Final Report

GEORGIA 2006 VISIBLE LITTER SURVEY
A Baseline Survey of Roadside Litter

Conducted for:

Keep America Beautiful and
Georgia Department of Community Affairs

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January 2007

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R. W. BECK
GEORGIA 2006 VISIBLE LITTER SURVEY
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Georgia Department of Community Affairs

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This report has been prepared for the use of the client for the specific purposes identified in the report. The conclusions, observations and recommendations contained herein attributed to R. W. Beck, Inc. (R. W. Beck) constitute the opinions of R. W. Beck. To the extent that statements, information and opinions provided by the client or others have been used in the preparation of this report, R. W. Beck has relied upon the same to be accurate, and for which no assurances are intended and no representations or warranties are made. R. W. Beck makes no certification and gives no assurances except as explicitly set forth in this report.

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EXECUTIVE SUMMARY

In June 2006, the Georgia Department of Community Affairs and Keep America Beautiful (KAB) contracted with R.W. Beck, Inc. to conduct a statewide visible litter survey in the State of Georgia. This project was part of the State's Litter Initiative to develop a strategy to prevent and abate litter in the State, which included passage of the Comprehensive Litter Prevention and Abatement Act in June 2006.

The purpose of the Visual Litter Survey was to:

- Characterize the types of litter in Georgia;
- Estimate the quantity of litter state-wide overall and by locale type;
- Determine the most likely sources of this litter; and
- Recommend next steps to effectively prevent and abate litter given the type, extent, and likely sources of litter revealed in this survey.

The results of this survey will serve as a baseline for determining the impact of litter prevention and abatement activities in the coming years. The State and local governments will continue an ongoing assessment of litter in the State in the future to determine the success of public education, enforcement, and eradication measures.

To quantify litter, R.W. Beck, Inc. counted the number and type of litter items over one inch, at 96 sites throughout the State of Georgia. The sites were divided into eight different categories, based on roadway type, and were located in both urban and non-urban locales, on roadways, interstates, and in public areas. The data were then analyzed to determine the composition of litter, litter rates, littering trends, litter quantities, identification of problem areas, and comparisons of these data with other similar surveys where possible.

A total of 5,347 items of litter were counted on the edge (three feet inward) of roadsides in Georgia during this survey. When a wider area (typically 15 feet from the roadside) was sampled to determine the composition of the litter found, a total of 16,520 items were found. To measure the visual impact of litter, these data were analyzed to determine where people were most likely to see litter, a factor not only of how much litter was found in these locales but also the number of vehicles and pedestrians passing by and the speed at which they traveled. Taking this all into consideration, nearly 26.7 percent of the litter exposure in Georgia is likely to happen on urban freeways, as shown in Figure ES-1. This is a factor of the amount of litter in these locales (there were more litter items per mile in these locales than anywhere else) and a factor of the number of vehicles on these roads. Another 26.8 percent of the litter exposure in Georgia is likely to happen on residential roads. Even though the number of litter items per mile in these areas was low, people walking and traveling these roads are more likely to see the litter that is present in these areas because of the slow speed at which they are traveling. These results suggest there are multiple factors to consider when determining where litter is the most significant issue.

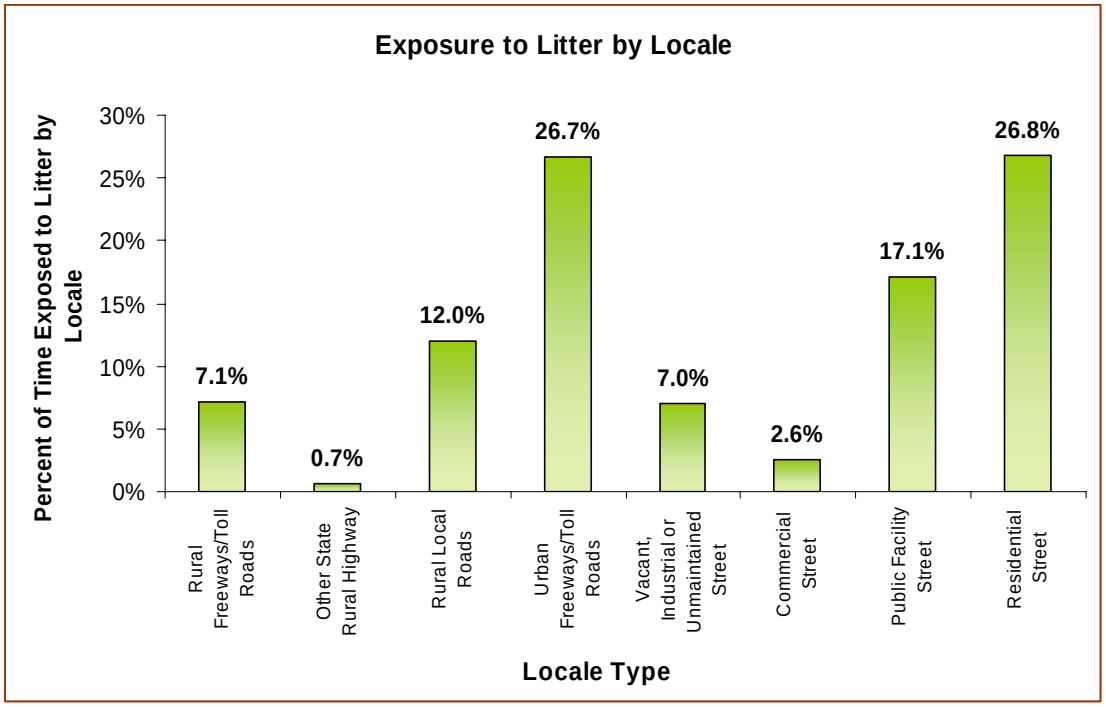


Figure ES-1

R.W. Beck also quantified the composition of litter found in the visual litter survey. Table ES-1 shows that miscellaneous plastic scraps comprised 22.3 percent of the items identified while miscellaneous paper scraps comprised 18.6 percent of the items found. Snack food packaging and vehicle debris and packaging were the third and fourth most abundant materials found, representing 9.4 percent and 9.1 percent of the litter identified in the visual litter survey. Vehicle packaging represents the wrappers and discarded materials from automobile parts and servicing materials that are purchased at car parts shops and other stores.

To determine the source of litter, each of these items were categorized as either deliberately littered (convenience-type products such as fast food and snack wrappers) or negligently littered (non-convenience products such as advertising circulars, vehicle debris and construction waste). Table ES-1 shows that negligent litter comprised 66.3 percent of litter in Georgia. Typical sources of negligent litter include construction sites, improperly maintained trash receptacles, recycling and trash vehicles, tire debris, untarped pickup trucks and remains of vehicle accidents.

Although deliberate litter was found to comprise only 33.7 percent, two of the major components were also significant portions of litter: fast food packaging (9.4 percent) and cups/lids/straws (6.7 percent). Beer and soft drink containers comprised 3.4 percent, while other beverage containers (juice, liquor, new age beverages, sports drinks, tea, water, wine, etc.) comprised 1.0 percent.

Table ES-1
Composition of Litter

Category	Percent
Beer and soft drink containers	3.40%
Juice, wine, liquor, water containers	1.00%
Bottle caps and seals	2.10%
Pull tabs	0.40%
Beverage carriers and cartons	0.30%
Cups, lids, straws	6.70%
Snack food packaging (candy, gum, etc.)	9.40%
Take-out food packaging	3.00%
Cigarette packs, lighters, matches	2.00%
Napkins, bags, tissues	4.60%
Toiletries, toys, drugs	0.80%
Deliberate	33.70%
Newspapers, magazines, books	1.10%
Advertising signs and cards	0.60%
Home food packaging (TV dinners, etc.)	0.10%
Vehicle debris and packaging	9.10%
Construction and demolition debris	1.30%
Miscellaneous paper	18.60%
Miscellaneous plastic	22.30%
Miscellaneous metal and foil	8.20%
Miscellaneous glass and ceramics	1.50%
Wood and yard debris	1.70%
Other (carpet, fabric)	1.70%
Negligent	66.30%
Total	100.00%

Some of the other major findings of the Visual Litter Survey were:

- Overall, urban and rural freeways were most littered of all roadway types, due, in no small part, to the high traffic levels. The high levels of negligent litter found on these particular roadway types suggests that improperly covered trucks may be a primary source of litter on these roadways. The rate at which vehicles travel on such roads impacts litter rates as well, since materials will tend to fly out of improperly covered vehicles at higher speeds.

- Mowed areas were generally more littered than non-mowed areas, suggesting that crews may consider cleaning an area before mowing. Failure to do so only aggravates the littering problem.
- Cigarette butts were not included in the base litter study because they did not meet the size threshold. However to understand their impact on litter, a separate count was performed in a small portion of each site. This sub-sorted count of cigarette butts yielded an estimate of 42,912 cigarette butts, more than eight times the amount of all other litter counted on roadway edges.
- Field staff also scored each site using Keep America Beautiful's Litter Index. The 96 sites surveyed in Georgia averaged a 2.8 rating overall.[1]

[1] KAB has developed an approach to litter measurement known as a Litter Index. This approach focuses on a visual assessment of the community by selecting appropriate sites to be assessed, taking photographs of the sites and finally, scoring the sites using a four-point scale: 1 = "No Litter", 2 = "Slightly Littered", 3 = "Littered", 4 = "Extremely Littered"

Section 1
INTRODUCTION

1.1 Background

In 2006 the Georgia General Assembly passed the Comprehensive Litter Prevention and Abatement Act. The Act improves the ability of law enforcement to punish litter offenders; clarifies complicated statutes related to litter; and stresses personal responsibility as an overarching principle. In the same year, Governor Sonny Perdue unveiled Georgia's new statewide anti-litter campaign aimed at encouraging a comprehensive approach to addressing litter problems in Georgia. Focusing on education and eradication, as well as enforcement, the litter campaign seeks to leverage the resources of state agencies, city and county governments, and volunteer organizations to engage the public and effect change. More information and resources about the State of Georgia's Litter Campaign can be found at www.litteritcostsyou.org.

1.2 What is Litter

Litter has been defined as solid waste discarded in the wrong place. The State of Georgia statutes define litter as any discarded or abandoned refuse, rubbish, junk, or other waste material or dead animals that are not subject to the other provisions of the Georgia Code. The Georgia Litter Act defines a new category of litter, referred to as "egregious litter", as litter that exceeds 10 pounds in weight or 15 cubic feet in volume; any amount of biomedical waste, hazardous waste or substance; any amount dumped for commercial purposes (16-7-51(4)). The penalties for egregious litter are more severe.

For the purposes of this survey methodology, any grass, weeds, ashes, sand, slag, gravel, brickbats and dead animals observed would not have been evaluated as litter. As it turns out, an insignificant amount of these materials was noted during the field survey conducted in July 2006.

1.3 Why Litter is an Issue

Litter has many negative impacts on quality of life in the State of Georgia. It impacts our environment by destroying the state's natural beauty, harming or killing wildlife, and diminishing water quality which leads to increased costs to treat it for public consumption. It impacts our economy. The Georgia Department of Transportation spent $14 million to clean up roadsides in Georgia in 2005. When local clean-up costs and the costs to other state agencies are added to this, the costs are likely to be well over $20 million per year. Litter also has a negative impact on the economy by hindering efforts to attract visitors and prospective new businesses to communities.

Preventing and abating litter will have positive impacts on the State's economy, environment, and quality of life. This litter assessment provides a baseline from which to measure progress toward these goals.

1.4 Purpose of Litter Assessment

In an effort to measure the changes resulting from implementation of the Comprehensive Litter Prevention and Abatement Act and the Georgia Litter Campaign, the State of Georgia undertook a statewide litter assessment to quantify the degree of litter in the State. Local governments, and specifically Keep Georgia Beautiful affiliates, have conducted litter assessments on a local scale for many years but a characterization of litter statewide was needed. The only data found regarding litter statewide was from a joint study of highway litter in Georgia, conducted in 1971, by Georgia DOT and the Federal Highway Administration (FHA).[2]

In addition to providing a baseline from which to measure progress, this statewide litter assessment was designed to identify the locations and sources of litter so that future education, enforcement, and eradication programs could be more specifically targeted to problem areas. Thus, the purpose of this litter survey is to:

- Characterize the types of litter in Georgia;
- Estimate the quantity of litter state-wide overall and by locale type;
- Determine the most likely sources of this litter; and
- Recommend next steps to effectively prevent and abate litter based on these results.

The State and local governments will continue to assess litter in the State in the coming years to determine the success of public education, enforcement, and eradication measures.

[2] Report to Congress prepared by the Staff of The Federal Highway Administration; *1974 Highway Litter Study*; U.S. Department of Transportation; Washington, D.C.; Page 19.

Section 2
METHODOLOGY

2.1 Site Selection

R.W. Beck, Inc. selected 96 sites throughout the State of Georgia at which to conduct a visible statewide litter survey. These sites were selected in a manner that provides a statistically credible picture of litter characterization and quantification throughout the State, as well as meaningful regional data that can be used in an on-line litter assessment tool that was also developed for the State of Georgia. All roadways within the State of Georgia were categorized into one of eight possible locales, each having unique characteristics. The roadway locales, acronyms used in this report and description of the road type are listed in Table 2-1.

Table 2-1
Roadway Locale

Roadway Type	Acronym	Description
Rural Freeways and Toll Roads	RFT	Interstate highways, non-interstate toll roads and limited access highways located outside of urban areas.
Other State Rural Highways	OSR	U.S. and State highways located outside of urban areas without limited access.
Rural Local Roads	RLR	Public roads outside of an urban area that are locally maintained (e.g. city, county)
Urban Freeways and Toll Roads	UFT	Interstate Highways, non-interstate toll roads and limited access highways located within an urban area.
Vacant, Industrial or Un-maintained Street Frontages	VIU	The edge of an urban street in front of a vacant lot, industrial site or a lot with a building and or landscaping which is not maintained.
Commercial Street Frontage	COM	The edge of an urban street in front of a business such as stores, restaurants and shopping centers.
Public Facility Street Frontage	PUB	The edge of an urban street in front of a government or quasi-public use building such as a courthouse, park, school or public library.
Residential Street Frontage	RES	The edge of an urban street in front of homes on neighborhood streets.

To select sites, R.W. Beck, Inc. utilized maps and demographic and topographic data, such as county population and mileage for each roadway type. These data allowed the identification of appropriate sites for conducting the litter survey. The number of sites

selected within each locale type is shown in Table 2-2 below. A list of the sites surveyed is included as Appendix A.

Table 2-2
Number of Sites by Locale

Locale	Sites Selected
Rural Freeways and Toll Roads	10
Other State Rural Highways	10
Rural Local Roads	10
Urban Freeways and Toll Roads	12
Vacant, Industrial or Unmaintained Street Frontages	10
Commercial Street Frontage	11
Public Facility Street Frontage	14
Residential Street Frontage	19

2.2 Field Survey

Once the site selection process was completed, litter was counted by two teams for one week in July 2006. One team operated in the northern half of the State and the other in the southern half. Field staff was trained by R.W. Beck staff experienced in conducting surveys using this methodology. Each team recorded the *number* of items found along the roadside. Since the impact of litter is primarily visual, quantifying the number of visible items yields a more accurate index of the visual impact of litter than weighing or measuring it.

Field staff first walked along the edge of the street or roadway, three feet inward from the edge of the road, counting the total number of items visible to the eye (those larger than 1 square inch in surface area). The observer walked a predetermined distance (usually 500 feet) using this “edge count” method. On the way back, the same observer performed a “meander count” and methodically meandered back and forth tallying all of the visible litter within about 15 feet of the roadside, categorizing each piece of litter into one of the categories listed in Table 2-3. The field team took photographs of the litter observed at each site to fully document this process. Separate counts were made by the other member of the team of the total vehicles and number of occupants and number of pedestrians. Recent weather conditions and other factors that may influence the litter at that particular site were documented to consider in the data analysis.

Table 2-3
Litter Composition Categories

Beer and soft drink containers
Other beverage containers (juice, wine, liquor, water, tea, new age beverages)
Beverage cartons, 6-ring carriers, labels
Bottle caps and seals
Cups, lids, straws and wrappers
Napkins, tissues, small paper bags, etc.
Pull tabs
Snack wrappers (candy, gum, snacks)
Take-out food packaging (fast food and convenience food bags and boxes)
Toiletries, drugs, clothing, toys, lottery tickets
Newspapers, magazines, books
Advertising leaflets, signs, cards
Home-prepared food packaging, food remnants, large juice and milk containers
Vehicle parts, debris and packaging
Construction and demolition debris, sawn wood, cable, rope
Yard trimmings, wood scraps, furniture
Miscellaneous paper
Miscellaneous plastic
Miscellaneous metal, foil and appliances
Miscellaneous glass and ceramic
Other Unclassified (unidentifiable fabric, etc.)

In addition to the edge and meander count for items larger than one inch, a sub-sort of cigarette butts was conducted as a part of this litter survey. For each site surveyed, the 3’ x 10’ area at the starting point of each of the 96 sites was set aside for this sub-sort. Cigarette butts were counted in this area and noted. The amount counted was extrapolated to the length of the survey site.

Finally, while gathering data for the visual litter survey, field staff followed KAB’s Litter Index approach and scored the same sites where the visual litter survey was conducted. The field staff assigned each of the 96 sites a score of 1 to 4 based on the methodology used for the Litter Index. These data were collected to allow for a comparison and correlation of the results gathered using the visual litter survey with those collected using KAB’s Litter Index.

2.3 Data Analysis and Reporting

After the physical sampling of litter was completed, Beck began the data analysis process. Analysis was done to convert the number of litter items found to a measure of litter rates, or the number of litter items per mile. The exposure to litter in each locale

was also calculated based on the number of motorists and pedestrians, the average speed, and other factors. The composition of litter was analyzed by locale type and an assessment of the contribution of deliberate and negligent litter was made based on the composition of the litter. In the analysis, the results were compared to data from similar surveys where possible. Many of these prior surveys were conducted by members of the R.W. Beck, Inc. project team.

3.1 Litter Rates and Exposure

A total of 5,347 items of litter were counted on the edge of roadsides at 96 sites in Georgia during this survey. The meandering count yielded a total of 16,520 pieces of litter. The number of litter items counted was converted to a "litter rate" or the amount of litter found along a mile of roadway. The visible litter items per mile presented in Figure 4-1 are a measure of how much litter has built up over a period of time in each type of locale. Locales vary in the rate that litter is picked up, washed away, decomposed or buried. For example, the street in front of a courthouse is generally cleaned more often than a site on a rural local road.

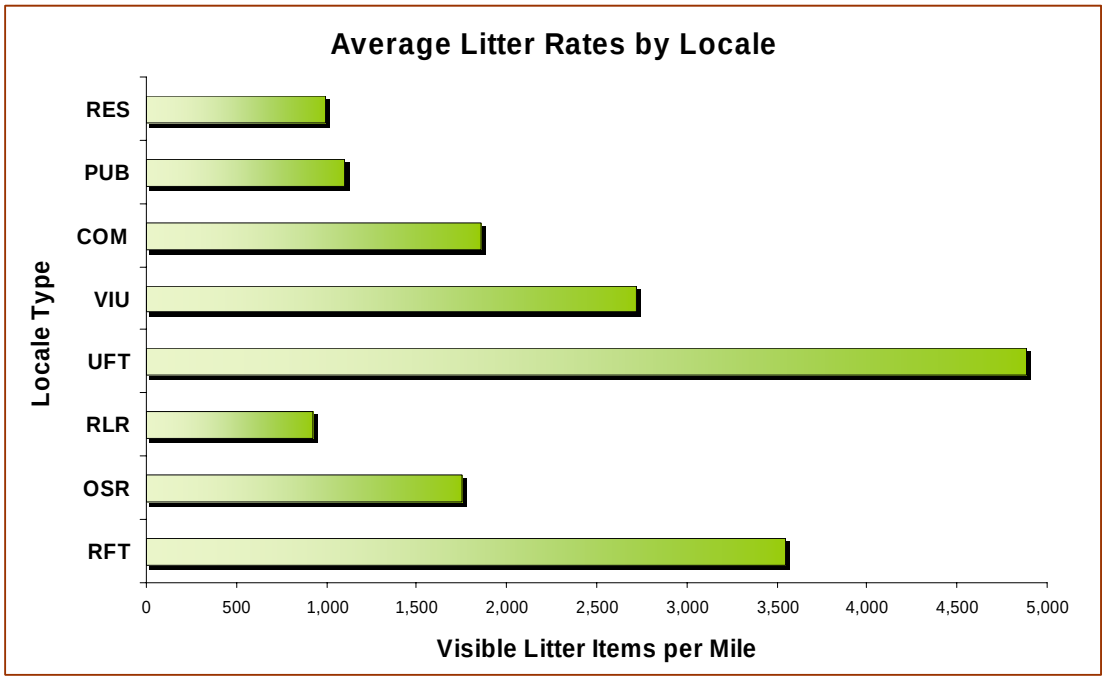


Figure 3-1

Figure 3-1 indicates that urban freeways (UFTs) have the highest number of visible litter items per mile, with an average of over 5,000. Rural freeways (RFTs) and vacant, industrial, and unmaintained street frontages (VIUs) have the second highest amount of visible litter items, with an average of over 3,500 and slightly less than 3,000 per mile, respectively. Residential streets (RES), rural local roads (RLR), and streets in front of public facilities were the least littered locales, all having close to 1,000 visible litter items per mile.

One way to establish priorities for litter reduction efforts is to consider where motorists and pedestrians are most likely to be exposed to litter. This is a factor of both the amount of litter and the likelihood of someone seeing it. Determining the potential for exposure to litter was calculated by taking roadway miles, vehicle and pedestrian daily traffic, and estimated traveling speeds into consideration. As shown in Figure 3-2, about 53.5 percent of all exposure to Georgia litter occurs on urban highways (UFT) and along residential streets (RES), while much less exposure occurs along commercial streets (COM) and other state rural highways (OSR). While the litter rate (or items found per mile) in residential areas is low compared to other locales, the exposure is higher due to the fact that pedestrian traffic moves much slower than vehicular traffic, thus increasing the likelihood that someone sees the litter.

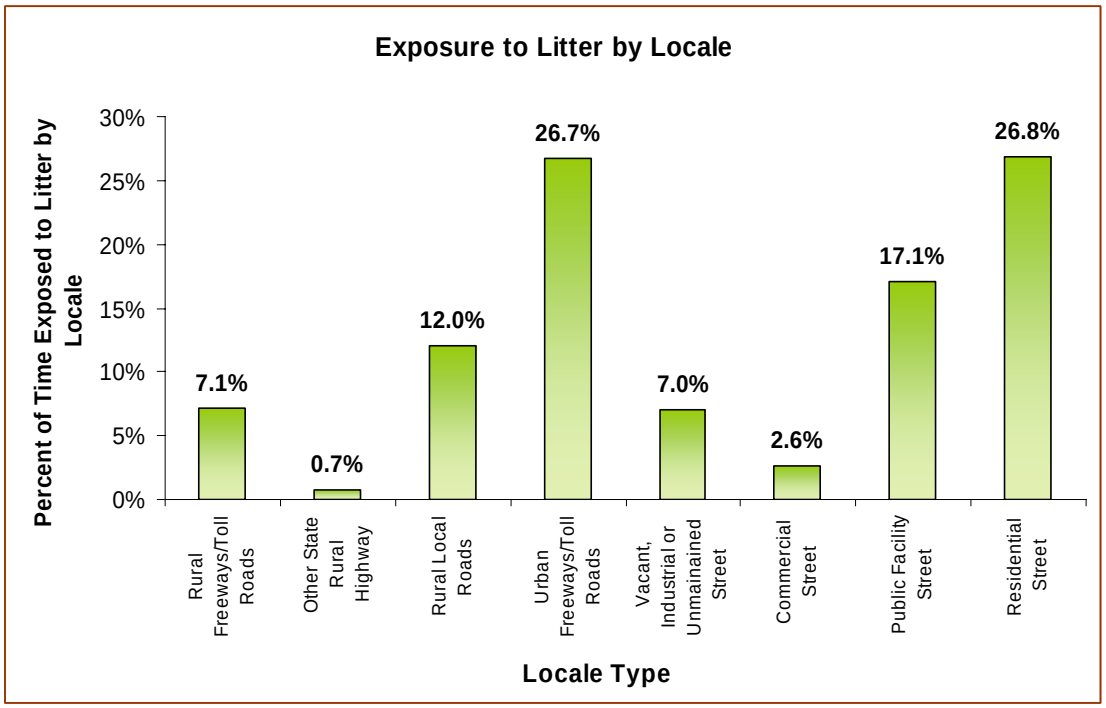


Figure 3-2

3.1.1 Impact of the Adopt-A-Highway Program

The data gathered for this study were analyzed to determine whether there was a difference in visible litter along roads that are part of the Georgia Department of Transportation's (DOT's) Adopt-A-Highway Program. The first Adopt-A-Highway program in the U.S. began in 1985 in Tyler Texas, when a local Civitan club adopted a part of Texas State Highway 69. That program moved to Georgia in 1989, where 18,000 miles of state highways are maintained by Georgia DOT. Georgia DOT reports that 712 Adopt-A-Highway groups are registered with the state. The current number of registered groups has dropped from a peak of more than 2,000. Out of those registered, 257 reported that they had conducted at least one pickup in FY 2006, although four

annual pickups are requested. The groups that reported data to DOT constituted cleanups along 221 miles of state and federal roadways in Georgia. According to the Georgia Department of Transportation, 9,496 bags of litter and debris were collected during clean-ups conducted in fiscal year 2006. This amount would be in addition to any collections conducted by groups that did not report to DOT.

Of the total 96 sites sampled in the Georgia 2006 litter survey, only four had signs noting that they were active Adopt-a-Highway sites. Three of the four were categorized as commercial streets (COM), while the remaining site was an "other state road" (OSR) locale. The visible litter items per mile in the sites that had signage indicating that they were part of the Adopt-A-Highway program was lower than in the sites that were not part of the Adopt-A-Highway program. This was especially notable for the three commercial sites, as shown in Figure 3-3. However, given only one OSR site had signage indicating it was an Adopt-A-Highway site and the number of items per mile, though lower, did not differ dramatically from the other OSR sites, it is difficult to draw a conclusion about the impact of Adopt-A-Highway in these locales.

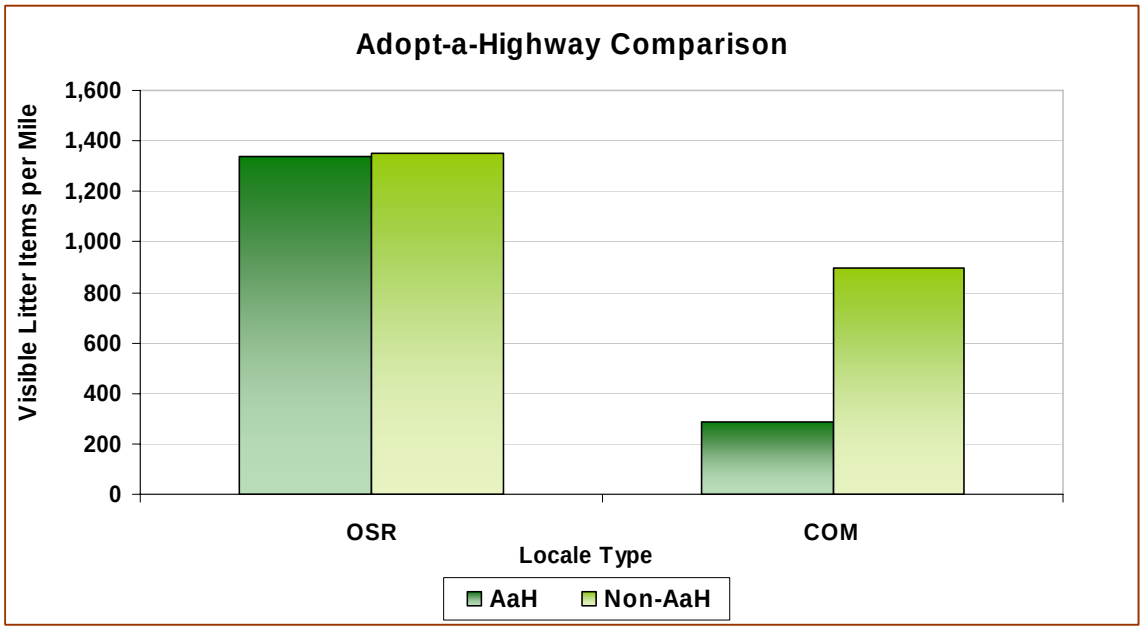


Figure 3-3

3.1.2 Impact of Mowing

The field survey team noted on every site whether the sample area had been recently mowed. Of the 96 total sites, 53 were recently mowed, while 43 had not been. The average items per mile for mowed sites was 3,608 while the average items per mile for non-mowed sites was 1,713, as shown in Figure 3-4. This significant increase in the amount of litter surveyed on mowed sites can best be attributed to two factors. The first being that mowing shreds litter that is on the ground, resulting in one item becoming multiple items. Secondly, when littered sites are mowed, litter is easier to

see and thus more accurately recorded. Most visible litter studies (North Carolina being the exception) show that mowed sites tend to have higher litter rates. Georgia DOT can reduce the amount of litter on mowed sites by ensuring that accumulated litter is cleaned from a site before mowing begins. If sites are not cleaned up before mowing, the litter problem can be greatly exacerbated.

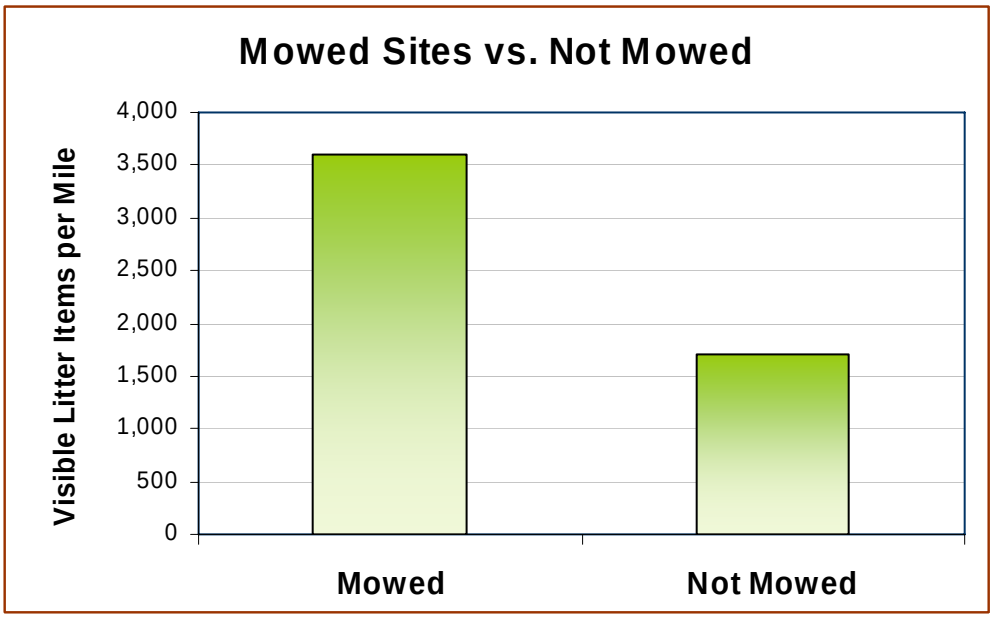


Figure 3-4

3.2 Composition of Litter

Table 3-1 shows the composition of the litter found in the Georgia survey in order of frequency. Miscellaneous plastic and miscellaneous paper combined comprised over 40 percent of the total number of litter items found. Snack food packaging and vehicle debris and packaging each comprised over 9 percent of the items found.

Table 3-1
Composition of Litter

Category	Percent
Miscellaneous plastic	22.30%
Miscellaneous paper	18.60%
Snack food packaging (candy, gum, etc.)	9.40%
Vehicle debris and packaging	9.10%
Miscellaneous metal and foil	8.20%
Cups, lids, straws	6.70%
Napkins, bags, tissues	4.60%
Beer and soft drink containers	3.40%

Category	Percent
Take-out food packaging	3.00%
Bottle caps and seals	2.10%
Cigarette packs, lighters, matches	2.00%
Wood and yard debris	1.70%
Other (carpet, fabric)	1.70%
Miscellaneous glass and ceramics	1.50%
Construction and demolition debris	1.30%
Newspapers, magazines, books	1.10%
Juice, wine, liquor, water containers	1.00%
Toiletries, toys, drugs	0.80%
Advertising signs and cards	0.60%
Pull tabs	0.40%
Beverage carriers and cartons	0.30%
Home food packaging (TV dinners, etc.)	0.10%
Total	100.00%

Table 3-2 shows the number of litter items found for certain material types by locale. The number of items categorized as miscellaneous plastic, the most commonly found item, was much higher on urban freeways (UFT) than in any other locale. Miscellaneous paper was most commonly found on locally maintained state roads (OSR) as were beverage containers. Vehicle debris and packaging were more commonly found on urban freeways (UFT) and rarely found on the rural local roads surveyed. These data suggest possible targets for public education, enforcement, and eradication efforts depending on the locale type.

Table 3-2
Number of Items by Locale

	RFT	OSR	RLR	UFT	VIU	COM	RES
Misc. Plastics	539	595	220	911	289	241	263
Misc. Paper.	136	566	237	141	111	265	160
Snack Food Packaging	234	249	100	284	85	175	157
Vehicle Debris and Packaging	158	136	5	847	48	80	19
Metal and Foil Packets	137	256	112	234	154	171	96
Cups, Lids, and Straws	145	207	119	280	61	79	113
Napkins, Bags, Tissues	126	142	48	205	59	47	54
Beverage Containers	176	435	242	153	99	30	89
Take-Out Food Packaging	68	131	41	121	44	53	49
Tobacco Related*	43	91	41	69	40	16	30

* Does not include cigarette butts.

3.2.1 Cigarette Butts

As the minimum size of litter counted is typically one inch, cigarette packages and wrappers, packs of matches and lighters were included in this visual litter survey. However, cigarette butts typically are less than one square inch and have thus been excluded from surveys using this methodology. To understand the impact of cigarette butts as a source of litter in Georgia, a subcount of cigarette butts was done at each site as part of this study.

A total of 5,347 items of litter were counted on the edge of roadsides in Georgia during this survey. The extrapolation for the count of cigarette butts yielded an estimate of 42,912 cigarette butts, more than eight times the amount of all other litter items combined on roadway edges. This may be due in part to the fact that when area cleanups are conducted, normally larger litter items are collected, while smaller items, such as cigarette butts, may be bypassed. Thus, the count of cigarette butts may, to some extent, represent fresh and accumulated litter, while other items would tend to reflect predominantly fresh litter. Additionally, the methodology used for this survey does not count items that are less than one inch in length, thus this comparison has limitations. Still, it was noted that most items less than one inch in length were cigarette butts. Other smaller scraps (mostly paper and plastic) were flat and thus less noticeable.

The large proportion of cigarette butts is consistent with other studies. Clean Virginia Waterways estimates that several trillion cigarette butts are littered worldwide annually, typically flicked onto roadways, recreational areas and in front of public facilities. Since cigarette butts are made of cellulose acetate rather than simple paper, they do not readily degrade. Littered butts can be the cause of fires and can travel through storm drains into waterways.[3]

3.2.2 Beverage Containers and Packaging

Beverage containers and packaging includes all beverage containers, six-pack rings, six- and twelve-pack fiber carriers, caps and any wrappers. All beverage-related packaging totaled 7.2 percent, while beverage containers themselves constituted 4.4 percent, which is one of the lowest figures in recent surveys as a percentage of total litter. Beer and soft drink containers themselves constitute 3.4 percent overall, while juice, wine, liquor and other containers constitute 1.0 percent for a total of 4.4 percent.

Except for the state of California, beer and soft drink containers were the lowest of any of the VLS studies conducted in the U.S. between 1990 and 2006. These numbers were surprisingly low given that beer sales have continued to be consistently higher in the South than in any other region of the U.S. (Beverage Marketing Corp.) and that this survey was conducted in July, the height of summer beer sales.[4]

Other beverage containers, which include juice, wine, liquor, water, tea, sports drinks and asceptic packaging, were also some of the lowest recorded levels in recent

[3] Clean Virginia Waterways website, http://www.longwood.edu/cleanva/index.htm
[4] Beverage Marketing Corp., 2006 Beer in the U.S., September 2006.

surveys. These numbers were also considered unusually low given the hot weather experienced during the summer of 2006 and the recent growth in use of bottled water, teas and new age beverages.

3.3 Deliberate and Negligent Litter

One of the most important implications of the composition data in Georgia is that the composition of the litter suggests the source of litter and therefore, which approaches to prevent and abate litter may have the most significant impact on litter rates. Each category of litter, identified and quantified in Table 3-1, was either categorized as *deliberate* litter (materials that are intentionally dropped, thrown or otherwise misplaced), or *negligent* litter (materials that fall, blow, or are otherwise misplaced through negligence such as failing to properly secure loads, improper maintenance of trash receptacles, etc.). Snack wrappers, take-out food packaging and beverage-related litter have historically been linked to deliberate littering. Items such as newspapers, fliers, construction debris and miscellaneous scraps have been categorized as negligent litter as observations have shown that such materials are more likely to originate from the back of a vehicle or from wind-blown materials. Some of the most common sources of negligent litter are:

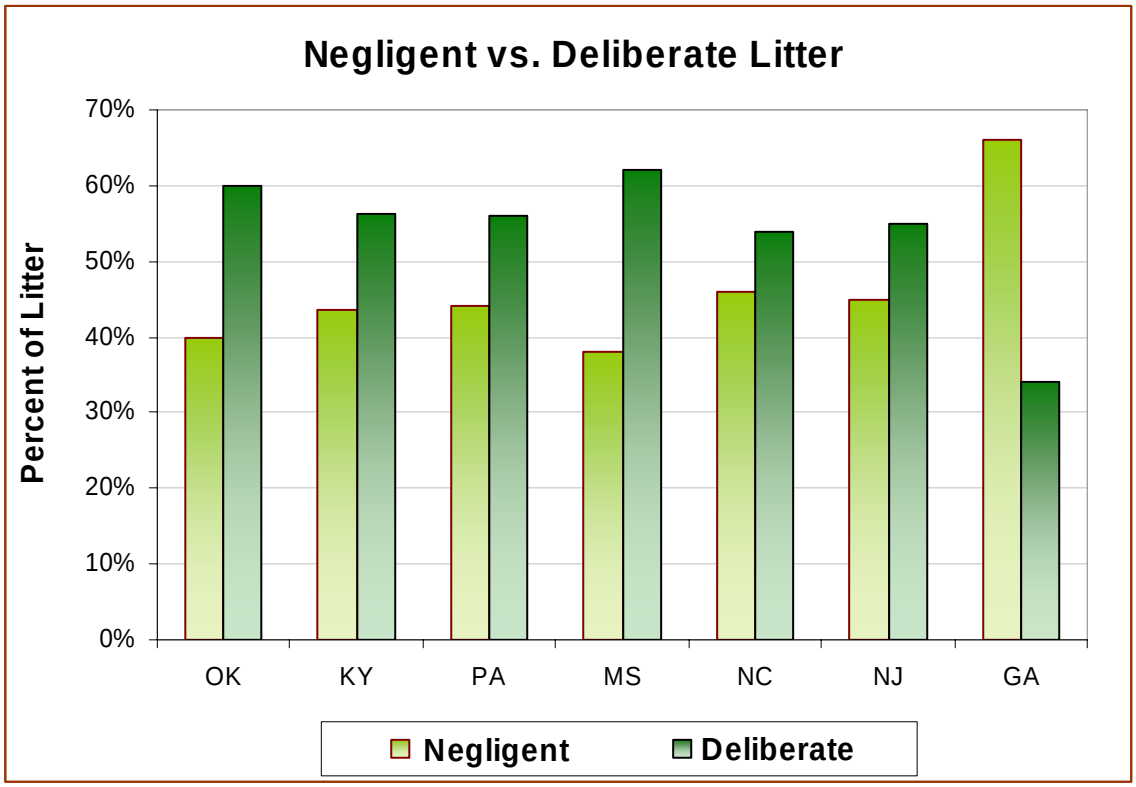
- Construction sites;
- Improperly maintained trash receptacles;
- Recycling and garbage trucks;
- Tire blowouts;
- Untarped pickups; and
- Vehicular damage.

Free newspapers (those delivered to homes that have not requested them) and advertising fliers can constitute a special category of negligent litter known as “instant litter.” Such items, when winds pick up, can end up as litter on roadways or in private areas as well. After exposure to rain and sun, fliers in particular can become difficult to identify and yet remain for months before breaking down completely.

Based on these definitions and assignments of material categories to deliberate or negligent litter, as shown in Table 3-3, nearly two-thirds of all the litter quantified in this visual litter survey was negligent litter. Figure 3-5 shows that negligent litter in Georgia is a significantly larger portion of the total litter than in other states where similar visual litter surveys were conducted. The studies in Figure 3-5 are shown in the order in which they were performed. Aside from the results in Mississippi, Figure 3-5 indicates that more recent studies show a higher proportion of materials that suggest negligent versus active littering. The results from Georgia, the most recent visual litter survey conducted, are consistent with this trend.

Table 3-3
Deliberate and Negligent Litter

Category	Percent
Beer and soft drink containers	3.40%
Juice, wine, liquor, water containers	1.00%
Bottle caps and seals	2.10%
Pull tabs	0.40%
Beverage carriers and cartons	0.30%
Cups, lids, straws	6.70%
Snack food packaging (candy, gum, etc.)	9.40%
Take-out food packaging	3.00%
Cigarette packs, lighters, matches	2.00%
Napkins, bags, tissues	4.60%
Toiletries, toys, drugs	0.80%
Deliberate	33.70%
Newspapers, magazines, books	1.10%
Advertising signs and cards	0.60%
Home food packaging (TV dinners, etc.)	0.10%
Vehicle debris and packaging	9.10%
Construction and demolition debris	1.30%
Miscellaneous paper	18.60%
Miscellaneous plastic	22.30%
Miscellaneous metal and foil	8.20%
Miscellaneous glass and ceramics	1.50%
Wood and yard debris	1.70%
Other (carpet, fabric)	1.70%
Negligent	66.30%
Total	100.00%



Waterman Environmental, Visible Litter in Oklahoma, 1998 Update.
Pennsylvania State University/Institute for Applied Research/Waterman Environmental, *Understanding Litter in Pennsylvania,* 1999.
Waterman Environmental/Institute for Applied Research, *Litter in Kentucky: 1998 Analysis*.
Gershman, Brickner & Bratton, *Mississippi Litter,* 2000.
Gershman, Brickner & Bratton, *North Carolina Litter Survey,* 2001.
Gershman, Brickner & Bratton, *New Jersey Litter Survey,* 2004.

Figure 3-5

3.4 Profile of a Litterer

In past litter surveys, persons observed in the act of littering were found to be predominantly young males. This is consistent with a comprehensive survey conducted by Responsive Management (RM) of Harrisonburg, VA.,[5] concurrently with Beck's litter survey. The RM survey researched littering opinions and practices utilizing phone surveys and focus groups and, using stepwise regression, also determined that young males (18-30) were clearly the most likely to litter.

The litter product composition data for the State of Georgia was analyzed along with the age group distribution for the historical distribution of the same categories of litter. The totals for negligent and deliberate littering were calculated as a weighted average using the visible items per mile rate for each product. Figure 3-6 shows the target age groups likely to be the most persistent litterers in Georgia.

[5] Mark Duda, *Georgia Residents' Opinions on Litter and Anti-Littering Programs in Georgia,* Responsive Management, 2006.

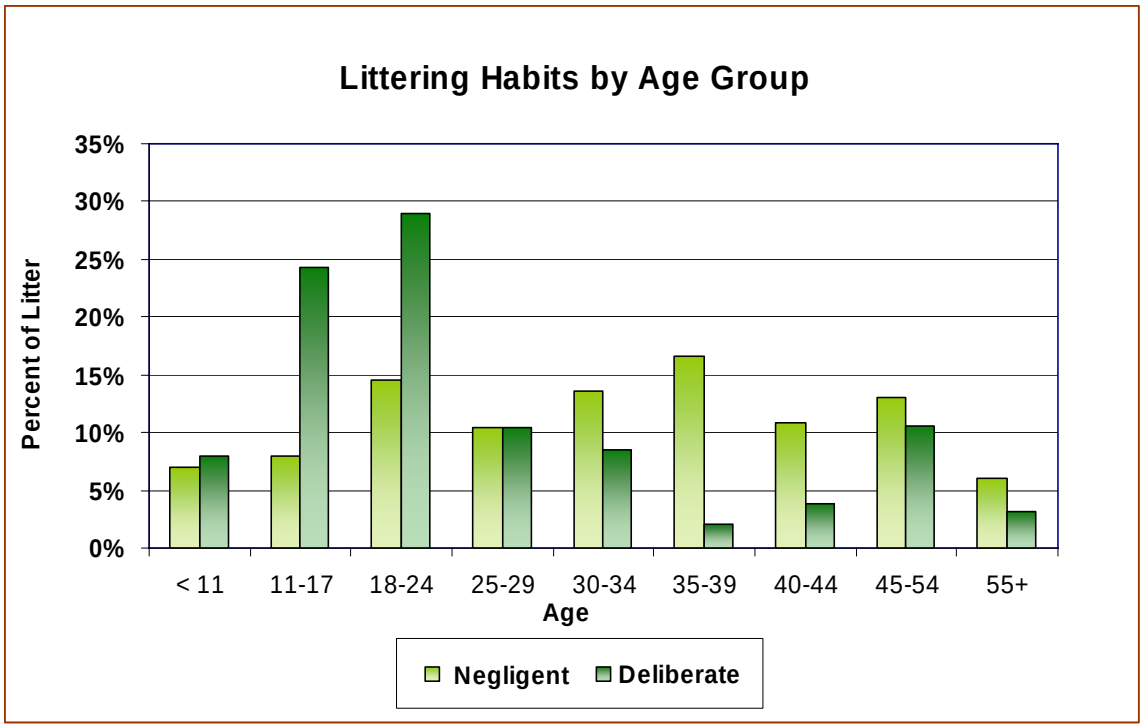


Figure 3-6

The data suggests that while the most persistent deliberate litterers tend to be between 11 and 24 years old, the negligent litterers are more evenly spread with the highest percentage showing for persons between 35 and 39 years old. This correlates with the notion that certain types of littering span all age groups.

These results also suggest that more focus should be given to urban litter since exposure to litter will be greater in urban areas than in rural areas. In addition, since the age profiles differ for deliberate and negligent litter, multiple messages will be more effective than one single anti-littering message.

3.5 Regional Variation

In order to understand the regional variation in the amount and type of litter rates, results from the northern portion of the State were compared to those in the south. Many sites in the northern half of the State were in the metro Atlanta area while those in the south tended to be more rural. Table 3-4 shows that, while the percentage of deliberate and negligent litter were very similar for both areas of the State, vehicle debris was much more prevalent in the southern portion of the State. Two sites in particular had an unusually high count of this category. Even if the vehicle debris for these two sites was reduced to nominal rates, the resulting calculations would show 17.9 percent of the litter in the southern region was attributable to vehicle debris, still much higher than sites surveyed in the northern region. Snack food packaging was more prevalent in the north, likely due in part to the higher population density and thus a higher abundance of convenience stores selling such products

Table 3-4
Regional Variation in Composition and Source of Litter

Categories	South	North
Beer & Soft Drink Containers	3.7%	3.4%
Juice, Wine, Liquor, Water Containers	1.1%	1.0%
Bottle Caps & Seals	2.5%	2.0%
Pull Tabs	0.7%	0.3%
Beverage Carriers & Cartons	0.2%	0.3%
Cups, Lids, Straws	7.0%	6.4%
Snack Food Packaging (Candy, Gum, etc.)	6.7%	10.7%
Take-out Food Packaging	3.7%	2.7%
Cigarette Packs, Lighters, Matches	1.7%	2.2%
Napkins, Bags, Tissues	3.8%	5.1%
Toiletries, Toys, Drugs	0.6%	0.7%
Deliberate	31.7%	34.8%
Newspapers, Magazines, Books	0.6%	1.3%
Advertising Signs & Cards	0.2%	0.8%
Home Food Packaging (TV Dinners, etc.)	0.0%	0.2%
Vehicle Debris & Packaging	24.0%	2.5%
Construction & Demolition Debris	1.8%	1.1%
Misc. Paper	12.5%	21.6%
Misc. Plastic	22.2%	21.4%
Misc. Metal & Foil	4.3%	10.5%
Misc. Glass & Ceramics	1.1%	1.7%
Wood & Yard Debris	0.4%	2.3%
Other (Carpet, Fabric)	1.2%	1.9%
Negligent	68.3%	65.2%
Total	100.0%	100.0%

More “other” paper was found in the northern region than in the southern region of the State. It is possible that the higher amount of paper was due to more trash and recycling truck traffic in the north. The reason for this should be examined further through the mapping of trash and recycling truck routes and observation of these vehicles in order to further clarify this issue. Table 3-5 is a summary of the categories of materials noted during the 2006 litter survey in the two regions.

Table 3-5
Summary of Regional Variation in Composition and Source of Litter

Category	North	South
Snack/Take Out	24.9%	21.2%
Other Plastic	21.4%	22.2%
Other Paper	23.7%	13.3%
Vehicle Related	2.5%	24.0%
Misc. Metal	10.5%	4.3%
Beverage Related	7.0%	8.2%
Other	2.8%	1.8%
Tobacco	2.2%	1.7%
Wood/Yard	2.3%	0.4%
Misc. Glass	1.7%	1.1%
Construction	1.1%	1.8%
Total	100.0%	100.0%

Section 4
CORRELATION TO KAB'S LITTER INDEX

4.1 Keep America Beautiful's Litter Index

Keep America Beautiful (KAB) is a national non-profit educational organization organized in 1953 as a vehicle to engage businesses and individuals to jointly improve their community roadways and landscapes. For more than 50 years, KAB has been the nation's leading advocate for community improvement through litter prevention strategies and beautification. KAB's network involves more than 565 town, city, and county affiliates and 22 statewide programs, representing more than 15,000 communities. Georgia has been an early supporter of KAB. Georgia Clean and Beautiful (now Keep Georgia Beautiful) became the first Keep America Beautiful statewide program in the U.S. Georgia now has sixty-four active county-level affiliates; forty-five of which have been active for more than ten years. Twenty-seven of the 54 counties with sites included in this litter survey have active KAB programs. Many of these programs have been in place for quite some time. For example, programs have been running in Bibb, Fulton and Dekalb counties for 32, 30 and 27 years respectively. Keep Tift Beautiful has been a KAB affiliate since 1973.

KAB has developed an approach to litter measurement known as a Litter Index. This approach focuses on a visual assessment of the community by selecting appropriate sites, identifying areas and then sub-areas to be indexed, taking photographs of the sites and finally, scoring the sites using a four-point scale:

1. "No Litter"
2. "Slightly Littered"
3. "Littered"
4. "Extremely Littered"

The same sites are to be evaluated each year using a team of at least three people. Each scorer independently ranks the site. In case of uncertainty, broadening the scale to include a .5 measurement has been acceptable. Notation of graffiti, broken windows or other unsightly conditions is encouraged.

While gathering data for the visual litter survey, field staff followed KAB's Litter Index approach and scored the same sites where the visual litter survey was conducted. Almost one-third of the sites surveyed were scored as 2.0, with an overall average of 2.8 for all 96 sites (Figure 4-1). Although the sites were evaluated based on a visual assessment of the site itself, two photographs were taken at each site for verification purposes.

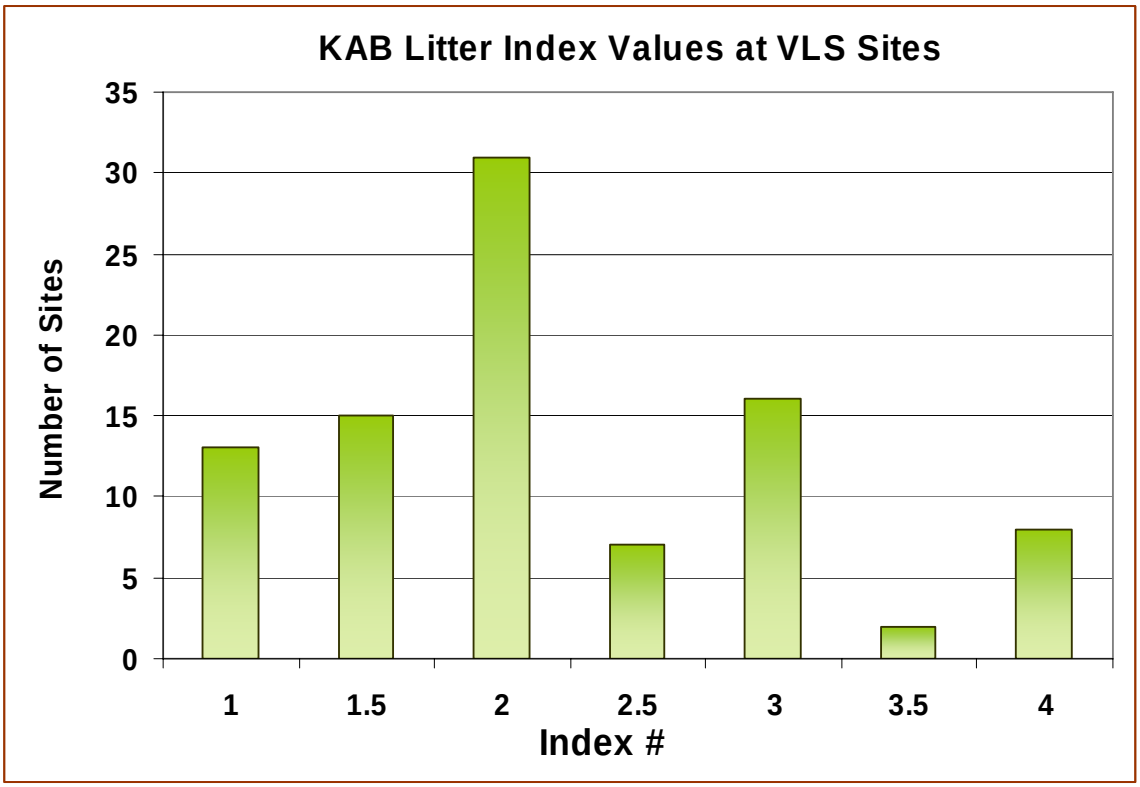


Figure 4-1

4.2 Correlating KAB's Litter Index with VLS Results

To maximize the number of data points that can be used in future assessment of litter in Georgia, R.W. Beck, Inc. was charged with determining a potential correlation between the results from a visual litter survey and the results from existing and future litter surveys using KAB's Litter Index. With this information, the results from studies conducted using both methodologies could be combined for a broader picture of litter in the State.

Since KAB's Litter Index is a measure of area (length and width), it would more likely correlate to the visual litter survey meandering count, which also measures area, rather than the edge count, which is a more linear form of measurement. Thus a regression model was developed to estimate the Meandering Pedestrian Visible Items for Mile (M-PVIM) given an observed value for the KAB Litter Index and a particular Locale Type (as defined elsewhere in this report).

The KAB Litter Index is a qualitative measure of the amount of litter existing in an area, which is visually determined on the basis of litter density. Whether the area is a street corner or a long street, the person scoring the site determines how littered an area is based on how much litter is visible on an integer scale of one to four. While conducting the visual litter survey field work in Georgia, it was determined that the integer scale might not be sufficient for developing a correlation to the M-PVIM.

Thus, field crews were instructed to use limited fractional counts (1.5, 2.5, etc.) as needed.

Given the above, it was believed that a strong relationship should exist between the KAB Litter Index and more direct, quantitative measures of litter, like the VLS. A correlation coefficient between the KAB Litter Index and M-PVIM was computed from the study data. While the result indicates some linear association between the two, the coefficient was much lower than expected. It was determined that the relationship may not be linear and that the KAB Litter Index might also be influenced by the locale from which it was determined.

A regression analysis on the study data was performed. Regression refers to the development of a mathematical equation to explain variations in one variable, the dependent variable, as a function of one or more explanatory, or independent, variables. Initial modeling efforts demonstrated that the relationship between the KAB Litter Index and M-PVIM was indeed non-linear, and that the range of M-PVIM values associated with any given KAB Litter Index tended to increase at higher levels of the KAB Litter Index. A strictly linear model tended not to fit the data well.

For certain Locale Types, the relationship between the KAB Litter Index and M-PVIM was distinctly different. The characteristics of the location for which study data was collected may alter the standards of litter quantity that are qualitatively associated with any particular KAB Litter Index. For example, residential and commercial areas would not take as much litter for the location to be assigned a high KAB Index, whereas a rural freeway would need to be significantly littered to be subjectively assigned the same index. The eight Locale Types were condensed into five to better reflect the relationship between M-PVIM and the KAB Litter Index.

The final model parameters, or coefficients, reflect the exclusion of one observation that was deemed to be an outlier, data points that are indicative of an unlikely occurrence. The resulting regression equation was then used to develop a mean estimate for the Pedestrian Visible Items for Mile for each locale type and each level of KAB Litter Index, the results of which are tabulated in Figure 4-2 below.

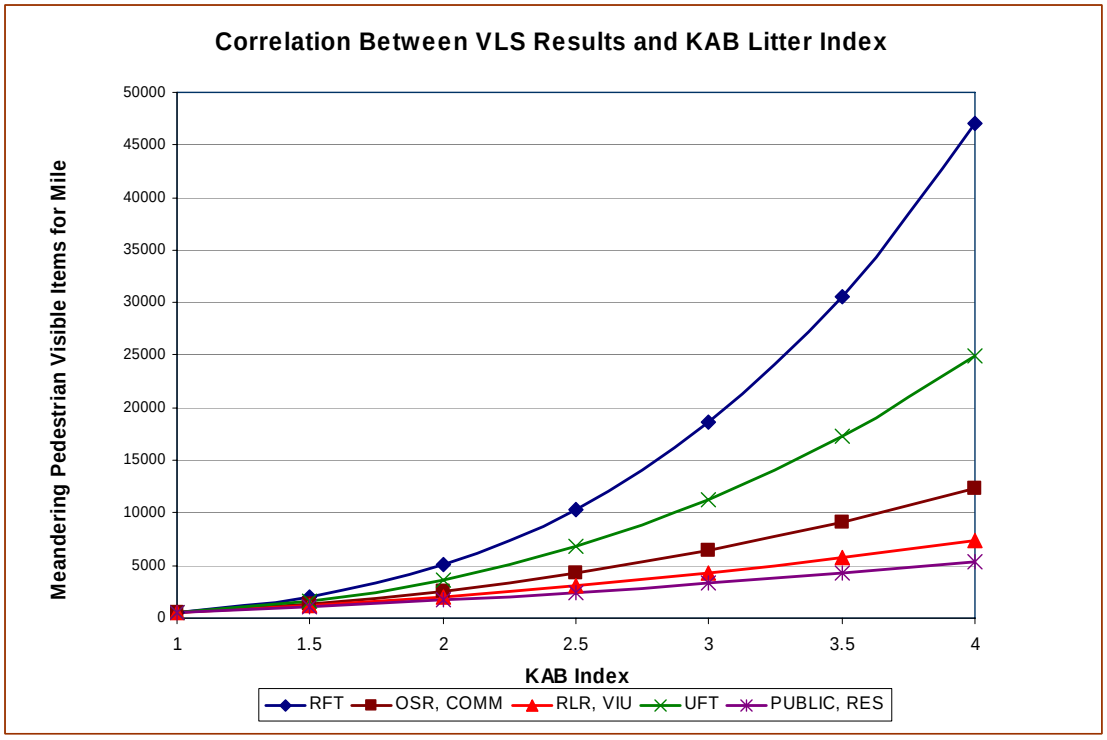


Figure 4-2

KAB Litter Index and M-PVIM values are highly related as they are both measures of litter density. An assignment of KAB Litter Index can be determined from, or caused by, M-PVIM. Thus, this tool should be used to estimate M-PVIM based on the KAB Litter Index.

A table of the mean Meandering Pedestrian Visible Items per Mile (M-PVIM) values returned by this exercise is shown below in Table 4-1. These are the average values based on the data for the 96 sites that were surveyed and should be considered as general guidelines for estimating the amount of litter for these locales based on the KAB Litter Index score. More research and data points are needed to provide a useful range of values that could have broader application.

Table 4-1
Meandering Pedestrian Visible Items per Mile for Each KAB Litter Index Score by Locale Type

KAB	RFT	OSR	RLR	UFT	VIU	COM	PUB	RES
1.0	543	543	543	543	543	543	543	543
1.5	2,003	1,355	1,164	1,664	1,164	1,355	1,063	1,063
2.0	5,055	2,590	2,000	3,684	2,000	2,590	1,712	1,712
2.5	10,366	4,284	3,042	6,823	3,042	4,284	2,478	2,478
3.0	18,641	6,461	4,286	11,289	4,286	6,461	3,352	3,352
3.5	30,614	9,145	5,727	17,280	5,727	9,145	4,327	4,327
4.0	47,050	12,356	7,362	24,987	7,362	12,356	5,398	5,398

For some Locale Types, the model relies on an extrapolation of the observed M-PVIM to KAB Litter Index relationship to values that have not been observed. For Rural Freeways and Tollways, for example, there were no observations of a KAB Litter Index value of 4. While extrapolation of an estimated relationship is not uncommon in the use of regression models, the extrapolations for 4, as the most littered type of site, could represent an unlimited range of litter values (e.g. an illegal dump site).

In light of the results of this analysis and the corresponding review of available data, the following recommendations are suggested for improvement of the data collection process:

- To mitigate the impact of observer bias on the KAB Litter Index assignments, which are subjective in nature, multiple observers should independently examine a locale carefully before assigning an index. Subsequent to such a process, the scores of the observers should be compared, with an emphasis on resolving large disparities in assessments (ex: one observer assigning a 2.5 and another assigning a 4). This more interactive process will help to bring about a more consistent assignment, which will help ensure that the true relationship that exists between KAB Litter Index and M-PVIM has been determined.
- Sampling plans should proactively seek not only to provide a representative sample with respect to locales and other socioeconomic characteristics, but also with respect to predisposed beliefs about the level of litter at each sampled site. This will increase the likelihood for increased variation in the overall dataset, particularly at the tails of the distribution, further helping to refine the statistical relationships.
- Photos of each site should be independently reviewed and a KAB Litter Index assigned from a photo, to be benchmarked and reconciled against on-site assignments. This redundancy check will limit the impact of environmental factors, observer fatigue, and bias related to the observers' general surroundings on the overall assignment process.

- Once a sufficient level of historical data and observations has been compiled to support more valid modeling, the resulting regression equation could be applied wholesale to the computation of the KAB Litter Index. This would standardize the procedure for assessing the level of litter.

Section 5
RECOMMENDATIONS

5.1 Recommendations for Future Surveys

The Georgia Department of Community Affairs is planning to update this Visual Litter Survey in 2007 to determine the success of litter prevention and abatement measures to date. The intention is to sample the same sites as those sampled in 2006, about the same time of year, to allow for meaningful comparisons of results.

Some of the litter prevention and abatement activities will require more than a year to have their full impact. Thus, both the State and local governments should continue to conduct litter assessments on an annual basis to measure progress and to adjust education, enforcement, and eradication strategies as the amount and sources of litter change. The correlation between Keep America Beautiful's Litter Index and the methodology used in visual litter surveys will allow for a wider range of data to be used to evaluate litter in the State. Both results gathered from visual litter surveys and those gathered using the Litter Index can be used to give a fuller picture of the amount, locations, and sources of litter in Georgia. To allow for a more comprehensive evaluation of results, a litter assessment tool is being developed and will be posted on line for use by local governments in Georgia.

5.2 Targeting Enforcement and Education

One of the primary benefits of the litter assessment is that it enables the State to target litter prevention and abatement efforts to the appropriate locations and sources of litter. The results contained in Section 3 of this report suggest that negligent litter comprises the largest portion of litter in Georgia. Thus, education, enforcement, and eradication strategies should focus, in part, on these sources.

One example of developing strategies tied to sources of litter might be gearing education and enforcement efforts to address the likely sources of miscellaneous paper and plastic, which comprises over 40 percent of litter documented in this survey. A large portion of these materials is likely to come from garbage and recycling trucks and pick-up trucks. Some of the strategies to address these sources may be:

- Develop a map of the State noting the locations of landfills, transfer stations, recycling facilities, the routes of large vehicles transporting and unloading solid waste in Georgia and litter hot spots. This will help identify prime locations for enforcement activities.
- Develop a plan for observing and following certain vehicle types such as pickup trucks, construction trucks and trash/recycling vehicles, to confirm the hypothesis that these vehicles are the prime sources of negligent litter.

- Set up a litter hotline for the purpose of sending letters to owners of vehicles observed littering.

Results of the litter assessment also suggest some “gatekeepers” or people that could be recruited to help in the enforcement and education efforts to reduce litter. Some of these may include:

- Pick-up truck dealerships who could help educate customers to cover vehicles or otherwise ensure that items in the bed do not blow away and become litter.
- Scale operators at landfills and transfer stations who could help ensure that departing vehicles do not have loose items on the vehicle when they leave the site.
- Public works employees, including DOT workers and parking meter attendants that could be granted citation authority to cite observed litterers.
- Convenience store and fast-food restaurants that could minimize the items leaving their establishment that could readily be littered and who could help educate their customers and the impacts and penalties associated with littering.
- Tow truck drivers who could be educated on the requirement in the litter law that they remove all vehicle parts and who could be penalized if they do not comply.
- Vehicle drivers who could be educated on the importance of proper inflation of tires and the obligation of truck drivers to ensure that trailer tires are safe.

In conclusion, the results of this survey, which indicate the locations and sources of litter in Georgia, will be used as the State continues to refine its public education, enforcement, and eradication strategies to address litter in the State.

Appendix A
LIST OF SITES

Table A-1
List of Sites

County	Locale City or Town	Location/ Road	Locale/ City or Town	Location/ Road	Locale/ City or Town	Location/ Road	Locale/ City or Town	Location/ Road
Baldwin	Residential Street Frontage: Milledgeville	Charlton St.						
Bartow	Residential Street Frontage: Cartersville	Bingham Road						
Ben Hill	Rural Local Roads	County Road 14						
Bibb	Residential Street Frontage: South Macon	Skipperton Road	Other State Rural Highways	US-80/ SR19	Urban Freeways and Toll Roads	I-75/SR 401		
Bulloch	Public Facility Street Frontage: Statesboro	Georgia Southern Univ.						
Camden	Residential Street Frontage: Kingsland	East Chester St.						
Carroll	Residential Street Frontage: Carrollton	Sims St.						

County	Locale City or Town	Location/ Road	Locale/ City or Town	Location/ Road	Locale/ City or Town	Location/ Road	Locale/ City or Town	Location/ Road
Chatham	Commercial Street Frontage: Savannah	12 Oaks Shopping Center	Public Facility Street Frontage: Savannah	Savannah H.S.	Residential Street Frontage: Chatham City	Chatham City Apts.	Rural Freeways and Toll Roads	I-16/SR 404
Chatham	Urban Freeways and Toll Roads	I-516 (Lynes Parkway)						
Cherokee	Residential Street Frontage: Canton	Shipp Street	Rural Local Roads	Avery Road				
Clarke	Rural Freeways and Toll Roads	US 8/10/29						
Clayton	Public Facility Street Frontage: Riverdale	Southern Regional Medical Center	Residential Street Frontage: Forest Park	Pine Valley Drive	Other State Rural Highways	US 19 & 41/ SR 3	Rural Local Roads	Turner Road
Cobb	Vacant, Industrial or Unmaintained Street Frontages: Smyrna	Highland Ridge (US Micro)	Commercial Street Frontage: West of Smyrna	Brookwood Sq. & Heritage Hills Shopping Center	Public Facility Street Frontage: Marietta	Cobb County Justice Center & Public Safety Building	Residential Street Frontage: Kennesaw	Lakewood Drive
Cobb	Rural Freeways and Toll Roads	I-75/SR401	Urban Freeways and Toll Roads	I-75/SR 401				

County	Locale City or Town	Location/ Road	Locale/ City or Town	Location/ Road	Locale/ City or Town	Location/ Road	Locale/ City or Town	Location/ Road
Coffee	Commercial Street Frontage: Douglas	N. Peterson Rd.						
Columbia	Commercial Street Frontage: Martinez	590 Bobby Jones Expressway (Anderson Plaza)						
Decatur	Urban Freeways and Toll Roads	US Route 84						
Dekalb	Vacant, Industrial or Unmaintained Street Frontages: Lithonia	Lithonia Industrial Blvd.	Commercial Street Frontage: Decatur	Scott Village Shopping Center	Public Facility Street Frontage: Tucker	Tucker High School	1. Residential Street Frontage: Pine Lake 2. Residential Street Frontage: Redan	1. Flintridge Drive 2. Laurel Green
Dekalb	Rural Freeways and Toll Roads	I-20/SR 402	Other State Rural Highways	SR 212 Brown Mills Road	Urban Freeways and Toll Roads	I-85/SR 403		
Dougherty	Other State Rural Highways	SR 62						
Douglas	Rural Local Roads	CR 203 (Berea Rd)						

County	Locale City or Town	Location/ Road	Locale/ City or Town	Location/ Road	Locale/ City or Town	Location/ Road	Locale/ City or Town	Location/ Road
Effingham	Commercial Street Frontage: Rincon	Columbia Ave.						
Emanuel	Rural Freeways and Toll Roads	Interstate 16/ SR 404						
Fayette	Vacant, Industrial or Unmaintained Street Frontages: Tyrone	Palmetto Road						
Forsyth	Urban Freeways and Toll Roads	US 19/SR 400						
Fulton	Vacant, Industrial or Unmaintained Street Frontages: College Park	Sullivan Rd. (Coca-Cola Plant)	Commercial Street Frontage: Atlanta	Howell Mill Village Shopping Center	1. Public Facility Street Frontage: Atlanta 2. Public Facility Street Frontage: Atlanta	1.Jimmy Carter Library & Museum 2. Fulton County Courthouse	1. Residential Street Frontage: North of Sandy Springs 2. Residential Street Frontage: East Point	1. Devonwood Drive 2. Old Colony Road
Fulton	Rural Freeways and Toll Roads	US 19/SR 400	Other State Rural Highways	SR 154 Cascade Palmetto Highway	Urban Freeways and Toll Roads	SR-400 Toll Road		

County	Locale City or Town	Location/ Road	Locale/ City or Town	Location/ Road	Locale/ City or Town	Location/ Road	Locale/ City or Town	Location/ Road
Glynn	Residential Street Frontage: Brunswick	Talmadge Ave.						
Gordon	Rural Freeways and Toll Roads	Interstate 75/ SR 401						
Gwinnett	Vacant, Industrial or Unmaintained Street Frontages: Buford	Commerce Parkway	Commercial Street Frontage: Sugar Hill	Sugar Hill Street Shopping Center	Public Facility Street Frontage: Lawrenceville	Central Gwinnet High school	Residential Street Frontage: NW Lawrenceville	Brighton Drive
Gwinnett	Rural Local Roads	Ewing Chapel Road	Urban Freeways and Toll Roads	Ronald Regan Parkway				
Hall	Commercial Street Frontage: Gainesville	Browns Bridge Road	Urban Freeways and Toll Roads	Interstate 985/ US 23/ SR 365 South				
Henry	Commercial Street Frontage: Stockbridge	Eagles Landing Shopping Center	Rural Local Roads	Mt. Carmel Road				
Houston	Other State Rural Highways	SR 127						

County	Locale City or Town	Location/ Road	Locale/ City or Town	Location/ Road	Locale/ City or Town	Location/ Road	Locale/ City or Town	Location/ Road
Jackson	Rural Freeways and Toll Roads	Interstate 85/ SR 403						
Laurens	Commercial Street Frontage: Dublin	US-80/GA-19 W (Dublin Jaycees Mall)						
Lee	Vacant, Industrial or Unmaintained Street Frontages: Leesburg	139 N. Walnut Ave.						
Liberty	Public Facility Street Frontage: Hinesville	Commerce Street (Police Station)						
Lowndes	Rural Freeways and Toll Roads	Interstate 75/ SR 401						
Madison	Other State Rural Highways	US Route 8/ SR 29						
Murray	Public Facility Street Frontage: East of Chatsworth	Woody Glen Highway						

County	Locale City or Town	Location/ Road	Locale/ City or Town	Location/ Road	Locale/ City or Town	Location/ Road	Locale/ City or Town	Location/ Road
Muscogee	Vacant, Industrial or Unmaintained Street Frontages: Columbus	2nd Avenue	Public Facility Street Frontage: Columbus	12th Street	Rural Freeways and Toll Roads	I-185/ SR 411	Urban Freeways and Toll Roads	US80/SR 22
Paulding	Residential Street Frontage: Dallas	Pinecrest Circle						
Polk	Rural Local Roads	Bellview Road						
Richmond	Vacant, Industrial or Unmaintained Street Frontages: Augusta	Goshen Industrial Bvld.	Other State Rural Highways	US-25/ SR-121	Rural Local Roads	Browns Road	Urban Freeways and Toll Roads	I-20/SR 402
Rockdale	Residential Street Frontage: Conyers	Malcolm St. SE						
Stephens	Vacant, Industrial or Unmaintained Street Frontages: Toccoa	Meeks Street						

County	Locale City or Town	Location/ Road	Locale/ City or Town	Location/ Road	Locale/ City or Town	Location/ Road	Locale/ City or Town	Location/ Road
Stewart	Rural Local Roads	County Road 34						
Sumter	Residential Street Frontage: Americus	East Church St.						
Thomas	Vacant, Industrial or Unmaintained Street Frontages: Boston	East Railroad Ave.						
Tift	Urban Freeways and Toll Roads	Interstate 75/ SR 401						
Upson	Other State Rural Highways	US Route 80/ SR 22						
Walker	Public Facility Street Frontage: Rossville	Mission Glenn Church						
Walton	Public Facility Street Frontage: Monroe	Social Circle Church						

County	Locale City or Town	Location/ Road	Locale/ City or Town	Location/ Road	Locale/ City or Town	Location/ Road	Locale/ City or Town	Location/ Road
Ware	Public Facility Street Frontage: Waycross	Dorothy St. (Center Elementary School)						
Wayne	Other State Rural Highways	SR 169						
Whitfield	Residential Street Frontage: Cohutta	Rogers St./Lane						