



**2013 ROADSIDE LITTER
CHARACTERIZATION STUDY**



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FINAL REPORT 2013 ROADSIDE LITTER CHARACTERIZATION STUDY

EXECUTIVE SUMMARY

Keep Iowa Beautiful (KIB) retained the services of BARKER LEMAR ENGINEERING CONSULTANTS (BARKER LEMAR) to perform a statewide litter survey in order to better understand and obtain objective information about roadside litter. BARKER LEMAR collected, characterized, and compared litter found in 2001 and 2013 at 15 selected sites across the state using a similar site selection methodology that was used in 2001 (see Attachment A). Collected litter was sorted into categories as outlined in the classification methodology (see Attachment B), counted, and weighed.

In general, BARKER LEMAR saw a decrease in the amount of litter observed and collected from the 15 selected sites in 2013 compared to the 2011 study results. The Packaging, Tobacco, Other Plastic, and Other Paper litter categories saw a notable decrease in pieces of collected litter from 2001 to 2013. Table 1 below summarizes the differences in collected pieces for these litter categories.

Table 1 – Notable Differences Between 2013 and 2001 Collected Litter by Litter Category

Litter Category	2013 Total Pieces Collected	2001 Total Pieces Collected	Difference in Total Pieces Collected	Percent Difference in Total Pieces Collected
Packaging	213	268	(55)	(21%)
Tobacco	362	647	(285)	(44%)
Other Plastic	224	336	(112)	(33%)
Other Paper	184	441	(257)	(58%)

Potential explanations for the identified decreases in these litter categories differ from site to site as each site has unique characteristics that may impact the amount of collected litter. However, some general statements can be made that may help explain some of the decreases. For instance, the decrease in general tobacco related products consumed may help explain the decrease in related litter. For urban sites (low, medium, and high traffic volume sights), it is possible that the use (or increase in use) of residential garbage containers with lids to prevent blowing litter and prevent animals from gaining access to garbage bags, may result in reduced litter identified at urban sites. It is also possible that local residents or businesses in the areas of the selected sites may have unofficially adopted the sites for litter collection. It is also assumed that the expansion in the number of or successes of community recycling programs (i.e., curbside and drop-off recycling, programs available at municipal solid waste landfills, education initiatives, creation of the litter hotline, litter regulation enforcement, etc.) may have helped decrease the amount of litter.

Another potential explanation may be the reduction of mowing frequency due to dry weather conditions throughout the summer of 2013 and road maintenance budgetary constraints.

Mowing roadsides chops litter into multiple small pieces and scatters them across the site. Decreased mowing frequency may have also therefore lead to decrease pieces of litter.

BARKER LEMAR did notice an increase in the number of beverage containers that could potentially be deposit containers between the 2013 and 2001 study. BARKER LEMAR collected 31 more pieces of beverage containers between the 2013 and 2001 study. Of the additional beverage container litter collected in 2013, 29% of the pieces could be considered deposit containers. Unfortunately the condition of the beverage containers (i.e., debris, crushed, torn, etc.) was such that the original content of the container could not always be determined.

A potential explanation for the increase in beverage containers may be due to a disregard for redeemable container deposits from a percentage of the population.

The Container/Boxes litter category also saw an increase in the number of litter pieces between 2013 and 2001. The category saw an increase of 240 pieces of litter. However, nearly all of this increase was identified at one site (Site #10).

Collected litter figures for each site (see Attachment C) were analyzed for potential trends or significant differences between the 2001 and 2013 survey results. Results for each site are presented in the Section III - Project Analysis with potential reasons for litter trends or differences. Table 2 on the following page summarized the results of each site.

BARKER LEMAR estimates that approximately 20 – 30% of the litter material collected could have been recycled through traditional curbside or drop-off recycling programs. A majority of the recyclable material collected as litter was wet, contaminated with organic material (i.e., dirt, food residue, etc.) or had been damaged by grass/highway maintenance equipment, damage from exposure to elements, or animals. Thus, a large majority of the recyclable material that was collected as litter was assumed not to have been recyclable.

Table 2: Site Result Summary

Site	Overall Totals	Comparisons	Potential Reason(s)
#10	Decrease of visual and sorted litter and weight in 2013 from 2001.	Increase of deposit container litter collected.	Potential decrease in general tobacco-related consumption. Increased populations and amount of traffic utilizing roadways.
		Decrease of tobacco-related litter.	
		Increase of 5,400 grams of collected litter weight due to increased amounts of beverage containers, cardboard, small pieces of plastic, demolition/construction materials, vehicle and tire related waste.	
#28	Decrease of visual and sorted litter and weight in 2013 from 2001.	Decrease of tobacco-related litter.	Potential decrease in general tobacco-related consumption. Increased populations and amount of traffic utilizing roadways.
		Slight increase of fast-food related litter.	
		Increase in paper-related waste.	
#32	Decrease of visual and sorted litter and weight in 2013 from 2001.	Decrease of tobacco-related litter.	Potential decrease in general tobacco-related consumption. Potential improvement of waste containment within the area.
		Largest categorical decrease in paper-related litter from 2001 to 2013.	
		Decrease in fast-food related litter despite presence of fast-food restaurants near the site.	
#43	Slight increase in amount of visual and sorted litter and collected litter weight in 2013 from 2001.	Slight decrease in tobacco-related litter.	Potential decrease in general tobacco-related consumption.
		Largest categorical increase was in candy/snacks packaging.	
#63	Decrease of visually observed litter and litter weight with slight increase of collected litter pieces in 2013 from 2001.	Increase in beverage containers and deposit containers.	Potential increase of area usage.
		Slight increase in tobacco-related litter.	
#65	Increase in visually observed and collected litter with litter weight decrease in 2013 from 2001.	Increase of collected pieces of broken glass containers with decrease in weight. May indicate smaller pieces were collected in 2013 vs. 2001.	Results largely unchanged from 2001 to 2013.
#86	Decrease in visually observed and collected litter in 2013 from 2001.	Decrease in tobacco-related litter collection.	Potential decrease in general tobacco-related consumption. Addition of a stop sign 1/4 mile south of site may reduce amount of vehicular waste. Park present may maintain candy packaging litter numbers.
		Decrease in vehicle-related litter.	

Site	Overall Totals	Comparisons	Potential Reason(s)
#92	Decrease in collected litter and litter weight with no change in visually observed litter in 2013 from 2001.	Decrease in tobacco-related litter collection.	Potential decrease in general tobacco-related consumption. Potential improvement of waste containment within the area. Entrapment area present may account for presence of containers, fast-food materials, and construction materials.
		Increase in deposit container litter.	
		Decrease in construction-related litter.	
#97	Slight increase of organic litter from 2001 to 2013.	Increase in small pieces of plastic collected	Increase in site dimensions may account for increase amount of collected litter.
#102	Decrease of visually observed and collected litter, and litter weight.	Decrease in tobacco-related litter collection.	Potential decrease in general tobacco-related consumption. Potential improvement of waste containment within the area.
		Decrease in amount of collected plastic packaging.	
#127	Slight increase in amount of visual and sorted litter and collected litter weight in 2013 from 2001.	One milk container contributed majority of collected litter weight to 2013 survey.	Potential decrease in general tobacco-related consumption.
		No tobacco-related litter was collected in 2001 or 2013.	
#130	Increase in visually observed and collected litter with litter weight 2013 from 2001.	Decrease in number of deposit containers collected in 2013 compared to 2001.	Increased grass height in 2001 may have inhibited litter search accuracy.
		Increase in amount of tobacco-related litter collected in 2013.	
#136	Decrease in visually observed and collected litter.	Deposit container collection remained largely unchanged from 2001 to 2013.	Increased grass height in 2001 may have inhibited litter visibility in 2001.
		No tobacco-related litter was collected in 2001 or 2013.	
#146	Decrease in visually observed and collected litter.	Slight increase of tobacco-related litter in 2013 survey.	Reduced vegetation height may have allowed litter to blow out of survey area.
		Decrease of plastic packaging litter in 2013 survey.	
#151	Slight increase in visually observed and collected litter with decrease in litter weight.	No tobacco-related litter was collected in 2001 or 2013.	Increased weight of litter may be contributed to liquid retention within the litter. Litter counts remain consistent in both 2001 and 2013.

I. PURPOSE

KIB retained the services of BARKER LEMAR in 2001 to perform a statewide litter survey. The purpose of the 2001 litter survey was to better understand and obtain objective information about roadside litter. BARKER LEMAR established and implemented systemic site selection and verification methodologies and collected and sorted litter from 151 locations that met the site selection criteria requirements. In 2013, KIB retained BARKER LEMAR to perform similar litter collection and selection services for 15 of the previously sampled sites. The data collected will allow comparisons to be performed to measure changes in quantity and types of litter, and to determine potential causes for identified changes.

II. PLANNING

BARKER LEMAR met with KIB staff to discuss the purpose and objectives for performing a second roadside litter survey. It was determined that the similar methodologies used to select and exclude sites for the survey performed in 2001 (see Attachment A) and the same litter classification methodologies (see Attachment B) identified in 2001 would be used for the 2013 survey. A total of 15 sites would be selected for litter collection and sorting. These 15 sites would be a representative sample for the type of sites sampled during the 2001 project.

It was determined that brands of products collected at the sites would not be captured during the sorting phase. It was discussed during project planning meetings that the brand of the products are suspected of following the market share for that type of product. Therefore, sorting my brand may not provide enough information to validate the additional expense of sorting products in this manner. It was also determined that the area the collected litter covered would not be calculated during the sorting phase of this project. This information was not used from the previous study.

It was also determined that any statistical analyses performed would focus on comparing the 2013 data to the 2001 data in an attempt to identify reasons for changes to litter type or quantity. Statistical analyses correlating specific categories (i.e., traffic counts, population, etc.) would not be performed for the 2013 study.

BARKER LEMAR categorized the previous 151 sites by the two main categories of urban or rural. The urban sites were further subdivided by high, medium, and low traffic volumes (separated by natural breaks). Table 3 below shows the number of sites for each of these categories that were sampled in 2001.

Table 3 – Litter Sample Sites in 2001 by Category Type

Category Type	Number of Sampled Sites	Percentage of Total Sites
Urban – High Traffic	14	9%
Urban – Medium Traffic	24	16%
Urban – Low Traffic	78	52%
Rural	35	23%
Total Sites	151	100%

Using the site category percentages from 2001, BARKER LEMAR allocated a representative number of sites to be sampled for the 2013 study. Table 4 below shows the number of sites selected to be sampled in 2013 based off the category percentages from the 2001 study.

Table 4 – Litter Sample Sites for 2013 Study by Category Type

Category Type	Number of Sites
Urban – High Traffic	1
Urban – Medium Traffic	2
Urban – Low Traffic	7
Rural	5
Total Sites	15

Note: It was determined during a meeting with KIB that at least 5 rural sites out of the 15 sites should be collected for the 2013 study.

BARKER LEMAR used a random number generator and the site identification numbers determined in 2001 to randomly select the appropriate number of sites for each category. BARKER LEMAR selected 5 additional sites using the random selection process in case a selected site was unable to be sampled due to a site modification since 2001 (i.e., site within established influence proximity to an adopted roadway, there is significant roadway construction in proximity to the site, etc.).

BARKER LEMAR developed a geographic information system (GIS) file of the randomly selected site locations and meet with KIB staff to discuss their locations. It was decided to use the randomly selected sites as the representative sample for the 2013 study.

BARKER LEMAR provided the Iowa Department of Transportation (DOT) a GIS file of all of the randomly selected sites. The DOT provided information on which randomly selected sites may be influenced by modifications.

BARKER LEMAR finalized site selection and confirmed that there was litter (at least one piece) collected at the randomly selected sites and then began collection the week of October 14, 2013. During collection, one site was inaccessible and the next randomly selected site for that category was selected as the alternative site.

III. PROJECT ANALYSIS

The figure below shows the location of the sites BARKER LEMAR collected roadside litter.

Roadside litter was collected at these locations during the week of October 14, 2013.

Figure 1: Study Collection Sites



The following data comparison results are derived from the data collected in 2013 with the data collected in 2001 for each of the 15 sites.

Site 10 – Urban and High Traffic Volume Site

2001 Litter collection performed: October 18, 2001

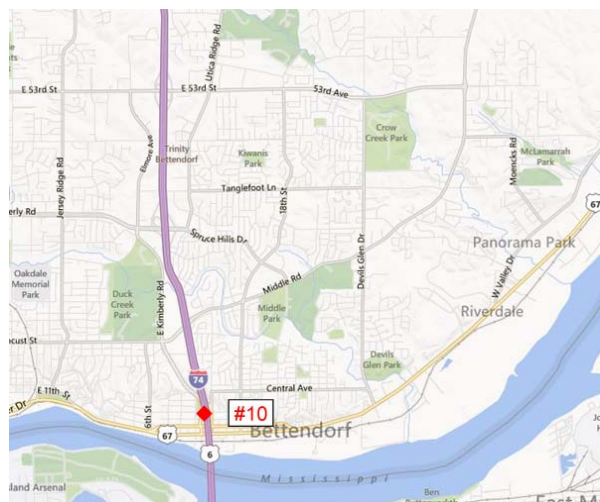
2013 Litter collection performed: October 16, 2013

Changes to Site Characteristics:

- The grass height in 2001 was estimated to be 6" and was estimated to be 5" in 2013.

Site #10 Litter Changes Summary:

Survey	Visual Litter Count	Sorted Litter Count	Sorted Litter Weight (grams)
2001	140	1,169	4,269
2013	70	1,123	9,381
Difference	(70)	(46)	5,112



Site #10 Location



Site #10 – October 18, 2001



Site #10 – October 16, 2013

Site 10 Summary:

- Site #10 saw an increase in the number and weight of beverage containers from the 2001 to 2013 survey. There were nearly 20 additional beverage containers collected and these accounted for more than 780 grams being added to the total weight of collected litter as compared to 2001.
- Of the 79 beverage containers collected, 57 are assumed to be deposit redemption containers. This is an increase of 34 deposit redemption containers as compared to the 2001 survey results for this site.
- The 2001 survey did not indicate corrugated cardboard was collected, while 245 pieces weighing 1,156 grams was collected in 2013. The corrugated cardboard collected in 2013 appears to have been chopped-up by a mower and approximately 0.04" of rain was recorded the day before litter collection occurred. These factors increased the number of pieces present and increased the weight of the material.
- The 2013 survey collected 32 less items of small pieces of plastic (undetermined source) but the collected pieces weighed 1,100 grams more than the material collected in 2001. The small pieces of plastic (undetermined source) appear to have been from several sources that could possibly include computer monitor casing, garden planters, and other miscellaneous sources.
- The 2013 survey collected 709 grams more of demolition/construction material, 766 grams more of vehicle related (not tires) material, and 839 grams more of tire material than the 2001 survey. These categories combined to increase the weight of litter collected by approximately 2,300 grams when compared to the 2001 survey.
- The increase in weight collected for Site #10 is attributed to the increase of weight collected for the following categories as compared to the 2001 survey: Beverage containers (non-broken); Corrugated cardboard; Small pieces of plastic (undetermined source); Demolition/Construction; Vehicle related (not tires); and Tire material. These categories combined increased the weight collected in 2013 as compared to 2001 by approximately 5,400 grams.
- Site #10 saw a decrease in cigarette filters/butts and tobacco packaging of 134 pieces and 13 pieces respectively.



Site #10 2013 – Small pieces of plastic



Site #10 2001 – Cigarette Butts



Site #10 – Cigarette Butts

Site 28 – Urban and Medium Traffic Volume Site

2001 Litter collection performed: December 19, 2001

2013 Litter collection performed: October 14, 2013

Changes to Site Characteristics:

- The grass height in 2001 was estimated to be 4" and was estimated to be 3" in 2013.

Site #28 Litter Changes Summary

Survey	Visual Litter Count	Sorted Litter Count	Sorted Litter Weight (grams)
2001	79	277	2,548
2013	20	197	503
Difference	(59)	(80)	(2,045)



Site #28 Location



Site #28 - December 14, 2001



Site #28 - October 19, 2013

Site 28 Summary:

- Site #28 saw a decrease in the amount of visual litter, collected litter, and weight of collected litter from 2001 to 2013.
- In 2001, two metal, foil, aluminum pieces were collected that weighed a total of nearly 1,900 grams. The weight of these pieces accounts for a majority of the collected litter weight decrease for 2013 as compared to 2001.
- There were 10 less cigarette filters/butts and 2 less tobacco packaging in 2013 than in 2001.
- This location has a fast food restaurant within 100 feet of the site and was present and appeared to be in business during both surveys. A slight increase in the number of fast food related litter pieces (i.e., condiment packaging, utensils, and fast food wrappers/bags) was identified during the 2013 survey. However, the largest increase was 3 identified litter pieces for the utensil category.
- Site #28 saw a decrease in the amount of small pieces of undetermined source of plastics category between 2001 and 2013 of 33 litter pieces.
- The largest increase in litter pieces from 2001 to 2013 was identified for the small pieces of undetermined source of paper with an increase of 25 pieces compared with the 2001 results.

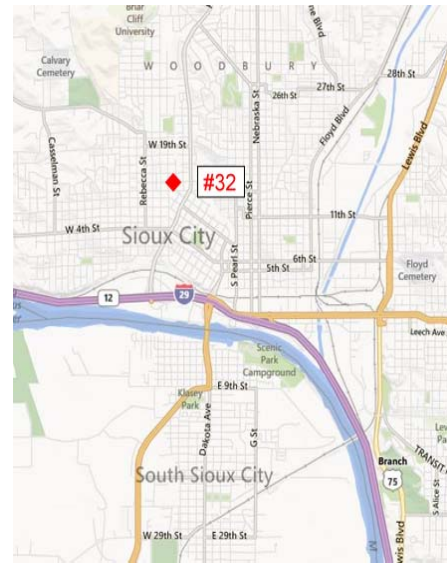
2001 Litter collection performed: December 21, 2001
2013 Litter collection performed: October 14, 2013

Changes to Site Characteristics:

- The grass height in 2001 was estimated to be 4-5" and was estimated to be 3" in 2013.

Site #32 Litter Changes Summary:

Survey	Visual Litter Count	Sorted Litter Count	Sorted Litter Weight (grams)
2001	68	440	822
2013	28	192	435
Difference	(40)	(248)	(387)



Site #32 Location



Site #32 – December 21, 2001



Site #32 – October 14, 2013

Site 32 Summary:

- Site #32 saw a decrease in the amount of visual litter, collected litter, and weight of collected litter from 2001 to 2013.
- The largest decrease in pieces of litter between 2001 and 2013 was for the category small pieces of undetermined source of paper with a decrease of 70 pieces.
- The site saw a decrease of 49 cigarette filters/butts and 20 tobacco packaging litter pieces from 2001 to 2013. This represents the second largest decrease in pieces of litter between 2001 and 2013.
- With fast food restaurants within approximately 1,200 feet of the site, it is surprising that fast food related litter counts were not higher for the 2001 or 2013 study. In fact, the 2013 study showed a decrease in the amount of fast food related litter pieces (i.e., condiment packages, utensils, straw related packaging) with a decrease of 26 litter pieces compared to the 2001 study.
- It is unclear as to why Site #32 saw a large decrease in the amount of collected litter. It is possible that residents or businesses within the area may have unofficially adopted the litter maintenance along this site. It is also possible that increased use of residential waste containers with lids has decreased the amount of blowing litter.

Site 43 – Urban and Low Traffic Volume Site

2001 Litter collection performed: December 22, 2001

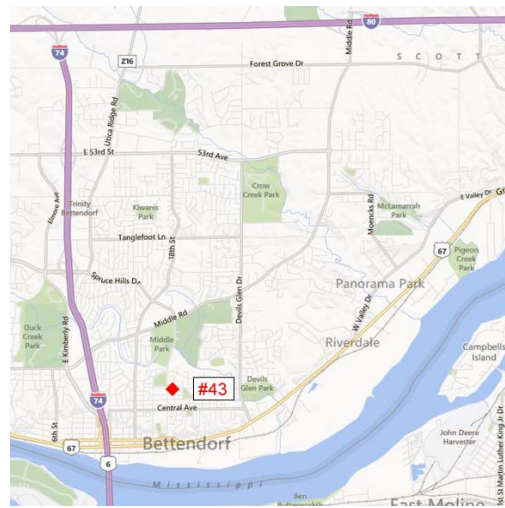
2013 Litter collection performed: October 16, 2013

Changes to Site Characteristics:

- Stop sign was present in 2013 located approximately 250 feet south from site.
- Park was present in 2013 located approximately 200 feet south from site.
- The grass height in 2001 was estimated to be 4" and was estimated to be 2" in 2013.

Site #43 Litter Changes Summary:

Survey	Visual Litter Count	Sorted Litter Count	Sorted Litter Weight (grams)
2001	6	26	15
2013	8	29	24
Difference	2	3	9



Site #43 Location



Site #43 – No photo available for December 22, 2001



Site #43 – October 16, 2013

Site 43 Summary:

- Site #43 saw a slight increase in the amount of visual litter, collected litter pieces, and collected litter weight.
- The largest increase in pieces of collected litter from 2001 to 2013 was for the candy wrapper/snacks category with an increase of 9 pieces. The second largest increase in pieces of collected litter was for the foamed packaging category with an increase of 4 pieces.
- The largest decrease in pieces of collected litter from 2001 to 2013 was for the plastic/paper/foil packaging and cigarette filters/butts categories each with a decrease of 5 pieces.

Site 63 – Urban and Low Traffic Volume Site

2001 Litter collection performed: October 9, 2001

2013 Litter collection performed: October 16, 2013

Changes to Site Characteristics:

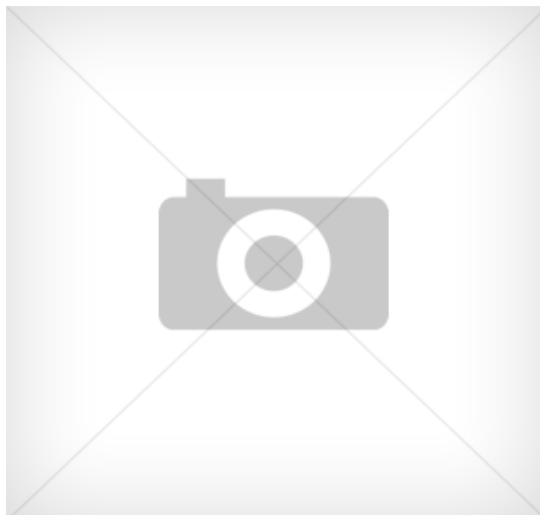
- The grass height in 2001 was estimated to be 3-6" and was estimated to be 2" in 2013.

Site #63 Litter Changes Summary:

Survey	Visual Litter Count	Sorted Litter Count	Sorted Litter Weight (grams)
2001	6	24	108
2013	4	38	42
Difference	(2)	14	(66)



Site #63 Location



Site #63 – No photo available for October 9, 2001



Site #63 – October 16, 2013

Site 63 Summary:

- The visual litter count and collected litter weight decreased from 2001 to 2013. However, the collected litter pieces increased by a total of 14 pieces from 2001 to 2013.
- In 2001, there were no beverage containers collected. In 2013, there were a total of 5 beverage container pieces. One piece was a whole juice box and the other pieces were remnants of metal and glass beverage containers. The broken metal container may have been part of a deposit can. It appears a mower has damaged the container, preventing it from being identified. The weight of these beverage container items increased the collected litter weight between 2001 and 2013 by 27 grams.
- In 2001, there were 12 total pieces of small pieces of undetermined source of plastics that weighed a total of 81 grams. In 2013, there were 6 total pieces of undetermined source of plastics weighing 5 grams. This represents a 75 gram decrease in collected litter weight for this category between 2001 and 2013.
- Site #63 saw an increase in number of cigarette filters/butts and packaging between 2001 and 2013 of 2 and 1 respectively.
- There were 4 pieces of straw related packaging collected in 2013 and none collected in this category in 2001.

Site 65 – Urban and Low Traffic Volume Site

2001 Litter collection performed: October 11, 2001

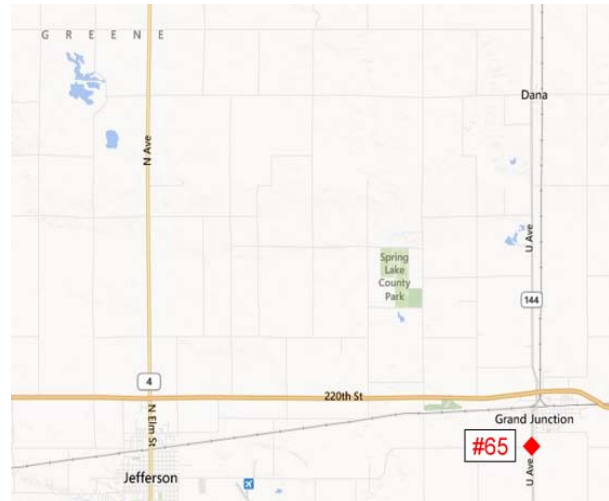
2013 Litter collection performed: October 18, 2013

Changes to Site Characteristics:

- Stop sign was present in 2013 located approximately 200 feet south from site.

Site #65 Litter Changes Summary:

Survey	Visual Litter Count	Sorted Litter Count	Sorted Litter Weight (grams)
2001	3	58	275
2013	7	67	155
Difference	4	9	(120)



Site #65 Location



Site #65 – October 11, 2007



Site #65 – October 18, 2013

Site 65 Summary:

- Site #65 saw an increase in the visual litter count and collected litter from 2001 to 2013. However, there was a decrease in the weight of collected litter from 2001 to 2013.
- There was an increase of 11 pieces of broken glass beverage containers collected from 2001 to 2013. However, the same category saw a decrease of 130 grams for 2013 when compared with 2001. It appears the pieces of broken glass collected in 2001 were larger than the pieces collected in 2013. This appears to account for the increase in pieces and the decrease in weight for this category between 2001 and 2013.



Site #65 – Broken Glass 2001



Site #65 – Broken Glass 2013

Site 86 – Urban and Low Traffic Volume Site

2001 Litter collection performed: November 19, 2001

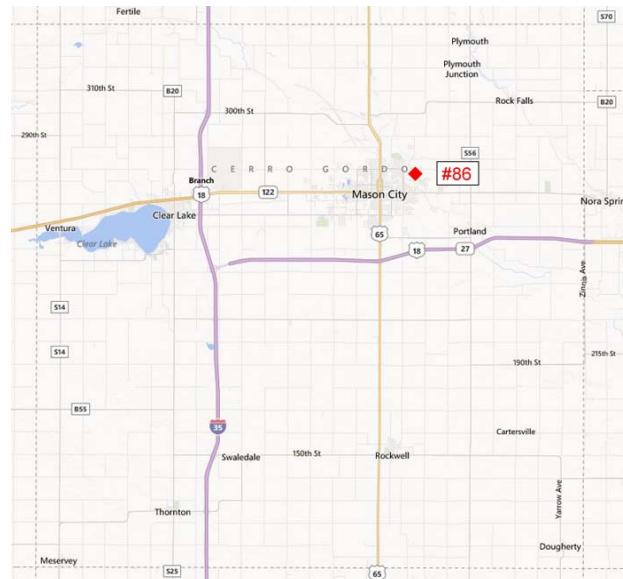
2013 Litter collection performed: October 15, 2013

Changes to Site Characteristics:

- Stop sign was present in 2013 located approximately ¼ mile (1,320 feet) south from site.

Site #86 Litter Changes Summary:

Survey	Visual Litter Count	Sorted Litter Count	Sorted Litter Weight (grams)
2001	10	108	209
2013	2	22	78
Difference	(8)	(86)	(131)



Site #86 Location



Site #86 – November 19, 2001



Site #86 – October 15, 2013

Site 86 Summary:

- Site #86 saw a decrease in the visual litter count and collected litter from 2001 to 2013.
- The amount of litter derived from paper products decreased in the 2013 collection event. There were 3 pieces of paper cups weighing 24 grams collected in 2001 and none collected in 2013. Similarly, there were 16 pieces of paper from undetermined sources weighing approximately 27 grams collected in 2001 with none collected in 2013. Collectively, 19 pieces of litter weighing 51 grams decreased in these categories from 2001 to 2013.
- There were 5 pieces of candy packaging weighing 2 grams collected in 2013 compared to 4 pieces that weighed 9 grams collected in 2001. This difference in weight may be attributed to larger and/or thicker pieces of packaging found in 2001 to account for fewer pieces weighing more.
- Collection of tobacco products also decreased from 2001 to 2013. There were 19 pieces of tobacco packaging for an approximate total of 11 grams of litter collected in 2001 compared to none collected in 2013.
- The amount of collected vehicle waste decreased from 2001 to 2013. There were 63 pieces collected in 2001 with none collected during the 2013 survey. The difference amounts to an additional 93 grams of vehicular waste collected in 2001 compared to 2013.
- The addition of a stop sign approximately ¼ miles south of the site may be the reason for less vehicular waste present at the 2013 collection. The 2001 collection may have occurred after a car accident that could have contributed the collected waste.
- The park directly west of the site may contribute to the regularity of candy packaging present in both collection events.

Site 92 – Urban and Low Traffic Volume Site

2001 Litter collection performed: October 9, 2001

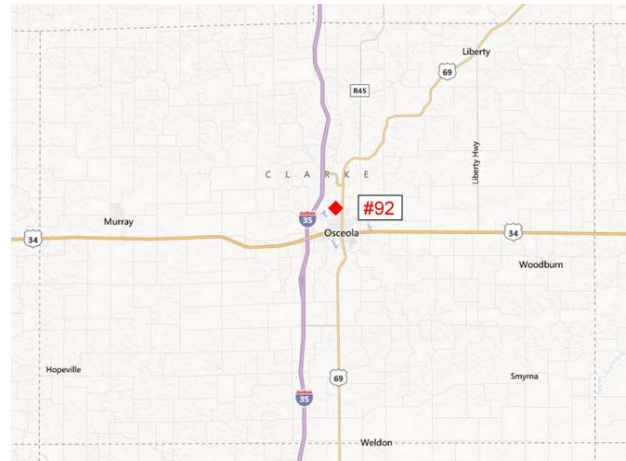
2013 Litter collection performed: October 17, 2013

Changes to Site Characteristics:

- Park was present in 2001 located approximately 528 feet north from site.
- The grass height in 2001 was estimated to be 3" and was estimated to be 5" in 2013.

Site #92 Litter Changes Summary:

Survey	Visual Litter Count	Sorted Litter Count	Sorted Litter Weight (grams)
2001	11	71	772
2013	11	26	244
Difference	0	(45)	(528)



Site #92 Location



Site #92 – October 9, 2001



Site #92 – October 17, 2013

Site 92 Summary:

- Site #92 saw no change in the visual litter count but decreased significantly in the sorted litter count and litter weight from 2001 to 2013.
- There were 19 cigarette butts weighing approximately 14 grams collected in 2001 while none were collected in 2013.
- There were 5 fast food wrappers and/or bags collected in 2013 which contributed 140 grams, over half of the 2013 total collection weight. No fast food litter was collected in 2001.
- There was a difference of 2 pieces of beverage containers and 50 grams of collected litter between 2001 and 2013. There was 1 milk container that weighed 16 grams collected in 2001, while 1 soda container and 2 metal beverage containers collectively weighing 66 grams were collected in 2013. The soda container is a deposit container. The metal beverage containers are suspected of being deposit containers as well.
- Collection of foamed packaging decreased from 2001 to 2013. There were 7 pieces that weighed 57.6 grams collected in 2001 compared to 1 piece that did not register on the scale found in 2013.
- Construction related litter contributed the largest amount of difference between 2001 and 2013. There were 13 pieces which weighed 649 grams collected in 2001 compared to none collected in the category in 2013.
- The presence of an entrapment area in the form of a ditch near the site may explain the presence of the construction and fast food materials in 2001 and 2013, respectively. Litter could have been deposited elsewhere and transported to the site via wind or storm water.

Site 97 – Urban and Low Traffic Volume Site

2001 Litter collection performed: October 9, 2001

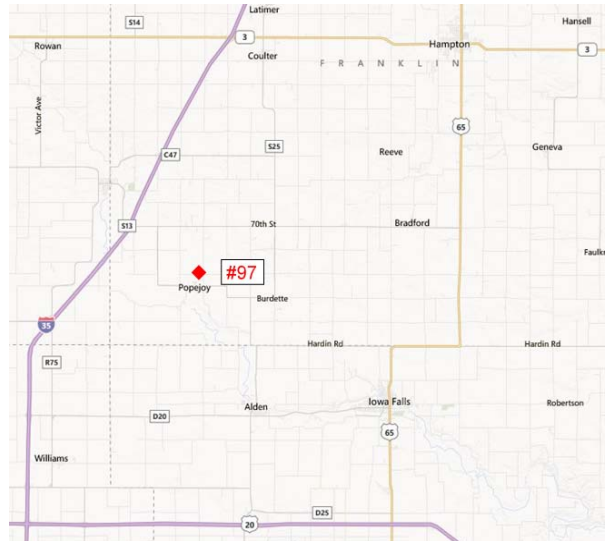
2013 Litter collection performed: October 15, 2013

Changes to Site Characteristics:

- The site dimensions in 2001 were 200 feet long by 14 feet wide due to a chain link fence. The site dimensions of the site in 2013 were 200 feet long by 40 feet wide as the chain link fence was not present.

Site #97 Litter Changes Summary:

Survey	Visual Litter Count	Sorted Litter Count	Sorted Litter Weight (grams)
2001	1	1	8
2013	4	8	40
Difference	3	7	32



Site #97 Location



Site #97 – October 9, 2001



Site #97 – October 15, 2013

Site 97 Summary:

- Site #97 saw an increase in litter from 2001 to 2013 primarily in miscellaneous organic materials.
- There was 1 item of miscellaneous organic material collected from the site in 2013 which weighed 33 grams. No litter was collected in this category in 2001.
- Small pieces of plastic from undetermined sources were collected both in 2001 and 2013. In 2001, 1 piece weighing approximately 8 grams was found while 5 pieces weighing 3 grams were found in 2013. The size of the plastic pieces could account for the weight differential indicating the single piece found in 2001 was larger than the 5 pieces found in 2013.
- There was 1 cigarette filter/butt collected in the 2013 survey and weighed at 1 gram.
- The increased site dimensions in the 2013 survey could explain the increased amount of litter collection.

Site 102 – Urban and Low Traffic Volume Site

2001 Litter collection performed: October 9, 2001

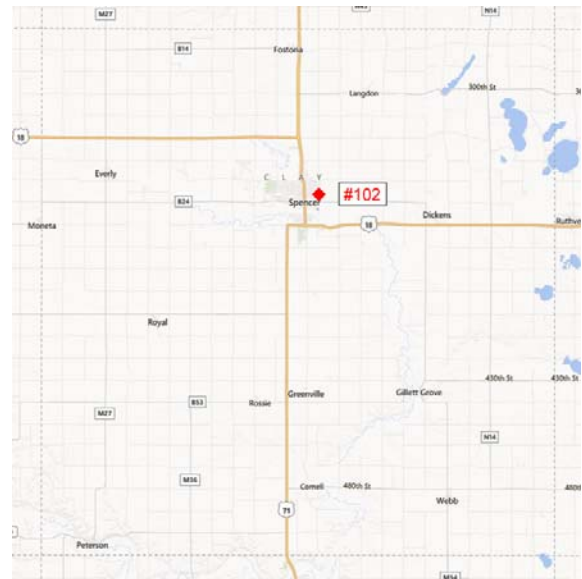
2013 Litter collection performed: October 15, 2013

Changes to Site Characteristics:

- The grass height in 2001 was estimated to be 4" and was estimated to be 3" in 2013.

Site #102 Litter Changes Summary:

Survey	Visual Litter Count	Sorted Litter Count	Sorted Litter Weight (grams)
2001	5	15	109
2013	3	4	18
Difference	(2)	(11)	(91)



Site #102 Location



Site #102 – October 9, 2001



Site #102 – October 15, 2013

Site 102 Summary:

- Site #102 saw a significant decrease of collected litter from 2001 to 2013.
- Both the 2001 and 2013 surveys collected 3 pieces of paper from an indeterminate source; however the weight of the collected pieces from the 2001 survey totaled 31 grams compared to the 17 grams collected in 2013. Differences in the types and size of paper pieces could account for those found in 2001 weighing more than those collected in 2013.
- There were 6 pieces of plastic packaging which weighed approximately 30 grams collected in the 2001 survey. No waste from this category was collected in the 2013 survey.
- There were 3 cigarette filters collected during the 2001 survey. Collectively, the filters weighed approximately 15 grams. No tobacco products were observed and/or collected at the site during the 2013 survey.
- There was 1 piece of a metal/foil/aluminum which weighed approximately 28 grams found during the 2001 survey, while none were found during the 2013 survey.
- Similar to the metal pieces, there was 1 piece of paper towel/napkin weighing 1.8 grams and also found during the 2001 collection. No paper products were collected during the 2013 survey.
- Residents could collect litter during/after mowing where they may not have in 2001 proceeding the litter survey date. Waste containers with lids may be responsible for decreased litter if the area did not containers with lids in 2001.

Site 127 – Rural Site

2001 Litter collection performed: October 31, 2001

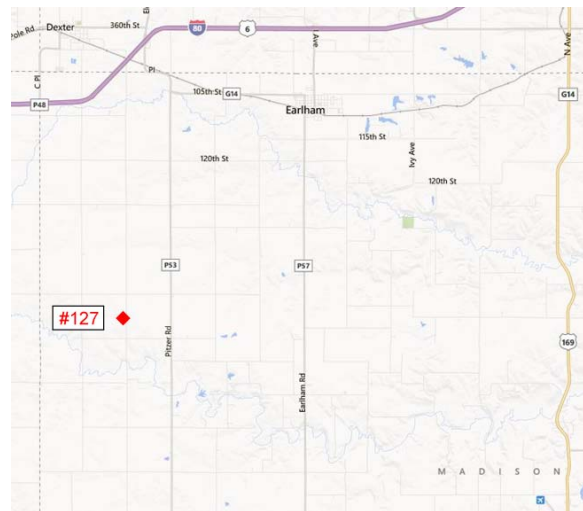
2013 Litter collection performed: October 17, 2013

Changes to Site Characteristics:

- The grass height in 2001 was estimated to be 8" and was estimated to be 5" in 2013.
- A barbed wire fence was present in 2001 and was not present in 2013.

Site #127 Litter Changes Summary:

Survey	Visual Litter Count	Sorted Litter Count	Sorted Litter Weight (grams)
2001	0	1	3
2013	3	3	262
Difference	3	2	259



Site #127 Location



Site #127 – October 31, 2001



Site #127 – October 17, 2013

Site 127 Summary:

- Site #127 did not see much variation in the visual litter or sorted litter count between the 2001 and 2013 surveys. The sorted litter weight did increase significantly from the 2001 number.
- There was 1 milk container containing liquid which weighed 236 grams collected from the survey area in 2013.
- Similarly, there was 1 paperboard box container which weighed 21 grams found on the site during the 2013 survey. No litter from this category was found during the 2001 survey.
- There was also 1 piece of candy packaging which weighed 5 grams and was collected during the 2013 survey. No litter from this category was found during the 2001 survey.
- The litter found during the 2001 survey was a single piece of plastic packaging which weighed 6 grams. No litter from this category was found during the 2013 survey.
- No tobacco related litter was collected from the site during either the 2001 or 2013 survey.
- The increase of collected litter in 2013 could indicate an increased number of residents living in the area, therefore increasing the regular travel conducted on the road where the site is located and similarly increasing chances for accidental littering.

Site 130 – Rural Site

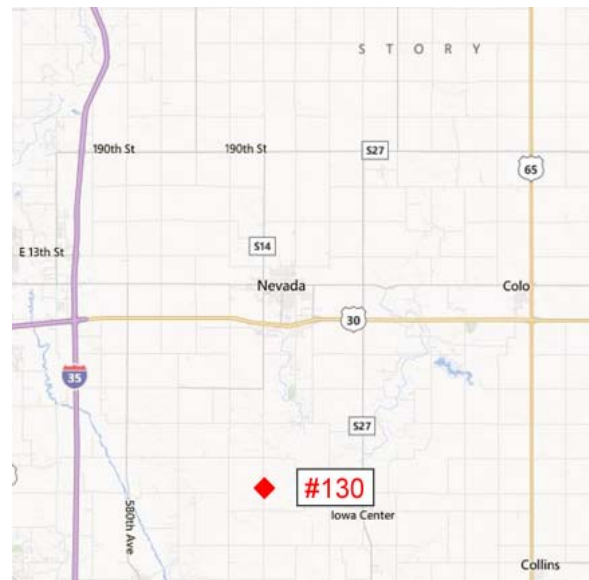
2001 Litter collection performed: October 9, 2001
2013 Litter collection performed: October 16, 2013

Changes to Site Characteristics:

- The survey from 2001 did not indicate entrapment present. However, the photo from 2001 indicates that the ditch and fence present in 2013 was also present in 2001.
- The grass height in 2001 was estimated to be 36" and was estimated to be 15" in 2013.

Site #130 Litter Changes Summary:

Survey	Visual Litter Count	Sorted Litter Count	Sorted Litter Weight (grams)
2001	1	9	241
2013	9	27	762
Difference	8	18	521



Site #130 Location



Site #130 – October 9, 2001



Site #130 – October 16, 2013

Site 130 Summary:

- Site #130 saw an increase of visual and sorted litter counts, with a dramatic litter weight increase from 2001 to 2013.
- The beverage container category contributed the most litter pieces in both 2001 and 2013. In 2001, 2 beer and 2 soda containers, and 1 tea and 1 water container were found during the survey and collectively weighed 119 grams. A soda, juice, tea, and a broken plastic container were found during the 2013 survey contributing a total of 154 grams to the collected waste weight. The soda container collected in 2013 appears to be the only deposit container.
- The largest weight contributions to both surveys occurred in the Containers/Boxes category, though in different sub-categories. There were 5 corrugated cardboard boxes found during the 2013 survey and weighed 383 grams. There was 1 aerosol/ pump can found on the site in the 2001 survey, and weighed at 106 grams.
- There were 7 cigarette filters/butts found and weighed at 2 grams during the 2013 survey. No litter from this category was found during the 2001 survey.
- There were 2 vehicular related pieces of litter collected during the 2013 survey and weighed at 67 grams. No litter from this category was found during the 2001 survey.
- Singular miscellaneous pieces of demolition/construction material and textile material were also found during the 2013 survey, weighing 18 and 91 grams, respectively. No litter from these categories was found during the 2001 survey.
- There were 7 pieces of tobacco related litter products found during the 2013 survey, collectively weighing 2 grams. No litter from this category was found during the 2001 survey.
- The increased height of the grass for the 2001 survey may have inhibited the survey effort by concealing the amount of litter onsite at the time of the survey. The most numerous category (beverage containers) appeared to be relatively consistent over the two surveys. The heavier items found during the 2013 survey may have been covered by grass during the 2001 survey.

Site 136 – Rural Site

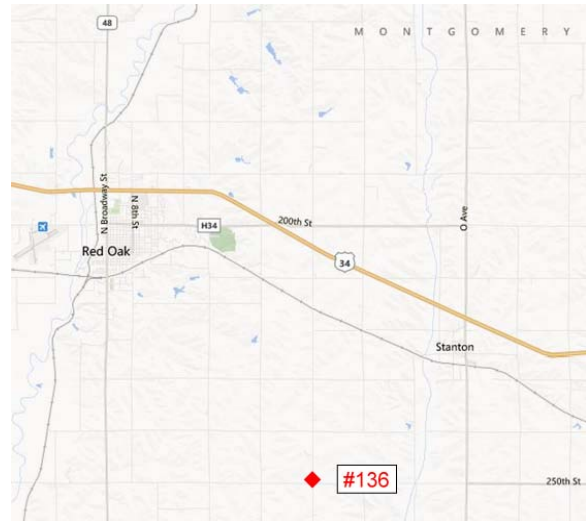
2001 Litter collection performed: October 9, 2001
2013 Litter collection performed: October 17, 2013

Changes to Site Characteristics:

- Stop sign was present in 2013 located approximately 500 feet south from site.
- The grass height in 2001 was estimated to be 24" and was estimated to be 8-10" in 2013.

Site #136 Litter Changes Summary:

Survey	Visual Litter Count	Sorted Litter Count	Sorted Litter Weight (grams)
2001	2	29	60
2013	0	5	59
Difference	(2)	(24)	(1)



Site #136 Location



Site #136 – October 9, 2001



Site #136 – October 17, 2013

Site 136 Summary:

- Site #136 saw a decrease in the number of litter pieces, both visually observed and collected, during the 2001 and 2013 surveys but maintained consistency of litter weight during both surveys.
- Beer containers collected during the surveys were the only similarity between the 2001 and 2013 surveys. 2 containers were collected during the 2001 survey and weighed approximately 33 grams, while 3 containers were collected during the 2013 survey and weighed 55 grams.
- There was 1 soda container collected during the 2001 survey and weighed approximately 17 grams. No litter from this category was found during the 2013 survey.
- There were 11 plastic cups and 2 polystyrene foam cups found during the 2001 survey and weighed approximately 1 gram for each category. No litter from this category was found during the 2013 survey.
- There were 2 pieces of plastic packaging and 11 pieces of paper packaging collected during the 2001 survey, each weighed 2 and 6 grams, respectively. No litter from this category was found during the 2013 survey.
- No tobacco related products were collected during either the 2001 or 2013 surveys.
- The higher grass height may have decreased litter visibility during the 2001 survey and therefore inhibited litter collection.
- The higher grass height may have also trapped more litter compared to the shorter vegetation height during the 2013 survey.

Site 146 – Rural Site

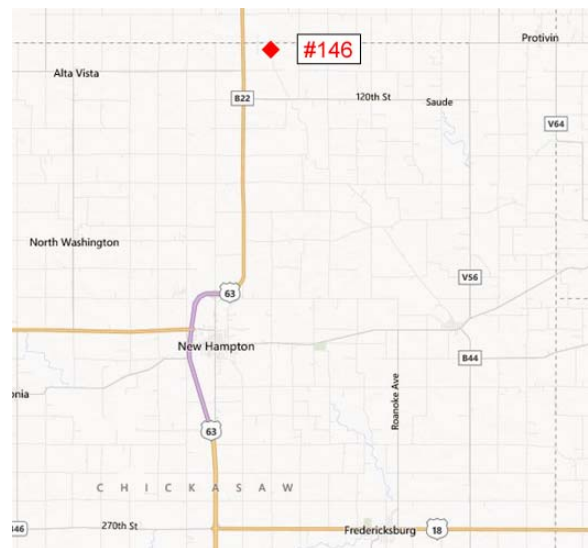
2001 Litter collection performed: October 9, 2001
2013 Litter collection performed: October 15, 2013

Changes to Site Characteristics:

- The site dimensions in 2001 were 200 feet long by 33 feet wide. The site dimensions of the site in 2013 were 200 feet long by 30 feet wide due to thick vegetation that grew into the site and was considered an entrapment.
- Stop sign was present in 2013 located approximately 130 feet south from site.
- The grass height in 2001 was estimated to be 24-48" and was estimated to be 4" for the site area that could be sampled in 2013.

Site #146 Litter Changes Summary:

Survey	Visual Litter Count	Sorted Litter Count	Sorted Litter Weight (grams)
2001	2	25	33
2013	1	4	4
Difference	(1)	(21)	(29)



Site #146 Location



Site #146 – October 9, 2001



Site #146 – October 15, 2013

Site 146 Summary:

- Site #146 saw a decrease of collected litter in the 2013 survey compared to the 2001 survey.
- There was 1 cigarette filter/butt collected during the 2013 survey. No litter from this category was collected during the 2001 survey.
- The most drastic difference in the survey results appears in the plastic packaging category where 12 pieces were collected and weighed at approximately 23 grams during the 2001 survey. No litter from this category was collected during the 2013 survey.
- There were 3 pieces of corrugated cardboard collected during the 2001 survey, and weighed at approximately 6 grams. No litter from this category was collected during the 2013 survey.
- The difference in vegetative height from 21-48" to 4" could have increased the likelihood of waste to blow off of the survey site completely or into the thick vegetation that grew into the site between the 2001 and 2013 surveys, and was not surveyed during the 2013 survey.

Site 151 – Rural Site

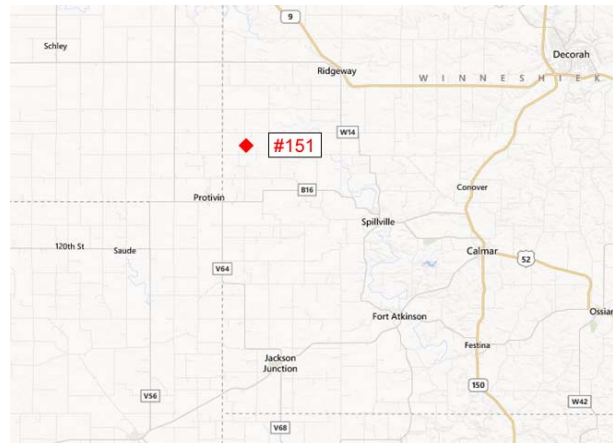
2001 Litter collection performed: October 9, 2001
2013 Litter collection performed: October 15, 2013

Changes to Site Characteristics:

- The survey from 2001 did not indicate entrapment present. However, the photo from 2001 indicates that the ditch present in 2013 was also present in 2001.
- Stop sign was present in 2013 located approximately 1,580 feet north from site.
- The grass height in 2001 was estimated to be 24" and was estimated to be 4-12" in 2013.

Site #151 Litter Changes Summary:

Survey	Visual Litter Count	Sorted Litter Count	Sorted Litter Weight (grams)
2001	0	1	43
2013	2	3	28
Difference	2	2	(15)



Site #151 Location



Site #151 – October 9, 2013



Site #151 – October 15, 2013

Site 151 Summary:

- Site #151 saw a slight increase in observed and collected litter pieces with a decrease in litter weight in the 2013 survey.
- There was 1 beverage container collected during the 2001 survey that weighed 43 grams. No litter from this category was collected during the 2013 survey.
- There was 1 piece of organic litter and 2 pieces of vehicular litter collected during the 2013 survey, each respectively weighing 14 grams. No litter from either category was collected during the 2001 survey.
- No tobacco related litter was collected during the 2001 or 2013 survey.
- The increased weight of the litter collected during the 2001 survey may be due to liquid being retained in the container, or container material increasing the weight of the litter. The number of litter pieces remains consistent in both surveys.

ATTACHMENT A

2001 & 2013 SITE SELECTION METHODOLOGY

A. Summary

BARKER LEMAR meet with KIB staff to discuss how the site selection methodologies performed in 2001 would be relied upon for the 2013 site selection. It was determined that sites that were selected and had a collection survey performed would be used as available sites for selection for the 2013 survey. BARKER LEMAR would randomly select the 15 sites for the 2013 survey according to the appropriate site category (urban high traffic, urban medium traffic, urban low traffic, and rural) and then submit these sites to the DOT to ensure these sites are still viable for participation in this study.

The following information is the methodology that was used in 2001 to identify and select the sites used for the 2001 study. Again, the 2013 study relied upon the results of these methods for the identification of viable sites to perform the collection study.

B. Initial Site Selection Criteria

Before the KIB site selection meetings, BARKER LEMAR attained DOT road data that, once applied to the preliminary KIB Internet/GIS program, provided the ability of programmers to select roadside sites based on almost one hundred road variables. BARKER LEMAR then began to layer the DOT road data with other data including DOT center line road data, demographic data from the US Census Bureau, the location of permitted sanitary disposal projects (landfills, transfer stations, etc.), rivers and waterways, railroads, schools, Iowa Department of Natural Resources (Department) owned lands, and data describing incorporated places. This preliminary work was provided to assist the stakeholders develop site selection criteria.

During the KIB stakeholder meetings site selection criteria was discussed with BARKER LEMAR moderating the discussions. BARKER LEMAR staff provided background information from other roadside studies, provided examples of data currently and potentially available, and reviewed possible random selection processes.

KIB stakeholders continually asked two important questions while determining site selection criteria, these were:

- How are the site selection criteria going to influence KIB's ability to change littering behavior through education and marketing efforts?
- How well will the selection process represent the entire state?

KIB stakeholders identified key parameters affecting site selection, they were:

- The entire State must be represented equally;
- The selection of roadside sites must attempt to minimize bias, and;
- The sites should be selected randomly.

Additional considerations in site selection involved access to data at a state level, preferably access to state level data in an electronic format.

Selecting Primary Stratification Systems for the Study

As the site selection discussion progressed, two distinct systems for site selection materialized.

First, the KIB stakeholders asked that the state to be divided into rural and urban areas. The Stakeholders then determined that urban areas should be further divided into categories based on population.

Second, the KIB stakeholders developed another tier of classifying urban sites. This stratification system involved selecting roadside litter collection sites based on DOT average daily vehicle counts (traffic volume).

Stratifying and Weighing Rural and Urban Roadside Sites

In 2001, The State of Iowa had 77% of the population living in incorporated places (urban sites) and 23% of the population living in unincorporated (rural) areas. Therefore, potential urban sites should total 116 (150 multiplied by 77%), and rural sites selected from rural areas should total 35 (150 multiplied by 23%).

Staff defined urban areas for this study as a roadside within the geographic boundary of incorporated places. For this study, rural place was defined as any place 2 miles from the border of any incorporated place. This definition of a rural place attempted to eliminate sites representing high suburban growth into unincorporated areas.

Before staff defined the 2-mile rural definition, a rural definition of 10 miles from any incorporated boundary was attempted. The GIS programming, defining buffers of ten miles around incorporated areas, showed that a 10-mile zone excluded 95% of the State as potential roadside sites. A 2-mile buffer zone was attempted and it afforded significantly more space from which to choose sites and still appeared to minimize sites representing more suburbanized areas.

Population

BARKER LEMAR used 2000 US Census Bureau data to stratify urban areas according to population. The State's cities were ordered in descending order from largest to smallest, and then cities were classified according to DOT city classification sizes (BARKER LEMAR used DOT's city classification sizes as identified on DOT's state highway maps - See Table 1).

Staff divided the total population of the DOT classification by the total population. The resulting percentage was used to assign a specific number of urban roadside sites to that classification size.

While cities were ordered in descending order, they were assigned a number from 1 to 955. A random number generator chose numbers within the City Classification. For example, the eight largest cities (numbered 1-8) identified as having populations over 50,001 received 39 random numbers (34% of 116 urban sites) numbered from 1-8.

Table 1 – DOT City Classification

DOT CITY CLASSIFICATION SIZE	NUMBER OF CITIES IN DOT CLASSIFICATION	ROADSIDE SITES / CATEGORY (151 TOTAL)	% OF TOTAL URBAN POP.
50,001 plus	8	39	34%
25,001 - 50,000	9	15	13%
10,001 - 25,000	13	11	10%
5,001 - 10,000	39	15	13%
1 - 5,000	886	36	31%
RURAL	NA	35	NA

Because KIB stakeholders required an equal distribution of roadside sites throughout the State and required sites to be selected randomly, some cities receiving a larger number of roadway sites were reduced by one roadside site so that the "extra" roadside site could go to a city with no representation. Table 2 describes the cities donating a site and the cities receiving a site. Cities received a site if they were next in the list, proceeding in descending order, from the providing city. The selection of cities allowed the next stratification criteria to be implemented - traffic volume.

Table 2 – City Site Manipulation

DONATING TOWN	SIZE CLASSIFICATION	ORIGINAL NUMBER	RECEIVING TOWN	SIZE CLASSIFICATION	NUMBER RECEIVED
Mason City	25,001-50,000	3	Marshalltown	25,001-50,000	1
Indianola	10,001-25,000	2	Muscatine	10,001-25,000	1
Oskaloosa	10,001-25,000	2	Keokuk	10,001-25,000	1
Coralville	10,001-25,000	2	Ft. Madison	10,001-25,000	1
Knoxville	5,001-10,000	2	Clear Lake	5,001-10,000	1
Washington	5,001-10,000	2	Estherville	5,001-10,000	1
Perry	5,001-10,000	2	Denison	5,001-10,000	1
Villisca	1-5,000	2	Fayette	1-5,000	1

Traffic Volume

Year 2000 DOT traffic volume data was used to develop three traffic volume classifications. Road segments are the geographical boundary for DOT road volume data. A road segment is an undetermined length of road from one intersection to another intersection. Staff weighed each traffic volume classification by adding the total miles within each classification and dividing it by the total - see Table 3.

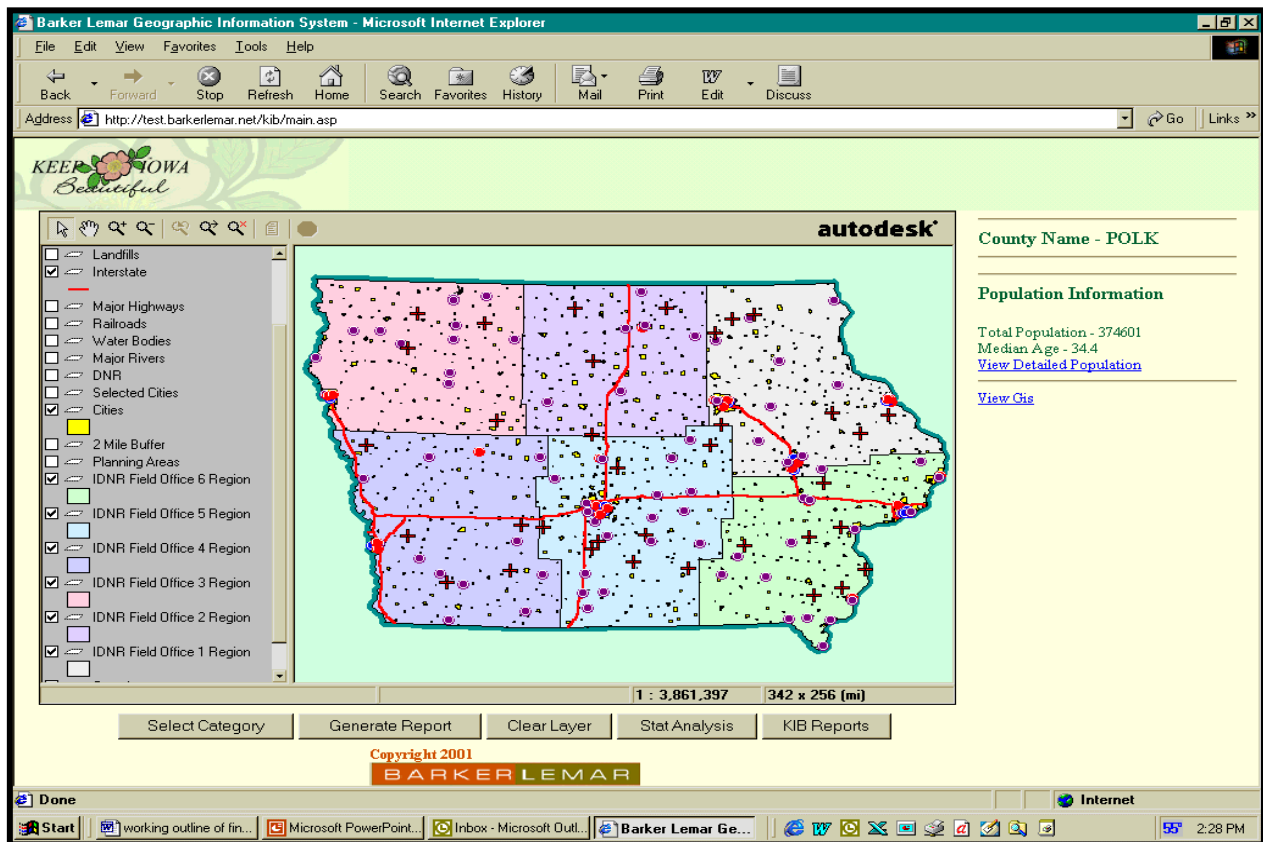
BARKER LEMAR staff used "Natural Breaks" ArcView's default classification method to determine the range for the daily vehicle traffic count classifications. This method identifies breakpoints by looking for groupings and patterns inherent in the data. ArcView uses Jenk's Optimization statistical formula to minimize the variation within each class. The categories for this stratification system are presented in Table 3.

Table 3 – Natural Breaks in 2000 DOT Traffic Count Data

CARS PER DAY	KIB CLASSIFICATION	% OF IOWA ROADWAYS	# OF ROADSIDE SITES (116 TOTAL)
1- 9,070	Low Volume	67%	78
9,071 - 31,200	Medium Volume	21%	24
31,201 +	High Volume	12%	14

Rural Roadside Sites – Stratified by Department Field Office Zones

Staff reviewed a GIS map of the selected roadside sites with KIB stakeholders at which time the random selection process was described. This first draft of mapped sites showed a significantly greater number of sites in the northern half of the state (due to the random selection process). In order to distribute the roadside sites equally throughout the State, the KIB stakeholders agreed that the Department Field Office Zones should be used to further stratify the rural roadside sites. The goal was to spread the rural sites equally throughout the State and weigh them equally by population.



Screen shot showing Department Field Office zones. The Field Office zones use counties for geographic borders. BARKER LEMAR staff identified the population within each Field Office Zone (using county populations) and then associated a number of rural roadside sites according to the percent of total State population in the Zone.

NOTE: This methodology was not repeated for the 2013 study. It was determined in meetings with KIB staff that the 15 sites should be selected at random across the state for the identified site categories.

Random Point Selection and Geographic Plotting of Roadside Sites

BARKER LEMAR staff designed a random point generator for use with ArcView and the KIB GIS/Internet site to select the actual roadside site location. To select urban sites in the State, staff selected a field encompassing the entire State. A random point generator created 50,000 points based on XY coordinates within the selection field and points were then selected within a 50-foot buffer of a road segment matching the specific traffic volume. Staff eliminated points outside incorporated places, then went to each of the selected cities and looked for a random point. If more than one point existed and only one point was required, then staff chose the first XY coordinate from the table of randomly selected XY coordinates. Tabular views were used to reduce geographical bias while selecting roadside sites.

The KIB Internet/GIS web site uses the site numbers as the primary identifier.

- High traffic volume sites are numbered 1-14, representing the 14 high traffic volume roads.
- Medium traffic volume sites are numbered 15-38, representing the 24 medium traffic volume roads.
- Low traffic volume sites are numbered 39-116, representing the 77 low traffic volume roads.
- Rural sites are numbered 117-151, representing the 35 rural sites.

C. Locating Sites

As staff scheduled field activities, maps were printed using the Internet/GIS program. Staff was able to locate the position of the litter collection point and then print maps with the site location, road names, intersections, town names, etc. Field technicians used the program to measure the distance, usually from a nearby intersection(s) to the site. Additional maps, printed on a larger scale, provided interstates and major highways instructing staff to the approximate roadside location.

The distance calculated from the GIS program was used in the field to find a starting point for the survey area. Staff noted which direction they traveled as they measured site length.

BARKER LEMAR instructed field crews to use the exact site randomly selected by the GIS program and not to bias the roadside site by changing roadsides, etc. However, staff was instructed to maintain safety and use common sense regarding site substitutions. For example, one site was not used as the entire street was closed for construction and another site was moved down the road a few hundred feet to avoid menacing dogs.

C. Length and Width of Sites

Field workers used a measuring wheel to measure length and width of the sites. The four corners of the roadside collection site were recorded for some sites with the GPS receiver and Tablet PC. Staff used spray-marking paint to identify the four corners of the site and outline the length and width of the site. Field crews were instructed to make sites 200 feet long if possible. Site width was not pre-determined, rather staff determined width in the field based on the location of barriers and natural breaks. Sites were not to exceed 40 feet in width. Paint markings, field notes, and GIS maps will serve as a backup to the GPS coordinates for future site identification.

D. Size Limitation - 1/2 Square Inch

Staff determined a 1/2-inch square litter size was appropriate, as field staff could approximate this size quickly in the field (about the size of a thumbnail). Additionally, the 1/2-inch square size included cigarette butts and cigarette filter material.

E. Photographs

Staff was instructed to take photographs at each roadside site.

F. Observations of Independent Variables

Other roadside litter studies identified other independent variables that may influence the amount of litter at any given site. BARKER LEMAR collected several key independent variables while on site. These variables included:

- grass height;
- location of a stop sign or stop light;
- location of a barrier such as a fence, row crop, ditch, building, bushes/weeds, etc.;
- location of convenience store or fast-food type restaurant, and;
- location of nearby school or park.

Visual Count - Walking Speed

Other litter characteristic researchers believe a visual count of litter is directly correlated to the actual amount of litter at a site and that visual litter is a better reflection of how an area is perceived by residents, pedestrians, and motorists.

The visual count was a separate measure of how much litter was located at a site. Before litter was collected, the field staff counted the visual litter at walking speed. BARKER LEMAR instructed staff to not stop walking while counting. The counts were revealed after each person had finished counting. Staff recorded the average of the two visual counts (one from each of the field crew staff).

If sidewalks were available, then the visual count took place from the sidewalk. If a sidewalk was not available, then the visual count took place from the edge of roadway.

ATTACHMENT B

LITTER CLASSIFICATION METHODOLOGY

A. Classifying Litter

KIB stakeholders provided input regarding some key litter classification categories, and subcategories. Specifically KIB stakeholders requested that beverage containers be identified by material type and then by their designation as a deposit or no-deposit container. Staff developed other categories from research performed on other statewide litter characterization studies and the experience of the BARKER LEMAR staff.

B. Classification Changes / Notes

Table 1 displays the original categories and subcategories used to classify litter and the changes made to the categories and subcategories.

Adding New Categories

"Fast Food Extras - Straw Related Packaging Plastic/Paper", "Fast Food Extras - Fast Food Wrappers/Bags", "Organics - Miscellaneous", and "Beverage Container - Water" were added as subcategories after the first few sorts. Staff thought these subcategories would better represent these unique litter streams. Staff also added the "Miscellaneous" category for materials not identified with any of the other subcategories.

Combining Categories for Data Analysis

BARKER LEMAR developed the litter categories by reviewing other roadside litter characteristic studies and listening to the ideas generated by KIB stakeholders. After the data was collected and reviewed, staff combined several subcategories because some of these contained no litter pieces. Additionally, sorting crews had difficulty distinguishing similar sub categories; consequently, the data is better represented if some subcategories and some categories are combined.

Table 1 – 2000 Litter Categories and Subcategories

CATEGORY (ORIGINAL AND/OR NEW)	OLD SUBCATEGORY	NEW SUBCATEGORY
Bags	Ice	Plastic and Paper Bags
	Paper Retail	
	Paper Small	
	Plastic Retail	
	Plastic Small	
	Sandwich Style Bags	
Construction Debris	Drywall / Framing / Trim / Paving / Demolition Related	Demolition/Construction Related
	Rocks / Gravel / Minerals	
Cup Related	Plastic Reusable	Plastic Cups
	Plastic Not Reusable	
Old Category = Home/Brown Good/White Good/ Textiles New Category = Textiles	Blankets/Towels	Miscellaneous
	Textiles	
Old Category = Medical Old Category =	Medical Supplies/Veterinarian Supplies	Miscellaneous

Biological New Category = Biohazardous/Medical	Biohazardous/Human Waste	
Other Metal	Metal/Aluminum Pieces	Metal Pieces
	Foil/Pie Tins	
Other Plastic	Foamed "Block and Shape" Pieces	Foamed Packaging
	Foamed "Peanuts"	
Tobacco	Cigar Filter/Butts	Cigar/Cigarette Filter and Butts
	Cigarette Filter/Butts	

Determining Deposit or Non-deposit Designations for Beverage Containers

During the litter classification stage, BARKER LEMAR instructed staff to designate a beverage container as "Deposit" only if staff observed deposit language on the container. BARKER LEMAR thought this system would be the most objective method for determining the deposit designation. If field staff could not identify any deposit language on the container, they were to classify the beverage container litter as "Non-deposit".

Categories Removed - No Litter Recorded

The following litter categories did not record any litter and are consequently not included in any analysis: "Brown Goods", "White Goods", "Cushions", "Tableware", "Blankets/Towels", "Household Hazardous Material" ("HHM"), "Yard Waste", "Dead Animals", "Prepared Foods", and "Animal Feed".

C. Counting Litter

Individual litter pieces $\frac{1}{2}$ square inch or larger were counted and individually recorded. Staff counted separate pieces of litter even if the pieces appeared to match (e.g. a reusable stadium type cup mowed into four pieces was counted as four separate pieces of litter). Field staff determined this system of counting to be the most objective system.

D. Estimating the Area of Each Litter Category and Subcategory

The area of litter was calculated to the nearest half-inch square. Classifying teams used a one-inch square grid to assist estimating area. After being sorted by subcategory, litter was spread into a single layer, without changing the shape of the litter significantly, e.g. unfolding candy wrappers, etc. The pieces were laid onto the grid and, looking down on the grid and counting 1-inch square sections covered by the litter, staff recorded the best estimate of area.



This example of Candy Packaging/Snack Packaging represents approximately 31 square inches. Staff estimated area looking down over litter - the angle of this photograph skews the perspective.

A standard measurement of $\frac{1}{2}$ square inch for cigarette filters/butts was used to speed the classification process.

For pieces of litter too large for the 1 square inch grid system (tire retreads, barrel lids, etc.), staff used a measuring tape to estimate area.

NOTE: This methodology was not repeated for the 2013 study. It was determined in meetings with KIB staff that this information was not necessary.

E. Recording the Weight of Each Litter Category and Subcategory

Litter categories were weighed to the nearest tenth of a gram up to materials weighing over 24 pounds (scale capacity). Staff weighed heavier items on a bathroom scale and converted the weight from pounds to grams.

F. Recording the Name Brands Within Each Litter Category for Each Site

After staff estimated the area for each litter category, individual name brands were identified and recorded. BARKER LEMAR instructed staff not to guess at a name brand but to look for clear indications of the name brands on the individual piece of litter.

NOTE: This methodology was not repeated for the 2013 study. It was determined in meetings with KIB staff that this information was not necessary.

G. Photographs

Staff took photographs of the litter from each site, the pictures show the litter in various stages of being classified and sorted and were used primarily to resolve any discrepancies in recorded data. Some pictures are representative of specific categories or sub categories. Staff will use these pictures to supplement sorting work and provide training for future studies. Most of the individual roadside sites have a photograph associated with it, except those sites where no litter was collected.

ATTACHMENT C

2013 SITE RESULTS AND COMPARISON DATA

Site #: 10

Category	Sub Category	2013 Total Pieces	2013 Total Grams	2001 Total Pieces	2001 Total Grams	Difference in Total Pieces*	Difference in Total Grams*
Beverage Container	Beer	30	371	6	57	24	314
	Wine/Liquor	2	142			2	142
	Soda	25	303	17	203	8	100
	Juice	1	36			1	36
	Milk	4	30			4	30
	Sports drink	3	69			3	69
	Tea					0	0
	Water	14	90			14	90
	Vegetable/health			1	13	(1)	(13)
	Broken plastic beverage Container					0	0
Cup Related	Broken metal beverage Container					0	0
	Broken glass beverage Container			36	40	(36)	(40)
	Plastic Cups	27	38	14	30	13	8
	Polystyrene foam cups	44	43	32	4	12	39
	Paper	2	17	33		(31)	17
Bags	Plastic lids			8	5	(8)	(5)
	Straws			6	2	(6)	(2)
	Plastic and Paper Bags					0	0
	Corrugated cardboard boxes	245	1156			245	1156
	Paperboard boxes			7	31	(7)	(31)
Containers/Boxes	Paper beverage casing					0	0
	Polystyrene foam clam shell					0	0
	Plastic clam shell					0	0
	Jars/bottles/boxes					0	0
	Non-beverage cans					0	0
	Aerosols/pump			1	140	(1)	(140)
	Lids					0	0
	Candy wrappers/snacks (paper or plastic)	105	110	27	4	78	106
	Plastic			25	4	(25)	(4)
	Paper			5	3	(5)	(3)
Packaging	Plastic/paper/foil/combo			35	18	(35)	(18)
	Foil					0	0
	Cigarette filters/butts	189	46	323	5	(134)	41
	Cigar filters/butts					0	0
	Packaging	15	16	28	10	(13)	6
Tobacco	Dip/chew/snuff					0	0
	Condiment packages	2	0	2	1	0	(1)
	Utensils	2	7	1	2	1	5
	Straw related packaging plastic/paper	3	2			3	2
	Fast food wrappers/bags	12	19	16	9	(4)	10
Organics	Miscellaneous					0	0
Biological	Biohazardous/human waste			1	178	(1)	(178)
Medical	Medical supplies/veterinarian supplies					0	0
Other Plastic	Bottle lid/cap	4	7	2	1	2	6
	Plastic plate					0	0
	Stretch/shrink style industrial film	70	168			70	168
	Small pieces of undetermined source	41	1140	73	0	(32)	1140
	Foamed Packaging	40	66	125	3	(85)	63
Other Rubber not Tires	Other rubber not tires			2	1	(2)	(1)
Other Metal	Metal/Foil/Aluminum Pieces	17	326	20	1097	(3)	(771)
	Bottle caps/tabs			4	17	(4)	(17)
	Towel/napkin			35	3	(35)	(3)
Other Paper	Lottery					0	0
	Plate/tray	10	23			10	23
	Food wrap					0	0
	Small pieces of undetermined source	116	136	256	24	(140)	112
	Miscellaneous	67	2577	14	1868	53	709
Demolition/Construction Related	Vehicle related not tires	11	778	2	11	9	767
Vehicle	Inner tubes/retreads/rims/caps	6	842	2	3	4	839
Tires	Miscellaneous	14	487	4	470	10	17
Textiles	Miscellaneous	2	7	6	1	(4)	6
Glass							
Total		1123	9052	1169	4257	(46)	4795

*=() indicates the 2001 survey result is higher than 2013 result.

Site #: 28

Category	Sub Category	2013 Total Pieces	2013 Total Grams	2001 Total Pieces	2001 Total Grams	Difference in Total Pieces*	Difference in Total Grams*
Beverage Container	Beer					0	0
	Wine/Liquor					0	0
	Soda					0	0
	Juice	1	0			1	0
	Milk					0	0
	Sports drink					0	0
	Tea					0	0
	Water					0	0
	Vegetable/health					0	0
	Broken plastic beverage Container					0	0
Cup Related	Broken metal beverage Container					0	0
	Broken glass beverage Container	1	1			1	1
	Plastic Cups	7	16	2	33	5	(17)
	Polystyrene foam cups			2	2	(2)	(2)
	Paper			1		(1)	0
Bags	Plastic lids	2	4	1	26	1	(22)
	Straws	2	2	1	1	1	1
Containers/Boxes	Plastic and Paper Bags					0	0
	Corrugated cardboard boxes					0	0
	Paperboard boxes					0	0
	Paper beverage casing					0	0
	Polystyrene foam clam shell					0	0
	Plastic clam shell					0	0
	Jars/bottles/boxes					0	0
	Non-beverage cans					0	0
	Aerosols/pump					0	0
	Lids					0	0
Packaging	Candy wrappers/snacks (paper or plastic)	44	4	15	3	29	1
	Plastic			6	0	(6)	(0)
	Paper					0	0
	Plastic/paper/foil/combo			28	2	(28)	(2)
	Foil					0	0
Tobacco	Cigarette filters/butts	64	11	74	81	(10)	(70)
	Cigar filters/butts					0	0
	Packaging	7	0	9	26	(2)	(26)
	Dip/chew/snuff					0	0
Fast Food Extras	Condiment packages	4	0	2	1	2	(1)
	Utensils	3	7			3	7
	Straw related packaging plastic/paper	3	0	3	0	0	(0)
	Fast food wrappers/bags	3	3	1	71	2	(68)
Organics	Miscellaneous			1	38	(1)	(38)
Biological	Biohazardous/human waste					0	0
Medical	Medical supplies/veterinarian supplies					0	0
Other Plastic	Bottle lid/cap	1	5			1	5
	Plastic plate					0	0
	Stretch/shrink style industrial film					0	0
	Small pieces of undetermined source	10	5	43	26	(33)	(21)
	Foamed Packaging	6	0	3	125	3	(125)
Other Rubber not Tires	Other rubber not tires					0	0
Other Metal	Metal/Foil/Aluminum Pieces			2	1898	(2)	(1898)
	Bottle caps/tabs			1	4	(1)	(4)
Other Paper	Towel/napkin	3	7			3	7
	Lottery			1	0	(1)	(0)
	Plate/tray					0	0
	Food wrap					0	0
	Small pieces of undetermined source	30	4	5	3	25	1
Demolition/Construction Related	Miscellaneous	2	409	22	67	(20)	342
Vehicle	Vehicle related not tires	4	17	25	112	(21)	(95)
Tires	Inner tubes/retreads/rims/caps					0	0
Textiles	Miscellaneous					0	0
Miscellaneous	Miscellaneous			29	4	(29)	(4)
Finds			8			0	8
Total		197	503	277	2522	(80)	(2019)

*=() indicates the 2001 survey result is higher than 2013 result.

Site #: 32

Category	Sub Category	2013 Total Pieces	2013 Total Grams	2001 Total Pieces	2001 Total Grams	Difference in Total Pieces*	Difference in Total Grams*
Beverage Container	Beer			20	16	(20)	(16)
	Wine/Liquor					0	0
	Soda			1	65	(1)	(65)
	Juice			1	11	(1)	(11)
	Milk					0	0
	Sports drink					0	0
	Tea					0	0
	Water					0	0
	Vegetable/health					0	0
	Broken plastic beverage Container	11	15			11	15
Cup Related	Broken metal beverage Container					0	0
	Broken glass beverage Container	3	17			3	17
	Plastic Cups			15	26	(15)	(26)
	Polystyrene foam cups	32	32	6	1	26	31
	Paper			15		(15)	0
	Plastic lids	3	5			3	5
Bags	Straws	4	2	10	5	(6)	(3)
	Plastic and Paper Bags			2	39	(2)	(39)
Containers/Boxes	Corrugated cardboard boxes					0	0
	Paperboard boxes					0	0
	Paper beverage casing					0	0
	Polystyrene foam clam shell					0	0
	Plastic clam shell					0	0
	Jars/bottles/boxes					0	0
	Non-beverage cans					0	0
	Aerosols/pump					0	0
	Lids					0	0
	Candy wrappers/snacks (paper or plastic)	25	27	29	5	(4)	22
Packaging	Plastic			1	25	(1)	(25)
	Paper			1	25	(1)	(25)
	Plastic/paper/foil/combo			28	6	(28)	(6)
	Foil					0	0
	Cigarette filters/butts	49	54	98	1	(49)	53
Tobacco	Cigar filters/butts					0	0
	Packaging	5	6	25	3	(20)	3
	Dip/chew/snuff					0	0
Fast Food Extras	Condiment packages	4	4	12	2	(8)	2
	Utensils			1	4	(1)	(4)
	Straw related packaging plastic/paper			17	0	(17)	(0)
	Fast food wrappers/bags					0	0
	Miscellaneous	7	7			7	7
Organics	Biohazardous/human waste					0	0
Medical	Medical supplies/veterinarian supplies			2	1	(2)	(1)
Other Plastic	Bottle lid/cap	4	8			4	8
	Plastic plate					0	0
	Stretch/shrink style industrial film	8	6			8	6
	Small pieces of undetermined source	7	7	36	43	(29)	(36)
	Foamed Packaging	6	4	17	1	(11)	4
Other Rubber not Tires	Other rubber not tires					0	0
Other Metal	Metal/Foil/Aluminum Pieces	1	1			1	1
	Bottle caps/tabs					0	0
Other Paper	Towel/napkin			7	1	(7)	(1)
	Lottery					0	0
	Plate/tray					0	0
	Food wrap					0	0
	Small pieces of undetermined source	16	40	86	446	(70)	(406)
Demolition/Construction Related	Miscellaneous					0	0
Vehicle	Vehicle related not tires	1	2	5	25	(4)	(23)
Tires	Inner tubes/retreads/rims/caps					0	0
Textiles	Miscellaneous	1	104	1	25	0	79
Miscellaneous	Miscellaneous			4	31	(4)	(31)
glass		3	1			3	1
Lighter		1	10			1	10
gum		1	0			1	0
finds			83			0	83
Total		192	435	440	807	(248)	(372)

*=() indicates the 2001 survey result is higher than 2013 result.

Site #: 43

Category	Sub Category	2013 Total Pieces	2013 Total Grams	2001 Total Pieces	2001 Total Grams	Difference in Total Pieces*	Difference in Total Grams*
Beverage Container	Beer					0	0
	Wine/Liquor					0	0
	Soda					0	0
	Juice					0	0
	Milk					0	0
	Sports drink					0	0
	Tea					0	0
	Water					0	0
	Vegetable/health					0	0
	Broken plastic beverage Container					0	0
Cup Related	Broken metal beverage Container					0	0
	Broken glass beverage Container					0	0
	Plastic Cups					0	0
	Polystyrene foam cups					0	0
	Paper					0	0
Bags	Plastic lids					0	0
	Straws					0	0
Containers/Boxes	Plastic and Paper Bags	1	0			1	0
	Corrugated cardboard boxes					0	0
	Paperboard boxes					0	0
	Paper beverage casing					0	0
	Polystyrene foam clam shell					0	0
	Plastic clam shell					0	0
	Jars/bottles/boxes					0	0
	Non-beverage cans					0	0
	Aerosols/pump					0	0
	Lids					0	0
Packaging	Candy wrappers/snacks (paper or plastic)	12	0	3	1	9	(1)
	Plastic					0	0
	Paper					0	0
	Plastic/paper/foil/combo			5	5	(5)	(5)
	Foil					0	0
Tobacco	Cigarette filters/butts	6	1	11	5	(5)	(4)
	Cigar filters/butts					0	0
	Packaging					0	0
	Dip/chew/snuff					0	0
Fast Food Extras	Condiment packages	1	0			1	0
	Utensils					0	0
	Straw related packaging plastic/paper					0	0
	Fast food wrappers/bags					0	0
Organics	Miscellaneous					0	0
Biological	Biohazardous/human waste					0	0
Medical	Medical supplies/veterinarian supplies					0	0
Other Plastic	Bottle lid/cap					0	0
	Plastic plate					0	0
	Stretch/shrink style industrial film					0	0
	Small pieces of undetermined source	2	14	2	1	0	13
	Foamed Packaging	4	3			4	3
Other Rubber not Tires	Other rubber not tires					0	0
Other Metal	Metal/Foil/Aluminum Pieces					0	0
Other Paper	Bottle caps/tabs					0	0
	Towel/napkin					0	0
	Lottery					0	0
	Plate/tray					0	0
	Food wrap					0	0
	Small pieces of undetermined source	3	6	5	3	(2)	3
Demolition/Construction Related	Miscellaneous					0	0
Vehicle	Vehicle related not tires					0	0
Tires	Inner tubes/retreads/rims/caps					0	0
Textiles	Miscellaneous					0	0
Total		29	24	26	15	3	9

*=() indicates the 2001 survey result is higher than 2013 result.

Site #: 63

Category	Sub Category	2013 Total Pieces	2013 Total Grams	2001 Total Pieces	2001 Total Grams	Difference in Total Pieces*	Difference in Total Grams*
Beverage Container	Beer					0	0
	Wine/Liquor					0	0
	Soda					0	0
	Juice	1	11			1	11
	Milk					0	0
	Sports drink					0	0
	Tea					0	0
	Water					0	0
	Vegetable/health					0	0
	Broken plastic beverage Container					0	0
Cup Related	Broken metal beverage Container	1	3			1	3
	Broken glass beverage Container	3	13			3	13
	Plastic Cups					0	0
	Polystyrene foam cups					0	0
	Paper					0	0
	Plastic lids					0	0
	Straws					0	0
	Bags					0	0
	Plastic and Paper Bags					0	0
	Corrugated cardboard boxes					0	0
Containers/Boxes	Paperboard boxes	2	1			2	1
	Paper beverage casing					0	0
	Polystyrene foam clam shell					0	0
	Plastic clam shell					0	0
	Jars/bottles/boxes					0	0
	Non-beverage cans					0	0
	Aerosols/pump					0	0
	Lids					0	0
	Candy wrappers/snacks (paper or plastic)	10	2	5	0	5	2
	Plastic			5	1	(5)	(1)
Packaging	Paper					0	0
	Plastic/paper/foil/combo					0	0
	Foil					0	0
	Cigarette filters/butts	3	0	1	26	2	(26)
Tobacco	Cigar filters/butts					0	0
	Packaging	1	0			1	0
	Dip/chew/snuff					0	0
	Condiment packages					0	0
Fast Food Extras	Utensils					0	0
	Straw related packaging plastic/paper	4	0			4	0
	Fast food wrappers/bags					0	0
	Miscellaneous					0	0
Organics	Biohazardous/human waste					0	0
Biological	Medical supplies/veterinarian supplies					0	0
Medical	Bottle lid/cap	2	4			2	4
Other Plastic	Plastic plate					0	0
	Stretch/shrink style industrial film	1	0			1	0
	Small pieces of undetermined source	6	6	12	81	(6)	(75)
	Foamed Packaging					0	0
Other Rubber not Tires	Other rubber not tires					0	0
Other Metal	Metal/Foil/Aluminum Pieces					0	0
	Bottle caps/tabs					0	0
Other Paper	Towel/napkin					0	0
	Lottery					0	0
	Plate/tray					0	0
	Food wrap					0	0
	Small pieces of undetermined source			1	1	(1)	(1)
Demolition/Construction Related	Miscellaneous	3	0			3	0
Vehicle	Vehicle related not tires					0	0
Tires	Inner tubes/retreads/rims/caps					0	0
Textiles	Miscellaneous	1	1			1	1
Findings			1			0	1
Total		38	42	24	108	14	(66)

*=() indicates the 2001 survey result is higher than 2013 result.

Site #: 65

Category	Sub Category	2013 Total Pieces	2013 Total Grams	2001 Total Pieces	2001 Total Grams	Difference in Total Pieces*	Difference in Total Grams*
Beverage Container	Beer					0	0
	Wine/Liquor					0	0
	Soda					0	0
	Juice					0	0
	Milk					0	0
	Sports drink					0	0
	Tea					0	0
	Water					0	0
	Vegetable/health					0	0
	Broken plastic beverage Container					0	0
	Broken metal beverage Container					0	0
	Broken glass beverage Container	25	47	14	177	11	(130)
Cup Related	Plastic Cups					0	0
	Polystyrene foam cups					0	0
	Paper					0	0
	Plastic lids	1	1			1	1
	Straws					0	0
Bags	Plastic and Paper Bags					0	0
Containers/Boxes	Corrugated cardboard boxes					0	0
	Paperboard boxes					0	0
	Paper beverage casing					0	0
	Polystyrene foam clam shell					0	0
	Plastic clam shell					0	0
	Jars/bottles/boxes					0	0
	Non-beverage cans					0	0
	Aerosols/pump					0	0
	Lids					0	0
	Candy wrappers/snacks (paper or plastic)			1	3	(1)	(3)
Packaging	Plastic					0	0
	Paper					0	0
	Plastic/paper/foil/combo					0	0
	Foil					0	0
Tobacco	Cigarette filters/butts	10	2	2	2	8	0
	Cigar filters/butts					0	0
	Packaging					0	0
	Dip/chew/snuff					0	0
Fast Food Extras	Condiment packages					0	0
	Utensils					0	0
	Straw related packaging plastic/paper					0	0
	Fast food wrappers/bags					0	0
Organics	Miscellaneous					0	0
Biological	Biohazardous/human waste					0	0
Medical	Medical supplies/veterinarian supplies			1	3	(1)	(3)
Other Plastic	Bottle lid/cap			2	11	(2)	(11)
	Plastic plate					0	0
	Stretch/shrink style industrial film					0	0
	Small pieces of undetermined source	1	2			1	2
	Foamed Packaging					0	0
Other Rubber not Tires	Other rubber not tires					0	0
Other Metal	Metal/Foil/Aluminum Pieces					0	0
	Bottle caps/tabs	3	6	1	2	2	4
Other Paper	Towel/napkin					0	0
	Lottery					0	0
	Plate/tray					0	0
	Food wrap					0	0
	Small pieces of undetermined source	1	0			1	0
Demolition/Construction Related	Miscellaneous	26	97	34	75	(8)	(23)
Vehicle	Vehicle related not tires					0	0
Tires	Inner tubes/retreads/rims/caps					0	0
Textiles	Miscellaneous					0	0
Miscellaneous	Miscellaneous					0	0
Total		67	155	55	272	12	(117)

*=() indicates the 2001 survey result is higher than 2013 result.

Site #: 86

Category	Sub Category	2013 Total Pieces	2013 Total Grams	2001 Total Pieces	2001 Total Grams	Difference in Total Pieces*	Difference in Total Grams*
Beverage Container	Beer			1	17	(1)	(17)
	Wine/Liquor					0	0
	Soda					0	0
	Juice					0	0
	Milk					0	0
	Sports drink					0	0
	Tea					0	0
	Water					0	0
	Vegetable/health					0	0
	Broken plastic beverage Container	2	7			2	7
Cup Related	Broken metal beverage Container					0	0
	Broken glass beverage Container	1	3			1	3
	Plastic Cups	6	1			6	1
	Polystyrene foam cups					0	0
	Paper			3	24	(3)	(24)
	Plastic lids					0	0
Bags	Straws					0	0
	Plastic and Paper Bags					0	0
	Corrugated cardboard boxes					0	0
	Paperboard boxes					0	0
	Paper beverage casing					0	0
	Polystyrene foam clam shell					0	0
	Plastic clam shell					0	0
	Jars/bottles/boxes					0	0
	Non-beverage cans					0	0
	Aerosols/pump					0	0
Containers/Boxes	Lids					0	0
	Candy wrappers/snacks (paper or plastic)	5	2	4	9	1	(7)
	Plastic					0	0
	Paper					0	0
	Plastic/paper/foil/combo			4	1	(4)	(1)
Packaging	Foil					0	0
	Cigarette filters/butts	1	0	35	0	(34)	(0)
	Cigar filters/butts	1	1			1	1
	Packaging			19	11	(19)	(11)
	Dip/chew/snuff					0	0
Tobacco	Condiment packages	1	2			1	2
	Utensils	1	5			1	5
	Straw related packaging plastic/paper					0	0
	Fast food wrappers/bags					0	0
						0	0
Organics	Miscellaneous	1	6	1	0	0	6
Biological	Biohazardous/human waste					0	0
Medical	Medical supplies/veterinarian supplies			1	1	(1)	(1)
Other Plastic	Bottle lid/cap					0	0
	Plastic plate					0	0
	Stretch/shrink style industrial film					0	0
	Small pieces of undetermined source			10	0	(10)	(0)
	Foamed Packaging			1	1	(1)	(1)
Other Rubber not Tires	Other rubber not tires					0	0
Other Metal	Metal/Foil/Aluminum Pieces					0	0
	Bottle caps/tabs			1	5	(1)	(5)
Other Paper	Towel/napkin			3	3	(3)	(3)
	Lottery			14	3	(14)	(3)
	Plate/tray					0	0
	Food wrap					0	0
	Small pieces of undetermined source			16	27	(16)	(27)
						0	0
Demolition/Construction Related	Miscellaneous					0	0
Vehicle	Vehicle related not tires			63	93	(63)	(93)
Tires	Inner tubes/retreads/rims/caps					0	0
Textiles	Miscellaneous			1	2	(1)	(2)
Miscellaneous	Miscellaneous					0	0
Golf ball		1	46	3	13	(2)	33
toothbrush		1	5			1	5
gum		1	0			1	0
Bag and gloves			136				
Total		22	214	180	209	(158)	(131)

*=() indicates the 2001 survey result is higher than 2013 result.

Site #: 92

Category	Sub Category	2013 Total Pieces	2013 Total Grams	2001 Total Pieces	2001 Total Grams	Difference in Total Pieces*	Difference in Total Grams*
Beverage Container	Beer					0	0
	Wine/Liquor					0	0
	Soda	1	37			1	37
	Juice					0	0
	Milk			1	16	(1)	(16)
	Sports drink					0	0
	Tea					0	0
	Water					0	0
	Vegetable/health					0	0
	Broken plastic beverage Container					0	0
Cup Related	Broken metal beverage Container	2	29			2	29
	Broken glass beverage Container					0	0
	Plastic Cups					0	0
	Polystyrene foam cups	3	0	6	11	(3)	(11)
	Paper					0	0
Bags	Plastic lids			6	1	(6)	(1)
	Straws			1	0	(1)	(0)
Containers/Boxes	Plastic and Paper Bags					0	0
	Corrugated cardboard boxes					0	0
	Paperboard boxes			1	15	(1)	(15)
	Paper beverage casing					0	0
	Polystyrene foam clam shell					0	0
	Plastic clam shell					0	0
	Jars/bottles/boxes					0	0
	Non-beverage cans					0	0
	Aerosols/pump					0	0
	Lids					0	0
Packaging	Candy wrappers/snacks (paper or plastic)	7	15	8	1	(1)	14
	Plastic	1	0			1	0
	Paper					0	0
	Plastic/paper/foil/combo			1	1	(1)	(1)
	Foil					0	0
Tobacco	Cigarette filters/butts			19	14	(19)	(14)
	Cigar filters/butts					0	0
	Packaging	2	16			2	16
Fast Food Extras	Dip/chew/snuff					0	0
	Condiment packages					0	0
	Utensils	2	3			2	3
Organics	Straw related packaging plastic/paper					0	0
	Fast food wrappers/bags	5	140			5	140
Biological	Miscellaneous					0	0
Medical	Biohazardous/human waste					0	0
Other Plastic	Medical supplies/veterinarian supplies					0	0
	Bottle lid/cap	1	2			1	2
	Plastic plate					0	0
	Stretch/shrink style industrial film					0	0
	Small pieces of undetermined source	1	2	2	6	(1)	(4)
Other Rubber not Tires	Foamed Packaging	1	0	7	58	(6)	(58)
	Other rubber not tires					0	0
Other Metal	Metal/Foil/Aluminum Pieces					0	0
	Bottle caps/tabs					0	0
Other Paper	Towel/napkin					0	0
	Lottery					0	0
	Plate/tray					0	0
	Food wrap					0	0
	Small pieces of undetermined source			6	2	(6)	(2)
Demolition/Construction Related	Miscellaneous			13	649	(13)	(649)
Vehicle	Vehicle related not tires					0	0
Tires	Inner tubes/retreads/rims/caps					0	0
Textiles	Miscellaneous					0	0
Total		26	244	71	772	45	(528)

*=() indicates the 2001 survey result is higher than 2013 result.

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Site #: 97

Category	Sub Category	2013 Total Pieces	2013 Total Grams	2001 Total Pieces	2001 Total Grams	Difference in Total Pieces*	Difference in Total Grams*
Beverage Container	Beer					0	0
	Wine/Liquor					0	0
	Soda					0	0
	Juice					0	0
	Milk					0	0
	Sports drink					0	0
	Tea					0	0
	Water					0	0
	Vegetable/health					0	0
	Broken plastic beverage Container					0	0
	Broken metal beverage Container					0	0
	Broken glass beverage Container					0	0
Cup Related	Plastic Cups					0	0
	Polystyrene foam cups					0	0
	Paper					0	0
	Plastic lids					0	0
	Straws					0	0
Bags	Plastic and Paper Bags					0	0
Containers/Boxes	Corrugated cardboard boxes					0	0
	Paperboard boxes					0	0
	Paper beverage casing					0	0
	Polystyrene foam clam shell					0	0
	Plastic clam shell					0	0
	Jars/bottles/boxes					0	0
	Non-beverage cans					0	0
	Aerosols/pump					0	0
	Lids					0	0
	Candy wrappers/snacks (paper or plastic)					0	0
Packaging	Plastic					0	0
	Paper					0	0
	Plastic/paper/foil/combo					0	0
	Foil					0	0
						0	0
Tobacco	Cigarette filters/butts	1	2			1	2
	Cigar filters/butts					0	0
	Packaging					0	0
	Dip/chew/snuff					0	0
Fast Food Extras	Condiment packages					0	0
	Utensils					0	0
	Straw related packaging plastic/paper					0	0
	Fast food wrappers/bags					0	0
Organics	Miscellaneous	1	33			1	33
Biological	Biohazardous/human waste					0	0
Medical	Medical supplies/veterinarian supplies					0	0
Other Plastic	Bottle lid/cap					0	0
	Plastic plate					0	0
	Stretch/shrink style industrial film					0	0
	Small pieces of undetermined source	5	3	1	8	4	(5)
	Foamed Packaging					0	0
Other Rubber not Tires	Other rubber not tires					0	0
Other Metal	Metal/Foil/Aluminum Pieces					0	0
	Bottle caps/tabs					0	0
Other Paper	Towel/napkin					0	0
	Lottery					0	0
	Plate/tray					0	0
	Food wrap					0	0
	Small pieces of undetermined source					0	0
Demolition/Construction Related	Miscellaneous					0	0
Vehicle	Vehicle related not tires					0	0
Tires	Inner tubes/retreads/rims/caps					0	0
Textiles	Miscellaneous	1	2			1	2
Total		8	40	1	8	7	32

*=() indicates the 2001 survey result is higher than 2013 result.

Site #: 102

Category	Sub Category	2013 Total Pieces	2013 Total Grams	2001 Total Pieces	2001 Total Grams	Difference in Total Pieces*	Difference in Total Grams*
Beverage Container	Beer					0	0
	Wine/Liquor					0	0
	Soda					0	0
	Juice					0	0
	Milk					0	0
	Sports drink					0	0
	Tea					0	0
	Water					0	0
	Vegetable/health					0	0
	Broken plastic beverage Container					0	0
	Broken metal beverage Container					0	0
	Broken glass beverage Container					0	0
Cup Related	Plastic Cups					0	0
	Polystyrene foam cups					0	0
	Paper					0	0
	Plastic lids					0	0
Bags	Straws					0	0
	Plastic and Paper Bags					0	0
Containers/Boxes	Corrugated cardboard boxes					0	0
	Paperboard boxes					0	0
	Paper beverage casing					0	0
	Polystyrene foam clam shell					0	0
	Plastic clam shell					0	0
	Jars/bottles/boxes					0	0
	Non-beverage cans					0	0
	Aerosols/pump					0	0
	Lids					0	0
	Candy wrappers/snacks (paper or plastic)					0	0
Packaging	Plastic			6	30	(6)	(30)
	Paper					0	0
	Plastic/paper/foil/combo					0	0
	Foil					0	0
Tobacco	Cigarette filters/butts			3	15	(3)	(15)
	Cigar filters/butts					0	0
	Packaging					0	0
Fast Food Extras	Dip/chew/snuff					0	0
	Condiment packages					0	0
	Utensils					0	0
	Straw related packaging plastic/paper					0	0
Organics	Fast food wrappers/bags					0	0
	Miscellaneous					0	0
Biological	Biohazardous/human waste					0	0
Medical	Medical supplies/veterinarian supplies					0	0
Other Plastic	Bottle lid/cap					0	0
	Plastic plate					0	0
	Stretch/shrink style industrial film					0	0
	Small pieces of undetermined source	1	1			1	1
Other Rubber not Tires	Foamed Packaging					0	0
	Other rubber not tires					0	0
Other Metal	Metal/Foil/Aluminum Pieces			1	28	(1)	(28)
	Bottle caps/tabs					0	0
Other Paper	Towel/napkin			2	4	(2)	(4)
	Lottery					0	0
	Plate/tray					0	0
	Food wrap					0	0
	Small pieces of undetermined source	3	17	3	31	0	(14)
Demolition/Construction Related	Miscellaneous					0	0
Vehicle	Vehicle related not tires					0	0
Tires	Inner tubes/retreads/rims/caps					0	0
Textiles	Miscellaneous					0	0
Total		4	18	15	109	(11)	(91)

*=() indicates the 2001 survey result is higher than 2013 result.

Site #: 127

Category	Sub Category	2013 Total Pieces	2013 Total Grams	2001 Total Pieces	2001 Total Grams	Difference in Total Pieces*	Difference in Total Grams*
Beverage Container	Beer					0	0
	Wine/Liquor					0	0
	Soda					0	0
	Juice					0	0
	Milk	1	236			1	236
	Sports drink					0	0
	Tea					0	0
	Water					0	0
	Vegetable/health					0	0
	Broken plastic beverage Container					0	0
Cup Related	Broken metal beverage Container					0	0
	Broken glass beverage Container					0	0
	Plastic Cups					0	0
	Polystyrene foam cups					0	0
	Paper					0	0
Bags	Plastic lids					0	0
	Straws					0	0
Containers/Boxes	Plastic and Paper Bags					0	0
	Corrugated cardboard boxes					0	0
	Paperboard boxes	1	21			1	21
	Paper beverage casing					0	0
	Polystyrene foam clam shell					0	0
	Plastic clam shell					0	0
	Jars/bottles/boxes					0	0
	Non-beverage cans					0	0
	Aerosols/pump					0	0
	Lids					0	0
Packaging	Candy wrappers/snacks (paper or plastic)	1	5			1	5
	Plastic			1	6	(1)	(6)
	Paper					0	0
	Plastic/paper/foil/combo					0	0
	Foil					0	0
Tobacco	Cigarette filters/butts					0	0
	Cigar filters/butts					0	0
	Packaging					0	0
	Dip/chew/snuff					0	0
Fast Food Extras	Condiment packages					0	0
	Utensils					0	0
	Straw related packaging plastic/paper					0	0
	Fast food wrappers/bags					0	0
Organics	Miscellaneous					0	0
Biological	Biohazardous/human waste					0	0
Medical	Medical supplies/veterinarian supplies					0	0
Other Plastic	Bottle lid/cap					0	0
	Plastic plate					0	0
	Stretch/shrink style industrial film					0	0
	Small pieces of undetermined source					0	0
	Foamed Packaging					0	0
Other Rubber not Tires	Other rubber not tires					0	0
Other Metal	Metal/Foil/Aluminum Pieces					0	0
	Bottle caps/tabs					0	0
Other Paper	Towel/napkin					0	0
	Lottery					0	0
	Plate/tray					0	0
	Food wrap					0	0
	Small pieces of undetermined source					0	0
Demolition/Construction Related	Miscellaneous					0	0
Vehicle	Vehicle related not tires					0	0
Tires	Inner tubes/retreads/rims/caps					0	0
Textiles	Miscellaneous					0	0
Total		3	262	1	6	(2)	(256)

*=() indicates the 2001 survey result is higher than 2013 result.

Site #: 130

Category	Sub Category	2013 Total Pieces	2013 Total Grams	2001 Total Pieces	2001 Total Grams	Difference in Total Pieces*	Difference in Total Grams*
Beverage Container	Beer			2	48	(2)	(48)
	Wine/Liquor					0	0
	Soda	1	41	2	27	(1)	14
	Juice	1	38			1	38
	Milk					0	0
	Sports drink					0	0
	Tea	1	39	1	28	0	11
	Water			1	16	(1)	(16)
	Vegetable/health					0	0
	Broken plastic beverage Container	1	36			1	36
Cup Related	Broken metal beverage Container					0	0
	Broken glass beverage Container					0	0
	Plastic Cups	1	15			1	15
	Polystyrene foam cups					0	0
	Paper					0	0
Bags	Plastic lids					0	0
	Straws					0	0
	Plastic and Paper Bags			1	9	(1)	(9)
	Corrugated cardboard boxes	5	383			5	383
	Paperboard boxes					0	0
Containers/Boxes	Paper beverage casing					0	0
	Polystyrene foam clam shell					0	0
	Plastic clam shell					0	0
	Jars/bottles/boxes					0	0
	Non-beverage cans					0	0
	Aerosols/pump			1	106	(1)	(106)
	Lids					0	0
Packaging	Candy wrappers/snacks (paper or plastic)	2	0			2	0
	Plastic					0	0
	Paper					0	0
	Plastic/paper/foil/combo					0	0
	Foil					0	0
Tobacco	Cigarette filters/butts	7	2			7	2
	Cigar filters/butts					0	0
	Packaging					0	0
	Dip/chew/snuff					0	0
Fast Food Extras	Condiment packages					0	0
	Utensils					0	0
	Straw related packaging plastic/paper					0	0
	Fast food wrappers/bags					0	0
Organics	Miscellaneous					0	0
Biological	Biohazardous/human waste					0	0
Medical	Medical supplies/veterinarian supplies					0	0
Other Plastic	Bottle lid/cap					0	0
	Plastic plate					0	0
	Stretch/shrink style industrial film					0	0
	Small pieces of undetermined source					0	0
	Foamed Packaging					0	0
Other Rubber not Tires	Other rubber not tires					0	0
Other Metal	Metal/Foil/Aluminum Pieces	2	17			2	17
Other Paper	Bottle caps/tabs					0	0
	Towel/napkin					0	0
	Lottery					0	0
	Plate/tray					0	0
	Food wrap					0	0
	Small pieces of undetermined source	1	0	1	7	0	(7)
Demolition/Construction Related	Miscellaneous	1	18			1	18
Vehicle	Vehicle related not tires	2	67			2	67
Tires	Inner tubes/retreads/rims/caps					0	0
Textiles	Miscellaneous	1	91			1	91
gum		1	0			1	0
finds			15			0	15
Total		27	762	9	241	18	521

*=() indicates the 2001 survey result is higher than 2013 result.

Site #: 136

Category	Sub Category	2013 Total Pieces	2013 Total Grams	2001 Total Pieces	2001 Total Grams	Difference in Total Pieces*	Difference in Total Grams*
Beverage Container	Beer	3	55	2	33	1	22
	Wine/Liquor					0	0
	Soda			1	17	(1)	(17)
	Juice					0	0
	Milk					0	0
	Sports drink					0	0
	Tea					0	0
	Water					0	0
	Vegetable/health					0	0
	Broken plastic beverage Container					0	0
	Broken metal beverage Container					0	0
	Broken glass beverage Container					0	0
Cup Related	Plastic Cups			11	1	(11)	(1)
	Polystyrene foam cups			2	1	(2)	(1)
	Paper					0	0
	Plastic lids					0	0
	Straws					0	0
Bags	Plastic and Paper Bags	1	0			1	0
Containers/Boxes	Corrugated cardboard boxes					0	0
	Paperboard boxes					0	0
	Paper beverage casing					0	0
	Polystyrene foam clam shell					0	0
	Plastic clam shell					0	0
	Jars/bottles/boxes					0	0
	Non-beverage cans					0	0
	Aerosols/pump					0	0
	Lids					0	0
	Candy wrappers/snacks (paper or plastic)					0	0
Packaging	Plastic			2	2	(2)	(2)
	Paper			11	6	(11)	(6)
	Plastic/paper/foil/combo					0	0
	Foil					0	0
Tobacco	Cigarette filters/butts					0	0
	Cigar filters/butts					0	0
	Packaging					0	0
	Dip/chew/snuff					0	0
Fast Food Extras	Condiment packages					0	0
	Utensils					0	0
	Straw related packaging plastic/paper					0	0
	Fast food wrappers/bags					0	0
Organics	Miscellaneous					0	0
Biological	Biohazardous/human waste					0	0
Medical	Medical supplies/veterinarian supplies					0	0
Other Plastic	Bottle lid/cap					0	0
	Plastic plate					0	0
	Stretch/shrink style industrial film					0	0
	Small pieces of undetermined source					0	0
	Foamed Packaging					0	0
Other Rubber not Tires	Other rubber not tires					0	0
Other Metal	Metal/Foil/Aluminum Pieces					0	0
	Bottle caps/tabs					0	0
Other Paper	Towel/napkin					0	0
	Lottery					0	0
	Plate/tray					0	0
	Food wrap					0	0
	Small pieces of undetermined source	1	0			1	0
Demolition/Construction Related	Miscellaneous					0	0
Vehicle	Vehicle related not tires					0	0
Tires	Inner tubes/retreads/rims/caps					0	0
Textiles	Miscellaneous					0	0
Finds			4			0	4
Total		5	59	29	60	(24)	(1)

*=() indicates the 2001 survey result is higher than 2013 result.

Site #: 146

Category	Sub Category	2013 Total Pieces	2013 Total Grams	2001 Total Pieces	2001 Total Grams	Difference in Total Pieces*	Difference in Total Grams*
Beverage Container	Beer					0	0
	Wine/Liquor					0	0
	Soda					0	0
	Juice					0	0
	Milk					0	0
	Sports drink					0	0
	Tea					0	0
	Water					0	0
	Vegetable/health					0	0
	Broken plastic beverage Container					0	0
Cup Related	Broken metal beverage Container					0	0
	Broken glass beverage Container					0	0
	Plastic Cups					0	0
	Polystyrene foam cups					0	0
	Paper					0	0
Bags	Plastic lids					0	0
	Straws					0	0
Containers/Boxes	Plastic and Paper Bags					0	0
	Corrugated cardboard boxes			3	6	(3)	(6)
	Paperboard boxes					0	0
	Paper beverage casing					0	0
	Polystyrene foam clam shell					0	0
	Plastic clam shell					0	0
	Jars/bottles/boxes					0	0
	Non-beverage cans					0	0
	Aerosols/pump					0	0
	Lids					0	0
Packaging	Candy wrappers/snacks (paper or plastic)	1	0			1	0
	Plastic			12	23	(12)	(23)
	Paper					0	0
	Plastic/paper/foil/combo					0	0
	Foil					0	0
Tobacco	Cigarette filters/butts	1	0			1	0
	Cigar filters/butts					0	0
	Packaging					0	0
	Dip/chew/snuff					0	0
Fast Food Extras	Condiment packages					0	0
	Utensils					0	0
	Straw related packaging plastic/paper					0	0
	Fast food wrappers/bags					0	0
Organics	Miscellaneous					0	0
Biological	Biohazardous/human waste					0	0
Medical	Medical supplies/veterinarian supplies					0	0
Other Plastic	Bottle lid/cap					0	0
	Plastic plate					0	0
	Stretch/shrink style industrial film					0	0
	Small pieces of undetermined source	2	2			2	2
	Foamed Packaging					0	0
Other Rubber not Tires	Other rubber not tires					0	0
Other Metal	Metal/Foil/Aluminum Pieces			5	1	(5)	(1)
	Bottle caps/tabs					0	0
Other Paper	Towel/napkin					0	0
	Lottery					0	0
	Plate/tray					0	0
	Food wrap					0	0
	Small pieces of undetermined source					0	0
Demolition/Construction Related	Miscellaneous					0	0
Vehicle	Vehicle related not tires					0	0
Tires	Inner tubes/retreads/rims/caps					0	0
Textiles	Miscellaneous					0	0
Miscellaneous	Miscellaneous			5	3	(5)	(3)
Find			2			0	2
Total		4	4	25	33	(21)	(29)

*=() indicates the 2001 survey result is higher than 2013 result.

Site: 151

Category	Sub Category	2013 Total Pieces	2013 Total Grams	2001 Total Pieces	2001 Total Grams	Difference in Total Pieces*	Difference in Total Grams*
Beverage Container	Beer			1	43	(1)	(43)
	Wine/Liquor					0	0
	Soda					0	0
	Juice					0	0
	Milk					0	0
	Sports drink					0	0
	Tea					0	0
	Water					0	0
	Vegetable/health					0	0
	Broken plastic beverage Container					0	0
Cup Related	Broken metal beverage Container					0	0
	Broken glass beverage Container					0	0
	Plastic Cups					0	0
	Polystyrene foam cups					0	0
Bags	Paper					0	0
	Plastic lids					0	0
Containers/Boxes	Straws					0	0
	Plastic and Paper Bags					0	0
	Corrugated cardboard boxes					0	0
	Paperboard boxes					0	0
	Paper beverage casing					0	0
	Polystyrene foam clam shell					0	0
	Plastic clam shell					0	0
	Jars/bottles/boxes					0	0
	Non-beverage cans					0	0
	Aerosols/pump					0	0
Packaging	Lids					0	0
	Candy wrappers/snacks (paper or plastic)					0	0
	Plastic					0	0
	Paper					0	0
	Plastic/paper/foil/combo					0	0
Tobacco	Foil					0	0
	Cigarette filters/butts					0	0
	Cigar filters/butts					0	0
	Packaging					0	0
Fast Food Extras	Dip/chew/snuff					0	0
	Condiment packages					0	0
	Utensils					0	0
	Straw related packaging plastic/paper					0	0
Organics	Fast food wrappers/bags					0	0
Biological	Miscellaneous	1	14			1	14
Medical	Biohazardous/human waste					0	0
Other Plastic	Medical supplies/veterinarian supplies					0	0
	Bottle lid/cap					0	0
	Plastic plate					0	0
	Stretch/shrink style industrial film					0	0
	Small pieces of undetermined source					0	0
Other Rubber not Tires	Foamed Packaging					0	0
Other Metal	Other rubber not tires					0	0
	Metal/Foil/Aluminum Pieces					0	0
Other Paper	Bottle caps/tabs					0	0
	Towel/napkin					0	0
	Lottery					0	0
	Plate/tray					0	0
	Food wrap					0	0
Demolition/Construction Related	Small pieces of undetermined source					0	0
Vehicle	Miscellaneous					0	0
Tires	Vehicle related not tires	2	14			(2)	(14)
Textiles	Inner tubes/retreads/rims/caps					0	0
Total	Miscellaneous					0	0
		3	28	1	43	(2)	(43)

*=() indicates the 2001 survey result is higher than 2013 result.

Site	Overall Totals	Comparisons	Potential Reason(s)
#10	Decrease of visual and sorted litter and weight in 2013 from 2001.	Increase of deposit container litter collected.	Potential decrease in general tobacco-related consumption. Increased populations and amount of traffic utilizing roadways.
		Decrease of tobacco-related litter.	
		Increase of 5,400 grams of collected litter weight due to increased amounts of beverage containers, cardboard, small pieces of plastic, demolition/construction materials, vehicle and tire related waste.	
#28	Decrease of visual and sorted litter and weight in 2013 from 2001.	Decrease of tobacco-related litter.	Potential decrease in general tobacco-related consumption. Increased populations and amount of traffic utilizing roadways.
		Slight increase of fast-food related litter.	
		Increase in paper-related waste.	
#32	Decrease of visual and sorted litter and weight in 2013 from 2001.	Decrease of tobacco-related litter.	Potential decrease in general tobacco-related consumption. Potential improvement of waste containment within the area.
		Largest categorical decrease in paper-related litter from 2001 to 2013.	
		Decrease in fast-food related litter despite presence of fast-food restaurants near the site.	
#43	Slight increase in amount of visual and sorted litter and collected litter weight in 2013 from 2001.	Slight decrease in tobacco-related litter.	Potential decrease in general tobacco-related consumption.
		Largest categorical increase was in candy/snacks packaging.	
#63	Decrease of visually observed litter and litter weight with slight increase of collected litter pieces in 2013 from 2001.	Increase in beverage containers and deposit containers.	Potential increase of area usage.
		Slight increase in tobacco-related litter.	
#65	Increase in visually observed and collected litter with litter weight decrease in 2013 from 2001.	Increase of collected pieces of broken glass containers with decrease in weight. May indicate smaller pieces were collected in 2013 vs. 2001.	Results largely unchanged from 2001 to 2013.
#86	Decrease in visually observed and collected litter in 2013 from 2001.	Decrease in tobacco-related litter collection.	Potential decrease in general tobacco-related consumption. Addition of a stop sign 1/4 mile south of site may reduce amount of vehicular waste. Park present may maintain candy packaging litter numbers.
		Decrease in vehicle-related litter.	
#92	Decrease in collected litter and litter weight with no change in visually observed litter in 2013 from 2001.	Decrease in tobacco-related litter collection.	Potential decrease in general tobacco-related consumption. Potential improvement of waste containment within the area. Entrapment area present may account for presence of containers, fast-food materials, and construction materials.
		Increase in deposit container litter.	
		Decrease in construction-related litter.	
#97	Slight increase of organic litter from 2001 to 2013.	Increase in small pieces of plastic collected	Increase in site dimensions may account for increase amount of collected litter.
#102	Decrease of visually observed and collected litter, and litter weight.	Decrease in tobacco-related litter collection.	Potential decrease in general tobacco-related consumption. Potential improvement of waste containment within the area.
		Decrease in amount of collected plastic packaging.	
#127	Slight increase in amount of visual and sorted litter and collected litter weight in 2013 from 2001.	One milk container contributed majority of collected litter weight to 2013 survey.	Potential decrease in general tobacco-related consumption.
		No tobacco-related litter was collected in 2001 or 2013.	
#130	Increase in visually observed and collected litter with litter weight 2013 from 2001.	Decrease in number of deposit containers collected in 2013 compared to 2001.	Increased grass height in 2001 may have inhibited litter search accuracy.
		Increase in amount of tobacco-related litter collected in 2013.	
#136	Decrease in visually observed and collected litter.	Deposit container collection remained largely unchanged from 2001 to 2013.	Increased grass height in 2001 may have inhibited litter visibility in 2001.
		No tobacco-related litter was collected in 2001 or 2013.	
#146	Decrease in visually observed and collected litter.	Slight increase of tobacco-related litter in 2013 survey.	Reduced vegetation height may have allowed litter to blow out of survey area.
		Decrease of plastic packaging litter in 2013 survey.	
#151	Slight increase in visually observed and collected litter with decrease in litter weight.	No tobacco-related litter was collected in 2001 or 2013.	Increased weight of litter may be contributed to liquid retention within the litter. Litter counts remain consistent in both 2001 and 2013.

TOTALS SUMMARY (All 15 Sites Collected in 2013)

Category	Sub Category	2013 Total Pieces	2013 Total Grams	2001 Total Pieces	2001 Total Grams	Difference in Total Pieces*	Difference in Total Grams*
Beverage Container	Beer	33	426	32	214.5	1	212
	Wine/Liquor	2	142	0	0	2	142
	Soda	27	381	21	311.6	6	69
	Juice	4	85	1	11.4	3	74
	Milk	5	266	1	15.5	4	251
	Sports drink	3	69	0	0	3	69
	Tea	1	39	1	27.8	0	11
	Water	14	90	1	16.4	13	74
	Vegetable/health	0	0	1	13.1	(1)	(13)
	Broken plastic beverage Container	14	58	0	0	14	58
Cup Related	Broken metal beverage Container	3	32	0	0	3	32
	Broken glass beverage Container	33	81	50	217.5	(17)	(137)
	Plastic Cups	41	70	42	89.4	(1)	(19)
	Polystyrene foam cups	79	75	48	18.7	31	56
	Paper	2	17	52	23.7	(50)	(7)
	Plastic lids	6	10	15	31.3	(9)	(21)
	Straws	6	4	18	8.3	(12)	(4)
	Plastic and Paper Bags	2	0	3	48.1	(1)	(48)
	Corrugated cardboard boxes	250	1539	3	5.8	247	1533
	Paperboard boxes	3	22	8	45.9	(5)	(24)
Containers/Boxes	Paper beverage casing	0	0	0	0	0	0
	Polystyrene foam clam shell	0	0	0	0	0	0
	Plastic clam shell	0	0	0	0	0	0
	Jars/bottles/boxes	0	0	0	0	0	0
	Non-beverage cans	0	0	0	0	0	0
	Aerosols/pump	0	0	2	246.1	(2)	(246)
	Lids	0	0	0	0	0	0
	Candy wrappers/snacks (paper or plastic)	212	165	92	25.6	120	139
	Plastic	1	0	58	90.4	(57)	(90)
	Paper	0	0	17	33.5	(17)	(34)
Packaging	Plastic/paper/foil/combo	0	0	101	33.4	(101)	(33)
	Foil	0	0	0	0	0	0
	Cigarette filters/butts	331	118	566	148	(235)	(30)
	Cigar filters/butts	1	1	0	0	1	1
	Packaging	30	38	81	50.1	(51)	(12)
	Dip/chew/snuff	0	0	0	0	0	0
	Condiment packages	12	6	16	3.4	(4)	3
	Utensils	8	22	2	5.2	6	17
	Straw related packaging plastic/paper	10	2	20	0.6	(10)	1
	Fast food wrappers/bags	20	162	17	79.97	3	82
Organics	Miscellaneous	10	60	2	38	8	22
Biological	Biohazardous/human waste	0	0	1	177.7	(1)	(178)
Medical	Medical supplies/veterinarian supplies	0	0	4	5	(4)	(5)
Other Plastic	Bottle lid/cap	12	26	4	11.4	8	15
	Plastic plate	0	0	0	0	0	0
	Stretch/shrink style industrial film	79	174	0	0	79	174
	Small pieces of undetermined source	76	1182	179	165.6	(103)	1016
	Foamed Packaging	57	73	153	186.9	(96)	(114)
	Other rubber not tires	0	0	2	0.9	(2)	(1)
	Metal/Foil/Aluminum Pieces	20	344	28	3024.5	(8)	(2681)
	Bottle caps/tabs	3	6	7	28.6	(4)	(23)
	Towel/napkin	3	7	47	10.3	(44)	(3)
	Lottery	0	0	15	2.9	(15)	(3)
Other Paper	Plate/tray	10	23	0	0	10	23
	Food wrap	0	0	0	0	0	0
	Small pieces of undetermined source	171	203	379	543.7	(208)	(341)
Demolition/Construction Related	Miscellaneous	99	3101	83	2658.7	16	442
Vehicle	Vehicle related not tires	20	878	95	241.1	(75)	637
Tires	Inner tubes/retreads/rims/caps	6	842	2	3.1	4	839
Textiles	Miscellaneous	18	685	6	496.6	12	188
Glass	Miscellaneous	76	628	159	991.53	(83)	(364)
Total		1813	12152	2435	10401.8	(622)	1750

*=() indicates the 2001 survey result is higher than 2013 result.