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Central Files

# A STUDY OF LITTER ALONG IDAHO'S HIGHWAYS

NOVEMBER 1969

RESEARCH PROJECT NO. 50

STATE OF IDAHO DEPARTMENT OF HIGHWAYS

# A

# STUDY OF LITTER

# ALONG

# IDAHO'S HIGHWAYS

Leland M. Hatch
Associate Research Engineer

November 1969

Idaho Department of Highways
Materials & Research Division
Boise, Idaho

## ACKNOWLEDGEMENT

The sponsors, Keep America Beautiful, Inc. and their research contractors, Research Triangle Institute, provided the instructions and the forms and made the selection of test sites. For their encouragement and assistance we extend our thanks.

Mr. Everett Kidner was the State's principle investigator until his promotion and transfer. He and Ray Lowe provided the Research Triangle Institute with the necessary information to make the site selections.

The Districts extended full cooperation. Our special thanks goes to the maintenance men who did most of the field work and to their supervisors, who both supervised and helped with the actual field work.

Mr. Scott Church, of the Planning Survey Section, did the drafting of the figures.

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# INTRODUCTION

The Idaho Department of Highways has just participated in a nationwide study of the litter problem. A nationally known organization called Keep America Beautiful, Inc. (KAB) sponsored this study. They worked through the Highway Research Board who encouraged participation by the state highway departments.

This study was to have been completed in mid-November 1968, but due to certain circumstances we, and other states, were unable to complete our part of the study until late spring 1969. Because of the severe winter and late spring we were unable to complete ten sites by the deadline. We were able to complete five, one of which was an alternate site. The other six primary sites were completed later. Figure 1 is a State map showing the location of the eleven sites completed.

The purpose of the study was to determine, not only the volume, but the type of litter being strewn along the highways. It is the purpose of the sponsoring organization to use this information to conduct programs of education for the people of America to reduce the scattering of litter wherever they travel.

It is the purpose of this report to show the vast volume of litter which is accumulating along the major highways of Idaho. Although the test sample is small, the results are quite significant.

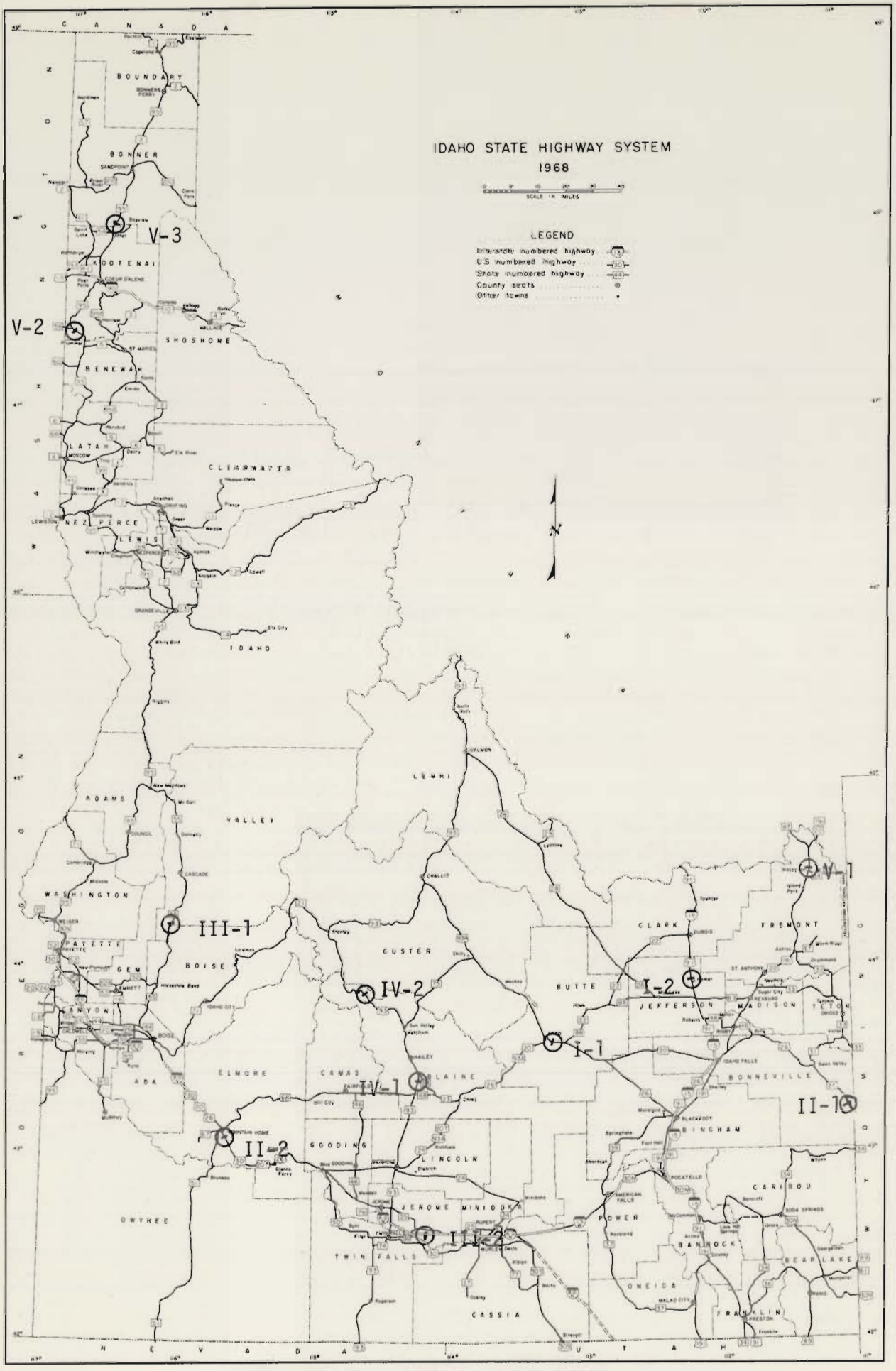


FIGURE 1 - LITTER PICKUP SITES

## CONCLUSIONS

From the facts presented in this report and the extension assumed it is quite apparent that the State is literally being deluged with litter, with 19.7 cubic feet, loose volume, being picked up on eleven-0.2 mile sections of roadway only 30 days after the sites were thoroughly cleaned.

It appears that the volume of litter is a function of A.D.T. and distance from the commercial establishment dispensing the product, especially those which are normally consumed in the vehicle.

Beer cans and bottles constitute a major item of litter, there being an average of over 14 picked up on each of the eleven sites. This amounts to an average of 865 cans per mile per year; if this extrapolation can logically be made.

Paper items appear to be the major problem from the standpoint of count alone. However, much of this was very small and would rot and disintegrate after exposure to the elements for a period of time. This is not true, however, of glass, metal and plastic items, nor of the rubber items such as tire or tire pieces.

Soft drink cans and bottles, while not as large in numbers as the beer bottles and cans, constitute a significant portion of the litter.

## RECOMMENDATIONS

The litter study should be extended to other sites and areas so as to obtain a more complete picture of the litter problem.

The Department should embark on an intensive program to inform the public of the results of this program and to educate them to use the litter barrels provided.

The Department should cooperate with other interested agencies in programs of information and education.

Litter barrels should be placed in more strategic locations. Signs advising the traveler of the litter barrel should be placed at least 1/4 mile each side of the litter barrel as has been done in some locations, and is done in various other states.

The Department should promote laws increasing the seriousness of the littering offense such as other states have done.

## PROCEDURE

The research agency chosen by KAB to conduct this investigation selected 15 test sites at random from the highway milepost log for Idaho's primary and Interstate highways. Ten of these sites were specified as primary sites for the collecting of litter. The other 5 were alternate sites to be substituted for the primary in case a primary site was at a location which was not suitable or accessible. Each site was 0.2 miles long and included the full right of way width.

Two litter pickups were conducted on each site. The initial pickup removed all litter which had collected within the bounds of the site, some of it having lain there hidden or half hidden for years. The second pickup was made 30 days following the first. This litter was, obviously, that which was discarded over the preceding 30-day period.

At each pickup the litter was carefully segregated, classified, and counted according to a schedule furnished by the conducting agency. The total volume was then measured and recorded.

## RESULTS

Figures 2 and 3 are copies of the forms furnished for recording information and data. Figure 2 contains site information taken from the project plans and files. Figure 3 is for the recording of the litter data and shows the classification breakdown of the litter. This particular sheet contains the summary of litter collected from all sites for both pickups.

Figure 4 is a summary table showing the comparison of all the sites, including the Average Daily Traffic, the individual litter counts, the litter totals and the total volumes, for the second pickup.

Paper items constitute the major item of litter from the standpoint of numbers. Of these and the plastic items a large part were food containers. Following the paper items in quantity are beer cans. Add to this the beer bottles, both returnable and nonreturnable and the quantity becomes considerable. The volume provided by these items is probably greater than any other. This is depicted in the photographs of Figures 5 and 6. Figure 5 shows only the beer cans collected on the first pickup on Section III-1 approximately 2 miles south of Cougar Mountain Lodge on SH-55. Figure 6 shows the entire first pickup. Although the second pickup represents less quantity the relationships and character are very similar.

In the Miscellaneous Items section of the forms it is interesting to note the number of auto parts and accessories found within these small sections of roadway. Since we are quite used to seeing old tires and tire rubber along the roadway it is hardly surprising to note the number of tires or tire pieces found. All sections had some and several had an unusually large number.

The lumber and construction items constitute a very significant quantity and volume of the total litter picked up. One section had a 12" x 12" timber which the maintenance men picked up later.

| STATE | SECTION |
|---|---|
| | |

STUDY SECTION DATA
KEEP AMERICA BEAUTIFUL LITTER STUDY

Highway Research Board

LINE

1. STATE: _____
2. COUNTY: _____
3. ROUTE DESIGNATIONS:
   (Main) _____
   (Other) _____
4. LOG NOTATION: _____
   _____
   _____
5. HWY CLASS: _____
   _____
6. HWY USE: _____
   _____
7. LANES & MEDIAN: _____
   _____
8. ACCESS CONTROL: _____
   _____
9. ADT: _____
10. LENGTH: _____

SPACE FOR PORTION OF STATE HIGHWAY MAP SHOWING STUDY SECTION AREA

11: RIGHT-OF-WAY: AVG WIDTH _____ WIDTH RANGE _____

12. PAVEMENT NOTES: _____

13. ROADSIDE FEATURES: _____
    _____

| | FIRST PICKUP | SECOND PICKUP |
|---|---|---|
| 14. PICKUP DATE | | |
| 15. ROADSIDE COVER STATUS | | |
| 16. REMARKS (Use Back Side For Continuation) | | |
| 17. DATA SUBMITTED BY (Name & Title) | | |
| 18. DATE SUBMITTED | | |

FIGURE 2 - SAMPLE OF STUDY SECTION DATA FORM

| | |
|---|---|
| STATE | SECTION |

LITTER COMPOSITION DATA
KEEP AMERICA BEAUTIFUL LITTER STUDY

Highway Research Board

| LINE | LITTER COMPOSITION | FIRST PICKUP DATA | SECOND PICKUP DATA |
|---|---|---|---|
| 19-22 PAPER | 19. Newspapers or Magazines | | |
| | 20. Paper Packages or Containers | | |
| | 21. Other Paper Items | | |
| | 22. Total Number of Paper Items (Sum of Lines 19-21) | | |
| 23-25 PLASTIC | 23. Plastic Packages or Containers | | |
| | 24. Other Plastic Items | | |
| | 25. Total Number of Plastic Items (Sum of Lines 23-24) | | |
| 26-30 | 26. Beer Cans | | |
| | 27. Soft Drink Cans | | |
| | 28. Food Cans | | |
| | 29. Other Cans | | |
| | 30. Total Number of Cans (Sum of Lines 26-29) | | |
| 31-38 BOTTLES AND JARS | 31. Returnable Beer Bottles | | |
| | 32. Nonreturnable Beer Bottles | | |
| | 33. Returnable Soft Drink Bottles | | |
| | 34. Nonreturnable Soft Drink Bottles | | |
| | 35. Wine or Liquor Bottles | | |
| | 36. Food Bottles or Jars | | |
| | 37. Other Bottles or Jars | | |
| | 38. Total Number of Bottles and Jars (Sum of Lines 31-37) | | |
| 39-44 MISCEL-LANEOUS ITEMS | 39. Auto Parts and Accessories (Not Tires) | | |
| | 40. Tires (or Tire Pieces) | | |
| | 41. Lumber or Construction Items | | |
| | 42. Unclassified Items | | |
| | 43. Total Number of Miscellaneous Items (Sum of Lines 39-42) | | |
| | 44. List of Special Interest Items (Already Counted in Line 43) | | |
| 45. Total Item Count | | | |
| 46. Total Litter Volume | | | |
| 47. Date of Litter Pickup | | | |
| 48. Days of Accumulation Since Previous Pickup | | | |
| 49. Data Verification By (Name & Title | First Pickup | | |
| | Second Pickup | | |

FIGURE 3 - SAMPLE OF LITTER COMPOSITION FORM

| LITTER COMPOSITION | | SITE I-1 | I-2 | II-1 | II-2 | III-1 | III-2 | IV-1 | IV-2 | V-1 | V-2 | V-3 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ADT 1400 | 1150 | 600 | 3300 | 990 | 2450 | 970 | 330 | 1050 | 1100 | 1750 | TOTAL |
| PAPER | Newspapers or Magazines | 3 | 0 | 0 | 0 | 3 | 2 | 0 | 0 | 1 | 1 | 1 | 11 |
| | Paper Packages or Containers | 67 | 4 | 32 | 13 | 29 | 24 | 17 | 4 | 25 | 21 | 31 | 267 |
| | Other Paper Items | 135 | 8 | 8 | 55 | 13 | 65 | 17 | 4 | 14 | 14 | 34 | 367 |
| | Total Number of Paper Items | 205 | 12 | 40 | 68 | 45 | 91 | 34 | 8 | 40 | 36 | 66 | 645 |
| PLASTIC | Plastic Packages or Containers | 4 | 0 | 0 | 2 | 4 | 5 | 1 | 1 | 3 | 1 | 3 | 24 |
| | Other Plastic Items | 9 | 1 | 0 | 2 | 3 | 2 | 5 | 1 | 6 | 2 | 7 | 38 |
| | Total Number of Plastic Items | 13 | 1 | 0 | 4 | 7 | 7 | 6 | 2 | 9 | 3 | 10 | 62 |
| CANS | Beer Cans | 13 | 2 | 11 | 13 | 5 | 14 | 14 | 10 | 17 | 5 | 9 | 112 |
| | Soft Drink Cans | 2 | 0 | 11 | 4 | 5 | 1 | 3 | 3 | 10 | 1 | 0 | 40 |
| | Food Cans | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 5 |
| | Other Cans | 8 | 0 | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 12 |
| | Total Number of Cans | 24 | 2 | 23 | 18 | 11 | 16 | 18 | 13 | 23 | 6 | 9 | 169 |
| BOTTLES AND JARS | Returnable Beer Bottles | 0 | 1 | 1 | 0 | 4 | 4 | 0 | 1 | 1 | 3 | 3 | 19 |
| | Nonreturnable Beer Bottles | 6 | 0 | 2 | 4 | 3 | 2 | 1 | 0 | 0 | 5 | 4 | 27 |
| | Returnable Soft Drink Bottles | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 5 |
| | Wine or Liquor Bottles | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 3 |
| | Food Bottles or Jars | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Other Bottles or Jars | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Total Bottles and Jars | 10 | 2 | 3 | 5 | 7 | 8 | 1 | 1 | 1 | 11 | 8 | 57 |
| MISCEL-LANEOUS ITEMS | Auto Parts and Accessories | 1 | 0 | 1 | 2 | 2 | 1 | 1 | 1 | 0 | 2 | 0 | 11 |
| | Tires (or Tire Pieces) | 1 | 1 | 0 | 5 | 1 | 11 | 1 | 0 | 1 | 0 | 1 | 22 |
| | Lumber or Construction Items | 4 | 0 | 0 | 11 | 0 | 17 | 18 | 0 | 2 | 1 | 0 | 61 |
| | Unclassified Items | 1 | 3 | 0 | 20 | 4 | 6 | 21 | 0 | 11 | 2 | 7 | 75 |
| | Total Miscellaneous Items | 7 | 12 | 1 | 38 | 7 | 35 | 41 | 1 | 14 | 5 | 8 | 169 |
| | Total Item Count | 384 | 29 | 67 | 133 | 77 | 158 | 100 | 25 | 92 | 61 | 101 | 1102 |
| | Total Litter Volume (C.F.) | 2 | 21 | 1 | 4 | 1 | 3 | 1/2 | 1/2 | 5.3 | 0.8 | 0.6 | 19.7 |

Figure 4 - SUMMARY OF LITTER DATA FOR ALL SITES - 2ND PICKUP

FIGURE 5 - BEER CANS COLLECTED ON INITIAL PICKUP SECTION III-1.

FIGURE 6 - LITTER COLLECTED DURING 1ST PICKUP SECTION III-1.
NOTE BEER BOTTLES

In the random selection of the sites for pickup typical locations were not necessarily chosen. With the small sample used it would be difficult to predict accurately the amount of litter actually being deposited along the highway rights of way in Idaho, however, Figure 7 is a plot of traffic volume versus litter volume. There appears to be a fair correlation between volume of traffic and volume of litter for a given period. If the volumes actually collected is representative as they appear to be, it can easily be shown that the litter deposit along the highways is tremendous in terms of volume.

For instance, for a highway with 3,300 ADT there was 4.0 cubic feet of litter collected on the 0.2 mile section of highway rights of way after only 32 days. This 32-day period was during April and May, which can probably be considered an average period. If this is extended to a year mile basis the volume would be approximately 240 cubic feet. Taking the arithmetic mean of the total volume of litter deposited during the 30-day period for all eleven sections tested, the volume would be approximately 107.3 cubic feet/yr./mi. of highway. Extending this volume as an average for the entire State primary and interstate system for the year 1966 we can prognosticate that there will be 336,761 cubic feet or 12,473 c.y. of litter strewn along the 3,138 miles of these classes of highways each year. This is enough to bury one acre nearly 8 feet deep. This does not include the 5,500 miles of State and County secondary roads, the Forest highways and all other highways totaling some 53,000 miles in Idaho.