

EXECUTIVE SUMMARY

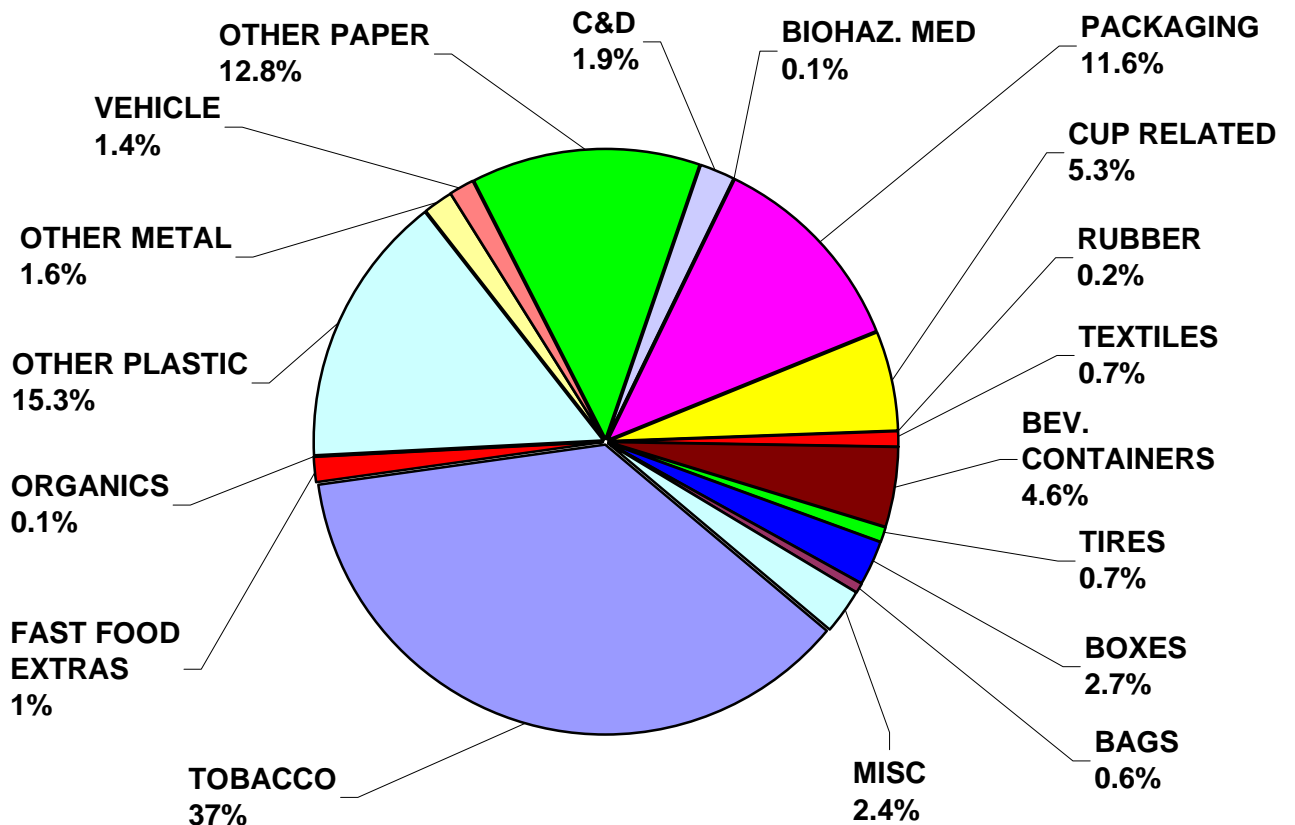
Keep Iowa Beautiful (KIB) developed a three-part statewide comprehensive program to collect "benchmark information" for litter assessment in 2001. Components of this program included an attitudinal survey prepared by the Iowa Department of Transportation, an analysis of the cost of litter control prepared by Franklin and Associates, and the 2001 Roadside Litter Characterization Study.

During the spring of 2001, **BARKER LEMAR ENGINEERING CONSULTANTS (BARKER LEMAR)** was selected to perform the 2001 Roadside Litter Characterization Study. The selected litter categories were:

- Bags
- Beverage Container
- Bio. Haz. / Medical
- Construction Debris
- Containers/OCC
- Cup Related
- Fast Food Extras
- Miscellaneous
- Organics
- Other Metal
- Other Paper
- Other Plastic
- Other Rubber not Tires
- Packaging
- Textiles
- Tires
- Tobacco
- Vehicle

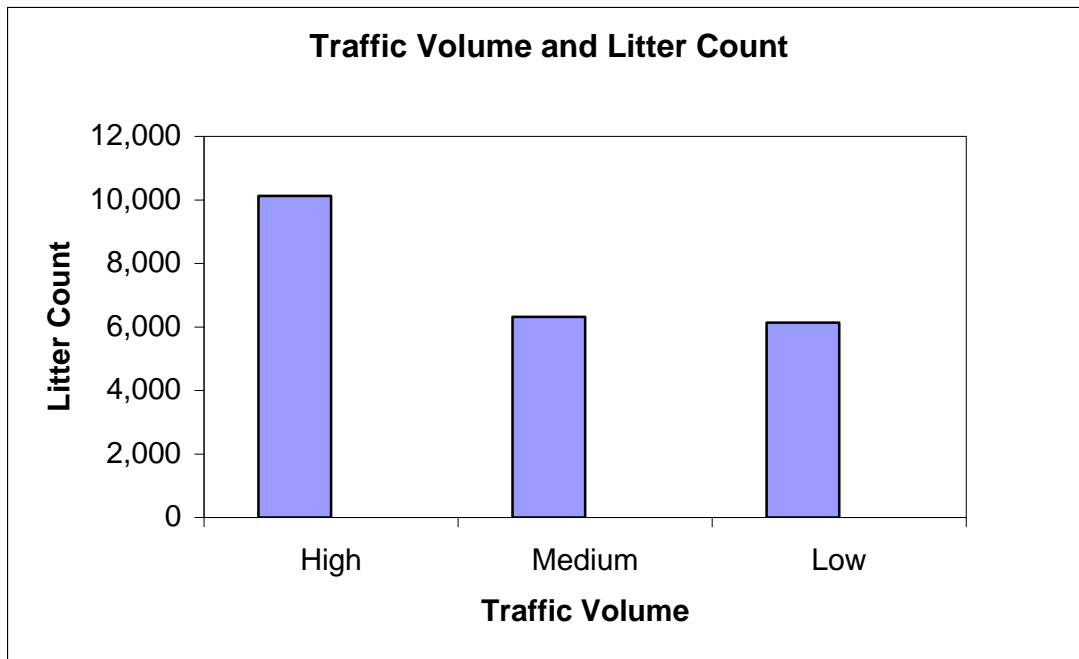
The pie graph provided below illustrates the percent of each litter category (by quantity).

2001 Roadside Litter Study Categorized by Quantity



SUMMARY OF RESULTS

- 150 roadside sites were sampled. The median width of the sites was 22.4 feet and the median length 195.3 feet long.
- The study randomly selected sites based on population, urban versus rural classification, and daily traffic count. 116 of the sites were located in incorporated places and 35 were located on rural roadways. The selection process implemented controls to disperse sites throughout the State.

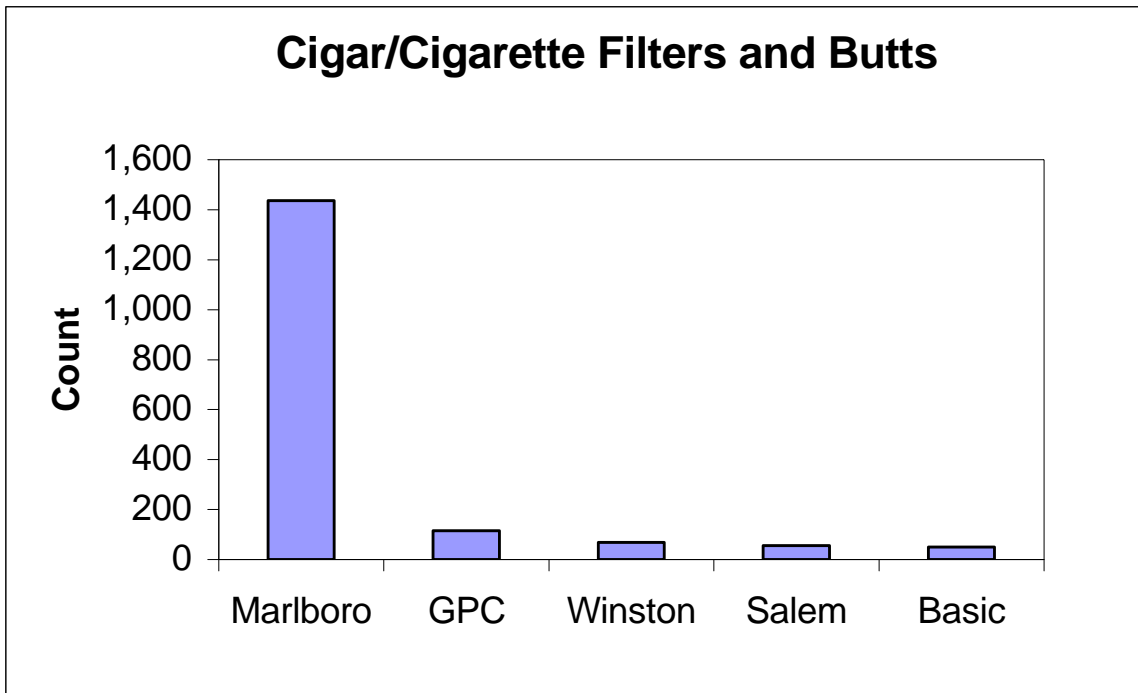


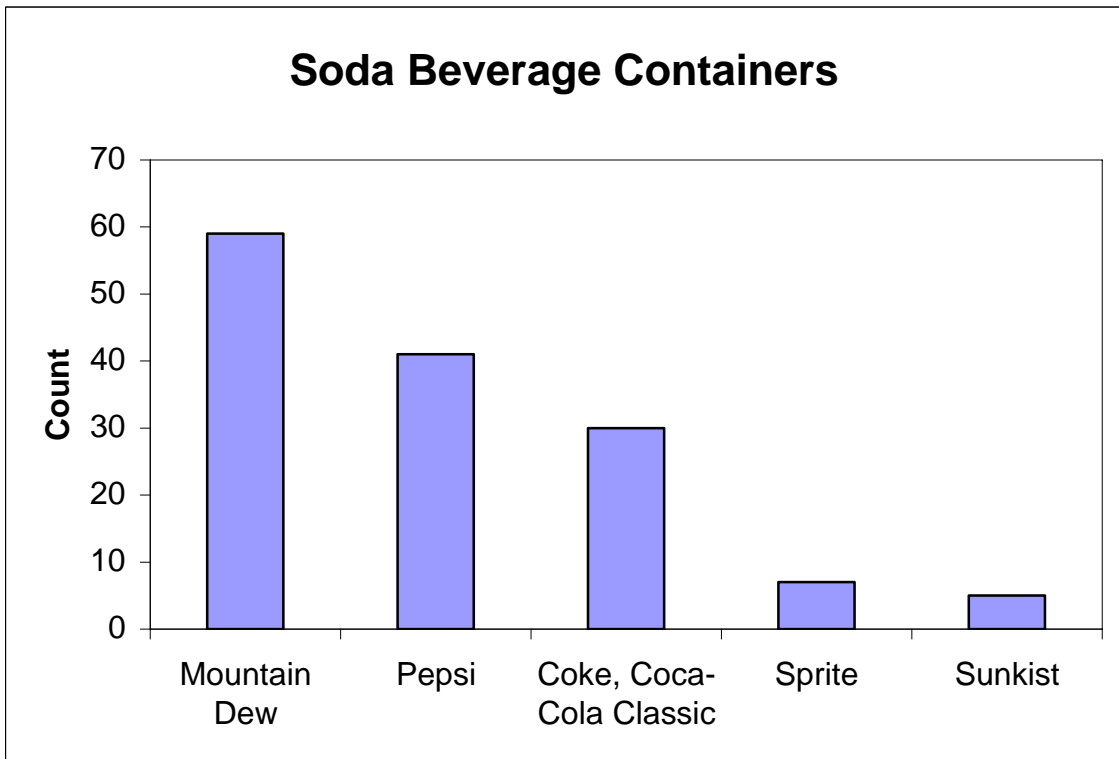
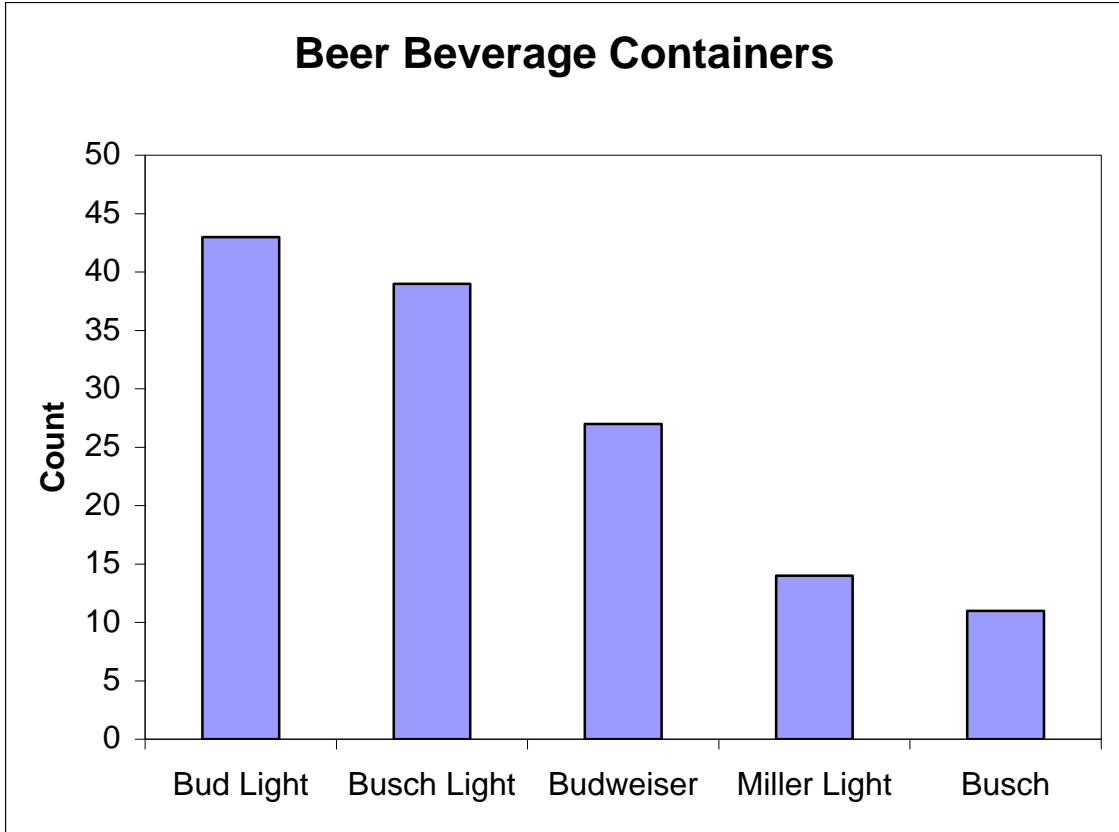
- Litter was collected if it was 1/2 inch square or larger, 22,585 pieces of litter were collected over 657,401 square feet of roadside survey area.
- The study identified namebrands within each category of litter. Staff calculated and counted litter pieces count, weight, and area (in square inches). The study identified beverage containers by material type and deposit designation.
- 468 pieces of deposit designated beverage container litter was collected along Iowa roadsides; representing 2% percent of all litter collected and 44% percent of all beverage container related litter collected (1,040 total pieces). 572 pieces of non-deposit designated beverage container litter was collected along Iowa roadsides representing 2.5% of all litter collected and 54% of all beverage container related litter.
- 220 pieces of beer beverage container related litter was collected, of which 66% were identified as an Iowa deposit container. 206 pieces of soda beverage

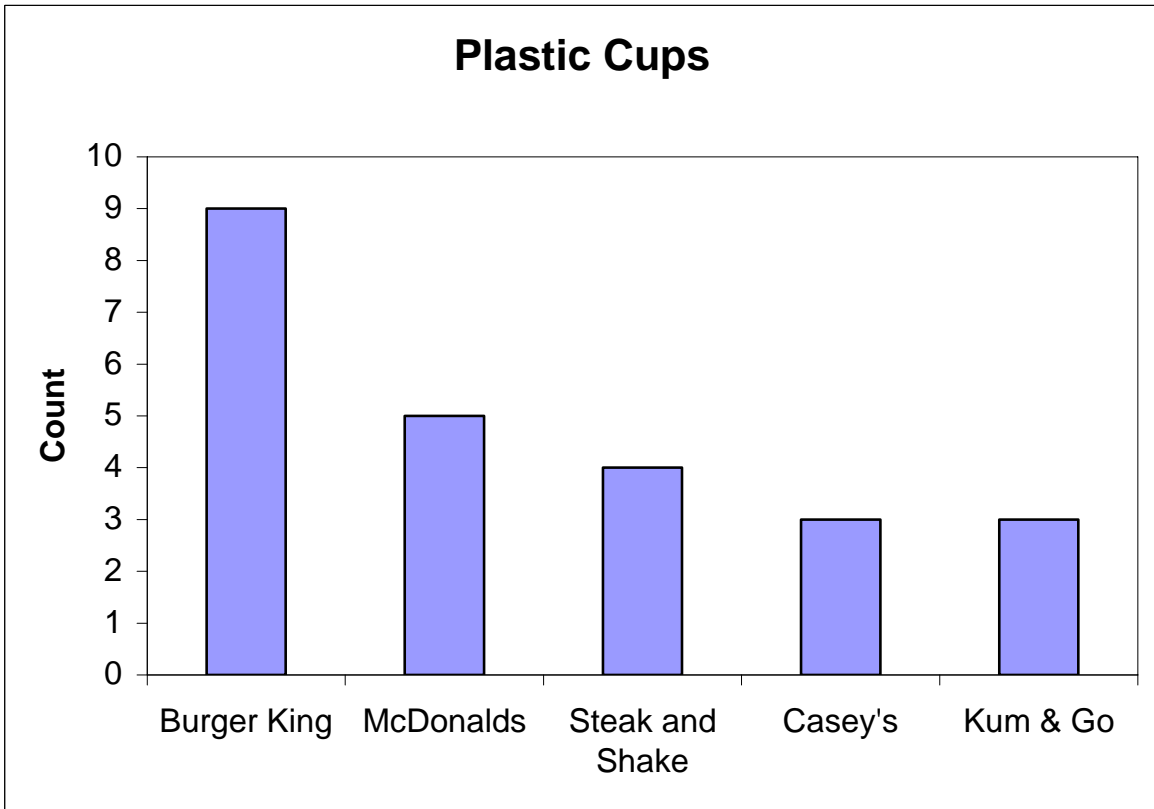
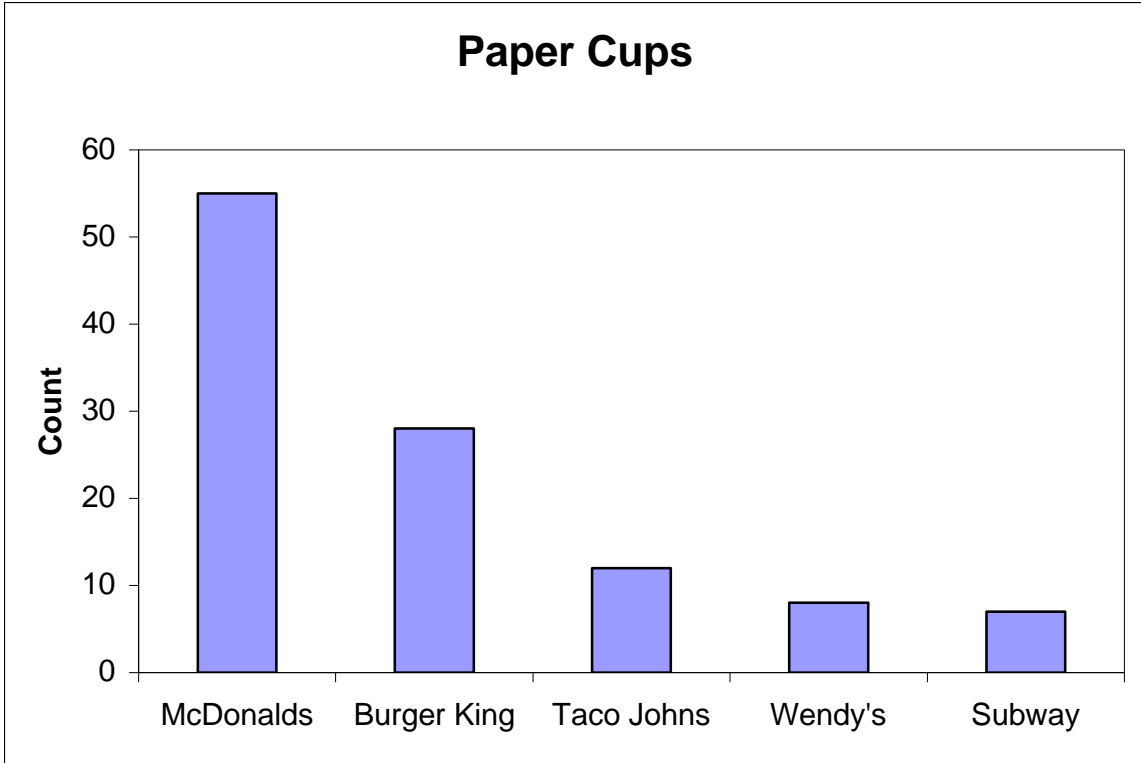
container related litter items were collected, of which 50% were identified as an lowa deposit container.

- 50% of the deposit litter was aluminum cans 44% percent was glass, and 5% was plastic.
- The leading namebrands for a selection of subcategories included Marlboro (Cigarette Filters and Butts), Snickers (Candy and Snack Packaging), Mountain Dew (Soda Containers), Bud Light (Beer Containers), McDonald's (Paper Cups), and Burger King (Plastic Cups).

The following bar charts illustrate the quantity of various namebrands in selected subcategories.







- 44.8% of the litter collected during the study was located along high volume roadside segments, although the high volume sites represented 12% of the samples. Additionally, the high volume sites generated more litter per square foot of surveyed area than medium volume, low volume, and rural sites combined. Examples of non-interstate high volume roadsides include SE 14th Street in Des Moines and Spruce Hills Drive, west of Elmore Ave., in Davenport.
- Iowa has 284 miles of high volume roadsides (counting both sides of the road) and the average area of the high volume roadsides sampled was 5,733 square feet. If the average roadside is 31.5 feet wide, and the average number of litter pieces per site is 723, then an extrapolation could be calculated for the State showing almost 21,000 pieces of litter per mile on high volume roadsides.

RECOMMENDATIONS (INFORMATION TO GUIDE POLICY)

1. A Litter Re-charge Study

The 2001 Roadside Litter Characteristic Study measured only accumulated litter; the rate at which litter is re-charging was not studied. **BARKER LEMAR** recommends a 2002 Litter Re-charge study on the high volume roadways, the medium volume roadways, and a statistical sample of low volume roadways. Field crews should sample a total of 24 medium volume sites and 14 high volume sites, in addition to a random sample of 25% of the 112 low volume/rural sites (or 28 sites). A random sample of low volume/rural sites should provide an adequate measurement of fresh litter for these locations. Sixty-six roadside litter sites would be re-sampled for fresh litter study in 2002. Researchers will collect litter from the same survey areas identifying survey areas using the GIS program and field notes from the 2001 survey.

The 2002 study should begin in September and complete the collection phase of the study by the end of October to coincide with the 2001 study. This study will use the same criteria and tools to measure litter size, area, and weight. The final report will calculate the amount of fresh litter deposited per year for categories, subcategories, and roadway type.

2. Targeted Anti Litter Campaign

Targeting specific litter types and specific namebrands

A targeted litter reduction education and promotional system should involve the leading sub- category data and the leading name brand data.

Targeting Specific Road Segments and Geographic Areas

Educational and promotional campaigns should also consider focusing on road segments that met the "high traffic volume" criteria (greater than 31,201 vehicles per day).

If littering behavior is to be changed, a theory could be developed that litter is not necessarily age specific, rather traffic volume and population specific. Educational

information might be concentrated in the areas of heaviest traffic volume within counties of medium to high populations.

Targeting Specific City Sizes

Based on field observations and objective data collected in the field, the amount of litter in rural areas, communities less than 5,000, and low volume road segments could be classified as very little to moderate. Staff had a few conversations with individuals, including mayors, of small towns (less than 5,000) when performing the litter characteristic fieldwork. A primary concern of these smaller communities was not litter, rather junk cars and other debris on private property and old buildings requiring demolition and disposal.

Medium sized communities of 5,001 - 10,000 also appeared to have very little to moderate levels of litter.

Larger communities (greater than 10,000) have mixes of low litter to heavily littered areas. A key predictor of the amount of litter was traffic volume and commercial development. Some high traffic volume road segments (including interstate sites and non-interstate sites) could be classified as moderately to heavily littered. Although some sites did not generate as much litter as a medium traffic road segment, the high traffic road segments appear to consistently generate more litter

3. Modifying the KAB Litter Index

The KAB Litter Index may require adjustments if this tool is applied toward rural areas and incorporated areas less than 5,000 people. Staff scored small towns with a score of "1" consistently using the current KAB system. Staff recommends a review of the 1-4 scoring system for small urban areas making the scores more conservative.

BARKER LEMAR experimented with the Internet/GIS/Tablet PC technology to track and digitally record Litter Index routes and scores. This field test showed how a state might collect electronic Litter Index Data from local affiliates and send information, including routes, over the web to parent organizations creating a management tool that can compare data within states and among states.

4. Targeting Specific Namebrand Demographics/Sales Data

Another interesting study might involve collecting sales data and calculate if the total number of name brand litter pieces identified in this litter study correlated with overall sales. If some of the leading littered name brands did not correlate with sales, then what other factors might influence their litter rate. Could it be the targeted demographic of the product, (e.g. are older or younger individuals littering)?

CONCLUDING REMARKS

BARKER LEMAR staff would like to thank the KIB Review Group that assisted with the development of the 2001 Roadside Litter Characterization Study.

- Keep Iowa Beautiful
- The Iowa Dept. of Natural Resources
- The Iowa Dept. of Transportation
- Carroll Co. Solid Waste Management Commission
- Iowa Recycling Association
- Story County Engineer's Office
- Iowa League of Cities
- Iowa Beverage Systems, Inc.
- Iowa Wholesale Beer Dist. Assoc.
- Iowa Grocery Industry Assoc.
- Casey's General Stores, Inc.
- Iowa Farm Bureau Federation
- Iowa Assoc. of Co. Conservation Board

The authors would like to personally thank Field Staff for their enthusiasm and professionalism during the collection and classifying phases. The authors would also like to thank the IT staff that listened to ideas and then transformed those ideas into working databases, reports, Internet compatible programs, statistical programs, and various other technical pieces.