

**REPORT FROM THE  
DEPARTMENT OF CONSERVATION AND ECONOMIC DEPARTMENT  
ON  
• LITTER SURVEY IN VIRGINIA  
• THE VIRGINIA LITTER CONTROL PLAN  
• TAXATION ALTERNATIVES FOR VIRGINIA'S LITTER CONTROL PROGRAM  
TO  
THE GOVERNOR  
AND  
THE GENERAL ASSEMBLY OF VIRGINIA**



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# **LITTER SURVEY IN VIRGINIA**

VIRGINIA HIGHWAY & TRANSPORTATION RESEARCH COUNCIL

NOVEMBER 1976

To: The Honorable Mills E. Godwin, Jr.

Governor of Virginia

and

The General Assembly of Virginia

Pursuant to the Litter Control Act, Title 10, Chapter 19, Section 10-201, Section 10-206H and Section 10-212, the following reports are submitted herewith:

- \* "Litter Survey in Virginia"
- \* "The Virginia Litter Control Plan"
- \* "Taxation Alternatives for Virginia's Litter Control Program"



J. E. Harwood, Commissioner  
Department of Highways and Transportation



Marvin M. Sutherland, Director  
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Department of Taxation

11/30/76

LITTER SURVEY IN VIRGINIA

by

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(The opinions, findings, and conclusions expressed in this report  
are those of the author and not necessarily those of  
the sponsoring agencies.)

Virginia Highway & Transportation Research Council  
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## ABSTRACT

This report summarizes the findings of the litter survey for highways, urban areas, and recreational areas as specified in the "Virginia Litter Control Act". Litter samples from 61 highway sites, 11 urban sites, and 10 recreational sites geographically distributed throughout the state were obtained and sorted into categories as indicated in Table 1 of the report. Item count, volume, and weight were determined for each category for each litter sample.

For analysis purposes, data were summarized into product group categories for highways, urban areas, and recreational areas. These summarized data are shown in Tables 9, 10 and 11. While the percentage contributions vary somewhat between the types of areas mentioned, the same ten product groups account for approximately 80% or more of the litter for each type of area.

Statewide litter proportions by product groups were estimated for all types of areas combined, assuming various proportional contributions from each area type. These combined data, as shown in Tables 12-15, indicate that beer products (bottles, cans, cartons) constitute the largest proportion of litter, being about 29% by item count, 1% by weight, and 27% by volume. The next four major contributions by product group are soft drink products, grocery wrappers and containers, prepared food wrappers and containers, and snack food wrappers and containers, with the order of importance being different by item count, weight, and volume.

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### INTRODUCTION

During its last session, the General Assembly of Virginia passed the "Virginia Litter Control Act" (see Appendix), which in part assigned to the Department of Highways and Transportation the responsibility for conducting a survey of the types and kinds of litter being discarded in violation of the laws of the state. Important aspects of Section 10-201 of the Act considered relevant to the litter survey are indicated below.

1. The survey was to be completed by November 30, 1976.
2. The survey should include litter found throughout the state, including standard metropolitan statistical areas, and rural and recreational areas.
3. Results of the survey should indicate the amount of litter collected, and an analysis by item, weight, and volume, and, where practicable, the biodegradability of the types of products, packages, wrappings, and other containers composing the principal amounts of the litter collected.
4. The products whose packages, wrappings, and containers constitute the litter should include, but not be limited to, the following categories:
  1. Food for human or pet consumption
  2. Groceries
  3. Cigarettes and tobacco products
  4. Soft drinks and carbonated waters
  5. Beer and other malt beverages
  6. Wine
  7. Newspapers and magazines
  8. Paper products and household paper
  9. Glass containers
  10. Metal containers
  11. Plastic or fiber containers made of synthetic material
  12. Cleaning agents and toiletries
  13. Nondrug drugstore sundry products
  14. Distilled spirits
  15. Motor vehicle parts

In addition to stipulating the survey, the Litter Control Act also required that the Department of Conservation and Economic Development formulate a litter control program, and that the Department of Taxation develop a tax plan to fund the program that would place the burden on those industries that manufacture or handle products that contribute to the litter problem. Since the completion date for these last two requirements was also November 30, 1976, and since the tax plan developed must be dependent on the results of the litter survey, it was decided that the litter survey should be completed by August 15, 1976, with a report indicating the results to be available September 15, 1976.

#### PURPOSE AND SCOPE

The primary purpose of this survey was to determine proportions of various types of litter as specified by the Litter Control Act.

The required completion date of August 15, 1976, imposed some limitations on the project. Litter collections necessarily took place during the spring and summer months, and thus the results likely reflect a seasonal bias whose magnitude is not known. In addition, any effects due to the bicentennial observance are not accounted for. Finally, because of the time constraint imposed, all litter sampled was collected in the normal collection procedures for the agency involved. For instance, samples from urban, incorporated areas were obtained from automated street sweepings or hand pickups normally performed.

It was not considered within the scope of this project to select samples in a manner and quantity required to predict litter item type proportions within prescribed confidence limits, although confidence levels are indicated in the discussion of the results. Instead, the selection of sampling locations was influenced basically by the desire to consider various highway types, as well as recreational and urban areas. To the extent possible, a randomization of locations was utilized for the highway samples. Also, representation of the various geographical areas within the state was desired.

The method of litter classification, the sampling procedures, and the survey results are discussed in the following three sections.

## LITTER CLASSIFICATION

As stated above in the Introduction, the Virginia Litter Control Act indicated that litter be classified in at least 15 categories of items. An obvious reason for the classification is to enable equitable taxation of various industry groups for the funding of future litter control programs as indicated in Section 10-212 of the Act. On the basis of these factors, a detailed classification system was used. The general and sub-classifications of the system used are shown in Table 1 (page 13). Notice that a subclassification may appear in more than one general classification as, for instance, grocery container, which may be paper, plastic, glass, or metal. The subclassifications were considered to be mutually exclusive so that an item was counted in only one. The system used allows for the summarization of the data in various ways - as, for example, by material types or product groups - depending on one's interest. The general classifications were chosen only to facilitate sorting, and as the study progressed some items were placed in subclassifications not entirely consistent with the material type. For instance, it was most convenient to classify oil cans with motor vehicle parts and not separately on the basis of the material the can was made from.

Most of the subclassifications are self-explanatory, but some discussion may clarify how certain items were classified.

Prepared food wrappers and containers - These items are usually associated with carryout restaurants such as chain hamburger operations and other fast food establishments.

Grocery wrappers and containers, and paper bags - Generally, an item in this classification would be a food container or wrapper of some sort, with the exception of the snack food items discussed below. Paper bags that could be identified as coming from a grocery store were included in the grocery classification.

Snack food wrappers and containers - Items in this category were normally paper or plastic bags or wrappers for products such as potato chips, nabs, or cookies. Obviously, the point of purchase of these items could be several sources, including vending machines.

Household paper or plastic - Items in these subclassifications would normally be paper towels, tissues, plastic food wrappers or bags, or plastic garbage can liners. To a lesser extent, items such as stationery and envelopes were included.

Other paper products - As indicated above, paper bags not identified as having come from a grocery store were counted under other paper products. The other subclassification with numerous items in this category was cardboard, much of which appeared to be utilized for packaging and shipping purposes.

Beer and soft drink can holders - These items are the plastic six-pack holders for soft drink and beer cans. No attempt was made to determine if the holder was utilized for beer or soft drink cans.

To achieve consistency from sample to sample, a crew of six people located at the Research Council sorted all samples obtained in the study. Normally the procedure was to sort major items such as bottles and cans near the sample location and to transport the remainder of the sample to Charlottesville for final sorting and weighing.

### SAMPLING

As discussed previously, all Litter samples were collected by normal collection procedures utilizing personnel normally responsible for litter collection. Detailed sorting, as just indicated above, was performed by a crew from the Research Council.

In order to achieve the geographic balance desired, and to include recreational and urban areas, the sampling plan shown in Table 2 was developed at the beginning of the project. For various reasons some deviations from the proposed plan occurred as the study progressed. The actual sampling completed is shown in Table 3.

As shown, 82 samples were obtained in time to be included in the analysis presented in this report. Seventeen samples were unusable because of questionable collection procedures, improper identification, or disturbance of the samples in the storage area by animals. The greatest difference between the planned and actual sampling was for secondary roads and urban areas particularly shopping centers. It is felt that additional secondary road samples have been of only marginal value since 50 usable samples were obtained, but additional urban samples would have been desirable had time permitted. For the usable samples obtained, there was reasonably good geographic distribution throughout the state, particularly for the highway samples.

### SURVEY RESULTS

Locational information, the total number of items of litter, the total weight of the litter, the total volume of the litter, and the number of days the sample represents, i.e., the number of days since the last previous litter collection, were determined for each litter sample obtained and are included in a supplemental report entitled "Litter Survey in Virginia Detailed Results".

For each usable sample obtained, the litter was sorted as indicated in Table 1; and for each subclassification, the number of items of litter, the weight, and volume were determined. The item count was determined by simply counting the number of items in each subclassification after the sorting was completed. Weights for many of the subclassifications were determined by actual weighings; for the other subclassifications they were determined by conversion factors developed in the study. Volume was also determined by conversion factors developed in the study and, in order to represent the volume of litter as collected, it is intended to be defined as the volume of items of a given type as placed in a container without any compactive effort. The conversion factors determined are shown in Table 4.

Data for each sample were summarized into detailed product group classifications by the various facility classifications for analysis purposes. An example of one of these summaries is shown in Figure 1, and the complete set is available for distribution in the supplemental report mentioned above. For inclusion in the present report, the data were further summarized into the general product group classifications as shown in Tables 5-7, 10, and 11. The summary procedure shown was agreed upon during a July 1976 meeting between the author and representatives from the Department of Taxation and the Department of Conservation and Economic Development. It should be mentioned that rounding errors at times cause total percentages, as shown in various tables, to be different from 100% by 0.2% or less.

### Highway Sample Results

Tables 5-7 show the survey results for the five highway classifications. Several things are evident from the results. First, the data are highly variable for product groups within each highway system as indicated by the standard deviations ( $\sigma$ ). Normally one could expect about 95% of the population to fall within  $\pm 2\sigma$  limits. Thus, because the standard error of the mean is related to the standard deviation by  $\sigma_{\bar{x}} = \sigma/\sqrt{n}$ , larger sample sizes would be desirable in order to better predict the mean proportions for product groups, i.e., to reduce the standard error ( $\sigma_{\bar{x}}$ ). As an example, the 95% confidence limits for the estimated mean proportion for the beer product by item count for the secondary system (41.5%) is  $\pm 2\sigma_{\bar{x}}$ , or 3.8%, where the sample size is 30, and is  $\pm 7.6\%$  for the same product group for the urban interstate where the sample size is 7. In both cases the standard deviation ( $\sigma$ ) is about 10.0%. It is worth noting that the variabilities do appear to be approximately equivalent by product group among the several highway classifications; thus in future surveys it may be desirable to have more balance in the sample sizes among the highway classifications.

Even though the data are variable, it is evident that proportions by product group change between highway classifications. For instance, beer products are clearly a higher proportion for the secondary system than for the interstate system. Thus, as will be discussed later, in order to combine the results for a single highway summary, it is necessary to consider the quantities of litter discarded annually on each highway system. It does appear, however, that the distinctions within the interstate and primary systems (urban-rural, arterial-nonarterial) were not necessary since the results within these two systems were fairly close.

Generally, more than 80% of the litter is accounted for by the first 10 product groups shown (down through household paper and plastic products), whether evaluated by item count, weight, or volume. This fact, it would seem, would be an obvious consideration in the development of a tax plan. Obviously, the proportions by product group change somewhat, depending on whether the quantification method is item count, weight, or volume. Regardless, the beer product group accounts for the greatest proportion in each case, with the exception of the urban and rural interstate breakdown by weight, where the automotive parts or products group accounts for slightly more than the beer product category.

Because the beer and soft drink product groups account for a large share of the total litter deposited along highways, it was considered worthwhile to show the proportions for subclassifications within these general categories. As can be seen, cans account for the largest proportions, except by weight, when bottles account for the largest proportions. With regard to the actual numbers, i.e., item count, the number of cans far exceeds the number of bottles.

The proportions of returnable versus nonreturnable bottles were determined for both beer and soft drink bottles. It was found that essentially 100% of the beer bottles were nonreturnable (only two returnable beer bottles were found in all samples), and 85% of the soft drink bottles were nonreturnable.

For approximately the last 40% of the samples collected, it was decided to determine the proportions of aluminum versus non-aluminum cans. For beer cans, 41% were aluminum and for soft drink cans, 10% were found to be aluminum.

#### Estimates of Annual Highway Litter and Combined Highway Sample

In order to combine the highway results, the most appropriate method of estimating litter quantities by highway system was evaluated. Since for the data collected in the study there



was no clear relationship between vehicle mileage driven and litter quantities, it was decided the best approach would be to assume that the samples for each system were representative in general for that system, and to estimate the annual quantity of litter by highway system on the basis of the mileage in that system.

Thus, for each of the highway samples, annual estimates for item count, weight, and volume were computed by determining the ratio of one year (365 days) to the number of days represented by the sample and multiplying by the total item count, weight, and volume for the sample. These values were then averaged and multiplied by two (since each sample was from a 0.5-mile section) to obtain average quantities per mile of road for each highway system. These values are shown in Table 8. Also shown in Table 8 are the system mileage, the total annual quantity of litter per system (mileage x quantity per mile), and the percentage of the total annual quantity for all highways represented by the system quantity.

Utilizing the percentage figures shown in Table 8, the various highway samples can be combined by multiplying the percentage values by the product group percentages in Tables 5-7. The resulting figures are shown in Table 9. Obviously, the figures are fairly close to the secondary system figures because of the very high quantities of litter attributed to that system. It should be noted that the estimates per mile for the urban interstate appear very high because of extremely large amounts of litter at three sites. While these estimates may or may not be accurate, they have little influence on the combined highway litter proportions because of the low mileage in the urban interstate system.

Before concluding the discussion of the highway samples, the annual estimates of cubic yards per mile of roadway as shown in Table 8 can be compared to estimates from other studies. In the "National Study of the Composition of Roadside Litter" it was estimated that on Virginia's primary and interstate system approximately 25 ft.<sup>3</sup> of litter per mile is generated monthly.<sup>(1)</sup> This figure equates to about 11.1 yd.<sup>3</sup> per mile annually, which is not too different from the 8.8 yd.<sup>3</sup>, 14.4 yd.<sup>3</sup>, and 10.1 yd.<sup>3</sup> shown in this study for rural, interstate, arterial, primary, and nonarterial primary, respectively. In a recent study by the Maintenance Division of the Virginia Department of Highways and Transportation, the estimates were 7.7 yd.<sup>3</sup>, 9.85 yd.<sup>3</sup>, and 5.74 yd.<sup>3</sup> per mile for the interstate, primary, and secondary systems, which figures also are in full agreement with the present results, with the exception of that for the secondary system.<sup>(2)</sup> The lower estimates in the Maintenance Division



study may be attributable to the fact that the litter was collected in the winter months, while in the current study it was collected in the spring and summer, when litter is likely to be higher. In the Maintenance Division study, the annual estimate of total litter was 329,685 yd.<sup>3</sup>, and in this study it was 947,049 yd.<sup>3</sup>. No doubt, the best estimate could be somewhere between these two values, or about 640,000 yd.<sup>3</sup>

### Urban Sample Results

Initially, consideration was given to evaluating urban samples on the basis of the method of collection and location, i.e., by automated street sweepers, hand pickup, and shopping centers. However, because a preliminary review of the data indicated that the proportions by product group were fairly close, the results were summarized together as shown in Table 10. As shown, even after combining sample types, the standard deviations for product groups are generally less than for the highway samples.

As with the highway samples, the first 10 product groups account for about 80% of the total litter. However, as one might expect, the proportions by product group are different than for the highway samples, with beer and soft drink products being less important and some other product groups having a larger proportional contribution. As expected, a very small proportion was attributed to automotive parts or products.

Estimates of total annual litter quantities for urban areas were extremely difficult to make because of limited information and varied practices from area to area. Furthermore, any data obtained referred only to normal city pickup methods, and thus did not consider quantities collected privately in shopping centers and other areas. Despite the difficulties involved, an annual estimate of 140,000 yd.<sup>3</sup> of litter was determined for public cleanup efforts based on data from three cities expanded to a statewide total on the basis of proportional population of the three cities to total population in incorporated areas. It is estimated that this figure may be as high as 230,000 yd.<sup>3</sup>, if private pickup in shopping centers and other areas is included.

### Recreational Area Results

As with the urban samples, the results of the recreational areas were all summarized together. The results are shown in Table 11. Again, the first ten product groups account for more

than 80% of the total litter. As would be expected, the larger proportions are associated with beer, soft drink, and food related product groups.

No annual estimates of litter quantities were made based directly on the study results, since no basis was established for making such estimates. However, in a previous study for the state of Washington, it was estimated that park and recreational areas accounted for about 5% of the litter.<sup>(3)</sup> Thus, using the cubic yard estimates previously determined for highway and urban samples of 640,000 yd.<sup>3</sup> and 230,000 yd.<sup>3</sup>, the estimated annual total for recreational area facilities would be about 46,000 yd.<sup>3</sup> Obviously, then, the percentage attributed to highways would be 70%, and that to urban areas would be 25%.

#### Combined Litter Proportion Estimates by Product Group

One of the primary reasons for making annual estimates of litter by highways, urban areas, and recreational areas was to combine these three groups of data to statewide proportions by product group. This approach was necessary since the proportions by product group differed somewhat among the three groups of data just as they differed among the highway systems. Obviously, a great deal of judgement was used in determining the total quantity estimates and the resulting percentages of litter attributed to highways, urban areas, and recreational areas. Nevertheless, it is felt the combined figures as shown in Table 12 based on 70%, 25%, and 5% proportions for highways, urban areas, and recreational areas, respectively, are the best estimates of litter proportions by product group presently available in Virginia.

Because of the judgement involved in determining the combined estimate, the proportions of total litter attributed to highways and urban areas were varied in order to indicate the change in the combined proportions. Data assuming proportions of

- (1) 65% highways, 30% urban areas, and 5% recreational areas;
- (2) 60% highways, 35% urban areas, and 5% recreational areas; and
- (3) 75% highways, 20% urban areas, and 5% recreational areas,

are shown in Tables 13, 14, and 15. As shown, the effect on the combined proportions is generally no more than 1% or 2%, with the greatest change being 4%.

## BIODEGRADABILITY

Of the items making up the major proportions of litter in Virginia, paper items are the only ones for which biodegradability may be a possibility. The biodegradability of the various paper items is dependent on the item itself as well as the environmental conditions prevailing where the item is located. Thus, it is most difficult to establish rates of biodegradability for various paper items. (No information of this type was found in available literature.) The product group classifications in which biodegradability may have the greatest effect are household paper, newspapers or magazines, and, to a lesser degree, prepared food and grocery. However, it is felt that, within the normal time cycles for litter pickup (daily up to a year or less), very few litter items biodegrade fully.

## REFERENCES

1. "A National Study of Roadside Litter", Summary of a Report from the Highway Research Board of the Division of Engineering, National Research Council, National Academy of Sciences—National Academy of Engineering, prepared by Research Triangle Institute, Research Triangle Park, North Carolina. Keep America Beautiful, Inc., 99 Park Avenue New York, New York 10016, October 1969.
2. Results of Litter Survey Conducted in January 1976, supplied by R. L. Fink, Virginia Department of Highways and Transportation, April 4, 1976.
3. "A Report on Litter in the State of Washington", submitted to the Washington State Department of Ecology, Olympia, Washington, by the URS Company, Seattle, Washington. June 1975.

TABLE 1  
Litter Classifications

General Classification	Subclassification
Paper	Newspaper and Magazines Prepared Food Wrappers and Containers Grocery Wrappers and Containers Paper Bags Snack Food Wrappers and Containers Cleaning Agents and Toiletries Containers Other Paper Products: Paper bags Cardboard Miscellaneous Beer and Soft Drink Cartons
Plastic	Prepared Food Wrappers and Containers Beer and Soft Drink Can Holders Grocery Wrappers and Containers Tobacco Product Wrappers and Containers Cleaning Agents and Toiletries Containers Household Products Other Plastic Products
Glass	Soft Drink Bottles: Returnable Nonreturnable Beer Bottles: Returnable Nonreturnable Wine Bottles Liquor Bottles Grocery Wrappers and Containers Tobacco Product Wrappers and Containers Cleaning Agents and Toiletries Containers Other Glass Products
Metal	Soft Drink Cans: Aluminum Non-aluminum Beer Cans: Aluminum Non-aluminum Tab Can Tops Grocery Wrappers and Containers Tobacco Product Wrappers and Containers Cleaning Agents and Toiletries Containers Other Containers Other Metal Containers
Motor Vehicle Parts	Glass Plastic Metal Tires or Tire Pieces Other Motor Vehicle Parts Oil Cans
Unwrapped Food Products	
Miscellaneous	

TABLE 2  
PLANNED DISTRIBUTION OF LITTER SAMPLES

General Classification	Subclassification	No.	Size	Distribution
Highways (rural)	Interstate - Urban	8	0.5 mile	Evenly distributed throughout 8 highway districts
	Interstate - Rural	8	0.5 mile	" " " " " " "
	Primary - Arterial	8	0.5 mile	" " " " " " "
	Primary - Nonarterial	8	0.5 mile	" " " " " " "
	Secondary	45	0.5 mile	" " " " " " "
Urban	Automated Street Sweepers	11	Variable - several miles	One sample from each of 11 cities*
	Areas cleaned by hand	11	Variable	" " " " " " "
	Shopping Centers	11	Variable	" " " " " " "
Recreational	State Parks	2	Variable	Fairystone and Pocahontas State Parks
	City Parks	2	Variable	One sample from each of 2 cities.
	County Parks	2	Variable	One sample from each of 2 counties
	Beaches and Marinas	2	Variable	
Total Number of Samples		118		

\* Cities included were Norfolk, Virginia Beach, Alexandria, Charlottesville, Herndon, Roanoke, Danville, Winchester, Bristol, Waynesboro, and Norton.

TABLE 3  
ACTUAL DISTRIBUTION OF LITTER SAMPLES

General Classification	Subclassification	Number of Samples Obtained	Number of Usable Samples	Distribution of Usable Samples							
				Bristol*	Salem	Lynchburg	Staunton	Calpoper	Richmond	Fredericksburg	Suffolk
Highways (rural)	Interstate - Urban	7	7	1	1	0	0	1	2	0	2
	Interstate - Rural	9	9	1	1	0	2	2	1	1	1
	Primary - Arterial	8	8	1	1	1	1	1	1	1	1
	Primary - Nonarterial	8	7	1	0	1	1	1	1	1	1
	Secondary	28	30	3	4	1	3	6	5	2	3
Urban	Automated Street Sweepers	9	5	1	1	0	0	2	2	0	1
	Areas Cleaned by Hand	7	5	0	0	0	2	2	1	1	0
	Shopping Centers	1	1	1	0	0	0	0	0	0	0
Recreational	State Parks	2	1	Pocahontas State Park							
	City Parks, Playgrounds	8	7	Charlottesville (3), Danville (1), Norfolk (2), Winchester (1)							
	Zoo	1	1	Norfolk							
	Botanical Gardens	1	1	Norfolk							
	Bench	1	0	Norfolk							
Totals		100	82								

\* Eight Highway Construction Districts

TABLE 4  
Conversion Factors for Weight and Volume

ITEM		Lb. /Item	Lb. /Ft. <sup>3</sup>	No. /Ft. <sup>3</sup>
Paper:	Newspaper	-	0.84	-
	Prepared Food Wrappers or Containers	-	1.01	-
	Paper Bags -- Grocery	-	0.66	-
	Snack Food Wrappers or Containers	-	1.14	-
	Grocery Wrappers or Containers	-	1.18	-
	Beer and Soft Drink Cartons	-	2.22	-
	Tobacco Items	-	2.54	-
	Household Paper	-	1.27	-
	Paper Bags -- Other than Grocery	-	1.74	-
	Other Paper	-	2.06	-
	Cardboard	-	2.11	-
Plastic:	Prepared Food Wrappers or Containers	-	0.62	-
	Grocery Wrappers or Containers	-	0.90	-
	Cleaning Agents or Toiletries	-	2.42	-
	Six-Pack Holders	-	0.60	-
	Other Plastic	-	1.28	-
	Household Plastic	-	1.26	-
Glass:	Returnable Beer and Soft Drink Bottles	0.99	-	30.00
	Nonreturnable Soft Drink Bottles	0.45	-	34.00
	Nonreturnable Beer Bottles	0.47	-	36.40
	Wine Bottles	1.08	-	16.00
	Liquor Bottles	0.86	-	24.10
	Grocery Containers	0.46	-	30.40
	Other Glass	-	62.50	-
Metal:	Beer and Soft Drink Cans - Aluminum	0.06	-	39.60
	Beer and Soft Drink Cans - Non-Aluminum	0.12	-	39.60
	Grocery Containers	0.12	-	59.20
	Other Metal	-	5.77	-
	Aluminum Foil	-	2.34	-
	Oil Cans, Etc.	0.19	-	18.40
Auto:	Plastic	-	4.51	-
	Metal	-	14.78	-
	Tire (Whole)	-	-	0.45
	Tire Parts	-	23.20	-
Other:	Building Materials, Etc.	-	6.89	-
	Cloth	-	5.58	-



TABLE 5

LITTER SURVEY RESULTS FOR HIGHWAYS BY ITEM COUNT  
PERCENTAGE BY PRODUCT GROUPS

Product Group Classification	Urban Interstate Sample Size = 7 *				Rural Interstate N = 9				Arterial Primary N = 8				Nonarterial Primary N = 7				Secondary N = 30			
	Avg. %	Standard Deviation	Standard Error	Summation	$\bar{x}$	$\sigma$	$\sigma/\bar{x}$	$\bar{c}\bar{x}$	$\bar{x}$	$\sigma$	$\sigma/\bar{x}$	$\bar{c}\bar{x}$	$\bar{x}$	$\sigma$	$\sigma/\bar{x}$	$\bar{c}\bar{x}$	$\bar{x}$	$\sigma$	$\sigma/\bar{x}$	$\bar{c}\bar{x}$
Beer: Cans	12.6	7.9	3.0		16.5	8.9	3.0		21.1	7.2	2.5		22.9	8.2	3.1		31.7	9.5	1.7	
Bottles	3.6	2.2	0.8		3.2	1.7	0.6		6.8	2.8	1.0		5.5	3.0	1.1		8.2	4.1	0.7	
Cartons	0.4	0.3	0.1		0.4	0.3	0.1		0.9	0.4	0.1		1.1	0.7	0.3		1.9	1.3	0.2	
Total Beer:	16.7	10.0	3.8	16.7	20.1	9.9	3.2	20.1	28.8	7.2	2.5	28.8	29.6	9.8	3.7	29.6	41.5	10.5	1.9	41.5
Soft Drink: Cans	4.8	2.8	1.1		7.5	3.1	1.0		10.3	7.6	2.7		6.1	2.9	1.1		7.1	4.7	0.9	
Bottles	1.7	1.2	0.4		1.6	1.1	0.4		3.2	1.4	0.5		2.5	2.1	0.8		3.0	2.1	0.4	
Cartons	0.0	—	—		0.0	—	—		0.1	0.1	0.4		0.1	0.3	0.1		0.2	1.0	0.2	
Total Soft Drink:	6.5	3.1	1.2	23.2	9.2	3.7	1.2	29.3	13.6	7.4	2.6	42.4	8.8	3.0	1.1	36.4	10.4	4.9	0.9	51.9
Other Beer or Soft Drink Items	0.8	0.8	0.3	24.0	0.9	1.1	0.4	36.2	3.0	7.8	2.7	46.0	1.3	1.0	0.4	39.7	1.8	1.8	0.3	53.7
Grocery	6.7	2.0	0.8	30.7	5.9	2.0	0.7	36.1	8.1	1.6	0.5	54.1	9.6	4.1	1.6	49.3	10.5	3.3	0.6	64.2
Prepared Food	13.4	3.0	1.1	44.1	11.5	5.2	1.7	47.6	11.3	4.8	1.7	65.4	12.6	4.6	1.7	61.9	12.0	7.4	1.3	76.2
Snack Food	5.0	2.3	0.9	49.1	7.2	3.4	1.1	54.8	5.4	2.2	0.8	70.8	9.5	4.3	1.6	71.4	6.0	5.0	0.9	82.2
Tobacco	12.1	5.4	2.0	61.2	15.5	4.9	1.6	70.3	7.5	3.0	1.1	78.3	8.6	2.6	1.0	80.0	5.1	3.0	0.5	87.3
Automobile Parts or Products	8.2	6.5	2.5	89.4	10.6	10.0	3.3	80.9	4.0	4.1	1.5	82.3	2.0	1.4	0.5	82.0	9.4	0.3	0.1	87.7
Newspapers or Magazines	4.1	6.1	2.3	73.5	0.6	0.5	0.2	81.5	0.9	0.9	0.3	83.2	1.2	1.6	0.6	83.2	1.2	0.8	0.2	88.9
Household	11.8	6.7	2.5	85.3	8.2	2.5	0.8	89.7	6.2	3.6	1.3	89.4	6.5	4.2	1.6	89.8	4.5	3.6	0.5	93.4
Liquor	0.2	—	—	85.5	0.2	0.2	0.1	89.9	0.6	0.3	0.1	90.0	0.3	0.3	0.1	90.1	0.7	0.6	0.1	94.1
Wine	0.1	—	—	85.6	0.1	0.1	—	90.0	0.2	0.3	0.1	90.2	0.1	0.2	0.1	90.2	0.3	0.5	0.1	94.4
Misc. Paper	8.7	6.2	2.4	94.3	4.7	3.7	1.2	94.7	5.9	6.5	2.3	95.2	5.4	3.4	1.3	95.6	3.2	2.9	0.6	97.6
Misc. Glass	0.0	—	—	94.3	0.0	—	—	94.7	0.8	1.2	0.4	96.0	—	—	—	95.6	0.3	0.7	0.1	97.9
Misc. Plastic	3.1	3.0	1.3	97.4	2.0	1.4	0.5	96.7	2.4	1.7	0.6	98.4	1.9	0.9	0.3	97.5	1.2	1.2	0.2	99.1
Misc. Metal	0.8	—	—	98.2	0.6	1.0	0.3	97.3	0.4	0.6	0.2	98.8	0.1	0.2	0.1	97.6	0.4	1.0	0.2	95.5
All Other	2.0	1.1	—	100.2	2.9	3.9	1.3	100.2	1.3	1.4	0.7	100.1	2.5	3.7	1.4	100.1	0.6	0.7	0.1	100.1

\*Symbols used in boxheads for columns to the right.

TABLE 5

LITTER SURVEY RESULTS FOR HIGHWAYS BY WEIGHT  
PERCENTAGES BY PRODUCT GROUPS

Product Group Classification	Urban Interstate Sample Size = 7*				Rural Interstate N = 9				Arterial Primary N = 8				Nonarterial Primary N = 7				Secondary N = 30			
	Avg. %	Standard Deviation	Standard Error	Summation	$\bar{x}$	$\sigma$	$\sigma/\bar{x}$	$\bar{c}\bar{x}$	$\bar{x}$	$\sigma$	$\sigma/\bar{x}$	$\bar{c}\bar{x}$	$\bar{x}$	$\sigma$	$\sigma/\bar{x}$	$\bar{c}\bar{x}$	$\bar{x}$	$\sigma$	$\sigma/\bar{x}$	$\bar{c}\bar{x}$
Bear: Cans	11.0	7.2	2.7		13.0	6.0	2.2		14.4	5.1	1.8		18.0	3.0	1.4		24.3	10.8	2.0	
Bottles	13.1	9.2	3.5		11.4	7.2	2.4		21.4	8.4	3.0		13.9	10.7	4.0		25.0	11.9	2.2	
Cartons	0.5	0.5	0.2		0.6	0.6	0.2		1.4	0.6	2.1		2.0	1.8	0.7		2.9	2.3	0.4	
Total Bear:	25.5	14.6	5.5	25.5	25.0	11.2	3.8	25.0	37.2	10.0	3.5	37.2	40.0	10.5	4.0	40.0	52.1	13.5	2.5	52.1
Soft Drink: Cans	5.2	2.5	0.9		8.0	5.4	1.8		7.5	4.9	1.7		6.9	3.9	1.5		5.8	3.3	0.6	
Bottles	6.6	5.6	2.1		8.7	7.0	2.3		13.8	7.6	2.7		9.9	7.1	2.8		12.0	7.4	1.4	
Cartons	0.0	—	—		0.0	—	—		0.0	—	—		0.4	1.2	0.5		0.1	0.2	0.4	
Total Soft Drink:	11.8	6.5	2.5	37.4	16.7	11.4	3.8	41.7	21.3	6.9	2.4	58.5	16.3	6.2	2.3	56.3	17.5	7.8	1.4	70.0
Other Beer or Soft Drink Items	0.1	0.1	—	37.5	0.1	0.1	—	41.8	0.1	0.2	0.1	58.6	0.1	0.1	—	56.4	0.1	0.1	—	70.1
Grocery	3.3	1.5	0.6	40.8	3.3	1.5	0.5	45.1	3.6	1.0	0.4	62.2	4.4	3.5	1.9	60.8	5.2	2.5	0.4	75.3
Prepared Food	2.0	1.0	0.4	42.8	2.1	1.2	0.4	47.2	1.7	0.8	0.3	63.9	1.7	1.1	0.4	62.5	1.9	1.6	0.3	77.2
Snack Food	0.4	0.2	0.1	43.2	0.5	0.1	—	47.7	0.4	0.2	0.1	64.3	0.7	0.5	0.2	63.2	0.8	0.4	0.1	77.8
Tobacco	1.1	0.5	0.2	44.3	1.8	1.1	0.4	49.5	0.6	0.2	0.1	64.9	1.0	0.6	0.2	64.2	0.5	0.4	0.1	78.3
Automotive Parts or Products	29.4	0.6	3.6	73.7	35.5	21.9	7.3	85.0	26.1	13.8	4.5	85.0	15.3	12.2	4.6	79.5	3.4	7.1	1.3	81.7
Newspapers and Magazines	1.0	1.3	0.5	74.7	0.4	0.4	0.1	85.4	0.3	0.4	0.1	85.3	1.0	1.3	0.5	80.5	0.9	1.2	0.2	82.6
Household	3.0	2.8	1.0	77.7	1.5	0.8	0.3	66.9	1.4	1.4	0.5	86.7	1.1	1.0	0.4	81.6	1.3	2.0	0.4	83.9
Liquor	1.3	0.7	0.2	79.0	1.6	1.5	0.5	88.6	3.9	3.3	0.8	90.6	2.0	1.3	0.5	83.6	4.5	3.8	0.7	89.4
Wine	1.6	1.9	0.7	80.6	0.5	0.5	0.2	89.0	1.6	2.1	0.8	92.2	1.0	1.1	0.4	84.6	2.2	2.9	0.5	90.6
Misc. Paper	7.7	5.1	1.9	88.3	3.2	3.3	1.1	92.2	2.9	2.5	0.9	95.1	6.7	8.3	3.1	91.3	4.4	5.3	1.0	95.0
Misc. Glass	0.0	—	—	88.3	0.0	—	—	92.2	0.6	0.8	0.3	95.7	0.0	—	—	91.3	0.2	0.6	0.1	95.2
Misc. Plastic	1.0	1.2	0.5	89.3	1.3	1.2	0.4	93.5	0.5	0.5	0.2	96.2	0.5	0.3	0.1	91.8	0.8	1.3	0.2	96.0
Misc. Metal	4.9	8.8	3.3	94.2	1.5	1.8	0.6	95.0	1.0	1.6	0.6	97.2	3.2	8.1	3.1	95.0	2.0	3.7	0.7	98.0
All Other	5.9	4.3	1.6	100.1	5.1	5.4	1.8	100.1	2.7	5.9	2.1	99.9	4.8	4.8	1.8	99.8	2.0	3.6	0.7	100.0

\*Symbols used in boxheads for columns to the right.

TABLE 7

LITTER SURVEY RESULTS FOR HIGHWAYS BY VOLUME  
PERCENTAGES BY PRODUCT GROUPS

Product Group Classification	Urban Interstate Sample Size = 7*				Rural Interstate N = 9				Arterial Primary N = 8				Nonarterial Primary N = 7				Secondary N = 30			
	Avg. %	Standard Deviation	Standard Error	Summation	$\bar{X}$	$\sigma$	$\sigma \bar{X}$	$c \bar{X}$	$\bar{X}$	$\sigma$	$\sigma \bar{X}$	$c \bar{X}$	$\bar{X}$	$\sigma$	$\sigma \bar{X}$	$c \bar{X}$	$\bar{X}$	$\sigma$	$\sigma \bar{X}$	$c \bar{X}$
Beer: Cans	14.6	10.3	3.9		17.7	7.5	2.5		20.6	8.5	3.0		21.5	9.7	3.7		25.7	8.5	1.6	
Bottles	5.0	3.4	1.3		3.7	1.6	0.5		7.0	3.2	1.1		5.3	3.7	1.4		3.9	3.1	0.6	
Cartons	0.8	0.8	0.3		1.3	1.3	0.4		3.3	1.4	0.5		3.4	2.1	0.8		5.7	3.9	0.7	
Total Beer:	20.3	13.1	5.0	20.3	22.6	8.3	2.8	22.6	31.0	9.3	3.3		30.3	10.3	3.9		35.3	11.9	2.2	35.3
Soft Drink: Cans	5.8	3.9	1.5		8.8	4.4	1.5		9.2	5.5	1.9		5.5	2.4	0.9		5.7	3.7	0.7	
Bottles	2.8	2.6	1.0		2.6	1.7	0.6		3.9	2.4	0.8		3.0	2.7	1.0		3.4	3.5	0.6	
Cartons	0.0	—	—		0.0	—	—		0.1	0.1	—		0.5	1.3	0.6		0.2	0.6	0.1	
Total Soft Drink:	8.5	5.1	1.9	28.8	11.5	5.7	1.9	34.1	13.1	4.7	1.7	44.1	9.0	3.7	1.4	39.3	9.3	4.6	0.8	44.6
Other Beer or Soft Drink Items	0.6	0.6	0.2	29.4	0.5	0.3	0.1	34.6	1.1	1.3	0.5	45.2	0.7	0.5	0.2	40.0	0.7	0.6	0.1	45.3
Grocery	13.0	5.1	1.9	42.4	13.0	6.4	2.1	48.2	18.1	5.4	1.9	63.3	17.2	9.2	3.6	57.2	18.1	4.8	0.9	63.4
Prepared Food	8.7	2.5	1.0	51.1	10.1	2.7	0.9	58.3	8.7	3.4	1.2	72.0	7.1	2.7	1.0	64.3	8.7	5.4	1.0	72.1
Snack Food	1.4	0.5	0.2	52.5	2.1	0.8	0.3	60.4	1.8	1.0	0.4	73.8	2.4	1.0	0.4	66.7	2.2	1.8	0.3	74.3
Tobacco	2.1	1.3	0.5	54.6	4.3	2.9	1.0	64.7	1.1	0.4	0.2	74.9	1.6	0.7	0.3	68.3	0.9	0.5	0.1	75.2
Automotive Parts or Products	6.8	4.3	1.6	67.4	11.2	10.4	3.5	75.9	7.7	5.9	2.1	82.6	4.3	3.1	1.2	72.6	1.3	2.5	0.5	76.5
Newspapers and Magazines	3.8	3.8	1.4	65.2	1.9	1.7	0.6	77.8	1.8	1.8	0.6	84.4	3.8	5.5	2.1	76.4	4.1	3.0	0.7	80.6
Household	8.6	6.4	2.4	73.8	5.8	2.1	0.7	83.6	5.2	4.7	1.7	89.6	3.5	2.3	0.9	79.9	4.3	9.2	1.7	84.9
Liquor	0.3	0.3	0.1	74.1	0.4	0.4	0.1	84.0	1.0	0.6	0.1	90.6	0.4	0.4	0.2	80.3	1.0	1.0	0.3	85.9
Wine	0.3	0.4	0.1	74.4	0.1	0.2	0.1	84.1	0.6	0.8	0.3	91.2	0.3	0.4	0.2	80.6	0.7	1.1	0.2	86.6
Misc. Paper	13.3	9.0	3.4	87.7	5.7	3.5	1.2	89.8	4.6	4.4	1.6	95.8	11.3	10.0	3.8	91.9	7.8	8.2	1.5	94.4
Misc. Glass	0.0	—	—	87.7	0.0	—	—	89.8	0.0	—	—	95.8	0.0	—	—	91.9	0.0	—	—	94.4
Misc. Plastic	2.9	2.8	1.0	90.6	4.5	4.1	1.4	94.3	2.1	2.1	0.7	97.9	1.5	1.4	0.5	93.4	2.5	3.1	0.6	96.9
Misc. Metal	6.0	10.9	4.1	96.6	1.7	1.6	0.5	96.0	0.7	1.2	0.4	98.6	3.3	7.8	2.9	96.7	2.1	4.6	0.8	99.0
All Other	3.6	2.7	1.0	100.2	4.1	4.2	1.4	100.1	1.6	3.4	1.2	100.2	3.3	4.0	1.5	100.0	1.2	2.5	0.5	100.2

\*Symbols used in boxheads for columns to the right.

TABLE 8

TOTAL HIGHWAY ANNUAL ITEM COUNT, WEIGHT, AND VOLUME  
ESTIMATES AND PROPORTIONS BY HIGHWAY SYSTEMS

System	Item Count				Weight				Volume			
	Items/ Mile/ Year	Mileage	Items	% of Total	Lb./ Mile/ Year	Mileage	Lb.	% of Total	Cu. Yd./ Mile/ Year	Mileage	Cu. Yd.	% of Total
Interstate Urban (1)	234,112	100	23,411,200	2.9	20,446	100	2,344,600	2.0	199.5	100	19,950	2.1
Interstate Rural	12,563	743	9,334,309	1.2	1,496	743	1,111,528	0.9	8.8	743	6,538	0.7
Arterial Primary	14,173	1,593	22,577,589	2.8	2,177	1,593	3,467,961	2.9	14.4	1,593	22,939	2.4
Nonarterial Primary	10,070	6,126	61,688,820	7.7	1,401	6,126	8,582,526	7.2	10.1	6,126	61,872	6.5
Secondary	15,938	42,859	683,086,742	86.4	2,428	42,859	104,061,652	87.0	19.5	42,859	835,750	88.3
Totals			800,058,660				119,568,267				947,049	

TABLE 9

## COMBINED LITTER PROPORTIONS BY PRODUCT GROUPS FOR HIGHWAYS

Product Group Classification	Item Count		Weight		Volume	
	Avg. %	Summation	Avg. %	Summation	Avg. %	Summation
Beer: Cans	29.8		23.2		25.0	
Bottles	7.8		24.2		4.1	
Cartons	1.7		2.7		5.4	
Total Beer:	39.3	39.3	50.0	50.0	34.5	34.5
Soft Drink: Cans	7.0		6.0		5.7	
Bottles	3.0		11.8		3.4	
Cartons	0.2		0.1		0.2	
Total Soft Drink:	10.2	49.5	17.8	67.8	9.4	43.9
Other Beer or Soft Drink Items	1.8	51.3	0.1	67.9	0.7	44.6
Grocery	10.2	61.5	5.0	72.9	17.9	62.5
Prepared Food	12.1	73.6	1.9	74.8	8.6	71.1
Snack Food	6.2	79.8	0.6	75.4	2.2	73.3
Tobacco	5.8	85.6	0.6	76.0	1.0	74.3
Automotive Parts or Products	1.0	86.6	5.6	81.6	1.7	76.0
Newspapers or Magazines	1.3	87.9	0.9	82.5	4.0	80.0
Household	5.0	92.9	1.3	83.8	4.4	84.4
Liquor	0.7	93.6	4.2	88.0	0.9	85.3
Wine	0.3	93.9	2.1	90.1	0.7	86.0
Misc. Paper	3.5	97.4	4.6	94.7	8.1	91.1
Misc. Glass	0.3	97.7	0.2	94.9	0.0	94.1
Misc. Plastic	1.3	99.0	0.8	95.7	2.5	96.6
Misc. Metal	0.8	99.8	2.1	97.8	2.2	98.8
All Other	0.4	100.2	2.3	100.1	1.4	100.2

TABLE 10

LITTER SURVEY RESULTS FOR URBAN AREAS  
PERCENTAGES BY PRODUCT GROUPS

Product Group Classification	Item Count Sample Size = 13*				Weight N = 13				Volume N = 13			
	Avg. %	Standard Deviation	Standard Error	Summation	$\bar{x}$	$\sigma$	$\sigma\bar{x}$	$\epsilon\bar{x}$	$\bar{x}$	$\sigma$	$\sigma\bar{x}$	$\epsilon\bar{x}$
Beer: Cans	4.4	4.0	1.1		11.8	9.0	2.5		6.3	5.0	1.4	
Bottles	0.6	0.9	0.2		4.1	6.5	1.8		0.7	1.2	0.3	
Cartons	0.2	0.4	0.1		0.9	2.0	0.6		0.8	1.7	0.5	
Total Beer:	5.2	4.4	1.2	5.2	16.9	12.3	3.4	16.9	7.8	6.3	1.7	7.8
Soft Drink: Cans	2.5	2.4	0.7		8.3	6.5	1.8		3.8	3.7	1.0	
Bottles	1.1	1.8	0.5		10.7	13.0	3.6		1.5	1.8	0.5	
Cartons	0.0	-	-		0.0	-	-		0.2	0.8	0.2	
Total Soft Drink:	3.6	2.9	0.8	8.8	19.0	13.6	3.8	35.9	5.5	4.6	1.3	13.3
Other Beer or Soft Drink Items	2.7	5.2	1.5	11.5	0.6	1.4	0.4	36.5	0.6	1.0	0.3	13.9
Grocery	7.0	3.8	1.0	18.5	8.6	5.3	1.5	45.1	17.0	12.3	3.4	30.9
Prepared Food	19.8	9.0	2.5	38.5	9.5	5.4	1.5	54.6	20.2	12.5	3.6	51.1
Snack Food	13.3	6.4	1.8	51.6	5.2	6.4	1.8	59.8	8.8	10.3	2.9	59.9
Tobacco	14.0	8.6	2.4	65.6	5.0	5.2	1.4	64.8	3.3	2.3	0.6	63.2
Automotive Parts or Products	0.0	-	-	65.6	0.3	0.9	0.2	65.1	0.0	-	-	63.2
Newspapers and Magazines	6.7	13.8	3.8	72.3	5.1	8.3	2.3	70.2	7.5	11.6	3.2	70.7
Household	12.9	8.9	2.5	85.2	6.5	5.9	1.6	76.7	10.7	8.9	2.5	81.4
Liquor	0.0	-	-	85.2	0.3	0.5	0.1	77.0	0.1	0.2	0.1	81.5
Wine	0.1	0.2	0.1	85.3	1.4	3.1	0.9	78.4	0.3	0.6	0.2	81.8
Misc. Paper	9.4	11.8	3.3	94.7	9.8	10.4	2.9	88.2	9.3	9.8	2.7	91.1
Misc. Glass	0.2	0.6	0.2	94.9	0.9	2.1	0.6	89.1	0.1	0.2	0.1	91.2
Misc. Plastic	3.3	3.1	0.9	98.2	2.1	2.5	0.7	91.2	2.9	2.9	0.8	94.1
Misc. Metal	0.7	1.1	0.3	98.9	3.5	4.8	1.3	94.7	1.1	1.6	0.4	95.2
All Other	1.1	1.1	0.3	100.0	5.1	6.2	1.7	99.8	4.8	11.5	3.2	100.0

\* Symbols used in boxheads for columns to the right.

TABLE 11

LITTER SURVEY RESULTS FOR RECREATIONAL AREAS  
PERCENTAGES BY PRODUCT GROUP

Product Group Classification	Item Count Sample Size = 10*				Weight N = 10				Volume N = 10			
	Avg. %	Standard Deviation	Standard Error	Summation	$\bar{x}$	$\sigma$	$\sigma \bar{x}$	$\epsilon \bar{x}$	$\bar{x}$	$\sigma$	$\sigma \bar{x}$	$\epsilon \bar{x}$
Beer: Cans	6.4	4.3	1.4		8.9	6.0	1.9		9.0	4.9	1.5	
Bottles	3.7	4.8	1.5		18.5	15.5	4.9		4.9	6.4	2.0	
Cartons	0.3	0.5	0.2		0.6	0.9	0.3		1.3	1.9	0.6	
Total Beer:	10.4	8.1	2.6	10.4	28.0	14.4	4.6	28.0	15.2	10.6	3.4	15.2
Soft Drink: Cans	6.4	4.1	1.3		10.8	10.6	3.4		9.9	8.3	2.6	
Bottles	2.9	5.1	1.6		20.2	16.6	5.2		7.7	11.4	3.6	
Cartons	0.0	-	-		0.0	-	-		0.0	-	-	
Total Soft Drink:	9.3	7.6	2.4	19.7	31.0	18.1	5.7	59.0	17.6	16.1	5.1	32.8
Other Beer or Soft Drink Items	1.7	1.9	0.6	21.4	0.1	0.1	-	59.1	0.8	1.5	0.5	33.6
Grocery	10.0	6.0	1.9	31.4	7.4	7.7	2.4	66.6	20.8	15.5	4.9	54.4
Prepared Food	28.4	15.2	4.8	59.8	10.4	12.5	3.9	76.9	26.4	21.2	6.7	80.8
Snack Food	19.0	11.4	3.6	78.8	2.6	1.5	0.5	79.5	5.4	2.4	0.8	86.2
Tobacco	5.0	1.6	0.5	83.8	1.2	1.2	0.4	80.7	0.7	0.5	0.2	86.9
Automotive Parts or Products	0.0	-	-	83.8	0.8	2.7	0.8	81.5	0.1	0.2	0.1	87.0
Newspapers and Magazines	0.4	0.9	0.3	84.2	1.0	2.6	0.8	82.5	2.6	5.2	1.6	89.6
Household	4.8	5.7	1.8	89.0	1.2	1.4	0.4	83.7	2.2	2.5	0.8	91.8
Liquor	0.0	-	-	89.0	0.3	0.7	0.2	84.0	0.1	1.6	0.5	91.9
Wine	0.6	0.6	0.2	89.6	11.0	11.2	3.5	95.0	2.0	2.2	0.7	93.9
Misc. Paper	7.7	9.0	2.8	97.3	-2.6	3.4	1.1	97.6	3.7	3.9	1.2	97.6
Misc. Glass	0.8	2.3	0.7	98.1	0.4	0.8	0.3	98.0	0.0	-	-	97.6
Misc. Plastic	1.0	1.0	0.3	99.1	0.5	0.7	0.2	98.5	1.2	2.2	0.7	98.8
Misc. Metal	0.5	0.8	0.2	99.6	1.0	1.8	0.6	99.5	0.9	2.0	0.6	99.7
All Other	0.3	0.5	0.2	99.9	0.7	1.8	0.6	100.2	0.3	0.7	0.2	100.0

\*Symbols used in boxheads for columns to the right.



TABLE 12

## COMBINED LITTER PROPORTIONS BY PRODUCT GROUPS

70% Highways, 25% Urban Areas, 5% Recreational Areas

Product Group Classification	Item Count		Weight		Volume	
	Avg. %	Summation	Avg. %	Summation	Avg. %	Summation
Beer: Cans	22.3		19.6		19.5	
Bottles	5.8		18.9		3.3	
Cartons	1.3		2.1		4.0	
Total Beer:	29.3	29.3	40.6	40.6	26.8	26.8
Soft Drink: Cans	5.8		6.8		5.4	
Bottles	2.5		11.9		3.1	
Cartons	0.1		0.1		0.2	
Total Soft Drink:	8.5	37.8	18.8	59.4	8.7	35.3
Other Beer or Soft Drink Items	2.0	39.8	0.2	59.6	0.7	36.2
Grocery	9.4	49.2	6.0	65.6	17.8	54.0
Prepared Food	14.8	64.0	4.2	69.8	12.4	66.4
Snack Food	8.6	72.6	1.9	71.7	4.0	70.4
Tobacco	7.8	80.4	1.7	73.4	1.6	72.0
Automotive Parts or Products	0.7	81.1	4.0	77.4	1.2	73.2
Newspapers or Magazines	2.6	83.7	2.0	79.4	4.8	78.0
Household	7.0	90.7	2.6	82.0	5.9	83.9
Liquor	0.5	91.2	3.0	85.0	0.7	84.6
Wine	0.3	91.5	2.4	87.4	0.7	85.3
Misc. Paper	5.2	96.7	5.8	93.2	8.2	93.5
Misc. Glass	0.3	97.0	0.4	93.6	0.0	93.5
Misc. Plastic	1.8	98.8	1.1	94.7	2.5	96.0
Misc. Metal	0.8	99.6	2.4	97.1	1.9	97.9
All Other	0.6	100.2	2.9	100.0	2.2	100.1



TABLE 13

COMBINED LITTER PROPORTIONS BY PRODUCT GROUPS  
65% Highways, 30% Urban Areas, 5% Recreational Areas

Product Group Classification	Item Count		Weight		Volume	
	Avg. %	Summation	Avg. %	Summation	Avg. %	Summation
Beer: Cans	21.0		19.1		18.6	
Bottles	5.4		17.9		3.1	
Cartons	1.2		2.1		3.8	
Total Beer:	27.6	27.6	39.0	39.0	25.5	25.5
Soft Drink: Cans	5.6		6.9		5.3	
Bottles	2.4		11.9		3.1	
Cartons	0.1		0.1		0.2	
Total Soft Drink:	8.1	35.7	18.8	57.8	8.6	34.1
Other Beer or Soft Drink Items	2.1	37.8	0.2	58.0	0.7	34.8
Grocery	9.2	47.0	6.2	64.2	17.8	52.6
Prepared Food	15.2	62.2	4.6	68.8	13.0	65.6
Snack Food	9.0	71.2	2.1	70.9	4.3	69.9
Tobacco	8.2	79.4	1.9	72.8	1.7	71.0
Automotive Parts or Products	0.6	80.0	3.8	76.6	1.1	72.7
Newspapers or Magazines	2.9	82.9	2.2	78.8	5.0	77.7
Household	7.4	90.3	2.9	81.7	6.2	83.9
Liquor	0.5	90.8	2.8	84.5	0.6	84.5
Wine	0.3	91.1	2.3	86.8	0.6	85.1
Misc. Paper	5.5	96.6	6.1	92.9	8.2	93.3
Misc. Glass	0.3	96.9	0.4	93.3	0.0	93.3
Misc. Plastic	1.9	98.8	1.2	94.5	2.6	95.9
Misc. Metal	0.8	99.6	2.5	97.0	1.8	97.7
All Other	0.6	100.2	3.1	100.1	2.4	100.1

TABLE 14

COMBINED LITTER PROPORTIONS BY PRODUCT GROUPS  
60% Highways, 35% Urban Areas, 5% Recreational Areas

Product Group Classification	Item Count		Weight		Volume	
	Avg. %	Summation	Avg. %	Summation	Avg. %	Summation
Beer: Cans	19.7		18.5		17.7	
Bottles	5.1		16.9		2.9	
Cartons	1.1		2.0		3.6	
Total Beer:	25.9	25.9	37.3	37.3	24.2	24.2
Soft Drink: Cans	5.4		7.0		5.2	
Bottles	2.3		11.8		3.0	
Cartons	0.1		0.1		0.2	
Total Soft Drink:	7.8	33.7	18.9	56.2	8.4	32.6
Other Beer or Soft Drink Items	2.1	35.8	0.3	56.5	0.7	33.3
Grocery	9.1	44.9	6.4	62.9	17.7	51.0
Prepared Food	15.6	60.5	5.0	67.9	13.6	64.6
Snack Food	9.3	69.8	2.3	70.2	4.7	69.3
Tobacco	8.6	78.4	2.2	72.4	1.8	71.1
Automotive Parts or Products	0.6	79.0	3.5	75.9	1.0	72.1
Newspapers or Magazines	3.2	82.2	2.4	78.3	5.2	77.3
Household	7.8	90.0	3.1	81.4	6.5	83.8
Liquor	0.4	90.4	2.6	84.0	0.6	84.4
Wine	0.2	90.6	2.3	86.3	0.6	85.0
Misc. Paper	5.8	96.4	6.3	92.6	8.3	93.3
Misc. Glass	0.3	96.7	0.5	93.1	0.0	93.3
Misc. Plastic	2.0	98.7	1.2	94.3	2.6	95.9
Misc. Metal	0.8	99.5	2.5	96.8	1.8	97.7
All Other	0.6	100.1	3.2	100.0	2.5	100.2

TABLE 15

COMBINED LITTER PROPORTIONS BY PRODUCT GROUPS  
75% Highways, 20% Urban Areas, 5% Recreational Areas

Product Group Classification	Item Count		Weight		Volume	
	Avg. %	Summation	Avg. %	Summation	Avg. %	Summation
Beer: Cans	23.6		20.2		20.5	
Bottles	6.2		19.9		3.5	
Cartons	1.3		2.2		4.3	
Total Beer:	31.0	31.0	42.3	42.3	28.2	28.2
Soft Drink: Cans	6.1		6.7		5.5	
Bottles	2.6		12.0		3.2	
Cartons	0.2		0.1		0.2	
Total Soft Drink:	8.8	39.8	18.7	61.0	9.0	37.2
Other Beer or Soft Drink Items	2.0	41.8	0.2	61.2	0.7	37.9
Grocery	9.5	51.3	5.8	67.0	17.9	55.8
Prepared Food	14.5	65.8	3.8	70.8	11.8	67.6
Snack Food	8.3	74.1	1.6	72.4	3.7	71.3
Tobacco	7.4	81.5	1.5	73.9	1.4	72.7
Automotive Parts or Products	0.8	82.3	4.3	78.2	1.3	74.0
Newspapers and Magazines	2.3	84.6	1.8	80.0	4.6	78.6
Household	6.6	91.2	2.3	82.3	5.6	84.2
Liquor	0.5	91.7	3.2	85.5	0.7	84.9
Wine	0.3	92.0	2.4	87.9	0.7	85.6
Misc. Paper	4.9	96.9	5.5	93.4	8.1	93.7
Misc. Glass	0.3	97.2	0.4	93.8	0.0	93.7
Misc. Plastic	1.7	98.9	1.0	94.8	2.5	96.2
Misc. Metal	0.8	99.7	2.3	97.1	1.9	98.1
All Other	0.5	100.2	2.8	99.9	2.0	100.1

CLASSIFICATION	1-64 Richmond		1-22 Petersburg		1-1 Bristol		1-2-1 Danville		1-204 Norfolk		5-03 Hampton		1-93 Fairfax	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
BOTTLE: Cases aluminum non-refillable	365	8.1	140	7.1	129	2.8	102	5.8	1141	11.0	458	29.0	409	4.1
Bottles: refillable	0	-	0	-	100	1.8	91	5.2	0	-	0	-	310	3.1
Cartons non-refillable	131	1.9	71	3.6	110	2.3	58	3.2	167	1.6	115	7.4	94	1.0
Cartons Total	127	10.3	210	10.7	220	15.9	244	15.3	1375	13.2	574	37.4	840	8.5
SOFT DRINK: Cases aluminum non-refillable	181	2.0	71	3.6	6	0.2	2	0.1	394	3.8	127	8.2	66	0.7
Bottles: refillable	4	0.1	31	0.6	21	1.0	9	0.5	0	-	1	0.1	5	0.1
Cartons non-refillable	70	1.1	68	3.4	24	1.0	31	1.8	0	-	11	0.8	18	0.2
Total	267	3.8	151	7.6	239	11.3	65	4.0	466	5.0	142	9.2	273	2.8
PLASTIC BKE PACK HOLDERS	45	0.7	17	0.8	7	0.3	16	0.9	20	0.2	36	2.3	13	0.1
TAP CAN OPENERS	1	-	0	-	0	-	0	-	0	-	0	-	0	-
GROCERY: Paper: paper bags	271	3.8	35	1.8	29	1.3	53	3.0	594	6.3	32	2.1	464	4.7
Plastic other	157	2.2	19	0.9	52	2.5	20	1.1	161	1.6	31	2.1	137	1.4
Metal	95	1.3	18	0.7	16	0.7	36	2.0	27	0.2	11	0.7	135	1.4
Glass	40	0.6	2	0.1	14	0.7	10	0.6	18	0.2	3	0.2	57	0.6
Total	613	8.7	82	4.6	112	5.4	103	5.8	783	7.9	73	4.7	798	8.1
PREPARED FOOD: Paper	775	11.0	101	5.1	120	6.7	175	10.0	781	7.9	99	6.4	586	5.9
Plastic	457	6.4	94	4.9	147	7.1	48	2.7	612	6.2	59	3.8	640	6.5
Total	1232	17.5	200	10.1	265	13.7	223	12.7	1397	14.1	158	10.2	1226	12.4
SNACK FOOD: Paper	547	8.3	135	7.3	95	4.6	83	4.7	378	3.8	62	4.0	125	1.3
TODACCO: Paper	652	9.2	331	19.7	295	14.7	263	15.0	806	10.1	209	13.5	266	2.7
Plastic	0	-	1	0.1	0	-	2	0.1	0	-	0	-	0	-
Metal	0	-	0	-	0	-	0	-	0	-	0	-	0	-
Total	652	9.2	332	19.8	295	14.7	265	15.1	806	10.1	210	13.6	266	2.7
AUTOMOTIVE: Glass	0	-	0	-	0	-	0	-	0	-	0	-	0	-
Metal: oil cans other	0	-	0	-	0	-	6	0.3	25	0.3	16	1.0	63	0.6
Rubber: tire other	24	0.3	25	1.3	0	-	28	1.6	26	0.3	19	1.2	79	0.8
Plastic: anti-freeze other	137	1.9	371	19.7	179	8.7	140	8.0	464	4.8	169	10.7	119	1.2
Total	203	2.9	396	20.1	201	9.7	205	11.5	127	1.3	135	8.7	287	2.9
NEWSPAPER	294	4.2	0	0.4	23	1.1	28	1.6	253	2.6	0	-	1734	17.5
HOUSEHOLD: Plastic	394	5.6	0	-	41	2.0	253	14.5	1722	17.7	35	2.3	90	0.9
Paper (incl. clam shell)	785	11.1	380	9.9	41	2.0	253	14.5	1722	17.7	43	2.8	1205	12.2
MISC. PAPER: Cardboard	860	11.0	62	3.1	24	1.2	95	5.4	482	5.1	23	1.5	1521	15.4
Other (incl. paper bags)	0	-	0	-	250	12.0	0	-	0	-	8	0.5	728	7.4
WINE BOTTLES	1	-	1	0.1	2	0.1	1	0.1	25	0.3	0	-	8	0.1
LIQUOR BOTTLES	3	0.1	4	0.2	7	0.3	3	0.1	10	0.1	4	0.2	10	0.1
MISC. GLASS	0	-	0	-	1	0.0	0	-	0	-	0	-	0	-
MISC. PLASTIC	111	1.6	50	2.8	194	9.5	33	1.9	0	-	0	-	738	7.5
MISC. METAL: Cans	0	-	11	0.6	0	-	0	-	5	0.1	0	-	0	-
Other	11	0.2	3	0.2	0	-	66	3.6	0	-	0	-	20	0.2
CLEANING AGENT BALETHES CONTAINERS	0	-	0	0.1	0	-	2	0.1	10	0.1	0	-	11	0.1
UNWRAPPED FOOD	0	-	0	-	0	-	0	-	0	-	0	-	0	-
TOTAL	155	2.2	19	1.0	21	1.2	16	0.9	165	1.7	37	2.4	416	4.2
TOTAL	561	10.0	192	10.2	205	9.6	170	10.0	250	10.1	150	10.0	991	10.1

Figure 1. Example of detailed summary— item counts and proportions by product

APPENDIX

VIRGINIA LITTER CONTROL ACT

Sec.	Sec.
10-197. Title.	10-206. Further duties of Department.
10-198. Legislative findings; purpose; intent.	10-207. Private organizations to cooperate in anti-litter campaign.
10-199. Definitions.	10-208. Authority of Department to contract.
10-200. Rules and regulations; Administrative Process Act.	10-209. Penalty for violation of chapter.
10-201. Collection and survey of litter.	10-210. Notice to public required.
10-201.1. Litter tax.	10-211. Allowing escape of load material; penalty.
10-202. Enforcement of chapter.	10-212. Tax study.
10-203. Litter receptacles; placement; penalty for violations.	10-213. Preemption of certain local ordinances.
10-204. Litter bag.	
10-205. Responsibility for removal of litter from receptacles.	

§ 10-197. Title. — This chapter shall be known and may be cited as the "Virginia Litter Control Act." (1976, c. 757.)

§ 10-198. **Legislative findings; purpose; intent.** — A. The General Assembly finds that the population of Virginia is increasing steadily requiring vigilance on the part of government to protect the public health and safety as well as to maintain a healthful, clean and beautiful environment. The proliferation and accumulation of litter discarded throughout the State impairs these objectives and constitutes a public hazard, and in addition, litter tends to damage the economy of the State by making it less attractive to tourists and newcomers. There is an imperative need to anticipate, plan for, and accomplish effective litter control through a state-developed and coordinated plan of education, control, prevention and elimination.

B. The General Assembly declares that it is the purpose of this chapter to accomplish litter control throughout the State by delegating to and vesting in the Department of Conservation and Economic Development, authority to conduct a continuous program to control, prevent and eliminate litter from the State to the maximum practical extent. Every department of State government and all governmental units and agencies of the Commonwealth shall cooperate with the Department in the administration and enforcement of this chapter.

C. This chapter is intended to add to and to coordinate existing litter control and removal efforts, and not terminate existing efforts nor, except as specifically stated, to repeal or affect any State law governing or prohibiting litter or the control and disposition of waste. (1976, c. 757.)

§ 10-199. Definitions. — As used in this chapter:

A. "Department" means the Department of Conservation and Economic Development;

B. "Disposable package or container" means all packages or containers intended or used to contain solids, liquids or materials and so designated;

C. "Litter" means all waste material including but not limited to disposable packages or containers but not including the wastes of the primary processes of mining, logging, sawmilling, farming, or manufacturing;

D. "Litter bag" means a bag, sack, or other container made of any durable material which is large enough to serve as a receptacle for litter inside the vehicle or watercraft of any person. It is not necessarily limited to the state-approved litter bag but shall be similar in size and capacity;

E. "Litter receptacle" means those containers prescribed by the Department and which may be standardized as to size, shape, capacity, and color and which shall bear the State anti-litter symbol, as well as any other receptacles suitable for the depositing of litter;

F. "Person" means any natural person, corporation, partnership, association, firm, receiver, guardian, trustee, executor, administrator, fiduciary, or representative or group of individuals or entities of any kind;

G. "Public place" means any area that is used or held out for use by the public whether owned or operated by public or private interests;

H. "Sold within the State" or "sales of the business within the State" means all sales of retailers engaged in business within the State and all sales of products for use and consumption within the State in the case of manufacturers and wholesalers;

I. "Vehicle" includes every device capable of being moved upon a public highway and in, upon, or by which any person or property may be transported or drawn upon a public highway, except devices moved by human power or used exclusively upon stationary rails or tracks; and

J. "Watercraft" means any boat, ship, vessel, barge, or other floating craft. (1976, c. 757.)

§ 10-200. Rules and regulations; Administrative Process Act. — In addition to its other powers and duties, the Department shall have the power to propose and to adopt rules and regulations necessary to carry out the provisions, purposes and intent of this chapter pursuant to the Administrative Process Act, § 9-5.14:1 et seq. of the Code of Virginia. (1976, c. 757.)

§ 10-201. Collection and survey of litter. — The Department of Highways and Transportation shall make a collection and survey of litter to be completed by November thirtieth, nineteen hundred seventy-six, of the types and kinds of litter that are discarded in violation of the laws of the State. The survey shall include litter found throughout the State, including Standard Metropolitan Statistical Areas and rural and recreational areas. To the fullest extent possible, in Standard Metropolitan Statistical Areas the Department of Highways and Transportation shall make use of local litter and trash collection services through arrangements with local governing bodies and appropriate agencies, in the discharge of the duties imposed by this section. The Department of Highways and Transportation shall report to the Governor, the General Assembly and the Department as to the amount of litter collected pursuant to this section and shall include in its report an analysis by item, weight and volume, and, where practicable, the biodegradability of the types of products, packages, wrappings and containers which compose the principal amounts of the litter collected. The products whose packages, wrappings and containers constitute the litter shall include, but not be limited to the following categories:

1. Food for human or pet consumption.



2. Groceries.
3. Cigarettes and tobacco products.
4. Soft drinks and carbonated waters.
5. Beer and other malt beverages.
6. Wine.
7. Newspapers and magazines.
8. Paper products and household paper.
9. Glass containers.
10. Metal containers.
11. Plastic or fiber containers made of synthetic material.
12. Cleaning agents and toiletries.
13. Nondrug drugstore sundry products.
14. Distilled spirits.
15. Motor vehicle parts. (1976, c. 757.)

§ 10-201.1. Litter tax. — A. There is hereby levied and imposed upon every person in the State engaged in business as a manufacturer, wholesaler, distributor or retailer of products enumerated in § 10-201 an annual litter tax of two dollars and fifty cents.

B. The tax imposed hereunder shall be collected annually by the Department of Taxation in the same manner as the income tax imposed under chapter 4 (§ 58-151.01 et seq.) of Title 58, as provided by regulations promulgated by such Department. Such regulations shall not be subject to the Administrative Process Act, chapter 1.1:1 (§ 9-6.14:1 et seq.) of Title 9 of the Code of Virginia. All pertinent provisions of Title 58 relating to administration and collection of income taxes shall be applicable, *mutatis mutandis*. (1976, c. 757.)

Effective date. — Clause 2 of the 1976 act adding this chapter provides that "the tax imposed by § 10-201.1 shall be only effective for taxable years beginning in the year nineteen hundred seventy-six."

§ 10-202. Enforcement of chapter. — The Department may designate its trained employees to be vested with police powers to enforce and administer the provisions of this chapter and all rules and regulations adopted hereunder. The Department shall also have authority to contract with other State and local governmental agencies having law-enforcement powers for services and personnel reasonably necessary to carry out the provisions of this chapter. In addition, all law-enforcement officers in the Commonwealth of Virginia and those employees of the Commission of Game and Inland Fisheries vested with police powers shall enforce the provisions of this chapter and all rules and regulations adopted hereunder and are hereby empowered to arrest without warrant, persons violating any provision of this chapter or any of the rules and regulations adopted hereunder. All of the foregoing enforcement officers may serve and execute all warrants and other process issued by the courts in enforcing the provisions of this chapter and rules and regulations adopted hereunder. (1976, c. 757.)

§ 10-203. Litter receptacles; placement; penalty for violations. — A. On or after July one, nineteen hundred seventy-seven, the Department shall design and adopt by rule or regulation one or more types of litter receptacles which are reasonably uniform as to size, shape, capacity and color, for wide and extensive distribution throughout the public places of the State. Each such litter receptacle shall bear an anti-litter symbol designed and adopted by the Department. All litter receptacles shall be designed to attract attention and to encourage their use.

B. Litter receptacles of the uniform design shall be placed along the public highways of the State and at all parks, campgrounds, trailer parks, drive-in restaurants, gasoline service stations, parking lots, shopping centers, retail store parking lots, parking lots of major industrial and business firms, marinas, boat launching areas, boat moorage and fueling stations, public and private piers, beaches and bathing areas, and other public places within the State as specified by rule or regulation of the Department. The number of such receptacles required to be placed as specified herein shall be determined by a formula adopted by the Department and related to the need for such receptacles.

C. A person owning or operating any establishment or public place in which litter receptacles of the uniform design are required by this section shall procure and place such receptacles at his own expense on the premises in accord with rules and regulations adopted by the Department.

D. Any person who fails to place and maintain such litter receptacles on the premises in the number and manner required by rule or regulation of the Department, or who violates the provisions of this section or rules or regulations adopted hereunder shall be subject to a fine of fifteen dollars for each day of violation. (1976, c. 757.)

§ 10-204. Litter bag. — The Department may design and produce a litter bag bearing the State anti-litter symbol and a statement of the penalties prescribed for littering. Within one year after the effective date of this chapter, such litter bags may be distributed by the Division of Motor Vehicles at no charge to the owner of every licensed vehicle in the State at the time and place of the issuance of license or renewal thereof. The Department may make such litter bags available to the owners of watercraft in the State and may also provide such litter bags at no charge for tourists and visitors at points of entry into the State and at visitor centers to the operators of incoming vehicles and watercraft. (1976, c. 757.)

§ 10-205. Responsibility for removal of litter from receptacles. — The responsibility for the removal of litter from receptacles placed at parks, beaches, campgrounds, trailer parks, and other public places shall remain upon those State and local agencies now performing litter removal services. The removal of litter from litter receptacles placed on private property used by the public shall remain the duty of the owner or operator of such private property. (1976, c. 757.)

§ 10-206. Further duties of Department. — In addition to the foregoing duties the Department shall:

A. Serve as the coordinating agency between the various industry and business organizations seeking to aid in the anti-litter effort;

B. Recommend to local governing bodies that they adopt ordinances similar to the provisions of this chapter;

C. Cooperate with all local governments to accomplish coordination of local anti-litter efforts;

D. Encourage, organize, and coordinate all voluntary local anti-litter campaigns seeking to focus the attention of the public on the programs of the State to control and remove litter;

E. Investigate the availability of, and apply for, funds available from any private or public source to be used in the program provided for in this chapter;

F. Allocate funds annually for the study of available research and development in the field of litter control, removal, and disposal, as well as study methods for implementation in the State of such research and development. In addition, such fund may be used for the development of public educational programs concerning the litter problem. Grants shall be made available for these purposes to those persons deemed appropriate and qualified by the Board of the Department;



G. Investigate the methods and success of other techniques in the control of litter, and develop, encourage and coordinate programs in the State to utilize such successful techniques as may aid in the control and elimination of litter; and

H. Report to the Governor and the General Assembly by December fifteenth, nineteen hundred seventy-six, on its proposed plan of litter control. (1976, c. 757.)

§ 10-207. Private organizations to cooperate in anti-litter campaign. — To aid in the statewide anti-litter campaign, all business, industry and private organizations which are active in anti-litter efforts are requested to cooperate with the Department so that the State anti-litter campaign may be made more effective. (1976, c. 757.)

§ 10-208. Authority of Department to contract. — The Department shall have the authority to make and enter into contracts with other State agencies, local agencies, or local governing bodies, to carry out the purposes and provisions of this chapter. (1976, c. 757.)

§ 10-209. Penalty for violation of chapter. — Every person convicted of a violation of this chapter for which no penalty is specially provided shall be punished by a fine of not more than twenty-five dollars for each such violation. (1976, c. 757.)

§ 10-210. Notice to public required. — On and after July one, nineteen hundred seventy-seven, pertinent portions of this chapter shall be posted along the public highways of the State and at public highway entrances to the State and in all campgrounds and trailer parks, at all entrances to State parks, forest lands, recreational areas, at all public beaches, and at other public places in the State where persons are likely to be informed of the existence and content of this chapter and the penalties for violating its provisions. (1976, c. 757.)

§ 10-211. Allowing escape of load material; penalty. — No vehicle shall be driven or moved on any highway unless such vehicle is constructed or loaded to prevent any of its load from dropping, sifting, leaking or otherwise escaping therefrom. Provided, however, that sand or any substance for increasing traction during times of snow and ice may be dropped for the purpose of securing traction, or water or other substance may be sprinkled on a roadway in the cleaning or maintaining of such roadway by the State or local government agency having that responsibility. Any person operating a vehicle from which any glass or objects have fallen or escaped, which could constitute an obstruction or damage a vehicle or otherwise endanger travel upon such public highway shall immediately cause the highway to be cleaned of all glass or objects and shall pay any costs therefor. Violation of this section shall constitute a Class 1 misdemeanor. (1976, c. 757.)

Cross reference. — As to punishment of Class 1 misdemeanors, see § 18-2-11.

§ 10-212. Tax study. — The Department of Taxation, in conjunction with the Department of Conservation and Economic Development shall conduct a study to determine the best method of taxation whereby the burden of administering this chapter will fall on those industries that manufacture or handle products that contribute to the litter problem. The departments shall consider methods of taxation that are fair and equitable, administratively practicable and that avoid multiple taxation of the designated tax base. The results of such study shall be included as part of the report required by § 10-201. (1976, c. 757.)

§ 10-213. Preemption of certain local ordinances. — The provisions of this chapter shall supersede and preempt any local ordinance not enacted prior to January one, nineteen hundred seventy-six, which requires a deposit on a disposable container or package. This section shall expire on June thirtieth, nineteen hundred seventy-seven. (1976, c. 757.)

§ 18.2-140. Destruction of trees, shrubs, etc.; depositing trash. — It shall be unlawful for any person to pick, pull, pull up, tear, tear up, dig, dig up, cut, break, injure, burn or destroy, in whole or in part, any tree, shrub, vine, plant, flower or turf found, growing or being upon the land of another, or upon any land reserved, set aside or maintained by the State as a public park, or as a refuge or sanctuary for wild animals, birds or fish without having previously obtained the permission in writing of such owner or his agent or of the superintendent or custodian of such park, refuge or sanctuary so to do, unless the same be done under the personal direction of such owner, his agent, tenant or lessee or superintendent or custodian of such park, refuge or sanctuary.

Any person violating this section shall be guilty of a Class 3 misdemeanor, provided, however, that the approval of the owner, his agent, tenant or lessee, or the superintendent or custodian of such park or sanctuary afterwards given in writing or in open court shall be a bar to further prosecution or suit. (Code 1950, § 18.1-178; 1960, c. 358; 1975, cc. 14, 15; 1976, c. 757.)

The 1976 amendment deleted "or to deposit any trash, debris, garbage or litter thereon" near the middle of the first paragraph.

**THE VIRGINIA  
LITTER CONTROL PLAN**  

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**DEPARTMENT OF CONSERVATION  
AND ECONOMIC DEVELOPMENT**

NOVEMBER 1976

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# **EXECUTIVE SUMMARY**



## VIRGINIA LITTER CONTROL PLAN

### EXECUTIVE SUMMARY

#### 1. Purpose

The Virginia Litter Control Act was passed by the 1976 General Assembly for the express purpose of "accomplishing litter control throughout the State by delegating to and vesting in the Department of Conservation and Economic Development, authority to conduct a continuous program to control, prevent and eliminate litter from the State to the maximum practical extent."

The Act requires that three reports be prepared and presented to the Governor and the General Assembly. These reports are as follows:

1. A survey of litter to be made by the Department of Highways and Transportation. This report is to be completed by November 30, 1976.
2. A study to determine the best method of taxation to finance the litter control program; this study to be conducted by the Department of Taxation in conjunction with the Department of Conservation and Economic Development.

The purpose of the two studies is "to determine the best method of taxation whereby the burden of administering the Litter Control Act will fall on those industries that manufacture or handle products that contribute to the litter problem." This report is to be completed by November 30, 1976.

3. A Litter Control Plan is to be prepared by the Department of Conservation and Economic Development. This plan is to be presented to the Governor and the General Assembly by December 15, 1976.

## II. Conclusions

### (A) Litter Control Survey

This survey has been completed and indicates that:

1. Litter is located predominantly along the highways of the State.  
Highways -- 70%  
Urban Areas -- 25%  
Recreation Areas -- 5%
2. Beer Containers constitute the largest single proportion of litter making up 29% by number of items, 41% by weight and 27% by volume.
3. Paper related products account for 50% by number of items, 18% by weight and 47% by volume.
4. Generally, more than 80% of all litter is composed of the first ten product groups regardless of location. These product groups consist of beer and soft drink containers, wrappers and packages for grocery, prepared food and snack food items, tobacco, newspaper and household paper.
5. Litter accumulation is highly seasonal, the majority being generated during the spring and summer months. Studies in the State of Washington indicate that over two-thirds of the total annual volume is generated during the spring and summer.

(B) Litter Control Plan

1. The ever increasing population, with the consequent spread and accumulation of litter, has created a public hazard beyond the scope and capabilities of existing programs to solve effectively. There is considerable interest and activity in litter control efforts on the part of private groups, business and government, but there is need for a strong, central coordinating organization to develop maximum effectiveness in litter control.
2. Initial funding of the Litter Control Program is to be provided by a special litter tax levied upon every person engaged in business as a manufacturer, wholesaler, distributor or retailer of specified products. This tax applies only to the taxable year beginning in 1976.
3. This tax should not be confused with the tax being developed by the Department of Taxation which is a litter tax on business and industry and is expected to generate between \$1.3 and \$1.6 million annually. However, neither tax will produce funds for use before sometime in 1977.
4. The Litter Control Program must be oriented toward motivation. If people are not motivated to practice those steps necessary to the prevention of litter, litter will continue to be a problem of pickup and disposal. Motivation may be initiated by a variety of approaches, but all may be encompassed within two major activities: (a) education and (b) law enforcement.

- (a) Education, in the sense that it is used here, means more than learning delivered through the public school systems; it also means knowledge gained through public relations and all other media.
  - (b) Law enforcement has not been effective as a deterrent to littering. Preliminary research of existing litter control ordinances, by locality, reveals that many do not have ordinances designed to deal with the litter problem and that others have ordinances that are completely inadequate.
5. A Statewide coordinated litter control program will require a field operation with a fairly high capability having personnel sufficient to reach most areas of the State with reasonable frequency.

### III. Recommendations

#### (A) Litter Survey in Virginia

- 1. This survey has generated baseline data necessary to an evaluation of the Virginia Litter Control Program. Once the program is implemented, a litter survey should be conducted every two years using the same standards, methods and procedures that were used in this preliminary survey.
- 2. These follow-up surveys will be necessary for not only program evaluation, but also to facilitate the proper direction and guidance of program activities necessary to the achievement of established goals.

(B) Litter Control Plan

1. Existing Litter Control Programs

- (a) A major objective of the State Litter Control Plan will be to cooperate with existing agencies and organizations and to coordinate its efforts with programs already in place.
- (b) Major emphasis must be placed on group involvement and the bringing together of the concerns and efforts of business, citizen and government organizations.

2. Education

- (a) Education must be viewed as a continuing, constantly evolving long range effort.
- (b) Public school programs will be developed through consultation with the State Department of Education.

3. Public Relations

- (a) Full use will be made of the communication media in informing the public as to the importance of the litter problem.
- (b) A priority activity, assigned to Regional Litter Control Representatives, will be to establish those contacts essential to an effective public relations program.

4. Law Enforcement

- (a) A model litter control ordinance will be developed for use by the localities of the State.
- (b) A litter control law leaflet will be developed.

5. Organization

- (a) The implementation of the Litter Control Plan will require an organization consisting of a State headquarters unit and field area offices placed throughout the Commonwealth.

6. Budget

- (a) The plan has been developed assuming that the program will be funded in the amount of \$1.5 million on an annual basis.

7. Codes

- (a) A search of the State statutes reveals that numerous statutes pertain to the control of litter in some manner.
- (b) There are sufficient authorizations for all cities, counties and towns to pass and enforce a proper litter control ordinance.

# **INTRODUCTION**

## THE VIRGINIA LITTER CONTROL PLAN

### II. INTRODUCTION

The Virginia Litter Control Plan is based on the character and intent of the authorizing sections of the Code. It is a plan which recognizes the many contributions made to the litter control effort by both individuals and organizations who have pioneered many of the procedures which are recommended. It seeks to accomplish effective litter control through widespread promotion and education, emphasizing and enlarging upon existing programs' efforts, reinforced by enthusiastic law enforcement and necessary civil penalties.

The success of the program will depend on effective management, communication and cooperation among all levels of government, the business sector, and private individuals and groups. Above all, the program and the processes must be viewed as long range. It must be a continuing effort, constantly evolving as methodology and technology develop and improve. Attitudes and habits will not and cannot be changed materially in the short term. The public at large must develop a litter consciousness; they must be motivated to both preach and practice litter control. Individual actions contributing to litter must eventually be viewed as offensive and detrimental to economic and physical well being as well as being unacceptable from an aesthetic viewpoint.

Man, through culture and technology, has seemingly made himself immune to natural laws, and the present size and continued growth of his population has enormous implications for the management of all natural resources and the waste products which result from their utilization. The rate at which we process materials is one measure of the ecological demand that we make upon the natural environment.



This has been doubling every 14 years, and may explain why pollution and environmental deterioration appear to have become major problems rather suddenly.<sup>1</sup>

As the population increases, so does the demand for food, water, housing and power. The processing and supply necessary to meet these needs, as well as the demand for products of all kinds, with the packaging necessary to their marketing, creates waste products. Consequently, waste products are being created so rapidly that they tend to pile up faster than they can be handled or rendered harmless, to say nothing of being recycled and reused.

However, technology in recycling methods is advancing rapidly, and solid waste is being utilized and recycled on an ever increasing basis, as must be the case if the problem of solid waste disposal is to be solved, and the nation's natural resources properly conserved. Studies by the U. S. Department of the Interior indicate that by 1985 the United States will be dependent on foreign sources for more than 50 percent of its supplies of nine of 13 basic metals, and that by the year 2000, we will have to depend on foreign countries for more than 50 percent of all our metal needs. In addition, the country will be more than 50 percent dependent on overseas sources for energy supplies unless imports are curtailed.

The impact of recycling on the nation's raw material needs can be much greater than it is, particularly in the conservation of energy. Studies by the U. S. Environmental Protection Agency indicate that the utilization of scrap metal and waste paper as opposed to virgin ore and pulp wood in manufacturing, saves tremendous amounts of energy. In the case of aluminum, it's 95 percent; for copper and steel it is 55 percent; and in paper, the energy savings are close to 70 percent.

<sup>1</sup>Smith, Frederick E., Journal of Forestry, Dec. 1970, "Ecological Demand and Environmental Response."

Litter is solid waste that is out of place; it is only a small though important portion of the total solid waste picture. However, it is outside of the disposal system where it causes aesthetic deterioration, neighborhood blight, needless expenditures of economic resources, loss of tourist revenues and injury or loss of livestock and wildlife.

Based upon the findings of the "Litter Survey of Virginia," recently completed by the Virginia Department of Transportation and Highways, total annual litter along the highways, in urban areas, and in recreation areas, amounts to approximately 57,600 tons occupying 916,000 cubic yards of space; and under current trends, litter will continue to increase unless steps are taken to bring this problem under control.

The Virginia State Highway Department is spending \$1,000,000 a year to clean up litter along the highways; another \$3,000,000 is being spent cleaning up towns, cities and parks.<sup>2</sup>

Consequently, the Litter Control Plan must address the many different areas of litter prevention through education and law enforcement, recycling research and solid waste disposal.

<sup>2</sup>Keep Virginia Beautiful - - 1976 Bulletin - - Keep Virginia Beautiful, Inc.

**PRECEPTS, POLICIES,  
GOALS AND OBJECTIVES**

### Precepts

The State Litter Control Program is founded upon certain precepts which result from current concerns relative to litter control and prevention at the national, state and local level.

1. Government should protect the public health and safety as well as to maintain a healthful, clean and beautiful environment.
2. The proliferation and accumulation of litter discarded throughout the state constitutes a public hazard.
3. Litter tends to damage the economy by creating expensive problems of clean up and disposal.
4. Litter makes the state less attractive to tourists and newcomers.
5. Litter begets litter.
6. Litter control and management is a continuing planning and management effort, the methods, procedures and techniques of which will be constantly evolving.

## Policies

The State Litter Control Program is being developed following basic operating policies and procedures:

1. To implement the development of the State Litter Control Program as a cooperative effort between the legislative and executive branches.
2. To serve as the coordinating agency between the various industry and business organizations seeking to aid in the litter control effort.
3. To cooperate with all local governments to accomplish coordination of local litter control efforts.
4. To integrate litter control planning requirements and procedures with other federal and state planning programs.
5. To work with and through government agencies, civic, professional, and interest groups, and the general public to create a climate conducive to proactive litter control efforts throughout the communities of the Commonwealth.
6. To determine the availability of, and apply for, funds available from private or public sources to be used in the furtherance of Virginia's Litter Control Program.

## Goals and Objectives

The goals are statements which indicate those accomplishments the Litter Control Program is designed to produce. The objectives determine the procedures necessary to the realization of these stated goals.

- I. To establish a continuing program of litter control procedures necessary to the protection of public health and safety as well as to the maintenance of a healthful, clean and beautiful environment.
  - (a) To conduct the State Litter Control Program in accord with stated legislative directives.
  - (b) To promote public acceptance of litter control concepts.
  - (c) To gear the program toward implementation at the local level.
  - (d) To recognize and emulate the efforts of those organizations which have initiated and carried out ongoing litter control programs.
- II. Through a continuous program of education, use of modern technology, updated ordinances and streamlined enforcement procedures, to accomplish consistent litter reduction.
  - (a) To develop educational programs for use in the various grade levels of the public school system.
  - (b) To develop educational programs suitable for presentation and/or use by civic organizations, local governments and other groups or agencies.
  - (c) To develop material for use by the communications media including spot announcements, newspaper fillers, scripts and feature articles.

- (d) To develop projects geared to organization and implementation by civic groups and other agencies.
  - (e) To develop and provide a model litter control ordinance for use by the localities of the Commonwealth.
  - (f) To develop or determine the technology to aid citizens in following the rules up-dated ordinances have established.
  - (g) To promote proper law enforcement techniques necessary to reach that element of the citizenry who will not cooperate on a voluntary basis.
- III. To establish a means of coordination through communication with federal, state, regional and local agencies.
- (a) To establish working relationships with those agencies having resource management interests and responsibilities at the state level.
  - (b) To work with and through the Department of Intergovernmental Relations in program coordination at the regional level.
  - (c) To develop a working relationship with Department of Defense agencies who are presently conducting successful litter control activities.
- IV. To develop a system of funding and grants necessary for technology development and local implementation of proper litter control procedures.
- (a) To investigate and determine sources of funding, both public and private, available for the development, or furtherance, of litter control objectives.

(b) To develop procedures and methods necessary to the conduct of a grant program including criteria necessary for grant evaluation.

V. To establish survey procedures essential to the development of baseline data necessary for program evaluation.

(a) To utilize the "Litter Survey in Virginia" report prepared through the Department of Highways and Transportation, to establish the extent of the current litter problem.

(b) To determine those procedures necessary to carry out "follow-up" surveys necessary to program evaluation.

(c) To establish local survey procedures necessary to the conduct of a constantly evolving program.



# **PROGRAM COMPONENTS**

### III. PROGRAM COMPONENTS

#### A. Litter Survey of Virginia - - 1976<sup>1</sup>

The Highway Research Council, of the Department of Highways and Transportation, conducted a litter survey in 1976. This survey has determined that litter in Virginia is located predominantly along the state's highways, in its urban areas, and in its recreation areas.

#### Estimated Annual Litter By Location

<u>Location</u>	<u>Volume in Cubic Yards</u>	<u>% of Total</u>
All Highways	640,000	70
Urban Areas	230,000	25
Recreation Areas	<u>46,000</u>	<u>5</u>
<u>Total</u>	916,000	100

In addition, the survey indicates that the majority of litter is made up of containers for beer and soft drinks and prepared and snack foods, wrappers for grocery items and tobacco products and household paper. These items constitute almost 91% of the total litter by item count and over 80% by weight or volume.

Large quantities of litter, averaging approximately one cubic yard per mile per month are generated along the interstate and other primary highways of the Commonwealth. However, 85% of the total annual litter occurring along the highways, occurs along the secondary roads. This is because these roads comprise a system of 42,859 miles or over 81% of the total highway system.

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<sup>1</sup> Chart 1, page 16

**SUMMARY - 1976 VIRGINIA LITTER SURVEY CHART 1**  
**LITTER BY PRODUCT GROUP AND LOCATION - BASED ON LITTER PROPORTION OF 70% HIGHWAYS, 25% URBAN & 5% RECR.**

PRODUCT GROUP CLASSIFICATION	HIGHWAYS			URBAN AREAS			RECREATION AREAS			ALL AREAS COMB.		
	ITEM	WGT.	VOL.	ITEM	WGT.	VOL.	ITEM	WGT.	VOL.	ITEM	WGT.	VOL.
1. BEER: CANS	29.8	23.2	25.0	4.4	11.8	6.3	6.4	8.9	9.0	22.3	19.6	19.5
BOTTLES	7.8	24.2	4.1	.6	4.1	.7	3.7	18.5	4.9	5.8	18.9	3.3
CARTONS	1.7	2.7	5.4	.2	.9	.8	.3	.6	1.3	1.3	2.1	4.0
BEER - TOTAL	39.3	50.0	34.5	5.2	16.9	7.8	10.4	28.0	15.2	29.3	40.6	26.8
2. SOFT DRINKS: CANS	7.0	6.0	5.7	2.5	8.3	3.8	6.4	10.8	9.9	5.8	6.8	5.4
BOTTLES	3.0	11.8	3.4	1.1	10.7	1.5	2.9	20.2	7.7	2.5	11.9	3.1
CARTONS	.2	.1	.2	.0	.0	.2	.0	.0	.0	.1	.1	.2
SOFT DRINK - TOTAL	10.2	17.9	9.3	3.6	19.0	5.5	9.3	31.0	17.6	8.5	18.8	8.7
BEER & SFT. DRK. TOTAL	49.5	67.9	43.8	8.8	35.9	13.3	19.7	59.0	32.8	37.8	59.4	35.5
3. OTHER CONTAINER METAL	1.8	.1	.7	2.7	.6	.6	1.7	.1	.8	2.0	.2	.7
4. GROCERY	10.2	5.0	17.9	7.0	8.6	17.0	10.0	7.4	20.8	9.4	6.0	17.8
5. PREPARED FOOD	12.1	1.9	8.6	19.8	9.5	20.2	28.4	10.4	26.4	14.8	4.2	12.4
6. SNACK FOOD	6.2	.6	2.2	13.3	5.2	8.8	19.0	2.6	5.4	8.6	1.9	4.0
7. TOBACCO	5.8	.6	1.0	14.0	5.0	3.3	5.0	1.2	.7	7.8	1.7	1.6
8. AUTO. - PARTS, PRODUCTS	1.0	5.6	1.7	.0	.3	.0	.0	.8	.1	.7	4.0	1.2
9. NEWSPAPER OR MAGAZINE	1.3	.9	4.0	6.7	5.1	7.5	.4	1.0	2.6	2.6	2.0	4.8
10. HOUSEHOLD PAPER	5.0	1.3	4.4	12.9	6.5	10.7	4.8	1.2	2.2	7.0	2.6	5.9
ITEM 3-10- TOTAL	43.4	16.0	40.5	76.4	40.8	68.1	69.3	24.7	59.0	52.9	22.6	48.4
ITEM 1-10- TOTAL	92.9	83.9	84.3	85.2	76.7	81.4	89.0	83.7	91.8	90.7	82.0	83.9
11. LIQUOR	.7	4.2	.9	.0	.3	.1	.0	.3	.1	.5	3.0	.7
12. WINE	.3	2.1	.7	.1	1.4	.3	.6	11.0	2.0	.3	2.4	.7
13. MISC. PAPER	3.5	4.6	8.1	9.4	9.8	9.3	7.7	2.6	3.7	5.2	5.8	8.2
14. MISC. GLASS	.3	.2	.0	.2	.9	.1	.8	.4	.0	.3	.4	.0
15. MISC. PLASTIC	1.3	.8	2.5	3.3	2.1	2.9	1.0	.5	1.2	1.8	1.1	2.5
16. MISC. METAL	.8	2.1	2.2	.7	3.5	1.1	.5	1.0	.9	.8	2.4	1.9
17. ALL OTHER	.4	2.3	1.4	1.1	5.1	4.8	.3	.7	.3	.6	2.9	2.2
ITEMS 11-17- TOTAL	7.3	16.3	15.8	14.8	23.1	18.6	10.9	16.5	8.2	9.5	18.0	16.2
GRAND TOTAL	100.2	100.2	100.1	100.0	99.8	100.0	99.9	100.2	100.0	100.2	100.0	100.1

An analysis of litter by product classification, by location, reveals the following trends:

- (1) The proportions of litter, by product group, change between highway classifications as well as for area locations; e.g. beer products are a higher proportion for the secondary road system than for the interstate system, and much higher for both than for urban areas or recreation areas.
- (2) Beer and soft drink product groups account for a large share of the total litter deposited along highways. Cans far exceed bottles in number.
- (3) Generally, more than 80% of all litter is composed of the first ten product groups listed in the data summary tables.<sup>1</sup>
- (4) The annual quantity of litter, by highway system, is estimated on the basis of the total mileage in each system.
- (5) The largest number of items, per mile per year, is found along the Interstate - - Urban System. This amounts to some 234,000 items per mile, but since this system contains only 100 miles, it represents only 2.9% of the total litter found along the highways.
- (6) The first ten product classes account for about 80% of the total litter in urban areas as well as in litter along highways. However, beer and soft drink products are far less important litter components in urban litter.
- (7) An analysis of the litter found in recreation areas indicates that well over 80% of all litter is composed of the first ten product classes. However,

<sup>1</sup> First 10 product classes: Beer and soft drink containers, wrappers and packages for grocery, prepared food and snack food items, tobacco, newspaper and household paper.

its composition is more oriented toward prepared food, snack food and grocery items than is the case in highway litter.

(8) Litter is highly seasonal, the majority being generated during the spring and summer months. Studies in the State of Washington indicate that over two-thirds of the total annual volume is generated during the spring and summer months.

(9) This survey has supplied and established baseline data necessary to an evaluation of the Virginia Litter Control Program. It is recommended and proposed that this survey be conducted every two years, beginning two years after the effective date of funding and implementation of the program. This survey will be necessary for not only program evaluation, but also to facilitate the proper direction and guidance of program activities necessary to the achievement of established goals.

#### Summation

It has been determined that a litter problem exists and that it will continue to exist and grow unless a concerted and coordinated effort is made to solve the problem. Litter is people oriented. If people disposed of trash and waste matter in receptacles suitable for this purpose, and if proper methods of transportation and final disposal were carried out, there would be no litter.

Consequently, the Litter Control Program must be oriented toward motivation. If people are not motivated to practice those steps necessary to the prevention of litter, litter will continue to be a problem of pick up and disposal. Motivation may be initiated, or developed, by a variety of approaches, but all may be encompassed within two major activities: education and law enforcement. Education should

receive the most emphasis, but law enforcement becomes necessary for that segment of the population which is motivated apparently by no other means.

B. Existing Litter Control Programs<sup>1</sup>

Many organizations, both public and private, have been conducting campaigns against "litter" for many years. This program is in no way intended to go off in a different direction than presently existing programs; a major objective will be to cooperate with existing agencies and organizations and to coordinate the efforts of the State Litter Control Program with programs already in place. It will be necessary to establish a uniform direction through coordination of program activities at both the state and local level.

Major emphasis must be placed on group involvement and the bringing together of the concerns and efforts of business, citizen and government groups. One approach to this goal will be to establish a system of recognizing outstanding litter prevention work by such groups with appropriate awards.




C. Education

Education must be viewed as a continuing, constantly evolving, long range effort. It must begin with the children in the lower grade levels and continue through adulthood. Attitudes and habits may be ingrained in the youth but will not and cannot be changed materially, in the short term, for either children or adults.

Education, in the sense that it is used here, means more than learning delivered through the school systems; it also means education which is delivered

<sup>1</sup> Figure 1, page 20.

ORGANIZATIONS CONCERNED WITH LITTER  
BY LOCALITIES

	0 - No involvement . . . . .	39
	1 - 2 Organizations & agencies . . . . .	49
	3 Or more organizations & agencies . . . . .	19

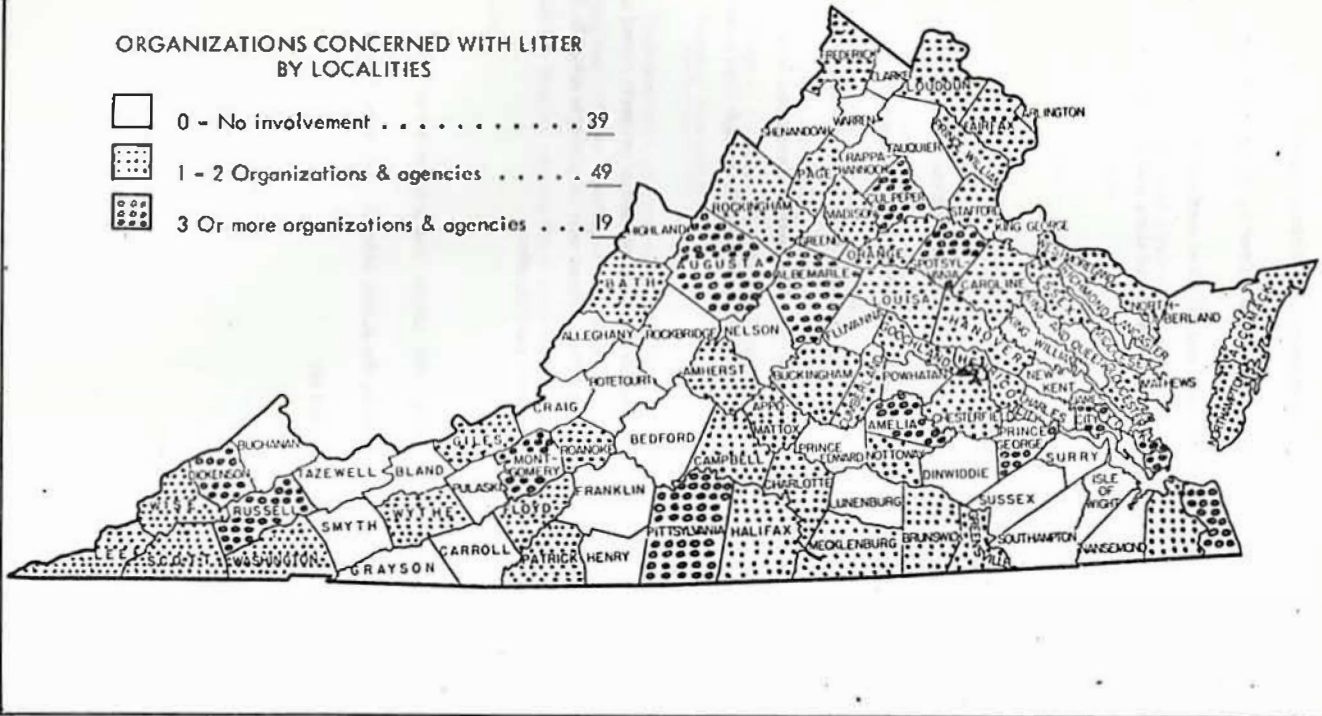


FIGURE 1

through the news media including newspapers, television, radio, magazines and organizational newsletters; it means knowledge gained by the public through workshops, civic organization programs and all other methods of communication including movies , slides and film strips, the use of signs and printed materials, and the distribution of litter bags.

(1) Public School Program

(a) Teaching Kits and Aids

Teaching Kits will be developed through consultation with the State Department of Education. This effort will be geared to promote environmental awareness and the part that littering and waste play in environmental deterioration. The Kits will be developed in a series so that they may appeal to all grade levels through high school.

(b) School Projects

Emphasis will be placed on the development of projects aimed at cleaning up and controlling litter. These will be projects suitable for class, or in some cases, school participation.

(c) Handout Materials

Materials emphasizing litter control and prevention will be developed and distributed in the public schools. Such items may include, but not be limited to:

1. Rulers
2. Comic books
3. Coloring sheets



4. Leaflets
5. Buttons
6. School book covers
7. Book marks
8. Calendars
9. Pencils

(d) Skits

School programs will be developed and designed for presentation by the students themselves. Some skits will be suitable for presentation to single classes, or small groups, while others will be designed for large groupings of classes. (Auditorium type programs.)

(e) Teacher Education

Environmental awareness programs, including litter control methods and practices, will be developed and presented to groups of teachers attending training sessions such as those conducted presently by the Resource Conservation Council.

D. Public Relations

(1) Communications Media<sup>1</sup>

Surveys have been taken which indicate that messages relative to litter control, presented by the communications media are remembered by the public in the order following:

Television	90%
Radio	64%
Newspapers	62%
Magazines	59%
Other Printed Matter	28%

It was also found that some 36% of those people interviewed had discussed the litter problem with neighbors and friends, but that only 15% remembered hearing any reference to the litter problem at meetings of groups or organizations which they attend.

These figures indicate how important the communication media is in educating the public as to the importance of the litter problem.

The litter control program will make full use of the media in promoting its objectives.

(a) Television - - public appearances - - news releases - - public service - - announcements - - editorials - - movie film.

(b) Radio - - news releases - - editorials - - features - - public service and paid spot announcements.

<sup>1</sup> See detailed breakdown of advertising costs on page 38.

- (c) Newspapers -- feature articles -- special releases -- paid advertisements.
- (d) Magazines -- feature articles -- paid advertisements.
- (e) Organizational newsletters -- special articles -- brief spot reminders.
- (f) Other printed material <sup>1</sup> -- litter bags, school materials including such items as coloring sheets, book covers and pencils, litter law handbooks and a variety of other printed matter.

Proper use of the media will depend upon contacts established with radio and television station program managers, newspaper and magazine editors and representatives of public and private organizations publishing newsletters. This will be a priority activity assigned to the Regional Litter Control Representatives as the proposed program is staffed.

(2) Public Contacts

- (a) Civic Organizations -- establish contacts with civic organizations -- use of litter control packets -- public appearances -- community projects.
- (b) Business and Industry -- establish contacts with other agencies whose programs relate to the need for proper disposal of solid waste and the control of litter.

See detailed breakdown of printing costs on page 37.

(c) Other Agencies - - establish contacts with other agencies whose programs relate to the need for proper disposal of solid waste and the control of litter.

(d) Program Liaison - - annual symposium for all government, civic and industry groups involved in the litter problem.

Program to include workshops on:

1. Litter prevention and cleanup,
2. Research and program evaluation and results,
3. Formation of program objectives and timetables.

(3) Development of Promotional and Educational Materials

(a) Film - Slides - Movies - Film Strips

1. Develop slide talk presentations.
2. Accumulate library of slides depicting different phases of the litter control problem.
3. Obtain movies geared to litter control.
4. Obtain and/or develop film strip presentations for use as teaching aids.

(b) Portable displays

1. Develop portable window display kits on litter prevention.
2. Develop displays suitable for placement at fairs, conferences, workshops and other places where numbers of people gather.

3. Develop a travel van display suitable for use throughout the State at schools, summer camps, parks and recreation areas.

(c) Signs and posters

1. Metal roadside signs - - with suitable messages imprinted, will be obtained for placement along the highways of the Commonwealth.
2. Waterproof posters - - bearing litter control messages will be developed for use around rest stops, play-ground and other recreation areas including boat landings.
3. Indoor posters - - for use in store fronts, as part of portable displays and in other suitable areas.
4. Bumper stickers - - litter control messages suitable for use on automobile and truck bumpers.

- (d) Litter control project kits - - develop kits containing "how to do it" information for use by organizations who wish to sponsor and/or conduct community projects in litter control and clean-up.

(e) Litter containers

1. Litter receptacles - - litter receptacles shall be placed and maintained by the owner or person in control of any property which is held out to the public as a place for assemblage, the transaction of

business, or as a public way. These receptacles shall be of sufficient volume and in sufficient numbers to contain the litter which can be expected to be generated by the numbers of people customarily coming on or using the property.

All receptacles shall be maintained in a manner to prevent overflow or spillage of litter from the receptacle. <sup>1</sup>

2. Litter bags - - litter bags will be designed and produced for distribution throughout the State. These bags will bear the State Litter Control Symbol and a statement of the penalties prescribed for littering. These bags may be distributed by the Division of Motor Vehicles at no charge to the owner of every licensed vehicle in the State at the time and place of the original issuance of such license or license renewal. These litter bags may also be made available to owners of watercraft in the State and to tourists at points of entry and at visitor centers.

<sup>1</sup> This recommendation will require an amendment to the Litter Control Act. See page 43, under Codes, "Suggested Amendments."

Other materials

1. Law leaflets - - synopsis of the State's Litter laws and penalties.
2. Logo decals - - develop decals of State's litter control symbol for use on receptacles, auto bumpers, and metal signs.
3. Printed materials as the need is determined.

#### E. Law Enforcement

Although enforcement of Virginia's Highway Littering Law, enacted in 1970, shows an increasing number of arrests and convictions, a true picture of enforcement of the litter laws and ordinances at the local level is not presently available. Preliminary research of existing litter control ordinances, by locality, reveals that many do not have ordinances designed to deal with the litter problem, and that others have litter control ordinances that are completely inadequate. Consequently, law enforcement has not been effective as a deterrent to littering.

In view of this situation, steps must be taken so that unbiased, effective law enforcement may take its proper place in the litter prevention effort.

##### (1) Litter Control Laws -- State

###### (a) Litter Control Law

Title 10, Chapter 19, Sections 10-197 through 10-213 should be amended and updated to become effective and enforceable. The provisions of the law relating to misdemeanors must be clarified and tied to specific penalties for violations.

(b) Numerous State laws presently exist which relate to litter control. These should be amended and consolidated with a view to making them more effective and enforceable.



(2) Local ordinances

Local litter control ordinances have not been effective as a littering deterrent for several reasons:

- (a) Many localities have no litter control ordinance.
- (b) Most local ordinances are ineffective.
- (c) Most local ordinances are difficult to enforce.
- (d) Litter law enforcement has a low priority.
- (e) Penalties for littering have not been sufficient to deter littering.

(3) In view of the above, the actions following will be given a high priority:

- (a) Develop and provide a model litter control ordinance for use by the localities of the Commonwealth.
- (b) Contact elected representatives of the various localities and urge adoption of the model ordinance, or an updating of existing ordinances to make them more effective and enforceable.
- (c) Develop a Litter Control Law Leaflet which will provide a synopsis of State litter laws, by section, with mandated penalties for violations.

# **ORGANIZATION**

IV. ORGANIZATION

A. Litter Control Field Area Offices

- (1) The implementation of a statewide, coordinated litter control program will require an organization consisting of a State headquarters unit with field area offices placed throughout the Commonwealth.
- (2) It is planned to organize a total of nine field offices, one of which will be housed with the State Litter Control headquarters in Richmond.<sup>1</sup>
- (3) The field area offices will supervise and conduct litter control activities, at the local level, in accordance with headquarters directives and policies.
- (4) Nine field areas are designated based on an evaluation of population and State highway road mileages.

Litter Control Area	Planning Districts	Population <sup>2</sup>	State Highway Mileage <sup>3</sup>
	1 - 2 - 3	369,000	8,265
2	4 - 5 - 12	578,200	8,156
3	6 - 10	313,700	6,367
4	7 - 9 - 16	269,500	6,304
5	11 - 13 - 14	333,800	9,019
6	8	964,000	3,905
7	15 - 19	716,200	6,845
8	17 - 18 - 21	414,500	4,564
9	20 - 22	806,200	4,066

Figure 11, page 31.

<sup>2</sup> Population Projections -- Va. Counties and Cities -- March 1975 Division of State Planning and Community Affairs

<sup>3</sup> Mileage Tables -- State Highway Systems -- Va. Dept of Highways and Transportation -- 12/31/75

**LITTER CONTROL FIELD AREAS  
BY POPULATION & TOTAL  
STATE HIGHWAY MILEAGE**

Area	PDC	Population	Mileage
1	1-2-3	369,000	8,265
2	4-5-12	578,200	8,156
3	6-10	313,700	6,367
4	7-9-16	269,500	6,304
5	11-13-14	333,800	9,019
6	8	964,000	3,905
7	15-19	716,200	6,845
8	17-18-21	414,500	4,564
9	20-22	806,200	4,066

**LOCATION OF FIELD AREA HEADQUARTERS**

- |              |                    |                  |
|--------------|--------------------|------------------|
| 1 - Abingdon | 4 - Fredericksburg | 7 - Richmond     |
| 2 - Roanoke  | 5 - Farmville      | 8 - Tappahannock |
| 3 - Staunton | 6 - Falls Church   | 9 - Norfolk      |



FIGURE 11

B. Personnel

(1) Headquarters Office

(a) Personnel responsible for formulating and implementing the Litter Control Program, at the State level, will be stationed in Richmond.

(b) Personnel making up this headquarters unit will consist of the positions following:<sup>1</sup>

- 1 -- Litter Control Supervisor
- 1 -- Administrative Officer
- 1 -- Field Coordinator
- 1 -- Planning and Programs Supervisor
- 1 -- Public Information Officer
  - Law Enforcement Coordinator
  - Clerk-Stenographer D
- 2 -- Clerk-Stenographer C
- 1 -- Clerk-Typist C
- 1 -- Clerk Messenger

(2) Field Area Offices

(a) Personnel necessary to conduct the Litter Control Program at the local level will operate out of nine regional field offices. Field Area personnel will consist of the positions following:<sup>2</sup>

<sup>1</sup>Chart II, page 34

<sup>2</sup>Ibid.

14 - - Field Representatives

9 - - Clerk-Stenographer C's - - In all probability, these secretarial positions will not require funding on a full time basis. It is probable that funding at a 75% rate will suffice; at least during the initial stages of program implementation.

(b) These positions will be allocated in the manner following:

<u>Field Area No.</u>	<u>Personnel</u>
	1 -- Field Representative
	1 -- Clerk-Steno C
2	2 -- Field Representatives
	1 -- Clerk-Steno C
3	1 -- Field Representative
	1 -- Clerk-Steno C
4	1 -- Field Representative
	1 -- Clerk-Steno C
5	1 -- Field Representative
	1 -- Clerk-Steno C
6	2 -- Field Representatives
	1 -- Clerk-Steno C
7	2 -- Field Representatives
	1 -- Clerk-Steno C
8	2 -- Field Representatives
	1 -- Clerk-Steno C
9	2 -- Field Representatives
	1 -- Clerk-Steno C

Field Area Offices cover regions that vary in population to the extent that Field Areas 2 - 6 - 7 - 8 - 9 are assigned two (2) Field Representatives. These are necessary due to the proliferation of schools, civic organizations, business groups, news media and others who must be contacted and dealt with in carrying out the Litter Control Program.

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- 2 - - Clerk-Stenographer C
- 1 - - Clerk-Typist C
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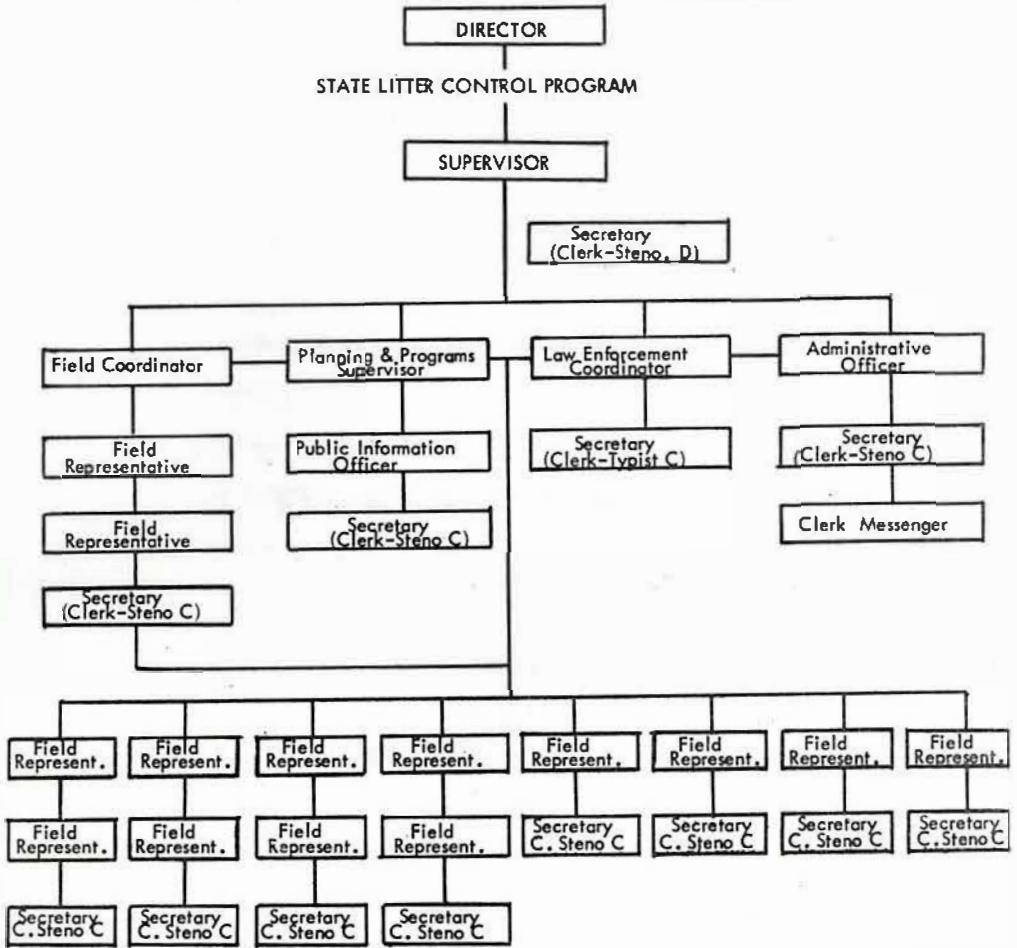
(b) These positions will be allocated in the manner following:

Field Area No.	Personnel
1	1 -- Field Representative 1 -- Clerk-Steno C
2	2 -- Field Representatives 1 -- Clerk-Steno C
3	1 -- Field Representative 1 -- Clerk-Steno C
4	1 -- Field Representative 1 -- Clerk-Steno C
5	1 -- Field Representative 1 -- Clerk-Steno C
6	2 -- Field Representatives 1 -- Clerk-Steno C
7	2 -- Field Representatives 1 -- Clerk-Steno C
8	2 -- Field Representatives 1 -- Clerk-Steno C
9	2 -- Field Representatives 1 -- Clerk-Steno C

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CHART II  
 DEPARTMENT OF CONSERVATION & ECONOMIC DEVELOPMENT



**BUDGET**

## V. BUDGET

### A. GENERAL

The following budget is based upon a program funded in the amount of \$1.5 million on an annual basis.

It envisions a statewide organization consisting of a headquarters staff and nine (9) field area offices. It includes annual expenditures necessary for personnel, equipment, materials and transportation necessary to the conduct of a state litter control program.

The headquarters and the Richmond Field Area Office will be housed together in Richmond.

A breakdown of the major expenditures follows.

### B. LITTER CONTROL PROGRAM

#### (1) 1100 Personnel Service

(a) 1110 Salaries—Full time positions. The proposed organization will require a total of (25) new positions to properly staff the headquarters and (9) field area offices.

(b) 1120 Wages — Part-time secretarial positions. A total of (8) Clerk—Stenographer C positions, to be staffed on a part-time basis. Initially these positions will not require full time employees. However, as the program develops, it will be necessary that these positions be staffed on a full time basis.

#### (2) 1200 Contractual Services

(a) The majority of items under this classification are essential to the operation of the overall organization, and are essentially self-explanatory. However, three major items are included which require a more detailed breakdown: Printing, Advertising, and Research and Development.

(b) 1270 Printing - Costs

ITEM	COST
1. School Supplies	
Grades 1 - 3	
Coloring Sheets	\$ 1,350
Balloons	\$ 6,550
Grades 4 - 6	
Pocket Calendars	\$ 1,690
Book Covers	\$ 12,025
Grades 1 - 6	
Wooden Rulers	\$ 12,775
Key Rings	\$ 13,360
	\$ 47,750
2. Promotional Materials (Excluding schools)	
Key chains, pens, pencils, luggage cards, place cards	\$ 10,000
3. Litter Bags	
2,000,000 - Cars and boats Production, shipping and storage	\$ 42,000
4. Litter Control Brochures	
2,000,000 pamphlets	\$ 70,000
5. Logo Decals	
100,000 - 14" x 19" Litter receptacles, metal signs	\$ 4,000
6. Litter Law Handbooks	
50,000 Handbooks	\$ 4,250
7. Aluminum Signs - Litter Control	
1300 - Rest areas, waysides, pull outs	\$ 68,250
8. Indoor Posters	
50,000 - 12' x 16'	\$ 10,000
9. Waterproof Outdoor Posters	
50,000 - 14" x 22" Marinas, campgrounds, other recreation areas, boat ramps	\$ 40,000

10. <u>Portable Wooden Display (outdoor)</u> 10 displays - 20' x 7' Shopping centers, malls, fairs		\$ <u>25,000</u>
11. <u>Portable Illuminated Display of Color</u> <u>Transparencies</u> 10 displays - 3'4" x 2'6" Fairs, meetings, conventions		\$ <u>25,000</u>
12. <u>Stationery</u> 15,000 - Letterhead 15,000 - Envelopes 10,000 - Press Release	\$ 280.00 \$ 240.00 \$ 480.00	\$ <u>1,000</u>
13. <u>Litter Control Project Kits</u> 5,000 @ \$2.55 each		\$ <u>12,750</u>
14. <u>10% Contingency</u>		\$ <u>40,000</u>
	Total	\$400,000

(c) 1299 Advertising - Costs

1. <u>Speaker's Bureau</u> Slide presentation and sink tape Photography Script Voice tract		\$ <u>7,500</u>
2. <u>TV Spot Announcements</u> 2 - 60 second spots 2 - 30 second spots Production and distribution Slides for station identification	\$ 25,000 \$ 2,000	\$ <u>27,000</u>
3. <u>Radio Spot Announcements</u> 2 - 60 second spots 2 - 30 second spots Production and distribution		\$ <u>2,500</u>
4. <u>Media Allocation (Purchase of Time)</u> Television Radio Newspaper	\$ 52,600 \$ 20,400 \$ 12,000	\$ <u>95,000</u>

5. <u>Newspaper Ads</u> Production of materials	\$ <u>3,000</u>
6. <u>Newsletter</u> Printing and distribution 10,000 persons	\$ <u>7,000</u>
7. <u>Original Photography</u> Magazines Newspapers Flyers Photography and quantity prints	\$ <u>5,000</u>
8. <u>Film (14 minutes)</u> TV and group showings	\$ <u>42,000</u>
9. <u>Four Stories</u> Known writers	\$ <u>1,000</u>
10. <u>Contingency (10%)</u>	\$ <u>20,000</u>
Total	\$200,000

(d) 1299 Research & Development

It is planned to develop special educational programs for use by the public educational TV stations of which there are five. These are located in Annandale, Harrisonburg, Norfolk, Richmond and Roanoke.

1. <u>Film Cost</u> Production of 5 - 20 minute educational films @ \$50,000 each	\$250,000	
2. <u>Specialized Teaching Aids</u> Development of manual, special project development and other	\$ 50,000	<u>\$300,000</u>
3. <u>Research Projects</u> Initial funding of a study of available research and development in the field of litter control	\$ 25,000	
Total		\$325,000

C. PROPOSED BUDGET FOR LITTER CONTROL PROGRAM

<u>1100 Personnel Service</u>		<u>1977-78</u>
1110 Salaries		
Litter Control Supervisor 7/1/77	\$20,500	
Merit Increase TOP	<u>          </u>	\$20,500
Litter Control Planning and Programs Supervisor 7/1/77	\$13,128	
Merit Increase 1/1/78	<u>      300</u>	\$13,428
Litter Control Field Coordinator 7/1/77	\$12,000	
Merit Increase 1/1/78	<u>      264</u>	\$12,264
Public Information Officer	\$11,472	
Merit Increase	<u>      264</u>	\$11,736
Litter Control Representative 1/77	\$11,472	
Merit Increase 4/1/78	<u>      132</u>	
Seven Positions	<u>\$11,604</u>	\$81,228
Litter Control Representative 1/1/78	\$11,472	
Merit Increase (None)	<u>      000</u>	
Seven Positions	<u>\$11,472</u>	\$80,304
Administrative Officer 7/1/77	\$10,512	
Merit Increase 1/1/78	<u>      240</u>	\$10,752
Enforcement Coordinator 9/1/77	\$9,600	
Merit Increase 1/1/78	<u>      108</u>	\$9,708
Clerk Steno D 7/1/77	\$7,680	
Merit Increase 1/1/78	<u>      180</u>	\$7,860
Clerk Steno C 7/1/77	\$6,720	
Merit Increase 1/1/78	<u>      156</u>	\$6,876
Clerk Steno C 9/1/77	\$6,720	
Merit Increase 4/1/78	<u>      78</u>	
Two Positions	<u>\$6,798</u>	\$13,596
Clerk Typist C 7/1/77	\$6,433	
Merit Increase 1/1/78	<u>      144</u>	\$6,577
Clerk Messenger B 9/1/77	\$5,400	
Merit Increase 4/1/78	<u>      120</u>	\$5,520
Total New Positions		<u>\$280,349</u>

Less: Turnover and Vacancy					
(Representative	\$956	Mo. x 2 = 1,912	x 7 = (\$13,386)		
(Representative	\$956	Mo. x 6 = 5,736	x 7 = (\$40,152)		
(Enforcement Coord.	\$800	Mo. x 2 = 1,600	x 1 = (\$ 1,600)		
(Clerk Steno C	\$560	Mo. x 2 = 1,120	x 2 = (\$ 2,240)		
(Clerk Messenger	\$450	Mo. x 2 = 900	x 1 = (\$ 900)		\$ 58,278

Total New Positions \$222,071

1120 Wages (75% of 8 Steno C \$6,720) \$ 40,319  
 Total Personnel Service \$262,390

1200 Contractual Services

1210 General Repairs				\$ 500
1213 Professional Services (other)				\$ 50,000
1241 Convention and Educational Travel				\$ 960
16 days at \$60/day				
1243 Travel -- Mileage				\$ 41,700
8 -- Field = 24,200				
4 -- Office = 3,000				
6 -- Field = 14,500 (6 Mo.)				
1245 Travel -- Fares				\$ 3,000
1246 Travel -- Subsistence and Lodging				\$ 27,000
12 Positions 18,000				
6 Positions 9,000 (6 Mo.)				
1251 Freight or Express Services				\$ 5,000
1261 Postal Services				\$ 5,800
1265 Telecommunications				\$ 8,500
1270 Printing				\$400,000
1290 Agency Service Contracts				\$ 25,000
1299 Other Contractual Services -- Advertising	\$200,000			
Grants	325,000			
Other	1,300			
				\$526,300
<u>Total Contractual Services</u>				<u>\$1,093,760</u>

1300 Supplies and Materials

1340 Office Supplies	\$ 5,000
1394 Wearing Apparel for Employees	\$ 1,080
1396 Photographic Supplies	\$ 1,500
1399 Other Supplies	\$ 1,930
Shipping Cartons	
<u>Total Supplies and Materials</u>	<u>\$ 9,510</u>



1600 Equipment -- Additional

1610 Office Equipment	\$ 45,535
1693 Books & Periodicals	\$ 300
1696 Photographic Equipment	\$ 19,965
	<u>\$ 65,800</u>

1700 Current Charges and Obligations

1730 Rent	\$ 33,100
1731 Rent (Business Equipment -- Xerox)	\$ 3,900
1742 Insurance (Workmen's Compensation)	\$ 310
1743 Insurance (Surety)	\$ 100
1749 Insurance (Other) Liability 175 Equipment 400	\$ 575
1785 Dues and Subscriptions	\$ 300
	<u>\$ 38,285</u>

1800 Pensions -- Retirement -- Insurance

1890 Federal Old Age Insurance 6%	\$ 15,745
1891 Employer Retirement Contributions 2.16%	\$ 5,665
1893 Medical/Hospitalization Insurance	\$ 1,045
	\$ 7,800
	<u>\$ 30,255</u>

Total Operating Expenses for Activity -- Special Fund

\$1,500,000

## **CODES**

## VI. CODES

- A. Suggested revisions to the Code of Virginia relative to those Sections dealing with the control of litter. The changes recommended are underlined.

Litter Control Act . . . Title 10 . . . Chapter 19,  
Sections 10-197 through 10-213.

- (1) Section 10-201. Collection and survey of litter. The Department of Highways and Transportation shall make a collection and survey of litter to be completed by November thirtieth, nineteen hundred-seventy-six, of types and kinds of litter that are discarded in violation of the laws of the State, including Standard Metropolitan Statistical Areas and rural and recreational areas. To the fullest extent possible in Standard Metropolitan Statistical Areas the Department of Highways and Transportation shall make use of local litter and trash collection services through arrangements with local governing bodies and appropriate agencies, in the discharge of the duties imposed by this section. The Department of Highways and Transportation shall report to the Governor, the General Assembly and the Department as to the amount of litter collected pursuant to this section and shall include in its report an analysis by item, weight and volume and, where practicable, the biodegradability of the types of products, packages, wrappings, and containers which compose the principal amounts of the litter collected. The products whose packages, wrappings and containers constitute the litter shall include, but not be limited to the following categories:

1. Food for human or pet consumption.
2. Groceries.
3. Cigarettes and tobacco products.
4. Soft drinks and carbonated waters.
5. Beer and other malt beverages.
6. Wine.
7. Newspapers and magazines.
8. Paper products and household paper.
9. Glass containers.
10. Metal containers.
11. Plastic or fiber containers made of synthetic material.
12. Cleaning agents and toiletries.
13. Nondrug drugstore sundry products.
14. Distilled spirits.
15. Motor vehicle parts. (1976, c.757.)

Follow up litter surveys using the same methods, standards and procedures shall be conducted every two years or as the need is determined by the Department or as directed by the General Assembly.

(2) Section 10-203. Litter receptacles; placement; violations; penalties.

This Section instructs the Department of Conservation and Economic Development to design and adopt, by rule or regulation, one or more types of litter receptacles which are reasonably uniform as to size, shape, capacity and color for wide and extensive distribution throughout the public places of the State.

It further requires that these standard litter receptacles be placed throughout the State in all areas open to the public, and that all persons owning or operating any establishment or public place, in which litter receptacles are required by this Section, be responsible for procuring and placing such receptacles, at his own expense, on the premises.

This Section, as written, would require that thousands of litter receptacles, now in use, would have to be replaced to conform to the present law. This would require a large expenditure of funds that would appear to be unnecessary.

As an example, the State Department of Highways and Transportation maintains 1300 rest areas, waysides and pull outs. They normally use repainted 50 gallon drums for litter receptacles at a cost of approximately \$5.00 per drum. If there was only one receptacle per stopping area the cost would be \$6500. If a standardized, commercial, all weather receptacle was required, the cost would be a minimum of \$195,000.

Consequently, it is recommended that Section 10-203 be amended as follows:

Section 10-203.A. In order to assist the public in complying with the Virginia Litter Control Law, the owner or person in control of any

property which is held out to the public as a place for assemblage, the transaction of business, recreation or as a public way, shall cause to be placed and maintained receptacles for the deposit of litter, of sufficient volume and in sufficient numbers to contain the litter which can be expected to be generated by the numbers of people customarily coming on or using the property.

A litter receptacle shall be maintained in a manner to prevent overflow or spillage of litter from the receptacle.

Section 10-203.B. Litter receptacles of ~~the uniform design~~, (a design acceptable by the Department,) shall be placed along the public highways of the State and at all parks, campgrounds, trailer-parks, drive-in restaurants, gasoline service stations, parking lots, shopping centers, retail store parking lots, parking lots of major industrial and business firms, marinas, boat launching areas, boat moorage and fueling stations, public and private piers, beaches and bathing areas, and other public places within the State as may be specified by rule or regulation of the Department. The number of such receptacles required to be placed as specified herein may be determined by a formula adopted by the Department and related to the need for such receptacles.

Section 10-203.C. A person owning or operating any establishment or public place in which litter receptacles of ~~the uniform design~~, (a design

acceptable by the Department,) are required by this section procure and place such receptacles at his own expense on the premises in accord with rules and regulations adopted by the Department.

(B) Litter tax; amount; collection.

In Chapter 757, Acts of Assembly 1976, there is imposed on certain persons an annual litter tax of two dollars and fifty cents which . . . "shall be only effective for the taxable years beginning in the year 1976."

Sponsors of this legislation intended for the tax to be designated as special revenue and appropriated to the Department of Conservation and Economic Development for administering the litter control program. However, through oversight, the appropriation was not made. In view of these circumstances, it is requested that legislation be drafted for introduction at the 1977 Session to appropriate the revenues from the litter tax as special revenues to the Department of Conservation and Economic Development for planning and implementing the litter control program.

The appropriation should carry an emergency clause, and should provide \$40,000 in the current fiscal year and \$85,000 in the 1977-78 fiscal year.

C. Litter laws in general

A search of the Code of Virginia reveals that numerous statutes pertain to the control of litter in some manner. Relevant sections follow:

- (1) Section 15.1-11 – Counties, Cities and Towns; Authority to provide for removal of trash, garbage, refuse, litter and other substances.
- (2) Section 15.1-28.1 – Counties, Cities and Towns; Authority to impose license taxes and regulate the services rendered by any business engaged in pickup and disposal of trash, garbage or refuse.
- (3) Section 15.1-239 – Counties, Cities and Towns; Authority to tax or assess for local improvements including the installation of waste receptacles.
- (4) Section 15.1-282 – Counties, Cities and Towns; Authority to acquire dumping places for waste materials and regulations covering the operation of such dumps.
- (5) Section 18.142 – Illegal to discard litter or refuse in caves of caverns.
- (6) Section 29-77 – Fine and loss of license to hunt, fish or trap if caught littering while engaged in hunting, fishing or trapping.
- (7) Section 33.1-345 – Illegal to dump or dispose of trash or other unsightly matter on a public highway, right-of-way property adjacent to highway or on private property.



- (8) Section 33.1-346 - Similar to 33.1-345 but places presumption of guilt upon owner or operator of vehicle from which trash was ejected. Authorizes counties, cities and towns to adopt ordinances not in conflict with this section.
- (9) Section 33.1-346.1 - Penalties for violation of Section 33.1-346.
- (10) Section 62.1-194 - Unlawful to cast, throw or dump refuse or trash into State waters.
- (11) Section 62.1-194.1 - Similar to Section 62.1-194, but prohibits dumping or placing of any materials on the banks of such waters, capable of causing these offenses or complicating the use and enjoyment of the waters and their environs.

D. Analysis of Code Authorizations

(1) Model Litter Control Ordinance

There are sufficient authorizations for all cities, counties and towns to pass and enforce a proper litter control ordinance.

(2) Litter Control Act

- (a) The provisions of the Litter Control Act do not conflict with other statutes of the code.
- (b) Those changes suggested under Codes, Suggested revisions, would make those sections dealing with laws and penalties more capable of enforcement.

(3) Other Statutes Pertaining to Litter

- (a) Six statutes pertain most directly to illegalities involving the throwing, dropping or dumping of litter, refuse or other waste.
- (b) It is probable that the most inclusive and important of these are Section 33.1-345, Section 33.1-346 with penalties as described under Section 33.1-346.1, Section 29-77 and Section 62.1-194. Proper enforcement of these statutes would do much to control litter along the State's highways, in and along its waters and in and near its woodlands and fields.

E. Beverage container bills introduced in 1976 and carried over to 1977

General Assembly:

(1) Senate Bills

- (a) S. B. 72 - A Bill to require that certain beverage containers have a refund value and providing penalties for violation. To be administered by ABC Board.
- (b) S. B. 132 - A Bill to require a five cent deposit on all beverage containers purchased at the retail level. To be administered by the Council on the Environment.
- (c) S. B. 203 - A Bill to require a deposit of not less than five cents on all beverage containers purchased at the

retail level. To be administered by the Council on the Environment. Essentially the same as S. B. 132.

- (d) S. B. 537 - A Bill to provide an excise tax on nonreturn-able beverage containers, collection and use of such tax. Tax to be 1/8 cent on each beverage container. To be administered by the Department of Taxation; payments to be made to the Department of Highways and Transportation, counties and cities.

(2) House Bills

- (a) H. B. 1074 - A Bill to provide an excise tax on nonreturn-able beverage containers and to provide for the collection and use of such tax. To be collected by the Department of Taxation. Payments to those that recycle, the Department of Highways and Transportation and the Department of Conservation and Economic Development.

F. Conclusion

Sufficient legislation necessary to the implementation of a successful litter control program appears to be in place at the present time. Those amendments to the Litter Control Act proposed in this section would clarify and facilitate its implementation.

It is probable that as the program develops further amendments and/or new legislation may become necessary.

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**TAXATION ALTERNATIVES  
FOR VIRGINIA'S LITTER  
CONTROL PROGRAM**

DEPARTMENT OF TAXATION

NOVEMBER 1976

TAXATION ALTERNATIVES FOR  
VIRGINIA'S ANTI-LITTER PROGRAM

Prepared by the  
Department of Taxation

November, 1976

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## TAXATION ALTERNATIVES FOR VIRGINIA'S ANTI-LITTER PROGRAM

### Introduction

The accumulation of litter on roadsides and in public places throughout the state has become a matter of increasing concern in recent years. A variety of ways to alleviate the problem have been discussed. Some proposals have been of a strictly regulatory nature, placing requirements designed to reduce litter on industry or consumers. Other possible solutions have called for some form of active government management of the litter problem.

Virginia opted for the latter through the passage by the 1976 General Assembly of House Bill No. 455, the Virginia Litter Control Act (Chapter 757, 1976 Acts of Assembly, see Appendix I). This act established a coordinated plan to be carried out by three state agencies, with the intent to "control, prevent and eliminate litter from the state to the maximum practical extent." The act authorized the Department of Conservation and Economic Development to design a multi-faceted anti-litter program and to implement it. It mandated the Department of Highways and Transportation to compile and present a survey reporting on the nature of litter found throughout the state. In conjunction with these agencies, the Department of Taxation would determine the best long-term method of taxation to fund the litter program. The department's goal would be to discover alternatives which might prove "fair and equitable, administratively practicable and [in avoidance of] multiple taxation of the

designated tax base." The act mandates that such tax mechanisms should place the burden on "those industries that manufacture or handle products that contribute to the litter problem." In the interest of comprehensiveness, however, this report focuses on a variety of potential approaches to litter taxation.

The anti-litter program is anticipated to require a maximum of \$1.5 million per year for the manpower, materials and projects involved. The funding could come from one of a number of alternative sources. The state might choose, for instance, to draw on existing revenue sources, simply appropriating for the litter program a portion of general fund revenues, special fund revenues, or a combination of the two. On the other hand, priorities might be such that a new, special tax is preferable as a funding mechanism.

This report presents an outline of the criteria by which potential funding sources will be evaluated, followed by a summary of the findings of the litter survey. This provides background for the subsequent discussion of the merits of current revenue sources and new taxes as alternative means of support for the anti-litter program.

#### Evaluative Criteria

A consumer product passes through many hands before it actually becomes litter, yet all those hands may be considered to be involved, at least circumstantially, in the creation of litter. A manufacturer wraps or boxes or seals his product in a disposable package and then sends it on to the wholesaler and then the retailer, where it may be packaged again and again. The consumer buys the product, and, after chewing the gum,

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reading the paper, drinking the beer, eating the candy, smoking the cigarettes, spraying the hair spray, eating the hamburger, sipping the soft drink or using the tissue, he disposes of it and its packaging. Improperly disposed of on a roadside, beach, campground, park or parking lot, the product and/or its packaging become litter.

A primary consideration in the evaluation of any tax proposal is the degree to which it imposes burdens upon the citizen that are viewed as just and equitable. Those citizens who litter impose costs on the rest of society - costs in the literal sense (litter prevention and cleanup) and the figurative sense (a less aesthetically pleasing environment). We think that a tax collected to fight litter, to be most equitable, ought to be related to the creation of that litter. Ideally, such a tax should be structured so that those citizens who cause the most litter pay the most to fund the anti-litter program. The various taxes proposed here reflect an attempt to place the burden of the litter tax on one or more parties who contribute to the litter problem from the time that a product is first manufactured to the time that it is eventually discarded. Several of the proposals considered here can also be examined in terms of costs and benefits. The equity of a tax under this approach is determined by the extent to which those who benefit most from a program bear a corresponding share of the costs.

Other factors besides equity ought to be considered in the design of a litter tax. Of substantial concern is the degree of difficulty with which workable statutes might be written, revenues collected, and compliance enforced. We think that administrative efficiency and practicality should be among the most important characteristics by which

any proposal is judged. The revenues generated by a litter tax will be relatively small, and the expense and effort undertaken in collecting these revenues should be kept at a modest level. Similarly, the average taxpayer would be likely to incur only a small burden under a litter tax, and he should bear no great effort or expense in complying with it. The tax should be simple enough so that he may easily understand the liability that he bears under it.

Any tax can produce unexpected side effects, and some persons may bear penalties or windfalls not envisioned by those who designed it. We think that a new litter tax should be careful to avoid such inadvertant distortions of the market. The only ancillary function that we might want a tax proposal to perform would be the generation of anti-littering incentives. The existence of such incentives, however, should be considered a bonus rather than a primary criterion for approval or disapproval of a funding scheme.

In short, we will review each taxation alternative with a focus on its potential equity, administrative efficiency, and indirect impacts.

#### Litter Survey

The survey undertaken by the Department of Highways and Transportation in the summer of 1976 provides a basic analysis of the nature of litter in Virginia. It contains a detailed breakdown of the relative importance of various categories of products as they or their packaging

appear in the litter stream. Without reiterating all of the findings of the survey itself, we can draw conclusions from the data which may be of value as we examine the various litter taxation alternatives.

The survey compiled data on the incidence of litter on interstate, primary and secondary roads, in urban areas, and in recreational sites throughout the state. In arriving at a composite summary of the nature of all litter in the state, the survey recommended giving varying weights to samples from different kinds of locations. Highway litter was estimated to be 70 percent of total litter, urban litter, 25 percent, and recreational litter, 5 percent. While these exact percentages are arbitrary, they do reflect generally accepted views on the litter problem which hold roadside litter to be the most prevalent by far. Among the various highway types, litter found along secondary roads received the heaviest weighting, reflecting the relatively large share of secondary mileage in the state's road system. For all locations, the survey classified litter according to the kind of product that generated it, and calculated the relative share of total litter for each category of product by weight, volume and number of items.

While the survey results appear reasonable and fairly consistent with other such studies, we cannot recommend basing any tax exactly on the survey results for several reasons. They are subject to unknown seasonal biases, the necessary arbitrariness of the proportions used to compute the combined figures, and the question of how litter shares which differ by weight, volume and item counts ought to be reconciled.

In any case, by reviewing the results we can account for at least 70 percent of all litter by any measure by summing the relative scores of litter held by food and beverage products (see Table 1).

TABLE 1--CATEGORY OF PRODUCT AND ITS RELATIVE PROPORTION  
OF LITTER SAMPLES

	<u>By Item</u> (Percent)	<u>By Weight</u> (Percent)	<u>By Volume</u> (Percent)
Beer Cans, Bottles, Cartons	29.3	40.6	26.8
Grocery and Snack Foods	18.0	7.9	21.8
Prepared Foods	14.8	4.2	12.4
Soft Drink Cans, Bottles, Cartons	8.5	18.8	8.7
Miscellaneous Beverage Litter	2.0	0.2	0.7
Total	72.6	71.7	70.4

Another 10 percent of the composition of the litter stream can be accounted for by calculating the amount of litter composed of household paper and plastics and miscellaneous paper. The remaining portion of the litter stream consisted of wine, liquor, and tobacco containers, newspapers and magazines, automotive debris, and miscellaneous plastics, metal, and glass.

Beverage container litter comprised the largest and most volatile product category in terms of its contribution to the litter stream. The Virginia litter survey estimated that beer and soft drink containers accounted for 9 percent of urban litter in number and 16 percent in volume, but 20 percent of recreational litter items (33 percent by volume) and 49 percent of highway litter (43 percent by volume). By weight, beverage containers made up 35 percent of urban litter, 59 percent of recreational litter and 68 percent of highway litter. This beverage container litter seems to consist almost entirely of nonreturnable containers. The Virginia survey found that only 15 percent of the soft drink litter consisted of returnables, and virtually none of the beer containers carried deposits.



While an exact figure representing the amount of beverage litter as a percent of all litter may be difficult to determine, there seems to be a basis for the contention that beverage containers are a significant portion of the total litter problem. As a point of interest, we might note that the average American consumer spends only 7 percent of his total grocery expenditures on beer and soft drink products, but apparently litters them with great frequency.<sup>1/</sup>

In summary, the litter survey shows a rather substantial concentration of beverage container litter in Virginia, assuming that the highway/urban/recreational proportions used in our survey are fairly accurate. A variety of other food products and, to a lesser extent, paper not used for packaging account for the other major sources of litter in Virginia.

#### Revenue Alternatives

We have identified four basic funding approaches for the programs to be instituted by the Department of Conservation and Economic Development under the Virginia Litter Control Act:

1. Existing general fund revenues
2. Tax on businesses with litter-related products
3. Beverage container tax
4. Motor vehicle use taxes

A discussion of each alternative, to include an evaluation of its equity, administrative efficiency and incidence and an analysis of its revenue potential, follows.

<sup>1/</sup> U. S. Bureau of the Census, Statistical Abstract of the United States, (Washington, D. C., 1975), p. 428.

### General Fund Financing

The nature of the anti-litter program, its size, and its benefits provide us with a number of reasons for considering general fund financing. The revenue needs of the program, currently estimated to be a maximum of \$1.5 million, may not be great enough to warrant the imposition of an entirely new tax structure to raise them. The use of general fund appropriations simplifies matters, removing the need for additional collection and administration costs.

Additional arguments for general fund financing are based on the contention, which we assume to be valid, that all citizens and businesses in the Commonwealth will benefit from the results of the program. This argument holds that since all citizens benefit from a cleaner environment, the broadest possible revenue raising mechanism should be used to assure that all contribute. While it is not possible to assign an exact monetary value to those benefits, it might be argued that the average value of the benefit gained by each taxpayer would be likely to exceed the fraction of a dollar that would be contributed to the program by the average taxpayer.

The standard equity arguments for a litter tax, by contrast, interpret litter program costs as a penalty to be paid by those who cause litter rather than a benefit to be purchased by all. It seems difficult to discern any equity in general funding from this viewpoint, since general fund revenues are contributed from a variety of sources and then disbursed independent of the nature of those sources. Thus we find it

impossible to determine whether those responsible for litter would pay for the program through their general taxes in relation to their propensity to litter.

Given the current shortage of state general fund revenues, other priorities might well rank ahead of the litter program, precluding the use of the general fund for its support. Indeed, the sense of the Virginia Litter Control Act is that a special tax be set up to fund the program. In any case, should the Governor and General Assembly deem general fund financing to be feasible, we find reasonably sound administrative efficiency and cost-benefit arguments in its favor.

#### Tax on Businesses with Litter-Related Products

The state of Washington first enacted a litter tax on businesses in its Model Litter Control Act of 1971. That legislation called for a comprehensive anti-litter program supported by a tax on the gross receipts of businesses operating within the state whose products were "reasonably related to the litter problem." Manufacturers, wholesalers, and retailers of food and beverage, eating and drinking places, drug stores, vending machines, printers and publishers, container manufacturers, paper manufacturers and distributors, and general merchandise stores all assumed a liability under the statute.

Under the Virginia Litter Control Act the Commonwealth has instituted an interim tax on businesses to provide start-up revenues for the program until a long-term revenue source is chosen. The interim tax levies a \$2.50 litter charge on every business operating in the state selling

products whose packaging constitutes litter, and would provide only a fraction of the revenues that the program, when fully underway, would demand. A long-term litter tax levied on businesses would differ from the interim tax in both structure and revenue potential and would probably bear a greater resemblance to the Washington statute.

A litter tax which singles out a certain class of taxpayers -- businesses, in this case -- ought to have strong equity arguments to defend that selectivity. One such argument contends that businesses are partially responsible for the litter which the users of their products discard. Thus, it follows that a tax on businesses is justified if it reflects the amount of litter eventually generated by those businesses' products.

Business can tenuously be considered a source of litter in the sense that it produces the products and packaging that become litter. A firm, of course, is not directly responsible for litter unless the firm itself becomes a litterer (e.g., a company truck spilling debris or leaving fragments of tire in the road). Some responsibility does lie with the producer of a good in the sense that the product is brought to market in packaging which is disposable but needn't be, or which, by its design, encourages litter.<sup>2/</sup>

An alternate equity argument disputes the previous discussion by contending that such a business tax would really be a tax on consumers, as businesses would pass the costs of the levy on to consumers. When the state taxed a business in relation to its sales of litter-related products, the tax would be included in the price of those goods. The more litter-

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<sup>2/</sup> Nonreturnable beverage containers and flip-tops on cans are cited by environmentalists as offenders on these counts.

related products the consumer bought, the more tax he would pay. Theoretically, then, he would pay his fair share for the litter program, since the propensity to litter those products is greater.

Neither of these arguments is completely valid. While it is not easy to determine exactly where the burden of this kind of tax would finally fall, it would almost certainly be split in some way between business (as one of its costs of production) and the consumer. If we wish to tax only the consumer for his purchases of litter-related goods, we suggest that a more direct method be used to do so. The business tax should thus be regarded, to some indeterminate degree, as a tax on businesses, and, to some degree, as a tax on consumers.

If we are willing to accept this kind of arrangement on theoretical grounds, we still face questions of its acceptability based on the criteria of practicality and administrative efficiency.

The state of Washington answered the question of how businesses should be taxed with a gross receipts tax. The state taxed .00015 of gross receipts of all firms (manufacturers, wholesalers and retailers) selling litter-related products. This structure was convenient, since Washington already levied a general business and occupation tax, and the litter tax was designed to be compatible with it. Officials in the state seem to have found this design to be a practical and acceptable way of raising anti-litter revenues.

A similar litter levy on businesses in Virginia would also result in a relatively small burden per taxpayer. Recent census figures list 150 food and beverage manufacturing and processing establishments in the state of Virginia. The number of wholesalers dealing in grocery and

beverage products amounts to nearly 800, and the most recent sales tax records indicate that there are more than 10,000 registered retail dealers of food and groceries. The total grosses of these firms have amounted to between six and eight billion dollars in recent years; a tax levied at a rate of .0002 could easily raise the \$1.5 million maximum estimated program cost. Add to that tax base those restaurants, paper product firms, vending machines, department and variety stores, drug stores and other firms which might have a liability, and the necessary tax rate would fall closer to the .00015 rate set in Washington.

Though the small burden per taxpayer might convince some to be less concerned about equity, there would still be substantial equity problems in the practical application of this kind of tax. Litter taxation by gross receipts does not guarantee an accurate reflection in revenues of a firm's contribution to the litter problem. It reliably meters neither the composition of a firm's production (a store may do only 10 percent of its business in litter-related items, yet be taxed on all its revenues) nor the product's contribution to the litter problem (two manufacturers may produce two products with differing impacts on the litter problem, yet if the products' sales receipts are identical, they will be taxed identically).

As a solution to the composition dilemma, businesses might be allowed to file separate returns to account for departments and divisions with and without litter liability. This might, however, entail some compliance and enforcement efforts out of line with a small tax such as this. The state of Washington offers exemptions to some businesses to ameliorate

such inequities. Drugstores may pay the tax on 50 percent of total sales rather than separately accounting for the sales of prescription, drug, and sundry items. Grocery stores may pay the tax on 95 percent rather than 100 percent of total sales, to account for the sales of non-grocery items. Such exemptions may compensate somewhat for the inaccuracies of gross receipts taxation, but they, too, are by nature arbitrary and would probably deliver only modest improvements in equity.

The fact that the businesses liable under a gross receipts tax might be manufacturers, wholesalers or retailers poses no equity problems if the tax is simply considered to be a tax on businesses per se. On the other hand, if we consider a business's liability to be related to the products it carries we seem to be violating the portion of House Bill No. 455 that instructs us to consider methods of taxation "that avoid multiple taxation of the designated tax base." Goods that are manufactured, distributed and retailed in Virginia would, theoretically, be taxed three times, while goods which enter the state at the wholesale or retail level would be taxed less, since only firms operating in the Commonwealth could incur a tax liability for carrying them. The net effect is self-defeating--a penalty, however small, on Virginia-manufactured products.

Arguments on behalf of taxation of a single class of firms (rather than a three-tier system) can be made on grounds of equity and efficiency. A tax on manufacturers is out of the question, since it would leave products of non-Virginian manufacture untaxed. A tax on either wholesale or retail businesses, however, would avoid multiple taxation and

offer reasonably comprehensive taxation of all litter-related products sold in the state. A tax on the retail level only would still not isolate for taxation purposes only litter-related products from the rest of a retailer's inventory. Wholesalers, who generally carry limited, homogeneous product lines, would be a more attractive tax base from this standpoint. Difficulties might result, however, in deciding who wholesalers were and whether their sales were litter-related.<sup>2/</sup>

An additional problem surrounds the use of a single-tier litter tax. If the costs of the tax are not passed on to the consumer, such arrangements can be criticized as discriminatory to the one level of business which is taxed, since the responsibility for litter, presumably, lies with all who handle the product. The validity of that argument is a matter of conjecture, since the question of where eventual incidence would fall under any single or multiple tier litter tax is not readily answerable.

In terms of sheer administrative practicality, a business gross receipts tax to fund a litter program faces much greater obstacles in Virginia than it did in Washington state. To begin with, the Commonwealth has no existing gross receipts tax structure in which to integrate a litter tax. Thus the state would have to devote additional resources toward implementing an entirely new business tax. In fact, administrative complications will be evident whether a gross receipts or some schedule of flat license taxes on business is contemplated.

<sup>2/</sup> Would certain products sold in "factory outlets" or without middlemen escape taxation? Would restaurant food distributors, for example, be taxed according to whether their customers were "eat-in" or "take-out" establishments?



Any business-based litter tax statute would have to include a carefully-written enumeration of the kinds of products which would constitute a tax liability for their producers. Only products which were substantially represented in our litter survey would be held liable. Defining a level of "substantial representation" and workable definitions of product categories would not be easy. Specific, detailed definitions of product categories might make the tax more cumbersome without improving equity; simple, broad definitions could engender countless disputes over tax liability and gross inequities.

The dilemmas inherent in a categorized product tax system are multiple. Should meat packers, poultry dressers, and dairies be liable as producers of grocery litter? How should prepared food be defined, and how much food can a restaurant sell for off-premises consumption before becoming liable for taxation? Should bakeries, produce and fish markets, cheese shops and other specialty food outlets be taxed as grocers? Should concessionaires at movie theatres, stadiums, and expositions be liable? Should paper products such as office stationery, greeting cards, and art paper be taxed? Should tobacco, wine and liquor, already taxed through excise taxes, be taxed again, and at all levels of sales? Does the taxation of container and packaging materials and the subsequent taxation of the products placed inside them count as multiple taxation?

We find no easy answers to the many questions of equity, incidence, and practicality raised by the various aspects of litter taxation through businesses. The goals of equity and simplicity seem to be inversely related with regard to proposals of this type. Given the small amounts

of overall revenue and revenue per taxpayer to be raised by a litter tax, we recommend that the prospects of the cost effectiveness of a business tax be very carefully scrutinized.

#### Beverage Container Taxes

While various and conflicting claims have been made regarding the severity of the litter problem which beverage containers impose, our studies indicate that beer and soft drink cans and bottles make up a major portion of the litter stream in Virginia. Environmentalists here and elsewhere have argued that beverage container litter could be substantially reduced by eliminating nonreturnable bottles and cans. Since nondeposit containers have no return value and a very small recycling value, they carry little incentive for their proper disposal. If all cans and bottles carried deposits, the argument follows, an incentive would exist and litter would be reduced. In addition, returnables are seen as being more socially desirable since they use less energy and materials than the equivalent number of disposable bottles and cans, and impose a much smaller burden on solid waste disposal facilities.<sup>4/</sup>

The states of Oregon and Vermont have banned nonreturnable beverage containers; many other states and localities, including Virginia, have entertained proposals to do so. Such statutes are not revenue producers, however, and in the context of this report we might consider not a ban on nonreturnable containers but a tax on them.

The equity arguments in favor of such a tax are based on the contention that the users of nonreturnable beverage containers impose costs on the

<sup>4/</sup> Environmental Action Foundation, Bottles and Sense, (Washington, D. C., 1976), p. 3.

rest of society, either by littering or by contributing unnecessarily to the solid waste stream. By taxing these containers rather than banning them, the state corrects and preserves the free market. People who want the convenience of nonreturnable containers would still find them available; they would simply have to pay the full costs of their choice. If fewer people, having been confronted with the real costs of their choice, decide to purchase returnable containers instead, then the beverage container tax has provided an anti-litter incentive as well. The effectiveness of this incentive hinges on the assumption that consumers will be less likely to litter if they are cognizant of the return value of the containers and in the habit of returning them.

On equity grounds, though, a litter tax on beverage containers is not without fault. It would force purchasers of nonreturnable beverage containers to pay all the costs of the litter program, even though beverage containers consist of only part of the litter problem. A beverage container tax might be equitable if taken as part of a tax package that also included a simple business tax. Such a package would best reflect the distribution of litter costs, based on our survey, if it allocated between 30 percent and 40 percent of the tax liability to beverage buyers, and the rest to the full range of litter-related industries.

The administrative difficulties associated with a beverage tax would probably not be severe--six states currently employ crown taxes on soft drinks, and many more tax malt beverages, apparently without serious problems. However, packaging such a tax with a business tax, whose problems we have already encountered, could produce considerable administrative expense, with the state attempting to implement two separate taxes for a small amount of total revenues.

The size of the revenues generated by the tax constitutes one of its greatest problems. Using extrapolated industry and taxation data, the Department of Taxation has calculated that a tax of 1/10¢ on each nonreturnable beverage container sold in the state has a revenue-producing potential of \$1.6 million, and a penny tax that of approximately \$16 million. Obviously, a beverage tax could finance the entire litter program, or the litter program and a variety of others. If we wish to construct the more equitable two-part litter tax, of which the beverage component contributes approximately 35 percent of total revenues (in view of its litter contribution), the charge per beverage container would be miniscule. The business tax would be assigned to raise \$975,000 of an estimated maximum \$1.5 million budget. The remaining \$525,000 would be raised by the beverage tax, necessitating an administratively clumsy 1/30th of a cent tax on every container. This small tax per unit of beverage would probably rule out the potential for anti-litter incentives, as no genuine price differential beyond what currently exists would be created between returnables and nonreturnables.<sup>5/</sup>

In summary, a beverage container tax would provide us with a very attractive means by which to force those who purchase waste-creating products to pay for the costs they create. It would not perform this function for all kinds of litter, however, though it might be used to achieve broad, equitable litter taxation in tandem with another tax.

<sup>5/</sup> The ability of any beverage tax to create a marked shift in consumer preferences toward returnables is questionable. A substantial price differential currently exists between deposit and non-deposit bottles, yet higher priced, non-deposit products show no sign of disappearing from the market. Demand for convenience may be fairly inelastic among many consumers.

Unfortunately, its effectiveness as an anti-litter incentive device is dissipated when included as part of a compound tax, and the cost effectiveness of the tandem tax arrangement is questionable.

#### Motor Vehicle Use Taxes

The rationale for using motor vehicle use taxes to fund an anti-litter program derives from the finding that most litter is related to road use. Recent studies of the litter problem, including the Virginia survey, have stated that approximately two-thirds or more of all litter is found along roads and highways. While cyclists may toss cans and pedestrians may drop papers on city streets, it seems likely that the majority of litter comes from passenger cars and trucks. Motor vehicle use could therefore be used as a crude proxy for the propensity to litter, and litterers would be taxed through their use of vehicles or gasoline. Of course not all motorists are litterers, and they would pay the penalty (the litter tax) while doing no wrong (littering). However, a benefit argument also supports the use of motor vehicle taxes for the anti-litter program. It says that since most litter is found on roadsides, it is road users who will benefit most from cleaner thoroughfares. One can enjoy that benefit the more one uses the roads, and so the more one uses the roads, the more one should be contributing to the litter tax through motor vehicle use taxes. By either argument an ideal litter tax device based on vehicle fees should exactly reflect motorists' use of highways.

Several kinds of motor vehicle use taxes might be suitable as funding sources, and the major special fund taxes consid red here are listed in Table 2.

TABLE 2--MAJOR MOTOR VEHICLE USE TAXES AND REVENUES (IN  
MILLIONS) FOR FISCAL YEAR 1975-76

Motor fuel taxes	\$254.1
Sales and use taxes	49.5
Motor vehicle licenses	69.3
Operator and chauffeur licenses	10.5
Title registration	8.4
	\$383.2

Source: Report of the Comptroller to the Governor of Virginia for the Fiscal Year Ended June 30, 1976, p. 35.

If they were available, revenues currently raised by any of the motor vehicle taxes could be appropriated for the anti-litter program without major administrative effort. On purely theoretical grounds, however, some are more appropriate than others.

Fuel taxes, for instance, reflect the amount of vehicle mileage more closely than any other (though they tend to penalize drivers of larger cars, who may or may not be the biggest litterers). Their base is quite broad, as vehicle owners and users from Virginia and out-of-state pay them when driving in Virginia. Titling fees and sales taxes reflect only the initial purchase of a vehicle, and sales taxes are biased against owners of newer, more expensive cars. The vehicle license registration fee, renewed throughout the life of the vehicle, is only slightly more useful in matching an owner's tax contribution to his volume of vehicle use. The use of operator's license revenues would include all drivers under the burden rather than just vehicle owners. No measure of the operator's mileage is, however, taxed by it. Pas-

sengers and motorists from out-of-state are the "free riders" under all but the fuel tax, since they would pay nothing toward the litter tax but still benefit from it.

If anti-litter program funding can be derived only from additions to motor vehicle use taxes, the title, vehicle license, and operators license fees become more attractive. Sales and fuel tax rates could not practically be raised by the small fraction needed for the anti-litter program. Additions of a half-dollar to vehicle license fees, one dollar to operator's and chauffer's licenses, and one dollar to title fees could each provide the program with between \$1 million and \$1.5 million annually. The only administrative problem that we might anticipate would be a reduction in present collection efficiency due to a raise in these fees of less than \$1, for example from \$15 to \$15.50 for the vehicle licenses fee.

We must note that the Department of Highways and Transportation already expends about \$1.2 million in motor vehicle use taxes annually on litter clean-up. The equity and benefit arguments which were offered earlier to justify the use of road taxes to fund the anti-litter program are equally valid when applied to the manner in which this existing program is supported. Whether road users should be called upon to support both programs simultaneously is another question, however. We should consider whether the motor vehicle area already bears a reasonable share of the litter burden, and, if so, whether the additional burden to pay for an anti-litter program might better rest with the general public or with the industries producing the litter.

In any event, the implementation of an effective program to reduce the public's propensity to litter would hopefully reduce the state's litter clean-up costs. Thus, while the total projected costs of both prevention and clean-up efforts add up to \$2.7 million under any funding arrangement, we might expect actual total expenditures to be lower at some point after the prevention program began. If the \$1.5 million expenditure for prevention did not eventually reduce litter along the roads and, hence, reduce clean-up costs, the prevention program might be judged partially ineffective.

In summary, the motor vehicle use area does meet the equity test as well as any other alternative used in this report, and additions to the motor vehicle use taxes would be administratively practical. To make additional use of motor vehicle revenues in the litter area would, however, require a judgment that the cost of both litter clean-up and control should be borne solely by highway users.

#### Summary and Findings

In this report, the Department of Taxation has presented four alternative methods by which the Commonwealth might fund a program aimed at reducing littering. Each of the alternatives the general fund, business gross receipts taxes, disposable container taxes and motor vehicle use taxes were evaluated with regard to their equity, practicality, efficiency, and incidence.

General fund financing would have no new collection or administrative costs, and thus was found to be the simplest alternative in that respect.



The department also found valid cost-benefit arguments in its favor. The equity of this alternative, in terms of its ability to allocate the burden according to a taxpayer's propensity to litter, could not be determined.

This report also discussed at length taxes on firms handling litter-related products, focusing particularly on the gross receipts form of tax currently employed in Washington state. We found a number of administrative and equity problems inherent in this kind of tax. While reasonable arguments for its theoretical equity can be made, the practical equity of such a tax seems questionable, since a simple gross receipts statute could not accurately meter and tax a firm's actual responsibility for litter. Attempts to improve the equity of the business tax would make it more complex and raise collection and compliance costs for the department and the taxpayer. Finally, such a tax, if levied on manufacturers, wholesalers and retailers, would result in the multiple taxation of certain goods, while a tax on a single level of the production process might allow some segments of industry to escape the tax entirely.

A tax on nonreturnable beverage containers was discussed, using the rationale that such a tax was a viable method of recovering the costs imposed on the state and its citizens by the users of such containers. This alternative falls short under our equity criteria, for although nonreturnables constitute the largest single litter category in the state, they by no means constitute the whole litter problem. A tax package which coupled the beverage container tax with a tax on other litter-related businesses might prove more equitable. However, the cost

efficiency of such a dual tax arrangement seems questionable, and any anti-litter incentive it might have embodied would be dissipated.

Motor vehicle use taxes were found to have some justification, in terms of equity, on the grounds that most litter has been found to accumulate on roadsides, presumably through the carelessness of motorists. The argument was also offered that motorists would benefit most from its reduction. In addition, the use of these fees could provide an administratively efficient method of raising revenue. This alternative would also increase the burden of litter-related costs on road users, since the current highway litter clean-up program is already financed through motor vehicle taxes.

After evaluating these alternatives, the department has made two findings. First, we do find theoretical justification for general fund financing, since the benefits of the program would be enjoyed by a wide variety of taxpayers throughout the Commonwealth. In addition, from an administrative standpoint, it is the most efficient and least costly method of financing the litter program.

Such technical issues are only the first step, not the sole consideration, in coming to a decision on whether a general fund appropriation should be used to support the litter program. The final policy determination rests with the Governor and General Assembly, based on their evaluation of the relative merits and priorities of the litter program measured against other programs for which the general fund is a logical revenue source. Therefore, the department does not recommend general fund financing but does find that as an efficient and logical funding source it merits consideration.

The department is aware of the fiscal problems that have faced the state in recent years and continue during the current biennium. Thus, as our second finding, we suggest that the Governor and General Assembly consider continuing the interim flat tax on business that was originally imposed only for 1976 if they wish to continue the litter program but cannot look to the general fund. No new collection apparatus would be required to do so, and the size of the flat levy could be varied to produce the size program that policymakers feel is optimal. While the equity of this tax is open to some question, as the flat payment in no way reflects a firm's output of litter-related goods or the impact of those goods on the litter problem, the rate might be raised beyond the current \$2.50 level without causing that imbalance to become a heavy burden on any taxpayer. The inequity of the flat tax might be slightly ameliorated by altering the current statute so that a firm would pay the fee on each establishment that it operated rather than a single fee for the whole firm. The department estimates that under the present levy-per-business structure between \$45,000 and 50,000 would be raised for every dollar of the flat tax rate. Under a levy-per-establishment arrangement, the revenue per dollar of flat tax would be approximately \$60,000.

Therefore, the department recommends that, given no general fund financing, the flat tax be continued for a second year at a rate consistent with the size of program desired by the state's policy-makers, and that it be levied on every establishment operated by firms liable under the statute. This extension would allow time for an evaluation of the administrative efficiency of the current tax mechanism prior to the time at which a long-term source of funding for the anti-litter program would be considered in the context of the 1978-80 budgetary process.

APPENDIX I

## APPENDIX

## VIRGINIA LITTER CONTROL ACT

Sec.	Sec.
10-197. Title.	10-206. Further duties of Department.
10-198. Legislative findings; purpose; intent.	10-207. Private organizations to cooperate in anti-litter campaign.
10-199. Definitions.	10-208. Authority of Department to contract.
10-200. Rules and regulations; Administrative Process Act.	10-209. Penalty for violation of chapter.
10-201. Collection and survey of litter.	10-210. Notice to public required.
10-201.1. Litter tax.	10-211. Allowing escape of load material; penalty.
10-202. Enforcement of chapter.	10-212. Tax study.
10-203. Litter receptacles; placement; penalty for violations.	10-213. Preemption of certain local ordinances.
10-204. Litter bag.	
10-205. Responsibility for removal of litter from receptacles.	

§ 10-197. Title. — This chapter shall be known and may be cited as the "Virginia Litter Control Act." (1976, c. 757.)

§ 10-198. Legislative findings; purpose; intent. — A. The General Assembly finds that the population of Virginia is increasing steadily requiring vigilance on the part of government to protect the public health and safety as well as to maintain a healthful, clean and beautiful environment. The proliferation and accumulation of litter discarded throughout the State impairs these objectives and constitutes a public hazard, and in addition, litter tends to damage the economy of the State by making it less attractive to tourists and newcomers. There is an imperative need to anticipate, plan for, and accomplish effective litter control through a state-developed and coordinated plan of education, control, prevention and elimination.

B. The General Assembly declares that it is the purpose of this chapter to accomplish litter control throughout the State by delegating to and vesting in the Department of Conservation and Economic Development, authority to conduct a continuous program to control, prevent and eliminate litter from the State to the maximum practical extent. Every department of State government and all governmental units and agencies of the Commonwealth shall cooperate with the Department in the administration and enforcement of this chapter.

C. This chapter is intended to add to and to coordinate existing litter control and removal efforts, and not terminate existing efforts nor, except as specifically stated, to repeal or affect any State law governing or prohibiting litter or the control and disposition of waste. (1976, c. 757.)

§ 10-199

§ 10-201

§ 10-199. Definitions. — As used in this chapter:

A. "Department" means the Department of Conservation and Economic Development;

B. "Disposable package or container" means all packages or containers intended or used to contain solids, liquids or materials and so designated;

C. "Litter" means all waste material including but not limited to disposable packages or containers but not including the wastes of the primary processes of mining, logging, sawmilling, farming, or manufacturing;

D. "Litter bag" means a bag, sack, or other container made of any durable material which is large enough to serve as a receptacle for litter inside the vehicle or watercraft of any person. It is not necessarily limited to the state-approved litter bag but shall be similar in size and capacity;

E. "Litter receptacle" means those containers prescribed by the Department and which may be standardized as to size, shape, capacity, and color and which shall bear the State anti-litter symbol, as well as any other receptacles suitable for the depositing of litter;

F. "Person" means any natural person, corporation, partnership, association, firm, receiver, guardian, trustee, executor, administrator, fiduciary, or representative or group of individuals or entities of any kind;

G. "Public place" means any area that is used or held out for use by the public whether owned or operated by public or private interests;

H. "Sold within the State" or "sales of the business within the State" means all sales of retailers engaged in business within the State and all sales of products for use and consumption within the State in the case of manufacturers and wholesalers;

I. "Vehicle" includes every device capable of being moved upon a public highway and in, upon, or by which any person or property may be transported or drawn upon a public highway, except devices moved by human power or used exclusively upon stationary rails or tracks; and

J. "Watercraft" means any boat, ship, vessel, barge, or other floating craft. (1976, c. 757.)

§ 10-200. Rules and regulations; Administrative Process Act. — In addition to its other powers and duties, the Department shall have the power to propose and to adopt rules and regulations necessary to carry out the provisions, purposes and intent of this chapter pursuant to the Administrative Process Act, § 9-6.14:1 et seq. of the Code of Virginia. (1976, c. 757.)

§ 10-201. Collection and survey of litter. — The Department of Highways and Transportation shall make a collection and survey of litter to be completed by November thirtieth, nineteen hundred seventy-six, of the types and kinds of litter that are discarded in violation of the laws of the State. The survey shall include litter found throughout the State, including Standard Metropolitan Statistical Areas and rural and recreational areas. To the fullest extent possible, in Standard Metropolitan Statistical Areas the Department of Highways and Transportation shall make use of local litter and trash collection services through arrangements with local governing bodies and appropriate agencies, in the discharge of the duties imposed by this section. The Department of Highways and Transportation shall report to the Governor, the General Assembly and the Department as to the amount of litter collected pursuant to this section and shall include in its report an analysis by item, weight and volume, and, where practicable, the biodegradability of the types of products, packages, wrappings and containers which compose the principal amounts of the litter collected. The products whose packages, wrappings and containers constitute the litter shall include, but not be limited to the following categories:

1. Food for human or pet consumption.

## § 10-201.1

2. Groceries.
3. Cigarettes and tobacco products.
4. Soft drinks and carbonated waters.
5. Beer and other malt beverages.
6. Wine.
7. Newspapers and magazines.
8. Paper products and household paper.
9. Glass containers.
10. Metal containers.
11. Plastic or fiber containers made of synthetic material.
12. Cleaning agents and toiletries.
13. Nondrug drugstore sundry products.
14. Distilled spirits.
15. Motor vehicle parts. (1976, c. 757.)

§ 10-201.1. Litter tax. — A. There is hereby levied and imposed upon every person in the State engaged in business as a manufacturer, wholesaler, distributor or retailer of products enumerated in § 10-201 an annual litter tax of two dollars and fifty cents.

B. The tax imposed hereunder shall be collected annually by the Department of Taxation in the same manner as the income tax imposed under chapter 4 (§ 58-151.01 et seq.) of Title 58, as provided by regulations promulgated by such Department. Such regulations shall not be subject to the Administrative Process Act, chapter 1.1:1 (§ 9-6.14:1 et seq.) of Title 9 of the Code of Virginia. All pertinent provisions of Title 58 relating to administration and collection of income taxes shall be applicable, mutatis mutandis. (1976, c. 757.)

Effective date. — Clause 2 of the 1976 act adding this chapter provides that "the tax imposed by § 10-201.1 shall be only effective for taxable years beginning in the year nineteen hundred seventy-six."

§ 10-202. Enforcement of chapter. — The Department may designate its trained employees to be vested with police powers to enforce and administer the provisions of this chapter and all rules and regulations adopted hereunder. The Department shall also have authority to contract with other State and local governmental agencies having law-enforcement powers for services and personnel reasonably necessary to carry out the provisions of this chapter. In addition, all law-enforcement officers in the Commonwealth of Virginia and those employees of the Commission of Game and Inland Fisheries vested with police powers shall enforce the provisions of this chapter and all rules and regulations adopted hereunder and are hereby empowered to arrest without warrant, persons violating any provision of this chapter or any of the rules and regulations adopted hereunder. All of the foregoing enforcement officers may serve and execute all warrants and other process issued by the courts in enforcing the provisions of this chapter and rules and regulations adopted hereunder. (1976, c. 757.)

§ 10-203. Litter receptacles; placement; penalty for violations. — A. On or after July one, nineteen hundred seventy-seven, the Department shall design and adopt by rule or regulation one or more types of litter receptacles which are reasonably uniform as to size, shape, capacity and color, for wide and extensive distribution throughout the public places of the State. Each such litter receptacle shall bear an anti-litter symbol designed and adopted by the Department. All litter receptacles shall be designed to attract attention and to encourage their use.

## § 10-203

## § 10-204

## § 10-206

B. Litter receptacles of the uniform design shall be placed along the public highways of the State and at all parks, campgrounds, trailer parks, drive-in restaurants, gasoline service stations, parking lots, shopping centers, retail store parking lots, parking lots of major industrial and business firms, marinas, boat launching areas, boat moorage and fueling stations, public and private piers, beaches and bathing areas, and other public places within the State as specified by rule or regulation of the Department. The number of such receptacles required to be placed as specified herein shall be determined by a formula adopted by the Department and related to the need for such receptacles.

C. A person owning or operating any establishment or public place in which litter receptacles of the uniform design are required by this section shall procure and place such receptacles at his own expense on the premises in accord with rules and regulations adopted by the Department.

D. Any person who fails to place and maintain such litter receptacles on the premises in the number and manner required by rule or regulation of the Department, or who violates the provisions of this section or rules or regulations adopted hereunder shall be subject to a fine of fifteen dollars for each day of violation. (1976, c. 757.)

§ 10-204. Litter bag. — The Department may design and produce a litter bag bearing the State anti-litter symbol and a statement of the penalties prescribed for littering. Within one year after the effective date of this chapter, such litter bags may be distributed by the Division of Motor Vehicles at no charge to the owner of every licensed vehicle in the State at the time and place of the issuance of license or renewal thereof. The Department may make such litter bags available to the owners of watercraft in the State and may also provide such litter bags at no charge for tourists and visitors at points of entry into the State and at visitor centers to the operators of incoming vehicles and watercraft. (1976, c. 757.)

§ 10-205. Responsibility for removal of litter from receptacles. — The responsibility for the removal of litter from receptacles placed at parks, beaches, campgrounds, trailer parks, and other public places shall remain upon those State and local agencies now performing litter removal services. The removal of litter from litter receptacles placed on private property used by the public shall remain the duty of the owner or operator of such private property. (1976, c. 757.)

§ 10-206. Further duties of Department. — In addition to the foregoing duties the Department shall:

A. Serve as the coordinating agency between the various industry and business organizations seeking to aid in the anti-litter effort;

B. Recommend to local governing bodies that they adopt ordinances similar to the provisions of this chapter;

C. Cooperate with all local governments to accomplish coordination of local anti-litter efforts;

D. Encourage, organize, and coordinate all voluntary local anti-litter campaigns seeking to focus the attention of the public on the programs of the State to control and remove litter;

E. Investigate the availability of, and apply for, funds available from any private or public source to be used in the program provided for in this chapter;

F. Allocate funds annually for the study of available research and development in the field of litter control, removal, and disposal, as well as study methods for implementation in the State of such research and development. In addition, such fund may be used for the development of public educational programs concerning the litter problem. Grants shall be made available for these purposes to those persons deemed appropriate and qualified by the Board of the Department;



## § 10-207.

G. Investigate the methods and success of other techniques in the control of litter, and develop, encourage and coordinate programs in the State to utilize such successful techniques as may aid in the control and elimination of litter; and

H. Report to the Governor and the General Assembly by December fifteenth, nineteen hundred seventy-six, on its proposed plan of litter control. (1976, c. 757.)

## § 10-212

§ 10-207. Private organizations to cooperate in anti-litter campaign. — To aid in the statewide anti-litter campaign, all business, industry and private organizations which are active in anti-litter efforts are requested to cooperate with the Department so that the State anti-litter campaign may be made more effective. (1976, c. 757.)

§ 10-208. Authority of Department to contract. — The Department shall have the authority to make and enter into contracts with other State agencies, local agencies, or local governing bodies, to carry out the purposes and provisions of this chapter. (1976, c. 757.)

§ 10-209. Penalty for violation of chapter. — Every person convicted of a violation of this chapter for which no penalty is specially provided shall be punished by a fine of not more than twenty-five dollars for each such violation. (1976, c. 757.)

§ 10-210. Notice to public required. — On and after July one, nineteen hundred seventy-seven, pertinent portions of this chapter shall be posted along the public highways of the State and at public highway entrances to the State and in all campgrounds and trailer parks, at all entrances to State parks, forest lands, recreational areas, at all public beaches, and at other public places in the State where persons are likely to be informed of the existence and content of this chapter and the penalties for violating its provisions. (1976, c. 757.)

§ 10-211. Allowing escape of load material; penalty. — No vehicle shall be driven or moved on any highway unless such vehicle is constructed or loaded to prevent any of its load from dropping, sifting, leaking or otherwise escaping therefrom. Provided, however, that sand or any substance for increasing traction during times of snow and ice may be dropped for the purpose of securing traction, or water or other substance may be sprinkled on a roadway in the cleaning or maintaining of such roadway by the State or local government agency having that responsibility. Any person operating a vehicle from which any glass or objects have fallen or escaped, which could constitute an obstruction or damage a vehicle or otherwise endanger travel upon such public highway shall immediately cause the highway to be cleaned of all glass or objects and shall pay any costs therefor. Violation of this section shall constitute a Class 1 misdemeanor. (1976, c. 757.)

Cross reference. — As to punishment of Class 1 misdemeanor, see § 18.2-11.

§ 10-212. Tax study. — The Department of Taxation, in conjunction with the Department of Conservation and Economic Development shall conduct a study to determine the best method of taxation whereby the burden of administering this chapter will fall on those industries that manufacture or handle products that contribute to the litter problem. The departments shall consider methods of taxation that are fair and equitable, administratively practicable and that avoid multiple taxation of the designated tax base. The results of such study shall be included as part of the report required by § 10-201. (1976, c. 757.)

§ 10-213. Preemption of certain local ordinances. — The provisions of this chapter shall supersede and preempt any local ordinance not enacted prior to January one, nineteen hundred seventy-six, which requires a deposit on a disposable container or package. This section shall expire on June thirtieth, nineteen hundred seventy-seven. (1976, c. 757.)

**§ 18.2-140. Destruction of trees, shrubs, etc.; depositing trash.** — It shall be unlawful for any person to pick, pull, pull up, tear, tear up, dig, dig up, cut, break, injure, burn or destroy, in whole or in part, any tree, shrub, vine, plant, flower or turf found, growing or being upon the land of another, or upon any land reserved, set aside or maintained by the State as a public park, or as a refuge or sanctuary for wild animals, birds or fish without having previously obtained the permission in writing of such owner or his agent or of the superintendent or custodian of such park, refuge or sanctuary so to do, unless the same be done under the personal direction of such owner, his agent, tenant or lessee or superintendent or custodian of such park, refuge or sanctuary.

Any person violating this section shall be guilty of a Class 3 misdemeanor; provided, however, that the approval of the owner, his agent, tenant or lessee, or the superintendent or custodian of such park or sanctuary afterwards given in writing or in open court shall be a bar to further prosecution or suit. (Code 1950, § 18.1-178; 1960, c. 358; 1975, cc. 14, 15; 1976, c. 757.)

The 1976 amendment deleted "or to deposit any trash, debris, garbage or litter thereon" near the middle of the first paragraph.

APPENDIX II

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Sources and Methodology

This report was researched and prepared by the Research Division of the Department of Taxation, Commonwealth of Virginia. A preliminary draft of the report was released in October, 1976.

Statistical data on the composition and volume of litter in Virginia was drawn from Litter Survey in Virginia, a companion to this report under the Virginia Litter Control Act, which was compiled in 1976 by Stephen N. Runkle of the Virginia Highway and Transportation Research Council. Two similar studies provided background on the nature of the litter problem. They were: National Study of the Composition of Roadside Litter, prepared by the Research Triangle Institute for Keep America Beautiful, Inc. in September 1969 under the auspices of the Highway Research Board of the National Academy of Sciences, and Litter in the State of Washington, published by the Washington Department of Ecology in June 1975.

A number of policy-oriented documents have been published on the topic of litter control by state governments. Two reports, both published by the Commonwealth of Virginia in January 1976, are of note: Litter Control Legislation, a report of the Solid Waste Committee, Council on the Environment, and Report on Beverage Container Legislation, the Commission to Study and Advise upon the Disposal of Solid Wastes, Senate Document No. 16. The state of Washington Department of Ecology makes available a comprehensive portfolio of information concerning its 1971 Model Litter Control Act. California's State Solid Waste Management Board has produced several useful studies in the litter control area, notably A Report on Litter Management in California (December 1974) and Proposed Policies for Waste Reduction in California (March 1976).

A number of private study groups involved in environmental issues offer pamphlets and publications on the litter problem, particularly with regard to beverage containers. Bottles and Sense, a 1976 publication of the Environmental Action Foundation, offers significant statistical data on litter and a generous bibliography of litter-related documents and publications. The Environmental Center at Duke University has published Proceedings of an Educational Conference on Minimum Deposit Legislation (April 1975), which effectively counterpoints industry and environmentalist views on the litter problem.

While preparing this report, the Department of Taxation also held a series of meetings with other state agencies, industry groups and environmental groups in order to solicit their comments and suggestions on the litter tax issue. Those who offered input were the Department of Highways and Transportation, Division of Motor Vehicles, Conservation Council of Virginia, U. S. Brewers Association, Virginia Beer Wholesalers Association, Virginia Dairy Products Association, Virginia Food Dealers Association, Virginia Manufacturers Association, Virginia Press Association, Virginia Restaurant Association, Virginia Retail Merchants Association, and Virginia Soft Drink Association.

The revenue projections for the gross receipts (pp. 11, 12) and flat business tax (p. 25) alternatives were based on data compiled by the Department of Taxation, the Virginia Employment Commission, and the 1972 U. S. Census of Business and Census of Manufacturers.

In calculating the revenue potential of a gross receipts litter tax on business, the Department compiled dollar sales figures for potentially

liable industries from census and sales tax summaries. After adjustments for inflation and possible exemptions of certain sales under a gross receipts statute, the Department found a base of taxable gross receipts averaging \$10 billion. At the tax rate of .015 percent of sales employed under the Washington state statute, this tax base would yield approximately \$1.5 million in revenues. These estimates were consistent with an earlier department study which attempted to estimate the revenues that a Virginia litter tax based on the Washington act would have yielded in 1973. This earlier study estimated a tax base of \$8.5 billion in gross receipts, and revenues of approximately \$1.3 million.

The revenue estimate for a continuation of the current flat tax on businesses was based on a department estimate, based on census, sales tax, and VEC data, of the number of businesses and business establishments which would be liable under such a tax. Assuming that all businesses which manufactured, distributed, or sold products listed in section 10-201 of the Virginia Litter Control Act would comply, we estimated that approximately 45,000 businesses would pay the tax under a levy-per-business arrangement, and approximately 1,500 manufacturing, 2,000 wholesale and 55,000 retail establishments would pay it under a levy-per-establishment arrangement. Assuming that the tax statute would be altered to apply the fee to each manufacturing, wholesale, and retail establishment operated by the liable firm, we thus arrived at the estimate that for each dollar of flat tax, \$60,000 in revenues would be raised.

The estimates on beverage container taxes (p. 18) were based on national and regional beverage consumption figures extrapolated to represent

Virginia sales. The number of units of nonreturnable soft drink containers which would be taxed was estimated by applying average per capita soft drink consumption (U.S.A.) to Virginia's population, and then by halving that number to reflect the number of nonreturnable units sold in the region. The number of units of nonreturnable beer containers was estimated with returns from the state's malt beverage excise tax, which were reduced by 15 percent to reflect the national percentage of returnable sales. From these figures we estimated nonreturnable container consumption for 1975 at 1.6 billion units, and tax receipts for the various rates were computed accordingly.

Motor vehicle use tax revenue estimates (p. 21) were based on data obtained from the Virginia Division of Motor Vehicles, particularly its Biennial Report 1973-75. That data revealed that just under 1 million operators' and chauffers' licenses were issued and renewed in the fiscal year ending June 30, 1975, and nearly 3 million motor vehicles were licensed in calendar year 1974. DMV estimated the number of titles issued yearly for new and used motor vehicles at approximately 1.5 million.

