio	Box Piece	10	45%
		Lip Balm	13	55%
	Purina	Bag	10	100%
	Rubber Maid	Container	17	44%
		Cooler Lid	13	34%
		Lid	8	22%
	Select	Carton	10	100%
	Sonic	Toy	20	100%

Litter Use	Brand Code	Item Code	Tally Count	%
Household/Personal	Stamina RX	Pill Container	21	67%
	State of Texas	Envelope	8	5.8%
		Lottery Ticket	137	94%
	Sylvania	Carton	10	100%
	Town and Countr	Lighter	16	100%
	Trojan	Condom Pack	77	85%
		Container	14	15%
	Tropicana	Carton	14	100%
	Tylenol	Carton	21	16%
		Medicine Contai	43	33%
		Pill Bottle	13	9.7%
		Pill Container	19	14%
		Pill Wrap	35	27%
	Ultra	Carton	13	62%
		Package	8	38%
	Union Fidelity	Mail	9	100%
	Unknown	AC Filter	29	0.3%
		Aerosol Can	10	0.1%
		Air Filter	10	0.1%
		Baby Nipple	25	0.3%
		Bag	189	2.1%
		Balloon	17	0.2%
		Bandage	33	0.4%
		Bandana	20	0.2%
		Baseball Card	21	0.2%
		Battery	21	0.2%
		Belt	84	0.9%
		Bottle	111	1.2%
		Bottle Cap	17	0.2%
		Bottle Cap, Win	8	0.1%
		Bow	217	2.4%
		Box Piece	14	0.2%
		Broom	9	0.1%
		Bucket	8	0.1%
		CD/DVD case	70	0.8%
		Calendar	19	0.2%
		Can	10	0.1%

Litter Use	Brand Code	Item Code	Tally Count	%
Household/Personal	Unknown	Cd	257	2.9%
		Cd Wrap	10	0.1%
		Cell Phone Char	108	1.2%
		Cellophane Stor	10	0.1%
		Coat	9	0.1%
		Comb	43	0.5%
		Condiment Pack	12	0.1%
		Condoms	21	0.2%
		Container	289	3.2%
		Corrugated Box	24	0.3%
		Crayon	43	0.5%
		Credit Card	124	1.4%
		Cup Holder	33	0.4%
		Cup Lid	33	0.4%
		Cup Pieces	10	0.1%
		Diaper	104	1.2%
		Dryer Sheet	272	3.0%
		Ear Protection	22	0.2%
		Envelope	699	7.8%
		Feminine Napkin	24	0.3%
		File Folder	14	0.2%
		Film	10	0.1%
		Fire Cracker	10	0.1%
		Flag	18	0.2%
		Flier/Catalog	76	0.8%
		Foil	12	0.1%
		Form	25	0.3%
		Garbage Bag (Em	27	0.3%
		Gift Wrap	300	3.3%
		Glass Frames	13	0.1%
		Glove	192	2.1%
		Hair Brush	12	0.1%
		Hair Net	57	0.6%
		Hat	57	0.6%
		Hypodermic Need	10	0.1%
		Inhaler	30	0.3%
		Key	53	0.6%
		Label	50	0.6%
		Lighter	144	1.6%
		Lipstick	8	0.1%
		Lottery Ticket	33	0.4%
		Magnet	46	0.5%
		Mail	361	4.0%
		Map	40	0.4%
		Marker	27	0.3%
		Mask	9	0.1%

Litter Use	Brand Code	Item Code	Tally Count	%
Household/Personal	Unknown	Miscellaneous	188	2.1%
		Mouth Wash Bott	24	0.3%
		Newspaper Bag	53	0.6%
		Note Pad	45	0.5%
		Package	151	1.7%
		Packing Materia	8	0.1%
		Pants	32	0.4%
		Paper Pieces	21	0.2%
		Pen	151	1.7%
		Pencil	10	0.1%
		Personal Check	17	0.2%
		Pet Door	8	0.1%
		Photo	56	0.6%
		Pill Bottle	92	1.0%
		Pill Container	139	1.5%
		Pill Wrap	147	1.6%
		Plastic Sheets	10	0.1%
		Playing Cards	197	2.2%
		Q-Tip	34	0.4%
		Rag	111	1.2%
		Ribbon	42	0.5%
		Screen	11	0.1%
		Shirt	40	0.4%
		Shoe	65	0.7%
		Shoe Insole	10	0.1%
		Shorts	11	0.1%
		Sign	10	0.1%
		Skirt	11	0.1%
		Sock	85	0.9%
		Speaker Cover	33	0.4%
		Sponge	9	0.1%
		Sticker	48	0.5%
		Strap	33	0.4%
		Styrafoam	10	0.1%
		Sunglass Rims	21	0.2%
		Sunglasses	39	0.4%
		T-Shirts	84	0.9%
		Tag	49	0.5%
		Tampon	85	0.9%
		Tape Insert	11	0.1%
		Teddy Bear	13	0.1%
		Tissue/Towel/Na	156	1.7%
		Toilet Paper Ro	74	0.8%
		Towel Holder	41	0.5%
		Toy	326	3.6%
		Tube	11	0.1%

Litter Use	Brand Code	Item Code	Tally Count	%
Household/Personal	Unknown	Water Jug	11	0.1%
		Wheels	11	0.1%
		Wrap	13	0.1%
	Vics Vapor Rub	Bow	50	82%
		Pill Wrap	11	18%
	Visine	Medicine Contai	9	100%
	Wal-mart	Bag	10	7.4%
		Bottle	10	7.4%
		Container Piece	10	7.4%
		Credit Card	10	7.4%
		Grocery Bag	73	52%
		Medicine Contai	26	19%
	Walgreens	Pill Bottle	13	100%
	Wells Fargo	Envelope	11	100%

Litter Use	Brand Code	Item Code	Tally Count	%
Non Alcoholic Beverage	7-Eleven	Beverage Cup	11	100%
	7-Up	Metal Cap	25	9.9%
		Soda Bottle	29	11%
		Soda Can	202	79%
	A&W	Beverage Cup	21	32%
		Six Pack Contai	13	19%
		Soda Bottle	11	17%
		Soda Can	21	33%
	Albertsons	Bottle	13	36%
		Soda Can	23	64%
	Allsups	Beverage Cup	51	100%
	Amco	Soda Can	11	100%
	American Fare	Beverage Cup	21	40%
		Cup Lid	32	60%
	Apex	Beverage Cup	31	100%
	Aquafina	Bottle	169	87%
		Water Jug	25	13%
	Arizona	Bottle	10	22%
		Can	21	45%
		Soda Can	16	33%
	Avery	Beverage Cup	11	100%
	B & C Parts	Soda Can	11	100%
	Barqs	Soda Can	13	100%
	Baskin Robins	Beverage Cup	11	100%
	Bengal	Soda Can	10	100%
	Big Red	Label	10	3.6%
		Six Pack Contai	23	7.9%
		Soda Bottle	110	38%
		Soda Can	144	50%
	Borden	Bottle	84	79%

Litter Use	Brand Code	Item Code	Tally Count	%
Non Alcoholic Beverage	Braums	Beverage Cup	12	100%
	Burger King	Beverage Cup	76	57%
		Cup Lid	58	43%
	Campbells	Bottle	11	35%
		Can	21	65%
	Canada Dry	Unknown	10	100%
	Capri Sun	Drink Pouch	265	92%
		Soda Bottle	13	4.5%
		Soda Can	10	3.3%
	Chevron	Beverage Cup	26	100%
	Cinemark	Beverage Cup	14	100%
	Circle K	Beverage Cup	21	50%
		Soda Bottle	21	50%
	Clover Valley	Soda Can	13	100%
	Coca-Cola	Beverage Cup	175	5.5%
		Bottle	24	0.7%
		Label	40	1.3%
		Six Pack Contai	29	0.9%
		Six Pack Ring	12	0.4%
		Soda Bottle	561	17%
		Soda Can	2358	73%
		Sponge	13	0.4%
	Country Time	Bottle	10	100%
	Cows	Beverage Cup	21	100%
	Dannon	Bottle	76	100%
	Dansani	Bottle	323	100%
	DejaBlue	Bottle	119	77%
		Bottle Cap	11	7.0%
		Industrial Tape	12	7.9%
		Six Pack Contai	12	7.9%
	Diet Coke	Bottle Cap	13	2.0%

Litter Use	Brand Code	Item Code	Tally Count	%
Non Alcoholic Beverage	Diet Dr. Pepper	Bottle	16	2.6%
		Can	12	2.0%
		Soda Bottle	245	40%
		Soda Can	347	56%
	Diet Pepsi	Can	44	28%
		Soda Bottle	43	28%
		Soda Can	66	43%
	Dixie	Beverage Cup	42	100%
	Dole	Bottle	9	100%
	Dollar General	Soda Bottle	8	100%
	Dr. Pepper	Beverage Cup	69	2.4%
		Bottle	79	2.7%
		Metal Cap	8	0.3%
		Six Pack Contai	73	2.5%
		Six Pack Ring	13	0.4%
		Soda Bottle	925	32%
		Soda Can	1761	60%
	Dr.B	Label	11	58%
		Soda Can	8	42%
	Easy Mart	Beverage Cup	10	100%
	Everest	Bottle	69	80%
		Water Jug	17	20%
	Evian	Bottle	10	100%
	Exxon	Beverage Cup	10	100%
	Fanta	Soda Bottle	18	24%
		Soda Can	55	76%
	Fernandos	Soda Can	21	100%
	Fiesta	Soda Can	13	100%
	Fiesta Mart	Soda Can	95	100%
	Folgers	Beverage Cup	69	100%

Litter Use	Brand Code	Item Code	Tally Count	%
Non Alcoholic Beverage	Gates	Soda Bottle	10	100%
	Gatorade	Bottle	329	69%
		Label	48	10%
		Soda Bottle	49	10%
		Sticker	50	10%
	Grandys	Beverage Cup	10	100%
	HEB	Beverage Cup	10	3.7%
		Bottle	57	20%
		Can	12	4.2%
		Drink Pouch	11	3.8%
		Soda Bottle	49	17%
		Soda Can	145	51%
	HI-C	Beverage Cup	10	36%
		Drink Pouch	8	29%
		Soda Can	10	36%
	Hawaiian Punch	Bottle	10	15%
		Can	57	85%
	Hersheys	Bottle	10	100%
	Hiland	Bottle	10	100%
	Hill Country	Soda Can	55	100%
	Hill Country Fa	Soda Can	49	67%
		Water Jug	24	33%
	Ice	Beverage Cup	11	100%
	Icee	Beverage Cup	35	100%
	Jumex	Can	29	68%
		Soda Can	14	32%
	K-mart	Can	17	57%
		Soda Can	13	43%
	Kelloggs	Soda Can	32	100%
	Kool Aid	Bottle	8	5.9%
		Container	9	6.5%

Litter Use	Brand Code	Item Code	Tally Count	%
Non Alcoholic Beverage	Libbys	Drink Pouch	9	100%
	Lipton	Bottle Cap	9	53%
		Can	8	47%
	Loves	Beverage Cup	31	100%
	Magnum	Beverage Cup	10	100%
	Minute Maid	Bottle	114	57%
		Bottle Cap	18	9.1%
		Can	36	18%
		Drink Pouch	14	6.7%
		Label	8	4.2%
		Soda Can	11	5.5%
	Monster	Can	72	86%
		Soda Can	12	14%
	Motor Craft	Beverage Cup	11	100%
	Mountain Dew	Bottle Cap	11	1.5%
		Can	9	1.2%
		Soda Bottle	368	51%
		Soda Can	341	47%
	Mug Root Beer	Soda Can	8	100%
	Nesquick	Bottle	31	100%
	Nestea	Bottle	42	35%
		Bottle Cap	10	8.8%
		Can	67	56%
	Nestle	Bottle	163	100%
	Oak Farm	Bottle	239	96%
		Bottle Cap	11	4.3%
	Ocean Spray	Bottle	10	100%
	Ozarka	Beverage Cup	10	1.7%
		Bottle	462	75%
		Bottle Cap	21	3.5%
		Carton	13	2.1%
		Water Jug	107	17%

Litter Use	Brand Code	Item Code	Tally Count	%
Non Alcoholic Beverage	Pepsi	Bottle	10	0.9%
		Bottle Cap	11	1.0%
		Six Pack Contai	14	1.2%
		Soda Bottle	365	33%
		Soda Can	646	58%
	Petsmart	Beverage Cup	21	100%
	Polar Ice	Soda Bottle	13	100%
	Power Aid	Bottle	41	100%
	PumpCo	Beverage Cup	11	50%
		Cup Lid	11	50%
	Quickick	Bottle	14	100%
	RC Cola	Soda Bottle	9	18%
		Soda Can	41	82%
	Red Bull	Bag	10	1.4%
		Can	573	85%
		News Paper	88	13%
	Red Flash	Soda Bottle	8	100%
	Reddy Ice	Beverage Cup	63	86%
		Cup Lid	10	14%
	Reeses	Soda Can	19	100%
	Remmington	Beverage Cup	43	100%
	Sams	Bottle	29	7.0%
		Can	8	2.0%
		Soda Bottle	95	23%
		Soda Can	283	68%
	Schepps	Bottle	8	100%
	Shepps	Bottle	14	100%
	Sierra	Beverage Cup	8	100%
	Sierra Mist	Soda Bottle	10	49%
		Soda Can	11	51%

Litter Use	Brand Code	Item Code	Tally Count	%
Non Alcoholic Beverage	Slim Fast	Can	38	100%
	Slush Puppy	Beverage Cup	14	100%
	Snapple	Beverage Cup	12	53%
		Six Pack Contai	10	47%
	Sobe	Bottle Cap	13	24%
		Can	42	76%
	Solo	Cup Lid	10	100%
	Sparkletts	Beverage Cup	8	26%
		Bottle	23	74%
	Sparkltts	Bottle	30	57%
		Water Jug	23	43%
	Sprite	Bottle	10	1.9%
		Condiment Pack	11	1.9%
		Six Pack	8	1.4%
		Soda Bottle	194	35%
		Soda Can	328	59%
	Squirt	Soda Bottle	8	100%
	Starbucks	Bag	14	8.7%
		Beverage Cup	75	48%
		Bottle	37	24%
		Bottle Cap	30	19%
	Starburst	Can	22	100%
	Stars & Stripes	Bottle	13	43%
		Soda Can	17	57%
	State of Texas	Bottle	41	22%
		Bottle Cap	8	4.4%
		Can	111	61%
		Soda Bottle	21	12%
	Sunkist	Six Pack Contai	10	3.2%
		Soda Bottle	159	48%
		Soda Can	159	49%
	Sunny Delight	Bottle	69	88%

Litter Use	Brand Code	Item Code	Tally Count	%
Non Alcoholic Beverage	Texas Life	Bottle	21	100%
	Thompson Constr	Beverage Cup	21	100%
	Total	Beverage Cup	21	100%
	Town and Countr	Beverage Cup	55	100%
	Tropicana	Beverage Cup	10	11%
		Bottle	79	89%
	Unknown	Beverage Cup	2277	22%
		Bottle	1357	13%
		Bottle Cap	903	8.6%
		Can	289	2.8%
		Cup Lid	1734	17%
		Cup Pieces	315	3.0%
		Drinking Glass	57	0.5%
		Drinking Straw	2172	21%
		Drinking Straw	25	0.2%
		Flier/Catalog	46	0.4%
		Seat Belt	11	0.1%
		Six Pack Contai	10	0.1%
		Six Pack Ring	314	3.0%
		Soda Bottle	521	5.0%
		Soda Can	278	2.6%
		Utensil	10	0.1%
		Water Jug	173	1.7%
	V-8	Bottle	34	45%
		Can	42	55%
	Vanilla Coke	Soda Bottle	8	19%
		Soda Can	37	81%
	Vantage	Beverage Cup	11	100%
	Wal-mart	Beverage Cup	11	16%
		Bottle	13	18%
		Soda Can	34	49%
		Water Jug	11	17%
	Walgreens	Beverage Cup	11	100%
	Welchs	Bottle	10	22%
		Soda Bottle	13	27%

Litter Use	Brand Code	Item Code	Tally Count	%
Non Alcoholic Beverage	Yoo Hoo	Can	13	20%
		Label	14	21%

Litter Use	Brand Code	Item Code	Tally Count	%
Other	Unknown	Form	99	73%
		Hypodermic Need	16	12%
		Miscellaneous	20	15%

Litter Use	Brand Code	Item Code	Tally Count	%
Printed	A&W	Label	13	100%
	Albertsons	Receipt	19	100%
	At&T	Tag	11	100%
	Avery	Instructions	10	100%
	Bank Of America	Receipt	12	100%
	Basic	Instructions	10	100%
	Best Buy	Receipt	8	100%
	Block Buster	Flier/Catalog	10	27%
		Receipt	28	73%
	Campbells	Label	10	100%
	Coastal Corpora	Label	10	100%
	Compass Bank	Receipt	10	100%
	Cows	Receipt	10	100%
	Dallas Morning	Coupon	13	7.2%
		News Paper	162	93%
	Dollar General	Label	20	42%
		Receipt	8	18%
		Tag	19	40%
	Durango	Instructions	12	100%
	Exxon	Receipt	32	100%
	Fiesta	Coupon	49	44%
		Newspaper	61	56%
	Foleys	Receipt	10	100%
	Garden Ridge	Receipt	19	100%
	Gates	Tag	10	100%
	HEB	Coupon	215	47%

Litter Use	Brand Code	Item Code	Tally Count	%
Printed	Home Depot	Receipt	26	72%
	K-mart	Receipt	10	100%
	Kroger	Coupon	31	27%
		News Paper	23	20%
		Receipt	62	53%
	Leviton	Packing Slip	10	100%
	Loves	Receipt	13	100%
	Lowes	Flier/Catalog	8	17%
		Grocery Bag	13	28%
		News Paper	13	28%
		Receipt	13	28%
	Oak Farm	Label	11	100%
	Ocean Spray	Label	10	100%
	Ozarka	Label	9	100%
	Petco	Receipt	14	100%
	Power Service	Receipt	10	100%
	Randalls	Receipt	8	100%
	Ross	Receipt	10	100%
	Sams	Instructions	10	18%
		Label	13	23%
		Receipt	32	59%
	San Antonio Exp	News Paper	11	50%
		Newspaper Bag	11	50%
	Shamrock	Receipt	13	100%
	Shell	Receipt	16	100%
	Shurtape	Receipt	13	100%
	Snapple	Label	12	100%

Litter Use	Brand Code	Item Code	Tally Count	%
Printed	State of Texas	Flier/Catalog	63	1.1%
		Label	98	1.8%
		Lottery Ticket	4785	86%
		Newspaper	97	1.8%
		Receipt	482	8.7%
		Tag	10	0.2%
	Target	Receipt	30	100%
	Tom Thumb	Receipt	10	100%
	Unknown	Book	23	0.2%
		Card	72	0.5%
		Card, Business	554	3.9%
		Coupon	254	1.8%
		Deposit Slip	43	0.3%
		Flier/Catalog	1221	8.5%
		Instructions	2032	14%
		Invoice	560	3.9%
		Label	2845	20%
		Lottery Ticket	79	0.6%
		Magazine	47	0.3%
		Memo	364	2.5%
		News Paper	1133	7.9%
		Newspaper	983	6.9%
		Packing Slip	125	0.9%
		Pornography	47	0.3%
		Receipt	1890	13%
		Tag	1896	13%
		Ticket	149	1.0%
	Verizon	Invoice	10	100%
	Wal-mart	Packing Slip	14	5.0%
		Receipt	240	88%
		Tag	19	7.1%
	Walgreens	Receipt	10	100%
	Wells Fargo	Receipt	25	100%

Litter Use	Brand Code	Item Code	Tally Count	%
Tobacco	Aberfoyle	Match Book	10	100%
	Ademco	Cigarette Butt	21	50%
		Cigarette Pack	21	50%
	Advanced Cons.	Cigarette Pack	11	100%
	Aearo	Cigarette Carto	10	50%
		Cigarette Pack	10	50%
	Altus	Cigarette Pack	10	100%
	Amco	Cigarette Butt	68	100%
	Austin Lights	Cigarette Pack	9	100%
	Basic	Cigarette Butt	780	77%
		Cigarette Carto	14	1.3%
		Cigarette Pack	203	20%
		Eye Liner Penci	10	1.0%
	Benson & Hedges	Cigarette Butt	1060	84%
		Cigarette Pack	196	15%
		Corrugated Box	13	1.0%
	Bic	Lighter	10	100%
	Big Shot	Cigarette Butt	10	100%
	Black & Mild	Cigar Box	72	36%
		Cigar Butt	10	5.2%
		Cigarette Butt	76	38%
		Tag	41	20%
	Cambridge	Carton	11	14%
		Cigarette Butt	68	86%
	Camel	Cigarette Butt	1583	77%
		Cigarette Carto	10	0.5%
		Cigarette Pack	449	22%
		Label	10	0.5%
	Camel Lights	Cigarette Butt	33	53%
		Cigarette Pack	30	47%
	Capri	Cigarette Butt	236	84[5]

Litter Use	Brand Code	Item Code	Tally Count	%
Tobacco	Carnival	Cigarette Butt	190	58%
		Cigarette Pack	138	42%
	Cartwright	Snuff Can	31	100%
	Classic	Cigarette Pack	9	100%
	Copenhagen	Cigar Box	21	10%
		Snuff Can	187	90%
	DK	Cigarette Butt	9	100%
	Diamond	Cigarette Butt	17	100%
	Dixie	Cigarette Butt	243	77%
		Cigarette Pack	74	23%
	Doral	Cigarette Butt	5186	89%
		Cigarette Pack	631	11%
	Eagle	Cigarette Pack	40	100%
	Echo	Cigarette Pack	14	100%
	Eclipse	Cigarette Butt	87	100%
	Eli Banks Farms	Cigarette Butt	110	100%
	Ev Salinas	Cigarette Butt	13	100%
	EvenFlo	Cigarette Pack	10	100%
	GPC	Cigarette Butt	379	92%
		Cigarette Pack	33	8.1%
	Golden Beach	Cigarette Butt	9	14%
		Cigarette Pack	59	86%
	Good Day	Cigar Box	13	100%
	Grenadiers	Cigar Box	13	100%
	Grizzly	Snuff Can	51	100%
	KOOL	Cigarette Butt	662	77%
		Cigarette Pack	202	23%

Litter Use	Brand Code	Item Code	Tally Count	%
Tobacco	King Edward	Cigar	13	100%
	Kool 100s	Cigarette Butt	41	81%
		Cigarette Pack	9	19%
	Liggett Select	Cigarette Pack	86	100%
	Main Street	Cigarette Pack	78	100%
	Marlboro	Bottle	68	0.3%
		Cigar Wrap	10	0.0%
		Cigarette Butt	19767	91%
		Cigarette Foil	17	0.1%
		Cigarette Pack	1839	8.5%
	Marlboro 100s	Cigarette Butt	249	60%
		Cigarette Pack	169	40%
	Marlboro Light	Card	21	0.1%
		Cigar Butt	52	0.2%
		Cigar Wrap	428	1.4%
		Cigarette	10	0.0%
		Cigarette Butt	26165	84%
		Cigarette Carto	14	0.0%
		Cigarette Pack	3159	10%
		Inhaler	1320	4.2%
		Lottery Ticket	68	0.2%
	Marlboro Mentho	Cigarette Butt	3792	94%
		Cigarette Pack	227	5.6%
	Marlboro Ultra	Cigarette Butt	334	73%
		Cigarette Pack	122	27%
	Marlin	Cigarette Butt	8	100%
	Marlin 100S	Cigarette Butt	14	100%
	Maverick	Cigarette Butt	73	100%
	Merit	Cigarette Butt	177	94%
		Cigarette Pack	10	5.6%
	Michelob	Snuff Can	11	100%
	Misty	Cigar Butt	21	1.8%

Litter Use	Brand Code	Item Code	Tally Count	%
Tobacco	Monarch	Cigarette Butt	231	93%
		Cigarette Pack	9	3.5%
	More	Cigarette Butt	58	85%
		Cigarette Pack	10	15%
	Newport	Cigarette Butt	400	59%
		Cigarette Pack	276	41%
	Pall Mall	Cigarette Butt	690	84%
		Cigarette Pack	130	16%
	Parliament	Cigarette Butt	246	96%
		Cigarette Pack	10	4.1%
	Patriot	Cigarette Pack	22	100%
	Red Man	Tobacco Pouch	84	100%
	Red Seal	Snuff Can	93	100%
	Ruters	Cigar Box	8	100%
	Salem	Cigarette Butt	1664	93%
		Cigarette Pack	125	7.0%
	Salem Light	Cigarette Butt	30	49%
		Cigarette Pack	31	51%
	Salem Ultra Lig	Cigarette Butt	47	100%
	Silver Creek	Snuff Can	13	100%
	Skoal	Snuff Can	128	100%
	Sky Dander	Cigarette Butt	200	61%
		Cigarette Pack	130	39%
	Smoke 1	Cigarette Pack	12	100%
	Sport	Cigarette Butt	13	12%
		Cigarette Pack	96	88%
	Stars	Cigarette Butt	1649	100%
	Sun Mart	Cigar Butt	10	34[5]

Litter Use	Brand Code	Item Code	Tally Count	%
Tobacco	TRUE	Cigarette Butt	86	100%
	Taylor's Pride	Tobacco Pouch	14	100%
	USA	Cigar Butt	31	9.9%
		Cigarette Butt	235	74%
		Cigarette Pack	51	16%
	USA Gold	Cigarette Butt	23	69%
		Cigarette Pack	10	31%
	USA Gold 100s	Cigarette Pack	10	100%
	Unknown	Cigar	26	0.4%
		Cigar Box	87	1.3%
		Cigar Butt	9	0.1%
		Cigar Tip	759	11%
		Cigar Wrap	10	0.2%
		Cigarette	107	1.6%
		Cigarette Butt	4557	67%
		Cigarette Carto	14	0.2%
		Cigarette Foil	52	0.8%
		Cigarette Pack	773	11%
		Label	17	0.2%
		Lottery Ticket	64	0.9%
		Snuff Can	237	3.5%
		Tobacco Pouch	103	1.5%
	Vantage	Cigarette Butt	118	84%
		Cigarette Pack	22	16%
	Viceroy	Cigarette Butt	77	50%
		Cigarette Pack	78	50%
	Virginia Slims	Cigar Box	16	0.8%
		Cigarette Butt	1855	96%
		Cigarette Pack	58	3.0%
	Winston	Cigarette Butt	2084	89%
		Cigarette Pack	263	11%
	Winston Lights	Cigarette Butt	72	100%
	Zig Zag	Cigarette Paper	16	55%
		Industrial Tape	14	45%

APPENDIX 5: DETAILED LIST OF LITTER ITEMS

Item Code	Tally Count	%	Item Code	Tally Count	%	Item Code	Tally Count	%
Cigarette Butt	77,240	28%	Styrafoam	2,086	0.8%	Coupon	584	0.2%
Tissue/Towel/Napk	14,609	5.3%	Gum Wrap	2,051	0.7%	Invoice	581	0.2%
Snack Wrap	13,158	4.7%	Rag	1,993	0.7%	Medicine Containe	550	0.2%
Beer Can	12,834	4.6%	Can	1,807	0.7%	Foam	539	0.2%
Beverage Cup	12,393	4.5%	Bottle Cap	1,766	0.6%	Utensil	475	0.2%
Cigarette Pack	10,167	3.7%	Plastic Pieces	1,708	0.6%	Pad	464	0.2%
Soda Can	8,146	2.9%	Carton	1,541	0.6%	Cigar Wrap	449	0.2%
Cup Lid	7,546	2.7%	News Paper	1,489	0.5%	Package	447	0.2%
Drinking Straw	7,173	2.6%	Flier/Catalog	1,424	0.5%	Drink Pouch	438	0.2%
Food Wrap	6,591	2.4%	Inhaler	1,350	0.5%	Six Pack Ring	431	0.2%
Lottery Ticket	5,167	1.9%	Foil	1,265	0.5%	Cardboard Piece	415	0.1%
Food Tray	5,002	1.8%	Container	1,199	0.4%	Water Jug	392	0.1%
Condiment Pack	4,985	1.8%	Newspaper	1,141	0.4%	Mail	370	0.1%
Bottle	4,782	1.7%	Box Piece	954	0.3%	Toy	370	0.1%
Bag	4,479	1.6%	Cellophane Storag	901	0.3%	Miscellaneous	350	0.1%
Soda Bottle	4,168	1.5%	Glove	898	0.3%	Cup Pieces	345	0.1%
Beer Bottle	3,884	1.4%	Cigar Tip	759	0.3%	Hat	337	0.1%
Receipt	3,852	1.4%	Card, Business	756	0.3%	Beer Carton	310	0.1%
Label	3,765	1.4%	Snuff Can	750	0.3%	Drinking Glass	304	0.1%
Shop Rag	3,403	1.2%	Envelope	727	0.3%	Gift Wrap	300	0.1%
Corrugated Box Pi	2,950	1.1%	Memo	713	0.3%	Pill Container	299	0.1%
Grocery Bag	2,802	1.0%	Packing Material	664	0.2%	Lid	297	0.1%
Wrap	2,410	0.9%	Plate	647	0.2%	Drinking Straw Wr	292	0.1%

Item Code	Tally Count	%	Item Code	Tally Count	%	Item Code	Tally Count	%
Six Pack Containe	277	0.1%	Cigar Butt	134	0.0%	Bungee Cord	80	0.0%
Insulation	272	0.1%	Tarp Pieces	134	0.0%	Packing Tape	78	0.0%
Dryer Sheet	272	0.1%	Sandpaper	133	0.0%	Ribbon	78	0.0%
Duct Tape	271	0.1%	Sign	128	0.0%	Tape Insert	78	0.0%
Cd	267	0.1%	Aerosol Cap	123	0.0%	Flare	75	0.0%
Bow	267	0.1%	Cell Phone Chart	118	0.0%	Bucket	75	0.0%
Industrial Tape	240	0.1%	Cigarette	118	0.0%	Feed Sack	74	0.0%
Pill Wrap	212	0.1%	Sticker	108	0.0%	Funnel	73	0.0%
Paper Pieces	212	0.1%	Condom Pack	108	0.0%	Flag	73	0.0%
Pen	208	0.1%	Cardboard	107	0.0%	Pvc	71	0.0%
Tie Down	206	0.1%	Diaper	104	0.0%	CD/DVD case	70	0.0%
Tobacco Pouch	200	0.1%	Unknown	97	0.0%	Cigarette Foil	69	0.0%
Playing Cards	197	0.1%	T-Shirts	95	0.0%	Match Book	69	0.0%
Lighter	191	0.1%	Twine	92	0.0%	Underwear	68	0.0%
Card	182	0.1%	Oil Rag	88	0.0%	Auto Related	67	0.0%
Tape	182	0.1%	Reflector	88	0.0%	Gas Cap	66	0.0%
Credit Card	174	0.1%	Fencing	86	0.0%	Shoe	65	0.0%
Rope	172	0.1%	Garbage Bag (Empt	85	0.0%	Newspaper Bag	64	0.0%
Bubble Wrap	166	0.1%	Sock	85	0.0%	Auto Trim	63	0.0%
Form	154	0.1%	Tampon	85	0.0%	Cigarette Carton	61	0.0%
Pill Bottle	150	0.1%	Belt	84	0.0%	Key	61	0.0%
Auto Part	149	0.1%	Container Pieces	84	0.0%	Plastic Sheets	61	0.0%
Packing Slip	149	0.1%	Corrugated Box	82	0.0%	Tube	61	0.0%

Item Code	Tally Count	%	Item Code	Tally Count	%	Item Code	Tally Count	%
Popsicle Stick	57	0.0%	Cigar	38	0.0%	Oil Filter	25	0.0%
Photo	56	0.0%	Wash Cloth	38	0.0%	Baby Nipple	25	0.0%
Tile	54	0.0%	Broom	37	0.0%	Feminine Napkin	24	0.0%
Sponge	54	0.0%	Bowl	37	0.0%	Cooler Lid	24	0.0%
Towel Holder	53	0.0%	Marker	36	0.0%	Fluff	24	0.0%
Auto Light	51	0.0%	Steel Strap	35	0.0%	Tools	24	0.0%
Sunglasses	51	0.0%	Q-Tip	34	0.0%	Mouth Wash Bottle	24	0.0%
Shotgun Shell	51	0.0%	Metal Cap	34	0.0%	Wire	23	0.0%
Pornography	47	0.0%	Cup Holder	33	0.0%	Lip Balm	23	0.0%
Mask	47	0.0%	Speaker Cover	33	0.0%	Ear Protection	22	0.0%
Magazine	47	0.0%	Tire And Rim	33	0.0%	Knife	22	0.0%
Aerosol Can	46	0.0%	Salt Pack	32	0.0%	Sunglass Rims	21	0.0%
Note Pad	45	0.0%	Bottles - Broken	32	0.0%	Caulk	21	0.0%
Spark Plug Box	44	0.0%	License Plate	32	0.0%	Air Mattress	21	0.0%
Bandage	43	0.0%	Calendar	32	0.0%	Baseball Card	21	0.0%
Plastic	43	0.0%	Shorts	32	0.0%	Condoms	21	0.0%
Crayon	43	0.0%	Pants	32	0.0%	Lumber	21	0.0%
Comb	43	0.0%	Auto Air Freshene	31	0.0%	Page Swb	21	0.0%
Deposit Slip	43	0.0%	Carpet	31	0.0%	Weather Strip	21	0.0%
Air Freshener	42	0.0%	Roofing Felt	30	0.0%	Health Item	21	0.0%
Book	41	0.0%	AC Filter	29	0.0%	Hose	21	0.0%
Road Marker	41	0.0%	Tire Parts	27	0.0%	Bandana	20	0.0%
Shirt	40	0.0%	Candy	27	0.0%	Shoe Insole	20	0.0%

Item Code	Tally Count	%
Personal Check	17	0.0%
Pizza Box	17	0.0%
Cigarette Papers	16	0.0%
Utility Knife	16	0.0%
Washers	16	0.0%
Cooler Pieces	14	0.0%
File Folder	14	0.0%
Foam Rubber	14	0.0%
Lock	14	0.0%
Paper	14	0.0%
Auto Floor Mat	13	0.0%
Fiberglass	13	0.0%
Glass Earpieces	13	0.0%
Glass Frames	13	0.0%
Apple	13	0.0%
Pallet Strap	13	0.0%
Teddy Bear	13	0.0%
Audio Cassette	12	0.0%
Hair Brush	12	0.0%
Pipe	12	0.0%
Plastic Strap	12	0.0%
Paint Can	11	0.0%
Skirt	11	0.0%
Liquor Bottle	11	0.0%
Measuring Tape	11	0.0%
Block	11	0.0%
Garment Bag	11	0.0%
Buffer Pad	11	0.0%
Screen	11	0.0%
Cd Wrap	10	0.0%
Clam Shell	10	0.0%
Eye Liner Pencil	10	0.0%
Film	10	0.0%
Lid With Straw	10	0.0%
Medicine Dropper	10	0.0%
Nylon Webbing	10	0.0%
Plywood	10	0.0%
Tin Lid	10	0.0%
Video Tape	10	0.0%
Vinyl	10	0.0%
Fire Cracker	10	0.0%
Air Filter	10	0.0%
Particle Board	10	0.0%
Pencil	10	0.0%
Siding	9	0.0%
Coat	9	0.0%
Bottle Cap, Wine	8	0.0%
Garbage Bag (Full	8	0.0%
Lipstick	8	0.0%
Automotive	8	0.0%
Pet Door	8	0.0%
Six Pack	8	0.0%
	278,019	100%

APPENDIX 6: DETAILED LIST OF LITTER BRAND NAMES

Brand Code	Tally Count	%	Brand Code	Tally Count	%	Brand Code	Tally Count	%
Unknown	107,758	39%	Pepsi	1,138	0.4%	Fiesta	499	0.2%
Marlboro Light	31,237	11%	Frito Lay	1,131	0.4%	Doritos	494	0.2%
Marlboro	21,701	7.8%	Natural Lite	1,115	0.4%	Sams	481	0.2%
State of Texas	5,903	2.1%	Milwaukees Best	1,093	0.4%	Mrs. Baird	478	0.2%
Doral	5,817	2.1%	Burger King	1,079	0.4%	Gatorade	476	0.2%
McDonalds	5,035	1.8%	HEB	1,022	0.4%	Sweetheart	463	0.2%
Bud Light	4,249	1.5%	Basic	1,017	0.4%	Marlboro Ultra	455	0.2%
Marlboro Mentho	4,018	1.4%	Wendys	901	0.3%	Chee-tos	438	0.2%
Coca-Cola	3,214	1.2%	Wal-mart	892	0.3%	Dixie	435	0.2%
Budweiser	3,028	1.1%	KOOL	864	0.3%	Slim Jim	431	0.2%
Dr. Pepper	2,929	1.1%	Busch	840	0.3%	Little Debbie	423	0.2%
Jack in the Box	2,548	0.9%	Pall Mall	819	0.3%	Marlboro 100s	417	0.2%
Whataburger	2,401	0.9%	Subway	817	0.3%	GPC	413	0.1%
Winston	2,347	0.8%	Snickers	791	0.3%	Dairy Queen	407	0.1%
Camel	2,053	0.7%	Mountain Dew	728	0.3%	Toms	378	0.1%
Virginia Slims	1,929	0.7%	Red Bull	691	0.2%	Sunkist	347	0.1%
Sonic	1,805	0.6%	Newport	676	0.2%	Big Red	345	0.1%
Salem	1,789	0.6%	Nestle	648	0.2%	Sky Dander	330	0.1%
Coors Light	1,741	0.6%	Ozarka	639	0.2%	Carnival	327	0.1%
Stars	1,658	0.6%	Diet Coke	637	0.2%	Dansani	323	0.1%
Keystone	1,633	0.6%	Hersheys	636	0.2%	Lance	322	0.1%
Miller Lite	1,432	0.5%	Diet Dr. Pepper	620	0.2%	Allsups	320	0.1%
Benson & Hedges	1,282	0.5%	Wrigleys	610	0.2%	Carloton	320	0.1%

Brand Code	Tally Count	%	Brand Code	Tally Count	%	Brand Code	Tally Count	%
Chucky Cheese	306	0.1%	Starburst	211	0.1%	Kroger	149	0.1%
Double Bubble	303	0.1%	Minute Maid	210	0.1%	Ziploc	149	0.1%
Shipleys Donunt	303	0.1%	Copenhagen	209	0.1%	Smirnoff	145	0.1%
M & M	290	0.1%	Michelob	202	0.1%	Kool Aid	140	0.1%
Capri Sun	288	0.1%	Lays	201	0.1%	Borden	140	0.1%
Arbys	286	0.1%	Black & Mild	199	0.1%	Nature Valley	137	0.0%
Dentyne	286	0.1%	Aquafina	194	0.1%	Hostess	134	0.0%
Capri	281	0.1%	Miller High Lif	194	0.1%	Good Humor	133	0.0%
Churchs Chicken	280	0.1%	Kit Kat	193	0.1%	Nestea	130	0.0%
Butterfinger	279	0.1%	Eclipse	188	0.1%	Tylenol	129	0.0%
Nabisco	271	0.1%	Dollar General	187	0.1%	Grandmas Cookie	129	0.0%
Planters	266	0.1%	Dallas Morning	175	0.1%	Skoal	128	0.0%
7-Up	266	0.1%	Taco Cabana	168	0.1%	Chicken Express	128	0.0%
Oak Farm	261	0.1%	Solo	165	0.1%	Albertsons	127	0.0%
Tootsie Roll	261	0.1%	Airhead	160	0.1%	Trident	117	0.0%
Chick Fil-A	260	0.1%	Heinz	159	0.1%	Three Musketeer	115	0.0%
Kelloggs	260	0.1%	Popeyes	158	0.1%	Shell	114	0.0%
Lone Star	259	0.1%	Starbucks	156	0.1%	Eli Banks Farms	110	0.0%
Parliament	256	0.1%	Viceroy	155	0.1%	Sport	109	0.0%
Monarch	248	0.1%	DejaBlue	154	0.1%	Almond Joy	109	0.0%
Blue Bell	244	0.1%	Town and Countr	153	0.1%	Tropicana	102	0.0%
Kentucky Fried	223	0.1%	Diet Pepsi	153	0.1%	Pizza Hut	102	0.0%
Reddy Ice	222	0.1%	Vantage	151	0.1%	Exxon	102	0.0%

Brand Code	Tally Count	%	Brand Code	Tally Count	%	Brand Code	Tally Count	%
Long John Silve	100	0.0%	Red Man	84	0.0%	Winston Lights	72	0.0%
Kent	100	0.0%	Monster	84	0.0%	Loves	69	0.0%
Dolly Madison	100	0.0%	Carta Blanca	84	0.0%	Armor-All	69	0.0%
Milky Way	100	0.0%	Braums	84	0.0%	Lifesavers	69	0.0%
Bic	99	0.0%	Carls Jr	83	0.0%	Folgers	69	0.0%
Miller	95	0.0%	Coors	82	0.0%	More	69	0.0%
Crystal Ice	95	0.0%	Ice House	82	0.0%	Golden Beach	68	0.0%
Fiesta Mart	95	0.0%	Skittles	82	0.0%	Advil	67	0.0%
Everest	95	0.0%	Slim Fast	82	0.0%	Dum Dum	67	0.0%
Sunny Delight	95	0.0%	Halls	80	0.0%	Salvadors	66	0.0%
Power Bar	94	0.0%	Auto Zone	80	0.0%	Seagrams	64	0.0%
Quaker	93	0.0%	Hunts	79	0.0%	Yoo Hoo	64	0.0%
Red Seal	93	0.0%	Cambridge	79	0.0%	Hill Country	64	0.0%
Blue Bunny	92	0.0%	Libbys	79	0.0%	Camel Lights	63	0.0%
Trojan	90	0.0%	Amco	78	0.0%	Salem Light	62	0.0%
Hefty	90	0.0%	Main Street	78	0.0%	Welchs	62	0.0%
Home Depot	90	0.0%	Hawaiian Punch	77	0.0%	Moon Pies	61	0.0%
Super Bubble	88	0.0%	Heineken	77	0.0%	Vics Vapor Rub	61	0.0%
Schlitz	88	0.0%	V-8	76	0.0%	Quiznos	59	0.0%
Corona	87	0.0%	Dannon	76	0.0%	Circle K	59	0.0%
Kraft	87	0.0%	Ice	74	0.0%	Bacardi	59	0.0%
TRUE	86	0.0%	Koito	74	0.0%	Arizona	58	0.0%
Liggett Select	86	0.0%	Hill Country Fa	73	0.0%	Target	57	0.0%

Brand Code	Tally Count	%	Brand Code	Tally Count	%	Brand Code	Tally Count	%
Orbit	56	0.0%	Mrs. Freshleys	46	0.0%	Austin Quality	41	0.0%
Oberto	56	0.0%	Red Dog	45	0.0%	Eagle	40	0.0%
Sunbelt	55	0.0%	Mounds	45	0.0%	Advanced Cons.	40	0.0%
Sobe	55	0.0%	Vanilla Coke	45	0.0%	Wonkas	40	0.0%
Charms	54	0.0%	Gates	45	0.0%	Tecate	40	0.0%
Sathers	54	0.0%	Nesquick	44	0.0%	K-mart	40	0.0%
Shiner Bock	53	0.0%	Yoplait	44	0.0%	Dominos	38	0.0%
American Fare	53	0.0%	Glad	44	0.0%	Block Buster	38	0.0%
Sparkltts	52	0.0%	Trails Best	44	0.0%	Rubber Maid	38	0.0%
Schafer	52	0.0%	Juicy Fruit	44	0.0%	Aleve	38	0.0%
Lasco	52	0.0%	Keebler	44	0.0%	Wells Fargo	37	0.0%
Del Monte	52	0.0%	Busch Light	43	0.0%	Anco	37	0.0%
Cows	52	0.0%	Icee	43	0.0%	Boones Farm	37	0.0%
Remmington	51	0.0%	Hanes	42	0.0%	Quickrete	36	0.0%
Grizzly	51	0.0%	Jumex	42	0.0%	Baskin Robins	36	0.0%
Slice	50	0.0%	Krispy Kremes	42	0.0%	Rustlers	36	0.0%
Swisher Sweet	50	0.0%	Polar Ice	42	0.0%	Benadryl	36	0.0%
Kool 100s	50	0.0%	Campbells	42	0.0%	Schlotzskys	35	0.0%
RC Cola	49	0.0%	Ademco	42	0.0%	Weinersnitzel	35	0.0%
Grandys	49	0.0%	Bosch	42	0.0%	Southwestern Be	34	0.0%
Kodak	48	0.0%	Diamond Shamroc	42	0.0%	Ice Breakers	34	0.0%
Salem Ultra Lig	47	0.0%	Oreily Auto	41	0.0%	Snapple	34	0.0%
Bimbo	46	0.0%	Power Aid	41	0.0%	Walgreens	34	0.0%

Brand Code	Tally Count	%	Brand Code	Tally Count	%	Brand Code	Tally Count	%
Winchester	33	0.0%	Stars & Stripes	30	0.0%	Prime Protectio	23	0.0%
Little Caesars	33	0.0%	Ring Pop	29	0.0%	General Mills	23	0.0%
Whoppers	33	0.0%	Magnum	29	0.0%	Act II	23	0.0%
Zima	33	0.0%	HI-C	29	0.0%	Sour Patch	23	0.0%
Funyuns	33	0.0%	Fruit Rollup	29	0.0%	Mini Ephedrine	23	0.0%
Pepridge Farm	32	0.0%	Bengal	29	0.0%	David	23	0.0%
Sparkletts	31	0.0%	Diamond	29	0.0%	Rolling Rock	22	0.0%
Car Fresh	31	0.0%	Corn Nuts	29	0.0%	Patriot	22	0.0%
Lifestyles	31	0.0%	Mid Western	28	0.0%	PumpCo	21	0.0%
Blue Ox	31	0.0%	Blow Pop	28	0.0%	San Antonio Exp	21	0.0%
Cartwright	31	0.0%	Naya	27	0.0%	Pillsbury	21	0.0%
Apex	31	0.0%	Miller Genuine	27	0.0%	Thompson Constr	21	0.0%
Fresh	31	0.0%	Dollar Tree	26	0.0%	Fernandos	21	0.0%
Odulls	31	0.0%	Bugles	26	0.0%	Motor Craft	21	0.0%
Stamina RX	31	0.0%	Lipton	25	0.0%	Easy Mart	21	0.0%
Pure Ice	31	0.0%	B.C. Powder	25	0.0%	Now & Later	21	0.0%
Zero	31	0.0%	Combos	25	0.0%	Petsmart	21	0.0%
Sierra Mist	31	0.0%	Race Trac	24	0.0%	Texas Life	21	0.0%
Sun Mart	30	0.0%	Keystone Ice	24	0.0%	Avery	21	0.0%
Dr.B	30	0.0%	Corning	24	0.0%	Sprint	21	0.0%
Panasonic	30	0.0%	Ebony	24	0.0%	Ultra	21	0.0%
Tic Tacs	30	0.0%	Shepps	24	0.0%	Twizzlers	21	0.0%
Clear & Pure	30	0.0%	Kleenex	23	0.0%	Bubblicious	21	0.0%

Brand Code	Tally Count	%	Brand Code	Tally Count	%	Brand Code	Tally Count	%
Total	21	0.0%	Dole	18	0.0%	Cinemark	14	0.0%
John Boos	21	0.0%	Blue Bird	17	0.0%	Slush Puppy	14	0.0%
Power Service	21	0.0%	John Deere	17	0.0%	Taylor's Pride	14	0.0%
#40	21	0.0%	Stanley	17	0.0%	Peter Pan	14	0.0%
180 Energy	21	0.0%	Arctic Ice	16	0.0%	Kotex	14	0.0%
A.T. Woods	21	0.0%	Nehi	16	0.0%	Sweet N Low	14	0.0%
Aearo	21	0.0%	Cracker Jacks	16	0.0%	Jell-o	14	0.0%
Modelo	21	0.0%	Crystal Clear	16	0.0%	Echo	14	0.0%
Cheerios	21	0.0%	Super Value	14	0.0%	Good Day	13	0.0%
Brookshire	21	0.0%	Pemmican	14	0.0%	Dunkin Donuts	13	0.0%
Dos Equis	20	0.0%	Ruffles	14	0.0%	Clover Valley	13	0.0%
General Motors	20	0.0%	El Chico	14	0.0%	Ev Salinas	13	0.0%
Peter Paul	20	0.0%	Igloo	14	0.0%	Farmers Bros.	13	0.0%
Famous Star	20	0.0%	Casa Solana	14	0.0%	Grenadiers	13	0.0%
Bud Dry	20	0.0%	Clover	14	0.0%	Hot Tamales	13	0.0%
Steak N Shake	20	0.0%	Cooper	14	0.0%	Shurtape	13	0.0%
Sylvania	20	0.0%	Dreyers	14	0.0%	Wix	13	0.0%
Blistex	19	0.0%	Marlin 100S	14	0.0%	Sunshine	13	0.0%
Deli Express	19	0.0%	Masterlock	14	0.0%	Mickeys	13	0.0%
Frigo	19	0.0%	Petco	14	0.0%	Bounty	13	0.0%
Bud Ice	19	0.0%	Quickick	14	0.0%	Barqs	13	0.0%
Peter Piper	19	0.0%	Malwaukee's Bes	14	0.0%	Bens & Jerrys	13	0.0%
Bueno	19	0.0%	Bush's Chicken	14	0.0%	King Edward	13	0.0%

Brand Code	Tally Count	%	Brand Code	Tally Count	%	Brand Code	Tally Count	%
Silver Creek	13	0.0%	At&T	11	0.0%	Avent	10	0.0%
Totinos	13	0.0%	B & C Parts	11	0.0%	Big Shot	10	0.0%
Arm & Hammer	13	0.0%	Band aids	10	0.0%	Carmex	10	0.0%
Nyquil	13	0.0%	Bartels and Jam	10	0.0%	Foleys	10	0.0%
Clorox	12	0.0%	Colt 45	10	0.0%	Jasons Deli	10	0.0%
Kudos	12	0.0%	Eckerd Drugs	10	0.0%	Leviton	10	0.0%
Bc Powder	12	0.0%	Evian	10	0.0%	No Doze	10	0.0%
Sven Hards	12	0.0%	Fresca	10	0.0%	Worlds Oven	10	0.0%
Durango	12	0.0%	Golden State	10	0.0%	Cup Noodles	10	0.0%
Car Quest	12	0.0%	Havoline	10	0.0%	Altoids	10	0.0%
Smoke 1	12	0.0%	Tom Thumb	10	0.0%	Buds Best	10	0.0%
Bank Of America	12	0.0%	USA Gold 100s	10	0.0%	Nutri Grain	10	0.0%
International	12	0.0%	Compass Bank	10	0.0%	Crunch	10	0.0%
Sparkling Ice	12	0.0%	Jazzercise	10	0.0%	Hiland	10	0.0%
Junior Mints	11	0.0%	Federal	10	0.0%	Hannahs	10	0.0%
Kelly Moore	11	0.0%	Everyday	10	0.0%	Bites	10	0.0%
Mc Coys	11	0.0%	Canada Dry	10	0.0%	Krackel	10	0.0%
Oral - B	11	0.0%	Metabolife	10	0.0%	Verizon	10	0.0%
Kentucky Deluxe	11	0.0%	Chick-O-Stick	10	0.0%	Turtlewax	10	0.0%
Mars	11	0.0%	Six Flags	10	0.0%	Duralast	10	0.0%
ACE	11	0.0%	A-1 Limo	10	0.0%	Chipotle	10	0.0%
Enjoyn	11	0.0%	Aberfoyle	10	0.0%	Country Time	10	0.0%
Crown	11	0.0%	Altus	10	0.0%	Fosters	10	0.0%

Brand Code	Tally Count	%
Max Brand	10	0.0%
Purina	10	0.0%
Ross	10	0.0%
SOCO	10	0.0%
Golden Chick	10	0.0%
EvenFlo	10	0.0%
Mike & Ikes	10	0.0%
Motrin	9	0.0%
Frenches	9	0.0%
RAIN-X	9	0.0%
Union Fidelity	9	0.0%
Bealls	9	0.0%
Pearl	9	0.0%
Visine	9	0.0%
Coastal	9	0.0%
Tang	9	0.0%
Austin Lights	9	0.0%
Classic	9	0.0%
DK	9	0.0%
Ruters	8	0.0%
Castrol Oil	8	0.0%
Squirt	8	0.0%
Dennys	8	0.0%
Jack Daniels	8	0.0%
Parade	8	0.0%
Eagle Electric	8	0.0%
Chesterfried	8	0.0%
Red Flash	8	0.0%
Best Western	8	0.0%
Goodies	8	0.0%
Lubys	8	0.0%
Olive Garden	8	0.0%
Energizer	8	0.0%
Best Buy	8	0.0%
Mug Root Beer	8	0.0%
Phillips 66	8	0.0%
Checkers	8	0.0%
Schepps	8	0.0%
Sierra	8	0.0%
	278,019	100%

APPENDIX 7: COMMUNICATION WITH TXDOT MAINTENANCE PERSONNEL

NuStats

3006 Bee Caves Road, Suite A-300
Austin, Texas 78746
512.306.9065 Fax: 512.306.9077

June 13, 2005

Dear «MAINTENANCE»:

We need your help. NuStats, a research firm in Austin, is under contract with the Texas Department of Transportation to conduct a two-phase **Visible Litter Study** throughout the state – NuStats conducted the same research in 2001. The three basic study goals are to 1) quantify the amounts of litter on Texas roadways, 2) characterize the types of litter on Texas roadways, and 3) assess the effectiveness of TxDOT's litter prevention program, including "Don't' Mess with Texas." I'm working closely with Mr. Joe Graff, Director, Maintenance Section, at TxDOT, to coordinate the study with Maintenance Supervisors across our state.

The research involves identifying roadway segments, marking these sections (approximately 750 feet long on both sides of the roadway), collecting all litter within the section, allowing litter to accumulate, and returning to collect all litter after the specified accumulation period – typically about four weeks. During this time, ***it is absolutely necessary that neither litter collection nor mowing occur on this research plot.***

Here's where your help comes in: Some of the roadways we identified are in your district. For example, in Phase I of the Visible Litter Study, we're targeting roadways in Abilene, Austin, Brownwood, Bryan, Dallas, Fort Worth, Laredo, San Antonio, Waco and Yoakum. The enclosed list shows the specific road segments included in the study. All segment sites will be staked off and flagged to identify the Visible Litter Study.

For the data to be accurate, and to avoid a "lost" site, it's important that the roadway segments not be disturbed during the study. It would be extremely helpful if you would contact your subcontractors to confirm they will not mow or collect litter during this phase of the study. I can't emphasize enough that there should be no mowing or litter collection during the research study. *Phase I runs from November 29 through February 7, 2005.*

Please feel free to call or email me regarding the study or if you have any questions. My contact information is (512) 306.9065 ext 2232 or khilsenbeck@nustats.com.

Your help with this important study is invaluable and I thank you in advance for your cooperation.

Sincerely,

Kim Hilsenbeck
Research Task Leader

NuStats

3006 Bee Caves Road, Suite A-300
Austin, Texas 78746
512.306.9065 Fax: 512.306.9077

June 14, 2005

Dear Adopt -a-Highway Coordinator:

We need your help. NuStats, a research firm in Austin, is under contract with the Texas Department of Transportation to conduct a two-phase **Visible Litter Study** throughout the state – NuStats conducted the same research in 2001. The three basic study goals are to 1) quantify the amounts of litter on Texas roadways, 2) characterize the types of litter on Texas roadways, and 3) assess the effectiveness of TxDOT's litter prevention program, including "Don't' Mess with Texas." I'm working with Brenda Flores-Dollar at TxDOT to get the word out to Adopt-a-Highway (AAH) coordinators across the state.

The research involves identifying roadway segments, marking these sections (approximately 750 feet long on both sides of the roadway and in any medians), collecting all litter within the section, allowing litter to accumulate, and returning to collect all litter after the specified accumulation period – typically about four weeks. During this time, ***it is absolutely necessary that AAH litter collection not occur on this research plot.***

Here's where your help comes in: Some of the roadways we identified are in your AAH region. For example, in Phase I of the Visible Litter Study, we're targeting roadways in Abilene, Austin, Brownwood, Bryan, Dallas, Fort Worth, Laredo, San Antonio, Waco and Yoakum. The enclosed list shows the specific road segments included in the study. All segment sites will be staked off and flagged to identify the Visible Litter Study.

For the data to be accurate, and to avoid a "lost" site, it's important that the roadway segments not be disturbed during the study. It would be extremely helpful if you would contact your AAH volunteers to confirm they will not collect litter during this phase of the study. I can't emphasize enough that there should be no litter collection by AAH volunteers during the research study. *Phase I runs from November 29, 2004 through February 7, 2005.*

Please feel free to call or email me regarding the study or if you have any questions. My contact information is (512) 306.9065 ext 2232 or khilsenbeck@nustats.com.

Your help with this important study is invaluable and I thank you in advance for your cooperation.

Sincerely,

Kim Hilsenbeck
Research Task Leader

Washington ▪ Austin ▪ El Paso