



COMMONWEALTH of VIRGINIA

HIGHWAY & TRANSPORTATION RESEARCH COUNCIL

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CHARLOTTESVILLE, VIRGINIA 22902
IN REPLY, PLEASE
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VHTRC 80-R50

MEMORANDUM

TO : Mr. John V. Jackson
FROM : Stephen N. Runkle
SUBJECT: Litter Survey — Status Report 3

As I discussed with you by telephone, this memorandum is intended to serve as the third status report for the litter survey work being performed by the Research Council for the Division of Litter Control. The memorandum discusses the results obtained in the fourth series of litter pickups, which were performed during October, November, and December of 1979, in comparison with results obtained in the first three series of litter pickups that were discussed in Status Report 2. As in Status Report 2, the discussion is in terms of item count. Detailed data by item count, weight, and volume are enclosed.

DATA ANALYSIS

From the detailed data, the items per day of litter were computed and summarized as shown in Table 1. The column headings \bar{X}_2 , \bar{X}_3 , and \bar{X}_4 represent the 2nd, 3rd and 4th litter pickups for each series. Normally the time between pickups was about two weeks. The heading \bar{X}_{2-4} represents the item/day figure from the entire period between the initial and 4th pickups and is not necessarily the average of \bar{X}_2 , \bar{X}_3 , and \bar{X}_4 , because the time periods between pickups sometimes differed. Only sites where complete data were obtained for all four series of pickups have been included in Table 1 so that comparisons from series to series are compatible by sites.

The results for the fourth series of litter pickups are compatible with those discussed in Status Report 2 in that the items per day of litter accumulation continued to decline, but by a decreased amount. The results appear to be consistent by highway system as illustrated graphically in Figure 1. The decline in the percentage decrease from survey period to survey period is shown in Table 2. As can be seen, the decrease fell from 45% between the

1st and 2nd periods, to 30% between the 2nd and 3rd periods, and to 12% between the 3rd and 4th periods. Obviously, it should be expected that the percentage decrease will decline as the number of items per day approaches zero.

The proportions of litter by categories of cans, bottles, paper/plastic, and auto/other are summarized in Table 3. The proportions determined in the fourth series were consistent with those obtained in the three previous series, with paper/plastic items making up by far the largest proportion (above 70%). Proportions by categories for all four series combined are shown in Table 4. It is indicated in Table 4 that, for the sites included in this study, the lower the classification of the highway, the larger the portion of litter accounted for by cans and bottles. This finding is consistent with the results obtained in the 1976 litter study.

SUMMARY AND CONCLUSIONS

As noted above and in Status Report 2, the rate of litter accumulation for the 18 sites included in this analysis is decreasing from series to series. As one would expect, the rate of decrease appears to be declining as the actual numbers of items per day of litter discarded at the sites become lower. The decrease is consistent by highway systems as illustrated in Figure 1.

With respect to proportions of litter by category, the results were fairly consistent for the four series. The proportions were slightly different by highway system, with bottles and cans being more predominant the lower the highway system. As discussed in Status Report 2, it would appear the proportion of paper/plastic items (about 71%) is higher than the 54% reported in the 1976 study.

Finally, it should be understood that the results discussed here and in previous status reports are not necessarily representative of the entire highway systems involved, but pertain only to the sites used in the study. Thus, generalization of the results should be made with extreme caution.

Table 1

Summary of Item Count Data

System	Site	Items/Day 1st Series				Items/Day 2nd Series				Items/Day 3rd Series				Items/Day 4th Series			
		\bar{X}_2	\bar{X}_3	\bar{X}_4	\bar{X}_{2-4}	\bar{X}_2	\bar{X}_3	\bar{X}_4	\bar{X}_{2-4}	\bar{X}_2	\bar{X}_3	\bar{X}_4	\bar{X}_{2-4}	\bar{X}_2	\bar{X}_3	\bar{X}_4	\bar{X}_{2-4}
Interstate	3	5.11	4.00	1.36	3.27	1.50	1.73	1.00	1.34	1.07	0.42	1.93	1.14	0.59	0.33	0.64	0.54
	6	4.11	1.30	0.88	2.11	1.57	0.80	2.40	1.51	0.73	0.57	0.57	0.61	1.14	1.71	0.46	0.79
	7	2.38	2.27	1.54	2.07	1.31	0.93	1.15	1.31	0.83	0.75	0.56	0.71	1.71	1.50	0.29	1.17
Primary	2	3.60	4.00	2.00	3.33	0.14	5.43	0.79	1.04	0.21	0.57	2.29	1.02	1.23	1.21	0.86	1.15
	3	5.10	5.00	6.33	5.38	2.00	5.14	2.36	2.55	2.50	2.14	2.79	2.48	1.85	3.07	2.00	2.53
	4	5.70	5.00	4.33	5.12	0.26	5.13	2.86	1.83	0.07	0.07	1.07	0.38	1.38	1.43	2.81	1.82
	5	5.67	2.38	1.50	2.86	3.86	2.36	1.87	2.70	3.64	4.00	4.29	3.98	1.69	1.86	1.52	1.67
	6	7.11	6.08	2.93	5.11	5.79	2.43	3.00	3.72	1.29	1.57	2.71	1.86	3.00	1.00	1.50	1.75
	10	4.11	1.79	1.85	2.39	3.00	0.57	3.18	2.20	0.64	0.71	0.07	0.48	2.15	0.19	0.18	0.88
	12	5.46	1.20	1.82	2.79	1.36	0.64	0.00	0.56	0.50	0.14	0.86	0.50	1.26	0.00	1.07	0.84
	13	8.67	1.40	0.88	3.67	1.64	1.20	0.70	1.16	1.53	1.06	2.57	1.37	3.14	2.57	0.18	1.07
	1	3.31	1.40	2.17	2.25	2.50	2.00	3.08	2.55	1.50	1.50	1.63	1.54	1.57	1.07	0.79	1.14
	2	3.20	3.25	2.50	3.00	0.25	10.00	0.21	1.63	0.86	0.21	1.00	0.69	0.23	0.14	0.43	0.24
	3	7.12	4.33	1.71	3.82	2.26	5.14	4.07	3.21	0.79	3.14	2.60	2.20	1.30	0.79	1.00	1.03
	4	8.11	2.92	1.17	3.42	1.43	1.50	0.47	1.12	1.14	2.36	0.21	1.24	1.69	0.07	0.57	0.73
	7	3.11	1.30	1.75	2.08	1.43	1.35	1.00	1.27	1.00	0.66	1.43	0.84	2.00	1.00	0.79	1.02
	8	3.00	2.20	1.00	2.11	1.00	0.35	2.27	1.12	0.33	0.63	0.28	0.51	2.71	0.43	0.00	0.52
	9	4.88	1.67	1.00	2.19	0.43	0.50	0.27	0.41	0.13	0.40	0.57	0.35	1.14	0.00	0.39	0.45
\bar{X} (Interstate)		3.87	2.52	1.26	2.48	1.46	1.00	1.52	1.39	0.88	0.58	1.02	0.82	1.15	1.18	0.46	0.83
\bar{X} (Primary)		5.68	3.36	2.71	3.83	2.13	2.86	1.85	1.97	1.30	1.28	2.08	1.51	1.96	1.42	1.27	1.46
\bar{X} (Secondary)		4.68	2.44	1.61	2.70	1.33	2.98	1.62	1.62	0.82	1.27	1.13	1.07	1.52	0.50	0.57	0.73
\bar{X} (Total)		4.99	2.86	2.04	3.17	1.71	2.60	1.71	1.74	1.04	1.16	1.53	1.22	1.65	1.02	0.86	1.07

Table 2

Decrease in Item Count From Series to Series

System	1st-2nd	Percent Decrease	2nd-3rd	Percent Decrease	3rd-4th	Percent Decrease
Interstate	2.48-1.39	44	1.39-0.82	41	0.82-0.83	—
Primary	3.83-1.87	51	1.97-1.51	23	1.51-1.46	3
Secondary	2.70-1.62	40	1.62-1.07	34	1.07-0.73	32
Total	3.17-1.74	45	1.74-1.22	30	1.22-1.07	12

Table 3
Proportions of Litter by Category
By Item Count

System	Site	1st Series			2nd Series			3rd Series			4th Series		
		Cans	Bottles	Paper/ Plastic	Auto/ Other	Cans	Bottles	Paper/ Plastic	Auto/ Other	Cans	Bottles	Paper/ Plastic	Auto/ Other
Interstate	3	16	11	68	5	6	4	57	33	15	15	69	16
	6	7	2	88	3	4	1	85	10	6	0	88	3
	7	18	1	71	10	2	4	56	38	14	0	83	9
Primary	2	9	6	78	7	17	11	66	6	26	7	53	14
	3	24	9	66	1	14	6	80	0	8	19	73	0
	4	11	7	80	2	14	6	79	1	29	12	47	12
	5	16	4	76	4	6	11	80	3	19	15	65	1
	6	9	9	82	0	4	6	89	1	13	9	78	0
	10	22	13	59	6	5	7	85	3	30	15	40	15
	12	6	9	84	1	43	21	11	25	29	5	37	29
	13	5	6	84	5	4	4	82	10	6	2	90	2
	1	13	11	76	0	12	14	73	1	23	1	76	0
	2	10	12	73	5	5	6	86	3	18	3	79	0
Secondary	3	33	15	51	1	21	16	63	0	46	8	46	0
	4	28	3	67	2	8	8	77	7	2	4	87	7
	7	2	7	89	2	6	10	81	3	23	6	69	2
	8	19	25	51	5	16	5	73	6	14	4	69	3
	9	34	18	47	1	5	15	80	0	30	25	45	0
	14	14	5	75	6	4	3	66	27	10	1	80	9
	13	13	8	76	3	13	9	72	6	20	11	60	9
	20	20	13	65	2	10	11	76	3	22	7	69	2
	16	16	9	72	3	10	9	73	8	22	8	64	6
	17	17	7	72	4	17	7	72	6	17	7	72	4
\bar{X} (Interstate)													
\bar{X} (Primary)													
\bar{X} (Secondary)													
\bar{X} (Total)													

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Table 4

Proportions of Litter by Category by Item Count,
All Series Combined

	Cans	Bottles	Paper/ Plastic	Auto/ Other
Interstate (3 sites)	10	4	74	12
Primary (8 sites)	15	9	71	5
Secondary (7 sites)	19	10	69	2
Combined	16	8	71	5

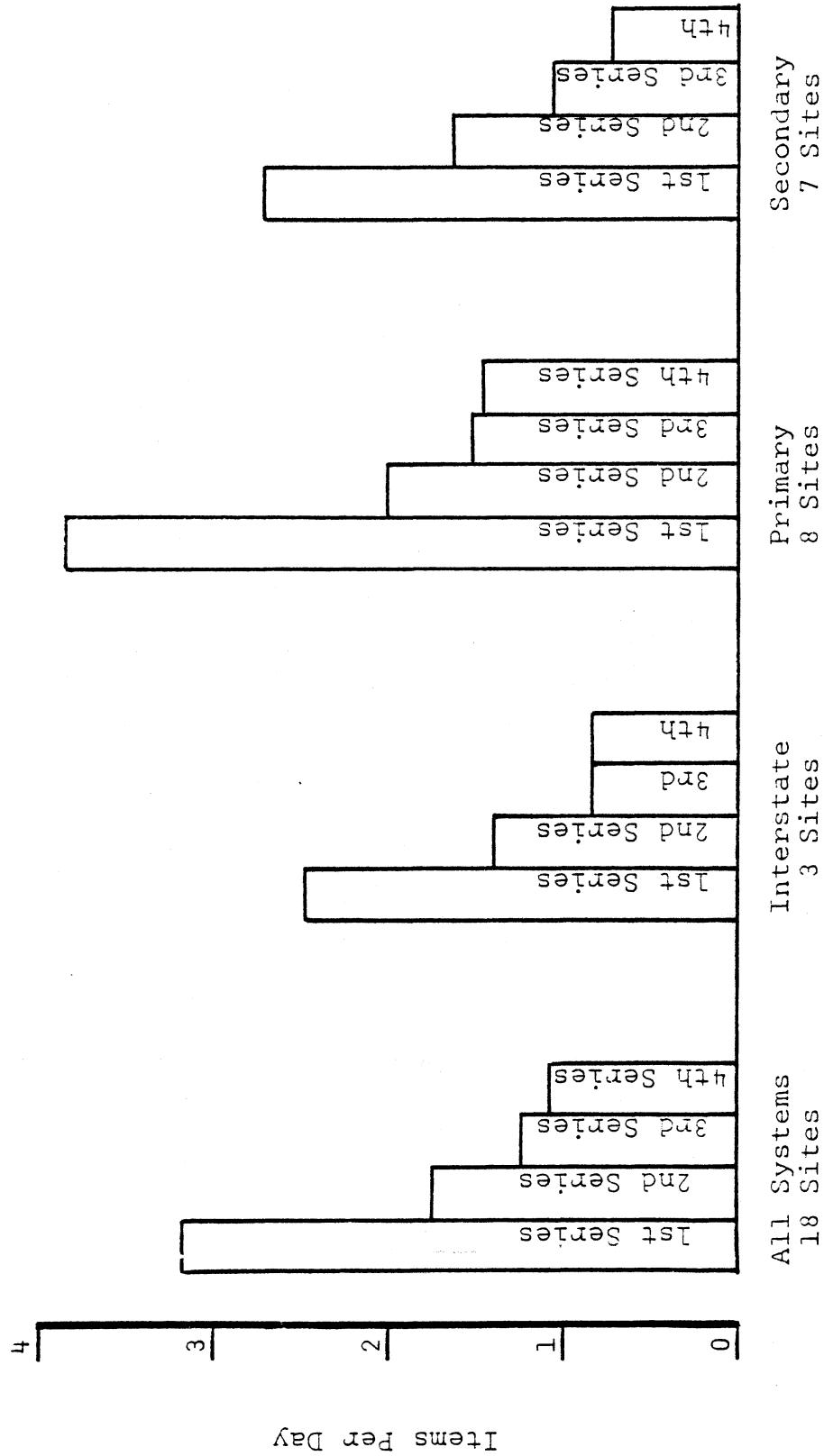


Figure 1. Decrease in items/day by survey period.

Litter Survey - 4th Series
Interstate by Item Count

Site	Date	Days	Cans	Bottles	Paper/ Plastic	Auto/ Other	Total	Item/ Day
I-64 (Ramp) Henrico	10/12/79	27	3	8	37		48	
	11/08/79	21	11	8	91	3	113	2.41
	11/29/79	28	11	5	85	2	103	0
	12/27/79	28	25	11	109	2	147	1.93
	Total (1-4)		25	14	115	3	157	
2	Total (2-4)	76	22	6	78	3	109	1.43
I-64 Henrico	10/12/79		9	1	37	4	51	
	11/08/79	27	3	5	5	3	16	0.59
	11/29/79	21	2		5		7	0.33
	12/27/79	28	1	1	14	2	18	0.64
	Total (1-4)		15	7	61	9	92	
3	Total (2-4)	76	6	6	24	5	41	0.54
I-95 (Ramp) Prince Wm.	10/16/79		22	5	100	1	128	
	10/23/79	7	18	4	114		143	2.0
	10/30/79	7	12	7	122	1	142	1.28
	11/27/79	28	24	4	107		135	0.43
	Total (1-4)		34	8	122	2	166	
5	Total (2-4)	42	12	3	22	1	38	0.90
I-66 Prince Wm.	10/16/79		6	1	37	1	44	
	10/23/79	7			7		8	1.14
	10/30/79	7			12		12	1.71
	11/27/79	28	2	1	11	1	13	0.46
	Total (1-4)		8		67	1	77	
6	Total (2-4)	42	2		30	1	33	0.79
I-81 Roanoke	10/03/79		6	2	14	3	25	
	10/17/79	14	7		17		24	1.71
	10/31/79	14			19	2	21	1.5
	11/14/79	14		2	4	5	4	0.29
	Total (1-4)		13		54		74	
7	Total (2-4)	42	7		40	2	49	1.17
I-81 (Ramp) Montgomery	10/03/79			4	15		19	
	10/17/79	14			6		6	0.43
	10/31/79	14		1	5		6	0.43
	11/14/79	14		2	4		6	0.43
	Total (1-4)			7	30		37	
8	Total (2-4)	42		3	15		18	0.43

Litter Survey -- 4th Series

Interstate by Weight

Site	Date	Days	Cans	Bottles	Paper/ Plastic	Auto/ Other	Total	Pound/ Day
I-64 Henrico 3	10/12/79	27	0.8	0.5	1.1	5.1	7.5	0.20
	11/08/79	21	0.2	3.5	.5	1.2	5.4	0.01
	11/29/79	28	0.1	0.5	0.2	0.8	1.6	0.06
	12/27/79	76	1.2	4.5	2.0	7.1	14.8	0.10
	Total (1-4)		0.4	4.0	0.9	2.0	7.3	
I-66 Prince Wm. 6	10/16/79	7	0.5	0.5	0.8	0.1	1.8	0.03
	10/23/79	7			0.1	0.1	0.2	0.17
	10/30/79	28	0.1	0.5	0.2	0.2	1.2	0.01
	11/27/79	42	0.6		2.3	0.1	3.5	0.04
	Total (1-4)		0.1		1.5	0.1	1.7	
I-81 Roanoke 7	10/03/79	14	0.6	0.9	1.0	3.2	5.7	0.07
	10/17/79	14	0.7		0.3	2.6	1.0	0.22
	10/31/79	14			0.5		3.1	0.06
	11/14/79	42	1.3	0.9	0.8	5.8	10.6	
	Total (1-4)		0.7		2.6	2.6	4.9	0.12
I-81 (Ramp) Montgomery 8	10/03/79	14		1.8	0.3		2.1	0.01
	10/17/79	14		0.5	0.1		0.1	0.04
	10/31/79	14		0.9	0.1		0.6	0.07
	11/14/79	42		3.2	0.6		3.8	
	Total (1-4)			1.4	0.3		1.7	0.04

Litter Survey — 4th Series

Interstate by Volume

Site	Date	Days	Cans	Bottles	Paper/ Plastic	Auto/ Other	Total	Ft. ³ / Day
I-64 Henrico	10/12/79	27	0.2	-	0.8	0.4	1.4	0.03
	11/08/79	21	0.1	0.2	0.3	0.1	0.7	0.01
	11/29/79	28	-	-	0.2	-	0.2	0.01
	12/27/79	76	0.4	0.2	1.4	0.6	2.6	-
	Total (1-4) Total (2-4)		0.2	0.2	0.6	0.2	1.2	0.02
I-66 Prince Wm.	10/16/79	7	0.2	-	0.6	-	0.8	-
	10/23/79	7	-	-	0.1	-	0.1	0.01
	10/30/79	28	-	-	0.9	-	0.9	0.13
	11/27/79	42	0.1	-	0.2	-	0.3	0.01
	Total (1-4) Total (2-4)		0.3	-	1.8	-	2.1	-
I-81 Roanoke	10/03/79	14	0.2	0.1	0.7	0.2	1.2	0.03
	10/17/79	14	0.2	-	0.2	-	0.4	0.04
	10/31/79	14	-	-	0.4	0.1	0.5	0.04
	11/14/79	42	0.4	0.1	1.9	0.3	2.7	-
	Total (1-4) Total (2-4)		0.2	-	1.2	0.1	1.5	0.04
I-81 (Ramp) Montgomery	10/03/79	14	-	0.1	0.2	-	0.3	-
	10/17/79	14	-	-	0.1	-	0.1	0.01
	10/31/79	14	-	-	0.1	-	0.1	0.01
	11/14/79	42	-	0.1	0.5	-	0.7	-
	Total (1-4) Total (2-4)		-	0.1	0.3	-	0.4	0.01

Litter Survey -- 4th Series

Primary by Item Count

Site	Date	Days	Cans	Bottles	Paper/ Plastic	Auto/ Other	Total	Item/ Day
Rt. 29 Albemarle	10/02/79	13	10	4	49	3	66	1.23
	10/15/79	14	2	0	14	0	16	1.21
	10/29/79	7	0	2	13	2	17	0.86
	11/05/79	7	4	0	2	0	6	1.15
	Total (1-4)	34	16	6	78	5	105	
2	Total (2-4)		6	2	29	2	39	
Rt. 250 (Ramp) Albemarle	10/02/79				79		107	1.85
	10/15/80	13	28	3	16		24	3.07
	10/29/79	14	5	1	37		43	2.0
	11/05/79	7	2	1	11		14	
	Total (1-4)	34	40	5	148		193	2.53
3	Total (2-4)		12	5	69		86	
Rt. 250 Augusta	10/09/79				77		96	1.38
	10/22/79	13	11	5	17	3	18	1.43
	11/05/79	14	0	3	17	0	20	2.81
	11/16/79	11	5	0	26	0	31	
	Total (1-4)	38	17	8	137	3	163	1.82
4	Total (2-4)		6	3	60	0	69	
Rt. 238 York	10/11/79				74		101	1.69
	10/24/79	13	9	15	17	3	22	1.86
	11/07/79	14	4	3	21		26	1.52
	11/28/79	21	4	6	22		32	
	Total (1-4)	48	19	25	134	3	181	1.67
5	Total (2-4)		10	10	60		80	
Rt. 33 New Kent	10/11/79				38		46	3.0
	10/24/79	13	7	1	36		39	1.0
	11/07/79	14	3		11		14	1.50
	11/29/79	21	10	1	20		31	
	Total (1-4)	48	23	2	105		130	1.75
6	Total (2-4)		16	1	67		84	
Rt. 44 (Ramp) Va. Beach	10/11/79				62		80	2.08
	10/24/79	13	12	6	25	1	27	0.14
	11/07/79	14	0	1	0		0	0.63
	11/28/79	21	0	3	0		3	
	Total (1-4)	48	12	10	87	1	110	
7	Total (2-4)		0	4	25	1	30	
Rt. 13 Va. Beach	10/11/79				7		9	3.15
	10/24/79	13	1	3	36	1	41	2.0
	11/07/79	14	2	3	20		28	0.67
	11/28/79	21	3	1	10		14	
	Total (1-4)	48	11	7	73	1	92	1.73
9	Total (2-4)		10	7	66		83	

Rt. 360 Hanover	10/12/79	27	8	0	59	7	74	2.15
	11/08/79	21	2	4	52	0	58	0.19
	11/29/79	28	1	3	0	0	5	0.18
	12/27/79		1	4	0	0		
	Total (1-4)	76	12	11	111	7	141	
10	Total (2-4)		4	11	52	0	67	0.88
Rt. 360 Chesterfield	10/12/79	27	15	4	58	4	77	1.26
	11/08/79	21	2	0	28	0	34	0
	11/29/79	28	0	0	0	0	0	1.07
	12/27/79		7	3	20	0	30	
	Total (1-4)	76	24	7	106	4	141	
12	Total (2-4)		9	3	48	4	64	0.84
Rt. 7 Loudoun	10/16/79	7	4	1	37		41	3.14
	10/23/79	7	6	2	15	2	22	2.57
	10/30/79		1		14	1	18	0.18
	11/27/79	28	11	3	3	3	5	
	Total (1-4)	42	7	3	69	3	86	1.07
13	Total (2-4)				32		45	
Rt. 221 Roanoke	10/03/79	14	4	6	58	1	68	1.71
	10/17/79	14	1	3	22		24	2.14
	10/31/79	14	1	1	26		30	1.71
	11/14/79		2	1	21		24	
	Total (1-4)	42	8	10	127	1	146	
15	Total (2-4)		4	4	69	1	78	1.86

Litter Survey -- 4th Series

Primary by Weight

Site	Date	Days	Cans	Bottles	Paper/ Plastic	Auto/ Other	Total	Pound/ Day
Rt. 250 (Ramp) Albemarle	10/02/79	13	2.3	2.9	1.7		4.0	0.21
	10/15/79	14	0.5	1.4	0.8		2.7	0.17
	10/29/79	7	0.4	1.0	1.0		2.4	0.17
	11/05/79		0.2	0.5	0.5		1.2	
	Total (1-4)		3.4	2.9	4.0		10.3	
3	Total (2-4)	34	1.1		2.3		6.3	0.19
Rt. 238 York	10/11/79		0.8	8.2	2.5	0.5	12.0	0.12
	10/24/79	13	0.4	0.5	0.6		1.5	0.29
	11/07/79	14	0.2	1.4	2.5		4.1	0.21
	11/28/79	21	0.4	2.7	1.4		4.5	
	Total (1-4)		1.8	12.8	7.0	0.5	22.1	0.21
5	Total (2-4)	48	1.0	4.6	4.5		10.1	
Rt. 33 New Kent	10/11/79		0.6	0.5	1.3		2.4	0.18
	10/24/79	13	0.2		2.1		2.3	0.09
	11/07/79	14	0.2		1.0		1.2	0.10
	11/28/79	21	0.7	0.5	1.0		2.2	
	Total (1-4)		1.7	1.0	5.4		8.1	0.12
6	Total (2-4)	48	1.1	0.5	4.1		5.7	
Rt. 13 Va. Beach	10/11/79		0.1		0.1	1.0	1.2	0.27
	10/24/79	13	0.2	1.4	1.9		3.5	0.27
	11/07/79	14	0.4	1.4	2.0		3.8	0.06
	11/28/79	21	0.3	0.5	0.5	1.0	1.3	
	Total (1-4)		1.0	3.3	4.5		9.8	0.18
9	Total (2-4)	48	0.9	3.3	4.4		8.6	
Rt. 7 Loudoun	10/16/79		0.2		1.8		2.0	0.30
	10/23/79	7	0.5	0.5	1.1		2.1	0.53
	10/30/79	7		0.9	0.1	2.7	3.7	0.09
	11/27/79	28	0.1	1.4	0.2	2.2	2.5	
	Total (1-4)		0.8	1.4	3.2	4.9	10.3	0.20
13	Total (2-4)	42	0.6	1.4	1.4	4.9	8.3	
Rt. 221 Roanoke	10/03/79		0.3	3.4	1.7		5.4	0.03
	10/17/79	14	0.1		0.2	0.1	0.4	0.12
	10/31/79	14	0.1	1.4	0.2		1.7	0.06
	11/14/79	14	0.1	0.5	0.3		0.9	
	Total (1-4)		0.6	5.3	2.4	0.1	8.4	0.07
15	Total (2-4)	42	0.3	1.9	0.7	0.1	3.0	

Litter Survey - 4th Series

Primary by Volume

Site	Date	Days	Cans	Bottles	Paper/ Plastic	Auto/ Other	Total	Ft. ³ / Day
Rt. 250 (Ramp) Albemarle	10/02/79	13	0.7	0.1	1.2		1.9	0.06
	10/13/79	14	0.1	-	0.6		0.8	0.06
	10/29/79	7	0.1	-	0.7		0.8	0.07
	11/05/79		0.1	0.1	0.4		4.0	
	Total (1-4)	34	1.0	0.1	2.9		2.1	0.06
Pt. 238 York	Total (2-4)		0.3	0.1	1.7			
	10/11/79	13	0.2	0.5	1.8	0.1	2.6	0.04
	10/24/79	14	0.1	-	0.4		0.5	0.14
	11/07/79	21	0.1	0.1	1.8		2.0	0.06
	11/28/79	48	0.1	0.2	1.0		1.3	0.08
Rt. 33 New Kent	Total (1-4)		0.5	0.8	5.0	0.1	6.4	
	Total (2-4)		0.3	0.3	3.2		3.8	
	10/11/79	13	0.2	-	0.9		1.1	0.12
	10/24/79	14	0.1	-	1.4		1.5	0.06
	11/07/79	21	0.1	-	0.7		0.8	0.05
Rt. 13 Va. Beach	11/28/79	48	0.7	-	3.7		4.4	0.07
	Total (1-4)		0.5	-	2.8		3.3	
	Total (2-4)		0.2	0.1	0.1	-	0.1	0.12
	10/11/79	13	0.1	0.1	1.4	-	1.6	0.11
	10/24/79	21	0.1	-	0.4	-	0.5	0.02
Rt. 7 Loudoun	11/28/79	48	0.3	0.2	3.3	-	3.8	0.08
	Total (1-4)		0.3	0.2	3.2		3.7	
	Total (2-4)		0.1	-	1.3	-	1.4	0.14
	10/16/79	7	0.2	-	0.8	-	1.0	0.09
	10/23/79	7	-	0.1	0.1	0.4	0.6	0.01
Rt. 221 Roanoke	10/30/79	28	-	-	0.1	0.3	3.4	0.05
	11/27/79	42	0.3	0.1	2.3	0.7	2.0	
	Total (1-4)		0.2	0.1	1.0	0.7		
	Total (2-4)		0.1	0.2	1.2	-	1.5	0.01
	10/03/79	14	-	-	0.1	-	0.1	0.04
15	10/17/79	14	-	0.1	0.4	-	0.5	0.02
	10/31/79	14	0.1	-	0.2	-	0.3	
	11/14/79	42	0.2	0.3	1.9	-	2.4	0.02
	Total (1-4)		0.1	0.1	0.7	-	0.9	
	Total (2-4)		0.1	0.1	0.7	-	0.9	

Litter Survey -- 4th Series

Secondary by Item Count

Site	Date	Days	Cans	Bottles	Paper/ Plastic	Auto/ Other	Total	Item/ Day
Rt. 655 Bedford	10/03/79		9	2	16		27	
	10/17/79	14	1	1	20		22	1.57
	10/31/79	14	2	2	11		15	1.07
	11/14/79	14	3	2	6		11	0.79
	Total (1-4)		15	7	53		75	
1	Total (2-4)	42	6	5	37		48	1.14
Rt. 654 Albemarle	10/02/79		16	4	77	2	99	
	10/15/79	13	0	0	0	3	3	0.23
	10/29/79	14	2	0	0	0	2	0.14
	11/05/79	7	3	0	0	0	3	0.43
	Total (1-4)		21	4	77	5	107	
2	Total (2-4)	34	5	0		3	8	0.24
Rt. 623 Rockingham	10/09/79		49	23	27		99	
	10/22/79	13	4	3	10		17	1.30
	11/05/79	14	2	1	7	1	11	0.79
	11/16/79	11		2	9		11	1.00
	Total (1-4)		55	29	53	1	138	
3	Total (2-4)	38	6	6	26	1	39	1.03
Rt. 630 York	10/11/79		6	6	117	1	130	
	10/24/79	13	6	0	14	2	22	1.69
	11/07/79	14	0	1	0	0	1	0.07
	11/28/79	21	0	0	10	2	12	0.57
	Total (1-4)		12	7	141	5	165	
4	Total (2-4)	48	6	1	24	4	35	0.73
Rt. 620 Fairfax	10/16/79		1	5	42		48	
	10/23/79	7	2	2	10		14	2.00
	10/30/79	7	2	1	4		7	1.00
	11/27/79	28	3	4	15		22	0.79
	Total (1-4)		8	12	71		91	
7	Total (2-4)	42	7	7	29		43	1.02
Rt. 641 Loudoun	10/16/79		25	16	49	0	90	
	10/23/79	7	4	1	13	1	19	2.71
	10/30/79	7	3	0	0	0	3	0.43
	11/27/79	28	0	0	0	0	0	0.00
	Total (1-4)		32	17	62	1	112	
8	Total (2-4)	42	7	1	13	1	22	0.52

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Rt. 652 Caroline	10/16/79	7	15	12	26	1	54	1.14
	10/23/79	7	3	1	4	0	8	0.00
	10/30/79	7	0	0	0	0	0	0.39
	11/27/79	28	0	0	11	1	11	0.45
9	Total (1-4)	18	13	13	41	1	73	
	Total (2-4)	42	3	1	15	0	19	
Rt. 640 Botetourt	10/04/79		9	6	45		60	1.79
	10/18/79	14	7		18		25	1.43
	11/01/79	14	9	1	10		20	1.43
	11/15/79	14	1	8	11		20	
10	Total (1-4)	26	15	15	84		125	
	Total (2-4)	42	17	9	39		65	1.54

Litter Survey -- 4th Series

Secondary by Weight

Site	Date	Days	Cans	Bottles	Paper/ Plastic	Auto/ Other	Total	Pound/ Day
Rt. 655 Bedford 1	10/03/79		0.8	0.9	1.2		2.9	0.13
	10/17/79	14	0.1	1.1	0.6		1.8	0.11
	10/31/79	14	0.1	1.3	0.2		1.6	0.09
	11/14/79	14	0.3	0.9	0.1		1.3	0.11
	Total (1-4)		1.3	4.2	2.1		7.6	
	Total (2-4)	42	0.5	3.3	0.9		4.7	0.11
Rt. 623 Rockingham 3	10/09/79		4.4	11.2	0.6		16.2	0.16
	10/22/79	13	0.3	1.5	0.3		2.1	0.09
	11/05/79	14	0.2	0.5	0.3	0.2	1.2	0.15
	11/16/79	11		1.5	0.1		1.6	
	Total (1-4)		4.9	14.7	1.3	0.2	21.1	0.13
	Total (2-4)	38	0.5	3.5	0.7	0.2	4.9	
Rt. 620 Fairfax 7	10/16/79		0.1	3.4	2.1		5.6	0.16
	10/23/79	7	0.1	0.9	0.1		1.1	0.17
	10/30/79	7	0.2	0.9	0.1		1.2	0.11
	11/27/79	28	0.2	1.8	1.0		3.0	
	Total (1-4)		0.6	7.0	3.3		10.9	0.13
	Total (2-4)	42	0.5	3.6	1.2		5.3	
Rt. 640 Botetourt 10	10/04/79		0.5	3.1	1.4		5.0	0.09
	10/18/79	14	0.4		0.8		1.2	0.17
	11/01/79	14	0.7	0.9	0.3		2.4	0.36
	11/15/79	14	0.1	3.8	1.1		5.0	
	Total (1-4)		1.7	7.8	4.1		13.6	0.20
	Total (2-4)	42	1.2	4.7	2.7		8.6	

Litter Survey - 4th Series
Secondary by Volume

Site	Date	Days	Cans	Bottles	Paper/ Plastic	Auto/ Other	Total	Ft. ³ / Day
Rt. 655 Bedford	10/03/79	14	0.2	0.1	0.9		1.2	
	10/17/79	14	-	-	0.5		0.5	0.04
	10/31/79	14	0.1	0.1	0.2		0.4	0.03
	11/14/79	14	0.1	0.1	0.1		0.3	0.02
	Total (1-4)		0.4	0.3	1.7		2.4	
1	Total (2-4)	42	0.2	0.2	0.8		1.2	0.03
Rt. 623 Rockingham	10/09/79		1.2	0.7	0.4		2.3	
	10/22/79	13	0.1	0.1	0.2		0.4	.03
	11/05/79	14	0.1	-	0.2		0.3	0.02
	11/16/79	11	-	0.1	0.1		0.2	0.02
	Total (1-4)		1.4	0.9	0.9		3.2	
3	Total (2-4)	38	0.2	0.2	0.5		0.9	0.02
Rt. 620 Fairfax	10/16/79		-	0.2	1.5		1.7	
	10/23/79	7	0.1	0.1	0.1		0.3	0.04
	10/30/79	7	0.1	-	0.1		0.2	0.03
	11/27/79	28	0.1	0.1	0.7		0.9	0.03
	Total (1-4)		0.3	0.4	2.4		3.1	
7	Total (2-4)	42	0.3	0.2	0.9		1.4	0.03
Rt. 640 Botetourt	10/04/79		0.2	0.2	1.0		1.4	
	10/18/79	14	0.2	-	0.5		0.7	0.05
	11/01/79	14	0.2	-	0.6		0.8	0.06
	11/15/79	14	-	0.2	0.7		0.9	0.06
	Total (1-4)		0.6	0.4	2.8		3.8	
10	Total (2-4)	42	0.4	0.2	1.8		2.4	0.06