

TECHNICAL ASSISTANCE
REPORT

**THE USE
OF SAFETY RESTRAINT SYSTEMS IN VIRGINIA
BY OCCUPANTS UNDER 16 YEARS OF AGE:
THE 1999 SURVEY RESULTS**



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

Virginia Transportation Research Council
(A Cooperative Organization Sponsored Jointly by the
Virginia Department of Transportation and
the University of Virginia)

Charlottesville, Virginia

November 2000
VTRC 01-TAR6

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ABSTRACT

The Virginia Transportation Research Council has been monitoring the use of child safety restraint systems in Virginia since 1983 through child safety seat surveys conducted annually (with the exception of 1995). The principal goal of the survey has been to estimate compliance with the relevant statutes in place at the time. Each year, data were collected from the four metropolitan areas of the state (northern, eastern, central, and western) at the same sites, on the same day of the week, and at the same hour of the day. In 1997, sites in three localities with a population between 50,000 and 100,000, referred to as mid-size cities, were added, as was data collection on safety belt use by occupants 4 to 16 years of age. This change was made because of changes to §§ 46.2-1094 and 46.2-1095 of the *Code of Virginia*, which required these rear seat occupants to use safety restraints.

In 1997, the percentage of children under age 4 seated in the front seat was in the double digits in every locality studied. Since then, the percentage of front seat passengers in this age group declined into single digits in all but one locality.

Between 1993 and 1998, Metropolitan area survey results were characterized by a lack of consistent change, with correct use rates hovering in the 50s and mid-60s. In 1999, correct use rose to 83.2%. Similar trends had been seen in all four metropolitan areas, with the 1999 correct use rate ranging from 78.8% in the western area to 89.0% in the eastern area. A similar increase from 57.0% in 1998 to 84.6% in 1999 was noted in the mid-size cities. Lynchburg experienced the greatest increase, from 36.8% to 91.9%, with the rate in Charlottesville increasing to 88.5% and in Danville to 70.6%. In all three mid-size cities, incorrect use rates dropped to below 10%.

In terms of restraint use among occupants 4 to 16 years of age, the picture is more complicated and not so positive. In the metropolitan areas, there was a modest increase in 1999 in correct restraint use (4.5 points), but nothing like the dramatic changes seen in the younger group of children. Front seat correct use rose to 61.8% in 1999, compared to the rear seat correct use of 49%. Correct restraint use among occupants 4 to 16 years of age also increased in mid-size cities, but by about 10 points. These increases were not consistent across metropolitan areas or mid-size cities.

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INTRODUCTION

The Virginia Transportation Research Council has been tracking the use of child safety restraint systems for the Commonwealth since 1983. Child safety seat surveys have been conducted annually, with the exception of 1995, to measure the frequency of use and to make the findings available to state officials. The surveys have varied in detail and scope, but the principal goal has always been to estimate compliance with the relevant statutes in place at the time. The surveys from 1983 through 1996 were conducted at the request of officials of Virginia's Department of Motor Vehicles. With the transfer of responsibility for the state's child safety seat program to the Virginia Department of Health (VDH) in 1997, that agency requested that the surveys be continued.

Because the sites used in the survey were not selected at random, the survey results cannot be used as estimates of statewide infant and child restraint use. However, these child safety restraint surveys provide a snapshot of child restraint system usage in four of the state's most urbanized areas and in three of its mid-size cities. Taken together, they give safety program administrators and public officials a good idea of how well citizens of the Commonwealth are observing the state's laws and whether changes have occurred over time.

The results of previous child safety restraint surveys have been presented in detailed technical reports. This is the first year that survey results are presented in a more simple format, in an attempt to make the results more accessible. This report contains the set of tables requested by VDH personnel, along with a concise narrative describing the major findings and pointing out areas where more activity may be considered.

METHODOLOGY

The 1999 child safety seat survey was a replication of the 1993 through 1998 studies. Data were collected from the four metropolitan areas of the state (northern, eastern, central, and western), at the same sites, on the same day of the week, and at the same hour of day as in previous years. The same criteria for determining correct, incorrect, and no use were used for all surveys since 1993. In response to a request from VDH officials, the number of sites was increased in 1997 to include three localities with a population between 50,000 and 100,000, referred to as mid-size cities. In addition, VDH officials requested that data be collected on safety belt use by occupants 4 to 16 years of age. This request was made because of changes to §§ 46.2-1094 and 46.2-1095 of the *Code of Virginia*, which required these rear seat occupants to use safety restraints.

The reader should be cautioned that throughout this report, rates of reported *correct* use are likely to be overestimated because of the method of observation and the definition of correct usage. With an in-traffic survey, the lap/shoulder belt holding the child seat in place cannot be checked for proper tension, a factor identified by other researchers as resulting in a high rate of incorrect use.

For the metropolitan areas, data were collected at signalized intersections at 12 sites in the northern area (Fairfax County, Arlington, and Alexandria), 11 in the eastern area (Norfolk, Portsmouth, Virginia Beach, and Newport News), 7 in the central area (Richmond, Henrico, and Chesterfield), and 4 in western area (Roanoke, Salem, and Vinton). For the mid-size cities, data were collected at 2 signalized sites in Charlottesville, 2 in Danville, and 3 in Lynchburg. The location of these sites is shown in Appendix Tables A-1 through A-4. The use of sites at shopping centers and day care centers was considered, but when a sample of these locations was checked at various times of the day, either the traffic volume was inadequate or the traffic was not representative of the socioeconomic status of the community at large. Therefore, sites at shopping centers and day care centers were not used.

There were two persons on each survey team. Each was trained in how to collect data, how to identify the factors that constituted correct and incorrect use, and how to estimate whether a child was under age 4. Because this was an in-traffic survey, two indices were used to help determine whether the child was under age 4. The first came from previous versions of the *Code of Virginia* in which required child seat users were defined as weighing 40 lb (18.1 kg) or less. The second was developed as an aid to police officers, where a required child seat user was defined as being 40 in (1.02 m) tall or less. In this survey, if the child was judged to be under 40 in (1.02 m) tall, weigh less than 40 lb (18.1 kg), or both, he or she was assumed to be under age 4. When the observer was judging whether an occupant was 4 to 16 years of age, the lower age limit was defined by occupants who were in the child safety seat category, and the upper limit was defined by the apparent age of the driver; the full licensing age in Virginia is 16.

Data were collected for passenger cars, small sport utility vehicles (SUVs), and small vans in the curb travel lane, and no distinction was made between Virginia-licensed and out-of-state vehicles (the law makes no such distinction). The only vehicles excluded were some very large pickup trucks, very large SUVs, and vans with darkly tinted side glass because with these

classes of vehicles, the observers could not see whether there was a child occupant or whether a child restraint device was being used. When a vehicle stopped for the red signal, the observers left the curb and approached the vehicle from the passenger side front fender. Each member of the survey team observed up to 15 vehicles per traffic light cycle, with the safety of the observer (staying clear of entrances to businesses) and the traffic volume determining the number of vehicles surveyed. At some intersections, only five vehicles were observed because of the signal timing at the site. As required by state policy, each team member wore a hard hat and an orange safety vest.

Data were collected during four periods each day: 7:30 to 9:00 a.m., 10:30 a.m. to noon, 1:30 to 3:00 p.m., and 4:00 to 5:30 p.m.

In an effort to put occupants at ease, survey personnel carried a clipboard lettered on the back with the message "Child Safety Seat Survey." Upon seeing the message, many drivers lowered their window, responded, and allowed the observer to lean in the window to check usage. At no time did survey team members report that they felt threatened by motorists' comments or felt ill at ease to be in a survey location.

To distinguish persons in the two age groups, a "U" was used for those under age 4 and an "O" was used to identify those 4 to 16 years of age (see Figure 1). An "S" was used to show that the use data were for a child safety seat, and an "L" was used for data on regular lap/shoulder belts. Child seat use was recorded as correct (C), incorrect (I), or non-use (N). Only those features easily identifiable from outside the vehicle were used to determine whether use was correct or incorrect. These features included that the arm bars/shields were used, that the seat harness was properly clipped between the legs of the child, that the seat was facing in the proper direction for the age of the child, that the lap/shoulder belt was routed through the child seat, and that the chest clip was in place. For a response to be recorded as correct, all features had to be used in the correct manner. Misuse or non-use of any one feature necessitated that the use be recorded as incorrect. Non-use was recorded if there was a child under age 4 in the vehicle and no safety seat was present, a seat was present but was not being used, or a lap belt was being used in place of a safety seat. As previously stated, because of the nature of the survey procedures, correct use was likely to be overestimated, and the number/rate given in the various tables in this report should be considered the maximum level of correct use.

Safety restraint use for occupants 4 to 16 years of age was also recorded as correct, incorrect, and non-use. Non-use was easy to determine. Incorrect use was defined as a shoulder belt obviously loose, behind the back, or under the arm. Correct use was recorded for all remaining occupants who did not fit in the two other classifications.

As seen in Table 1, a summary of the sample sizes of the 1997 to 1999 surveys, in 1999 observations were made of 469 occupants under 4 years of age for child safety seat use (34 in the front and 435 in the rear seats). In terms of safety restraint use by occupants 4 to 16 years of age, 1,273 observations were made (463 in the front and 810 in the rear seats).

CHILD SAFETY SEAT SURVEY

Summer 1998

Area _____ Site _____ @ _____ Sheet # _____

Vehicle	Front Seats						Back Seats					
	Driver	Middle		Right		Left		Middle		Right		
		Belt	Use	Belt	Use	Belt	Use	Belt	Use	Belt	Use	
1		U	S	U	S	U	S	U	S	U	S	
		O	L	O	L	O	L	O	L	O	L	
		C	N	C	N	C	N	C	N	C	N	
2		U	S	U	S	U	S	U	S	U	S	
		O	L	O	L	O	L	O	L	O	L	
		C	N	C	N	C	N	C	N	C	N	
3		U	S	U	S	U	S	U	S	U	S	
		O	L	O	L	O	L	O	L	O	L	
		C	N	C	N	C	N	C	N	C	N	
4		U	S	U	S	U	S	U	S	U	S	
		O	L	O	L	O	L	O	L	O	L	
		C	N	C	N	C	N	C	N	C	N	
5		U	S	U	S	U	S	U	S	U	S	
		O	L	O	L	O	L	O	L	O	L	
		C	N	C	N	C	N	C	N	C	N	
6		U	S	U	S	U	S	U	S	U	S	
		O	L	O	L	O	L	O	L	O	L	
		C	N	C	N	C	N	C	N	C	N	
7		U	S	U	S	U	S	U	S	U	S	
		O	L	O	L	O	L	O	L	O	L	
		C	N	C	N	C	N	C	N	C	N	
8		U	S	U	S	U	S	U	S	U	S	
		O	L	O	L	O	L	O	L	O	L	
		C	N	C	N	C	N	C	N	C	N	
9		U	S	U	S	U	S	U	S	U	S	
		O	L	O	L	O	L	O	L	O	L	
		C	N	C	N	C	N	C	N	C	N	
10		U	S	U	S	U	S	U	S	U	S	
		O	L	O	L	O	L	O	L	O	L	
		C	N	C	N	C	N	C	N	C	N	

I = Incorrect C = Correct N = Nonuse U = Under four S = Safety seat O = Over four L = Lap/Shoulder

Figure 1. Survey form

Interestingly, in 1997, the percentage of children under age 4 in the front seat was in the double digits in every locality. Since then, front seat passengers in this age group declined into single digits everywhere except Danville. The consistent 20% front seat occupancy among young children in Danville may be due to the small number of observations made there. However, since these figures are consistent across years, some additional effort may be needed to inform parents in Danville of the safety benefits of having children ride in the back seat. No consistent trend in front/rear seat ridership was noted among occupants 4 to 16 years of age.

RESULTS

The results of this survey are presented in several parts: (1) statewide results on both child safety seat use and restraint use by older children for both metropolitan areas and mid-size cities; (2) findings that relate to each locality, including discussion of areas of opportunity; and

(3) a comparison of use rates among the various locations to assist in prioritization of efforts. The tables on which these findings are based appear in Appendices A through E.

	Infants						4 to 16 Years					
	1997		1998		1999		1997		1998		1999	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Total Metro Area	484		386		346		1593		1106		1026	
Front	95	19.6	28	7.3	23	6.6	761	47.8	340	30.7	359	35.0
Rear	389	80.4	358	92.7	323	93.4	832	52.2	766	69.3	667	65.0
Northern	151		128		133		459		342		367	
Front	26	17.2	3	2.3	8	6.0	212	46.2	83	24.3	121	33.0
Rear	125	82.8	125	97.7	125	94.0	247	53.8	259	75.7	246	67.0
Eastern	213		148		109		694		442		328	
Front	39	18.3	16	10.8	10	9.2	336	48.4	114	25.8	113	34.5
Rear	174	81.7	132	89.2	99	90.8	358	51.6	298	67.4	215	65.5
Central	92		69		71		297		224		229	
Front	22	23.9	5	7.2	2	2.8	145	48.8	77	34.4	81	35.4
Rear	70	76.1	64	92.8	69	97.2	152	51.2	147	65.6	148	64.6
Western	28		41		33		143		98		102	
Front	8	28.6	4	9.8	3	9.1	68	47.6	36	36.7	44	43.1
Rear	20	71.4	37	90.2	30	90.9	75	52.4	62	63.3	58	56.9
Total Mid-Size	81		86		123		385		289		247	
Front	12	14.8	13	15.1	11	8.9	179	46.5	85	29.4	104	42.1
Rear	69	85.2	73	84.9	112	91.1	206	53.5	204	70.6	143	57.9
Danville	21		20		34		98		77		70	
Front	4	19.0	4	20.0	7	20.6	42	42.9	18	23.4	30	42.9
Rear	17	81.0	16	80.0	27	79.4	56	57.1	59	76.6	40	57.1
Charlottesville	29		47		52		152		114		94	
Front	3	10.3	7	14.9	1	1.9	72	47.4	30	26.3	39	41.5
Rear	26	89.7	40	85.1	51	98.1	80	52.6	84	73.7	55	58.5
Lynchburg	31		19		37		135		98		83	
Front	5	16.1	2	10.5	3	8.1	65	48.1	37	37.8	35	42.2
Rear	26	83.9	17	89.5	34	91.9	70	51.9	61	62.2	48	57.8

Total Metropolitan Area Findings

Previous child safety seat survey results were characterized by a lack of consistent change. As seen in Figure 2, correct use rates in the metropolitan areas hovered around the mid-50s and had never been higher than the low to mid-60s. In 1999, correct use rose to 83.2%. At the same time, non-use fell to 7.5% and incorrect use fell to 9.2%. Similar trends were seen in all four metropolitan areas, with correct use ranging from 78.8% in the western area to 89.0% in the eastern area. Non-use and incorrect use fell in all areas except in the west, where incorrect use increased, from 9.8% to 18.2%. However, this may not be a meaningful increase, since the incorrect use rate had been varying within that same range since 1994. In terms of seating position, too few children under 4 occupy the front seat to be able to draw definitive conclusions concerning their use rates, making rear seat and overall use rates almost identical.

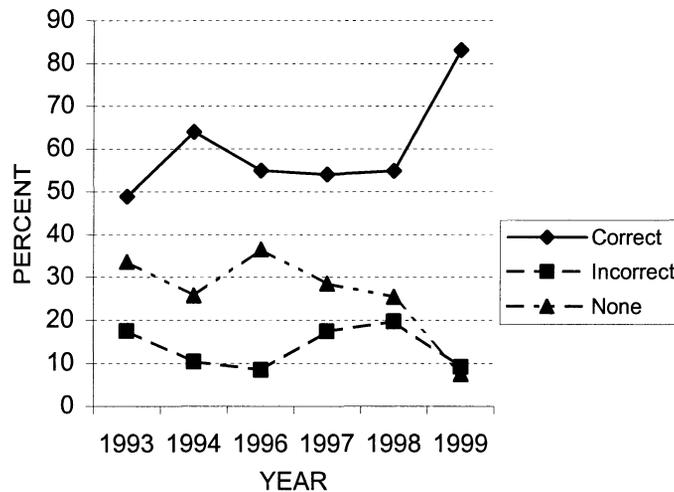


Figure 2. Total Metropolitan Area Child Safety Seat Use: All Seating Positions

In terms of restraint use among occupants 4 to 16 years of age, the picture is more complicated and not so positive. In the metropolitan areas, there was a modest increase between 1998 and 1999 in correct restraint use (4.5 points) and a modest decrease in incorrect use (3.9 points), but nothing like the dramatic changes seen for the younger group of children (see Figures 3a-c). These changes persisted in both front and rear seating positions, although both correct and incorrect use were more likely in the front seat than the rear. Front seat correct use was 61.8% in 1999, and rear seat correct use of 49%. Front seat incorrect use was 12.3% in 1999, and rear seat incorrect use of 9.3%.

Total Mid-Size City Findings

For occupants under 4 years old, there was an increase from 57.0% in 1998 to 84.6% in 1999 in correct use rates (Figure 4). Lynchburg experienced the greatest increase, from 36.8% to 91.9%, with the rate in Charlottesville increasing from 76.6% to 88.5% and in Danville from 30.0% to 70.6%. In all three mid-size cities, incorrect use rates dropped to below 10%. Again, there were very few children under 4 observed sitting in the front seat. Clearly, these dramatic

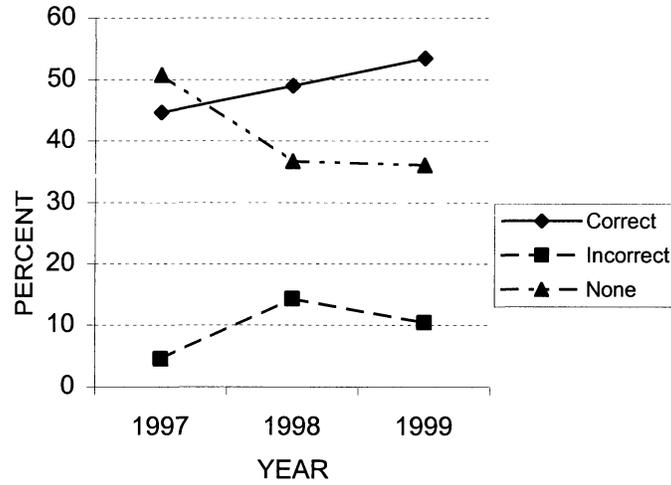


Figure 3a. Total Metropolitan Area 4 to 16-Year-Old Restraint Use: All Seating Positions

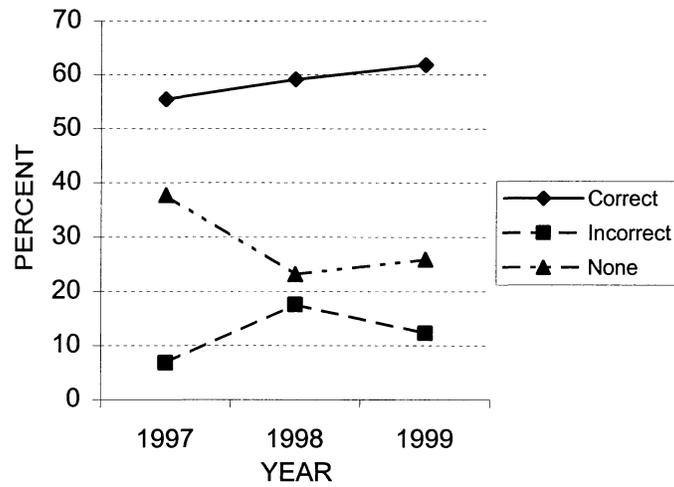


Figure 3b. Total Metropolitan Area 4 to 16-Year-Old Restraint Use: Front Seat

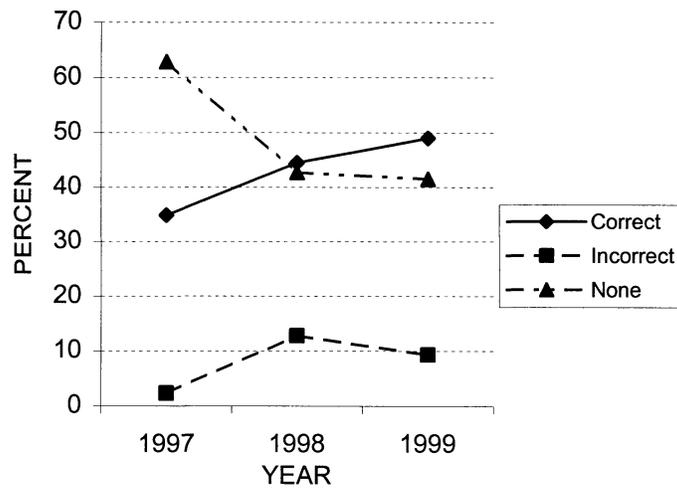


Figure 3c. Total Metropolitan Area 4 to 16-Year-Old Restraint Use: Rear Seat

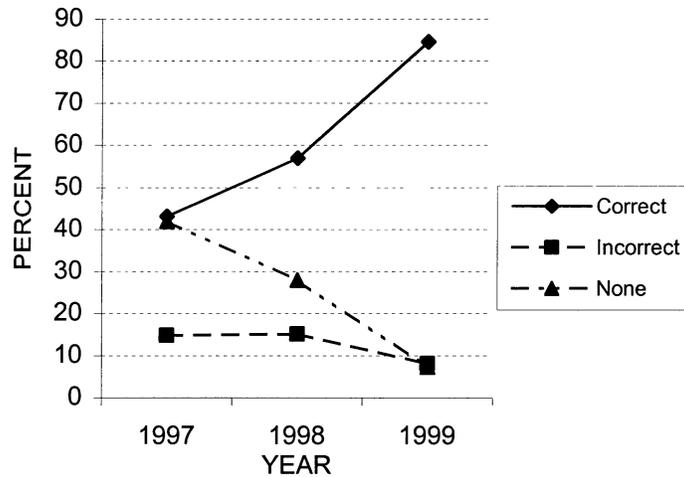


Figure 4. Total Mid-Size Cities Child Safety Seat Use: All Seating Positions

increases in restraint use among young children sitting in the rear seat can be viewed as good news.

Correct restraint use among occupants 4 to 16 years of age also increased in mid-size cities, but to a greater degree, from 42.2 in 1998 to 52.2 in 1999 (Figures 5a-c). However, incorrect use, which had peaked in 1998, decreased by 5.7 points in 1999, resulting in a very small net gain in terms of overall restraint use among this age group. Patterns were similar in both the front and rear seats, except that restraint use among front seat occupants increased more than use among rear seat occupants and ended at a higher level (55.8% vs. 49.7%). Incorrect use was also higher for front seat occupants in 1999 (15.4% vs. 11.2%). These findings suggest target audiences needing more information, and perhaps more persuasion.

Localities

Northern Metropolitan Area

In the northern metropolitan area, correct child safety seat use rates had been gradually declining since 1996 and had reached 49.2% in 1998 (Figure 6). Thus, 1999's 30-point increase to 80.5% reversed the existing downward trend. In addition, incorrect use had been increasing over time, so the decline to 10.5% was also the reversal of a trend.

In terms of restraint use by occupants 4 to 16 years of age, results were similar to those statewide. Use rates for older children were much lower than rates for their younger counterparts (Figures 7a-c). However, correct use has improved somewhat in the last 3 years, and in 1999, incorrect use has seen modest drops in both the front and back seats. Correct use is much lower in the back seat than the front (52.4% vs. 69.4%), and correspondingly, nonuse is much higher in the rear seat than the front (37.4% vs. 19.8%). Incorrect use is about 10% in both seating positions.

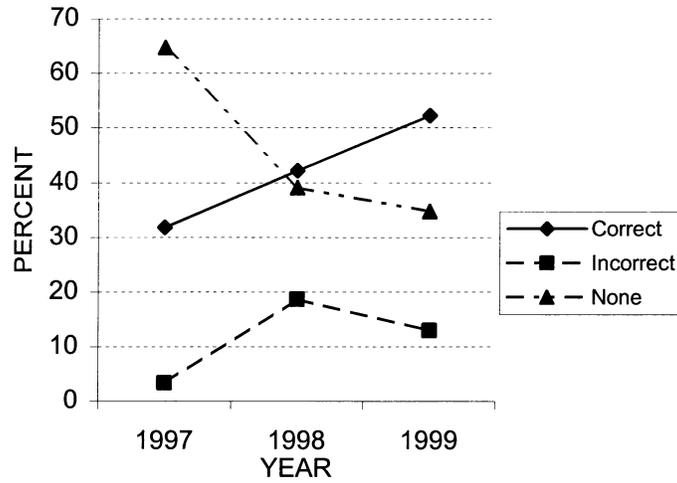


Figure 5a. Total Mid-Size Cities 4 to 16-Year-Old Restraint Use: All Seating Positions

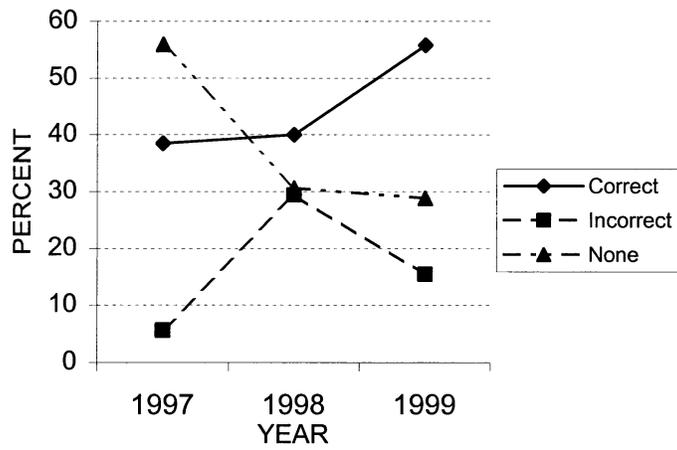


Figure 5b. Total Mid-Size Cities 4 to 16-Year-Old Restraint Use: Front Seat

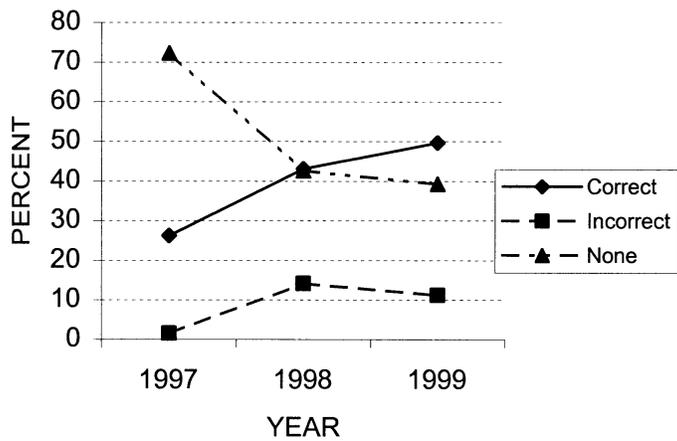


Figure 5c. Total Mid-Size Cities 4 to 16-Year-Old Restraint Use: Rear Seat

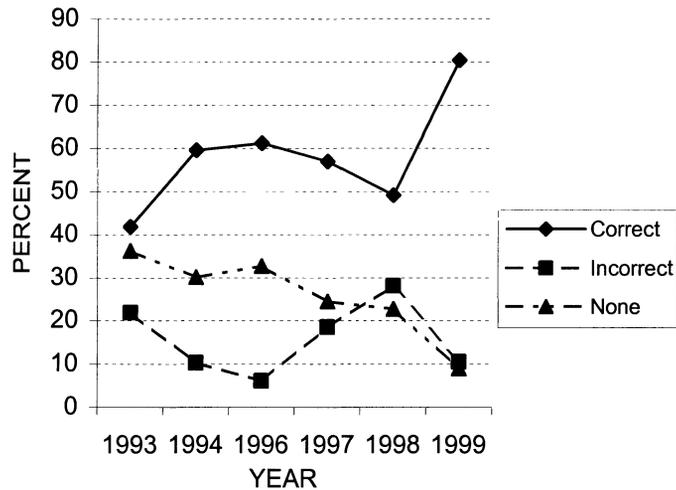


Figure 6. Northern Metropolitan Area Child Safety Seat Use: All Seating Positions

Assuming that the significant improvements in child safety seat use continues, VDH's emphasis in Northern Virginia should be on increasing restraint use by occupants 4 to 16 years of age, especially in the rear seat positions.

Eastern Metropolitan Area

In 1999, the dramatic increase in correct use for occupants under 4 from 52.7% to 89% and similar dramatic decrease in incorrect use accounted for the bulk of the change in the eastern metropolitan area (Figure 8). Incorrect use fell to 8.3, and nonuse fell to an astonishing 2.8%.

Also in the eastern metropolitan area, the biggest changes in restraint use among older children occurred between 1997 and 1998 and that changes in 1999 are lesser continuations of these previous trends (Figures 9a-c). Although correct restraint use among occupants 4 to 16 years of age increased gradually since 1997 to reach 57.3% in 1999, nonuse fell markedly between 1997 and 1998 and leveled off in 1999 at 32.6%. Incorrect use increased somewhat between 1997 and 1998 and then leveled off at about 10%.

This effect is especially clear in terms of rear seat use rates. Between 1997 and 1998, correct use increased from 33.2% to 49.7% and nonuse decreased from 65.6% to 39.3%. Correct and nonuse leveled off at 53% and 38.6%, respectively, in 1999. Similar but less dramatic trends were noted for front seat usage, although correct front seat use rates started higher than rates for rear seat occupants (56% vs. 33.2%) and ended higher (65.5% vs. 53%). Although improvements have been made, a significant number of children aged 4 to 16 do not use safety belts (front seat 38.6% vs. rear seat 21.2%).

Since child safety seat use rates are high, the remaining challenge in the eastern metropolitan area is to increase correct restraint use among occupants 4 to 16 years of age, especially in the rear seat position. In addition, even though incorrect use rates are generally low, they are higher in the front seat than in the rear seat and have been gradually increasing

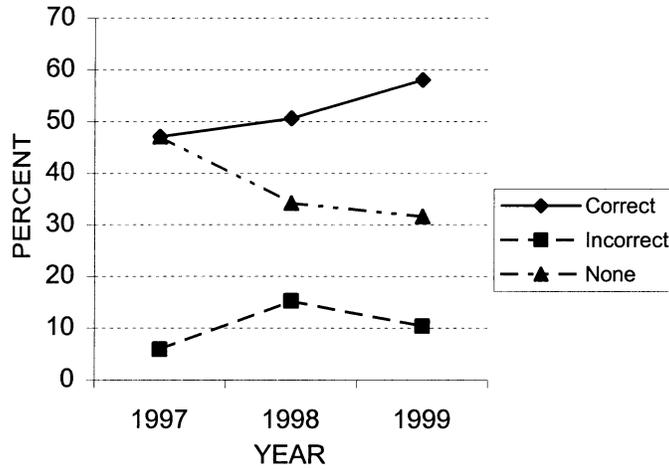


Figure 7a. Northern Metropolitan Area 4 to 16-Year-Old Restraint Use

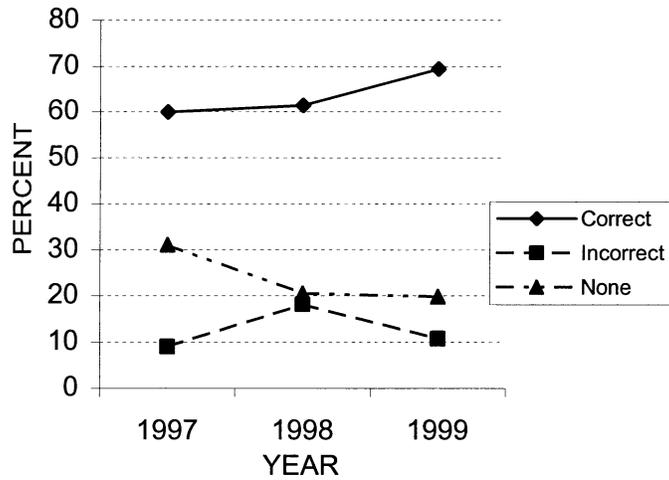


Figure 7b. Northern Metropolitan Area 4 to 16-Year-Old Restraint Use: Front Seat

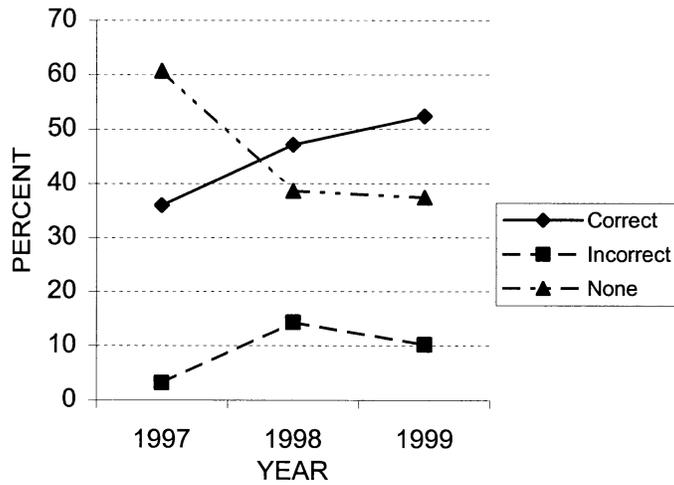


Figure 7c. Northern Metropolitan Area 4 to 16-Year-Old Restraint Use: Rear Seat

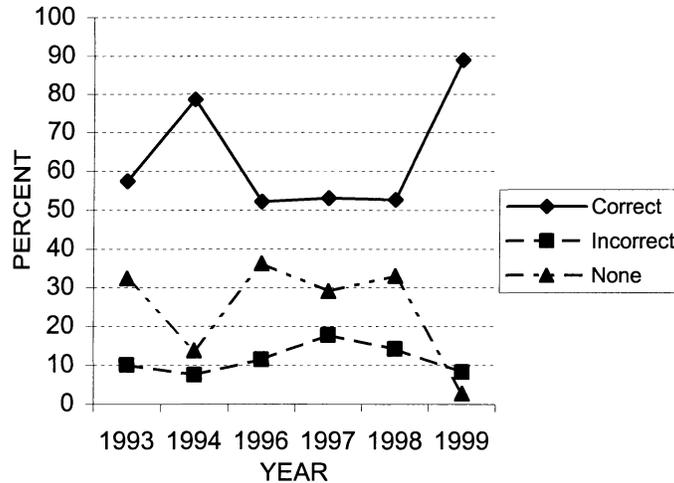


Figure 8. Eastern Metropolitan Area Child Safety Seat Use: All Seating Positions

there. This trend should be monitored to see if it continues in coming years, and perhaps some attention given to the problem now.

Central Metropolitan Area

In the central metropolitan area between 1996 and 1998, both incorrect and correct child safety seat use had been gradually increasing (Figure 10). In 1999, for the first time in several years, incorrect use also dropped, to 4.2%, and correct child safety seat use increased by more than 34 points.

Non-restraint use among older children in the central metropolitan area was almost as high as correct use (41.9% vs. 44.5%) (Figures 11a-c). Interestingly, correct restraint use among occupants 4 to 16 years of age in the front seat decreased from 53.1% to 48.1% over the last 3 years. Although not a dramatic decrease, this trend is troubling. In the rear seat, correct use rates started lower than the front seat rate and then fell from 42.8% to 30.6% between 1997 and 1998, but rebounded to their 1997 level in 1999. Nonuse showed a net decrease between 1997 and 1999 in both the front and rear seats. In 1998, incorrect use increased into the low 20s in the front seat and declined to 18.5% in 1999, and back seat incorrect use increased to 12.2% and remains at about 11%.

There are several challenges remaining in the central metropolitan area regarding restraint use by older children. Correct use has had a net decrease in the last 3 years, and remains in the 40s for both front and rear seat occupants. Incorrect use rates remain high among front seat passengers. Non-use is nearly 50% for rear seat occupants. All of these problems could constitute target areas for VDH.

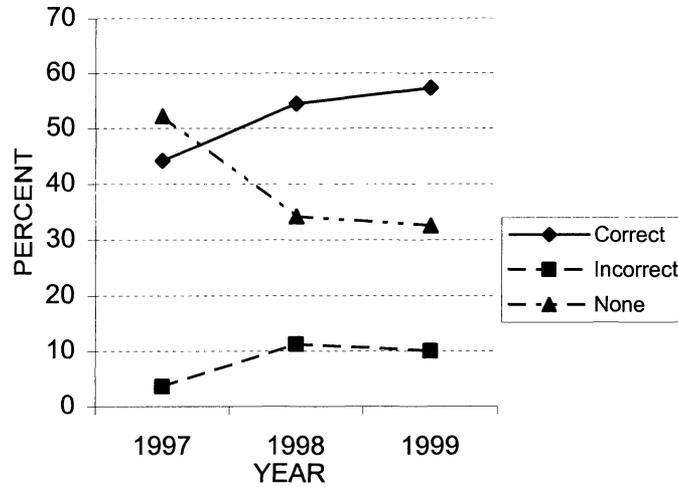


Figure 9a. Eastern Metropolitan Area 4 to 16-Year-Old Restraint Use: All Seating Positions

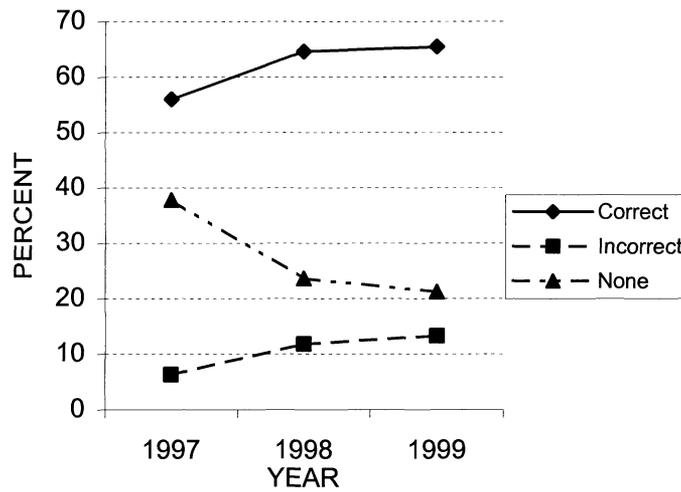


Figure 9b. Eastern Metropolitan Area 4 to 16-Year-Old Restraint Use: Front Seat

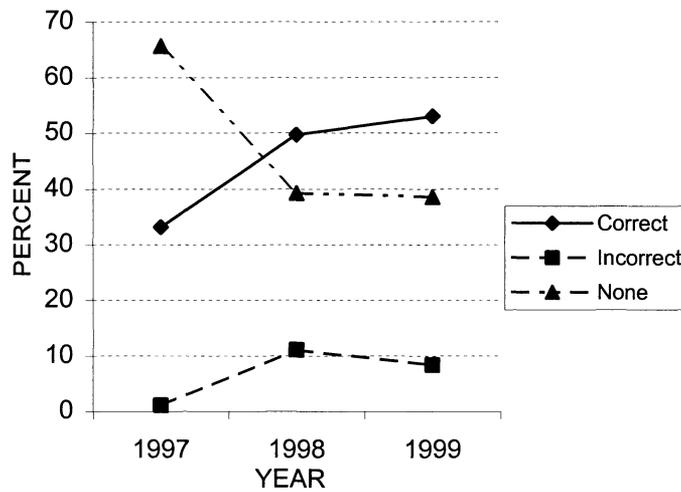


Figure 9c. Eastern Metropolitan Area 4 to 16-Year-Old Restraint Use: Rear Seat

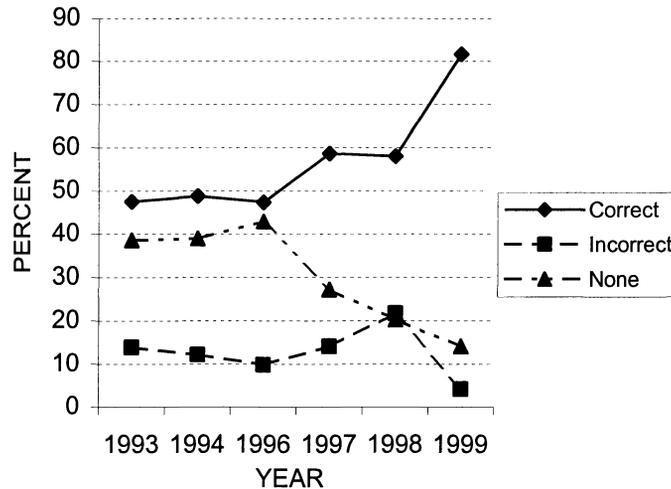


Figure 10. Central Metropolitan Child Safety Seat Use: All Seating Positions

Western Metropolitan Area

Some of the most interesting shifts in child safety seat use rates occurred in the western metropolitan area of the state (Figure 12). Correct use was already at 75.6% in 1998, so the increase to 78.8% in 1999 was small compared to the rest of the state. Nonuse had already declined from nearly 50% in 1997 to 14.6% in 1998 and continued to decline to 3% in 1999. However, incorrect use increased to 18.2%, but stayed within its 1996 to 1998 range.

Overall, correct restraint use among occupants 4 to 16 years of age in the western metropolitan area has had a net increase between 1997 and 1999, although very slight decreases were noted in 1999 in rear seat and total correct use rates (Figures 13a-c). Incorrect use peaked in 1998, especially in the front seat positions, but fell in 1999 to levels below 1997 figures (and to 0% in the front seats and 6.9% in the rear seats). In 1999, nonuse was higher than correct use for all seating positions (50% vs. 45.1%), with most of that difference coming from the rear seat figures (56.9% nonuse vs. 36.2% correct use).

Clearly, there are opportunities for improvement in both child safety seat use and restraint use among older children in the western metropolitan area. Incorrect child safety seat use remains higher in the western area than in any other metropolitan area. In terms of older children's restraint use, correct use is low and non-use is high, especially among rear seat occupants.

Danville

Between 1998 and 1999, Danville's rate of correct use of child safety seats increased from 30% to 70.6% and its nonuse rate decreased from 55% to 20.6%, accounting for most of the change in the city's figures (Figure 14). Even though Danville's increase in correct use was the most for any of the mid-size cities, its correct use rate is still the lowest compared to all other areas.

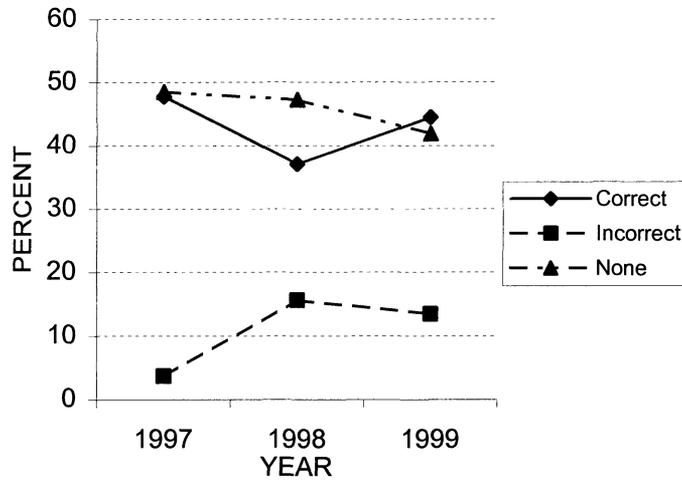


Figure 11a. Central Metropolitan Area 4 to 16-Year-Old Restraint Use: All Seating Positions

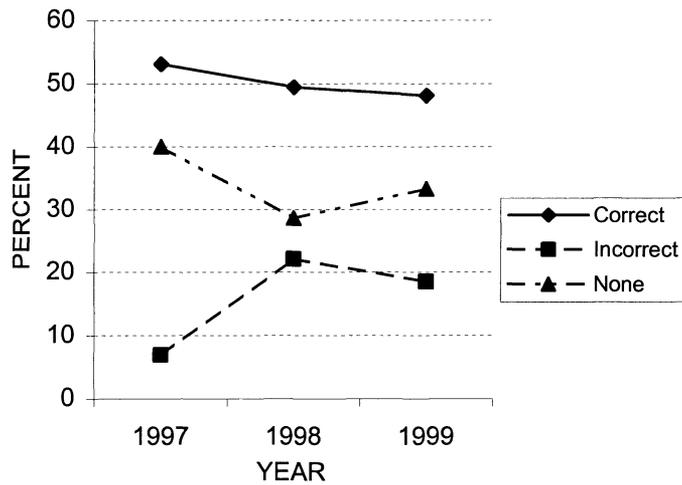


Figure 11b. Central Metropolitan Area 4 to 16-Year-Old Restraint Use: Front Seat

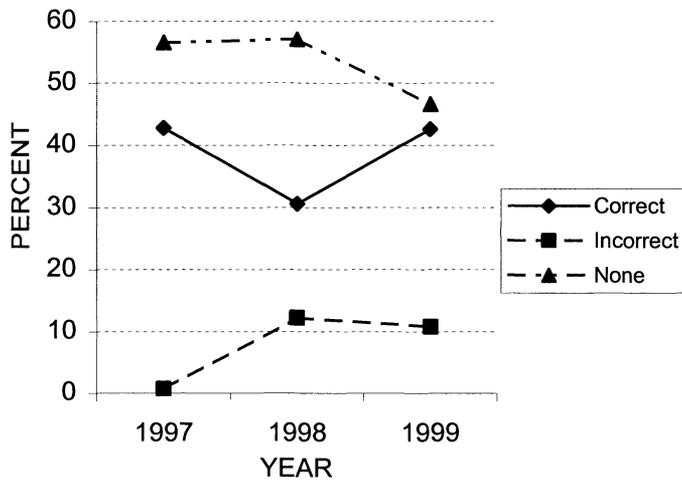


Figure 11c. Central Metropolitan Area 4 to 16-Year-Old Restraint Use: Rear Seat

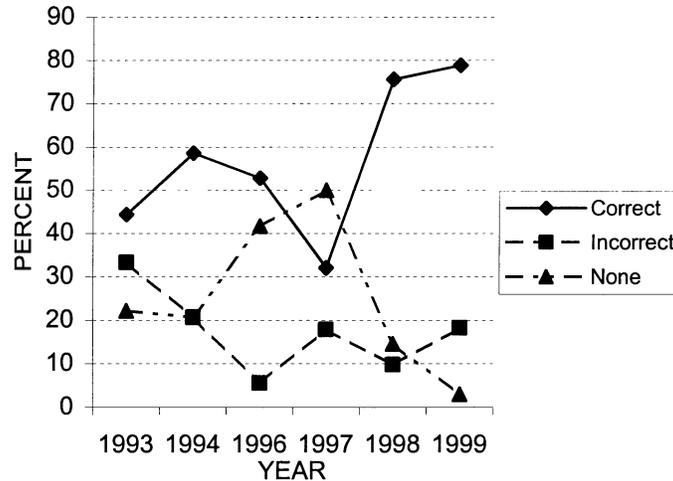


Figure 12. Western Metropolitan Child Safety Seat Use: All Seating Positions

Correct restraint use among occupants 4 to 16 years of age increased between 1997 and 1999, but 1998/1999 decreases in correct use rates among the rear seat occupants kept the overall increase low, at 11.4 points (Figures 15a-c). Danville’s correct use rate of 25.7% in 1999 is much lower than that of any other mid-size city or metropolitan area. Nonuse is consistently much higher than correct use, even though nonuse decreased from 84.7% to 60%. Incorrect use increased since 1997 to 14.3%, although this is not out of line with the 1999 rates for other cities and metropolitan areas. Use rates for front and rear seat passengers are similar to the overall figures, except that the 1999 front seat occupants’ correct use rate is higher than that of the rear seat occupants.

In terms of challenges, Danville’s restraint use by occupants 4 to 16 years of age requires attention overall, since the correct use rate is very low and non-use is very high. In addition, if any increase in activity for child safety seat use is considered, Danville should be considered for inclusion.

Charlottesville

Similar to the western metropolitan area, much of the increase in correct child safety seat use occurred in Charlottesville by 1998, when it increased from 61.7% to 76.6% (Figure 16). This increase in correct use continued in 1998 to 88.5%, along with the decrease in nonuse. However, the incorrect use rate remained essentially the same as it had been in 1998.

In Charlottesville, correct restraint use by occupants 4 to 16 years of age increased consistently across the three surveys, from 42.8% in 1997 to 64.9% in 1999 (Figures 17a-c). Correspondingly, nonuse dropped about the same amount, to 20.2%. Similar results were noted for front and rear seat passengers, except that correct use for rear seat passengers increased so much that it nearly caught up with front seat rates in 1999 (63.3% vs. 66.7%). Charlottesville is one of the few localities where rear seat restraint use rates for older children are not significantly

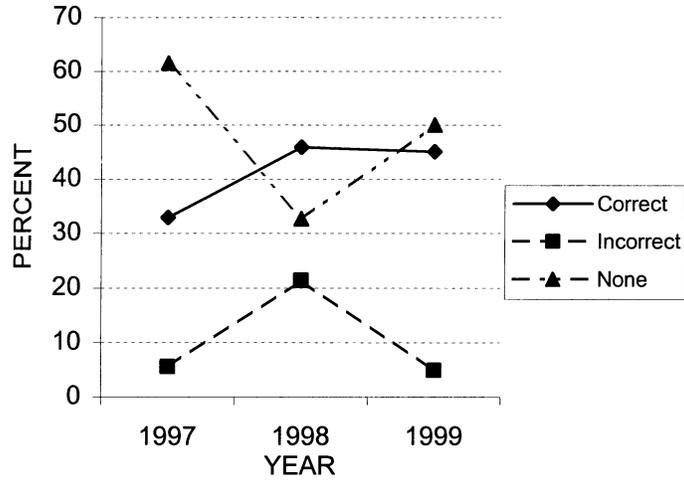


Figure 13a. Western Metropolitan Area 4 to 16-Year-Old Restraint Use: All Seating Positions

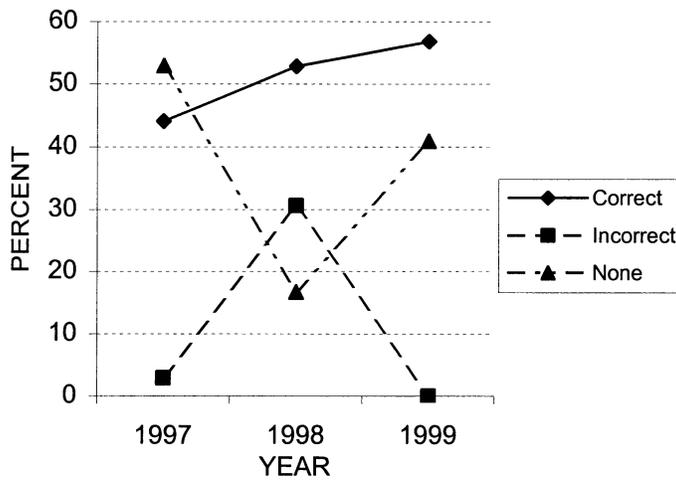


Figure 13b. Western Metropolitan Area 4 to 16-Year-Old Restraint Use: Front Seat

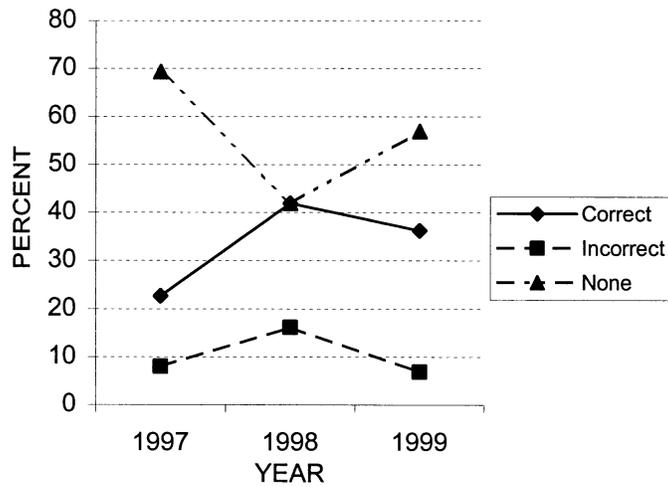


Figure 13c. Western Metropolitan Area 4 to 16-Year-Old Restraint Use: Rear Seat

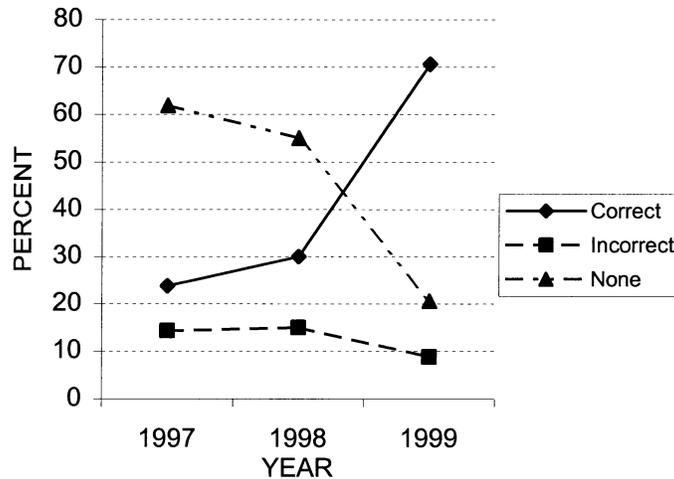


Figure 14. Danville Child Safety Seat Use: All Seating Positions

lower than front seat use rates. However, incorrect use remained high, especially in the front seat.

No particular portion of the Charlottesville survey results call for particular attention. However, since incorrect use among front seat passengers was 20.5%, this group could be targeted for additional work.

Lynchburg

Lynchburg was another location where previously declining child safety seat use trends were reversed, and its 1999 improvements were dramatic (Figure 18). Correct use increased from 36.8% to 91.9%, incorrect use dropped from 36.8% to 8.1%, and nonuse dropped to zero!

Correct restraint use by older children increased considerably in Lynchburg after 1997, from 32.6% to 40.8% to 60.2% (Figures 19a-c). Although incorrect use peaked at 26.5% in 1998, it is now a respectable 9.6%. Most of the 1999 increase in correct use is accounted for by the marked decrease in incorrect use. The rates for front and back seat occupants follow similar trends, except that the correct rear seat use rate is lower than the correct front seat use rate (56.3% vs. 65.7%). Non-use occurred for one-fourth of the front seat occupants and one-third of the rear seat occupants.

Lynchburg has some of the best child safety seat results in the state, and its data for older children are comparable to those for the rest of the state as well. One area of emphasis in Lynchburg could be the relatively high rates of non-use by the older children.

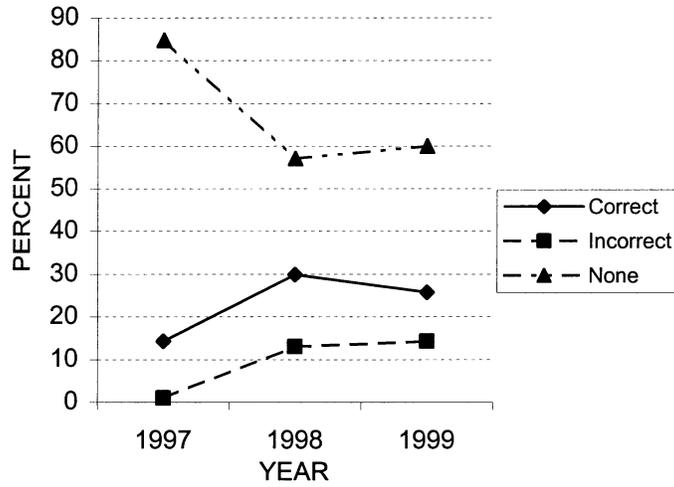


Figure 15a. Danville 4 to 16-Year-Old Restraint Use: All Seating Positions

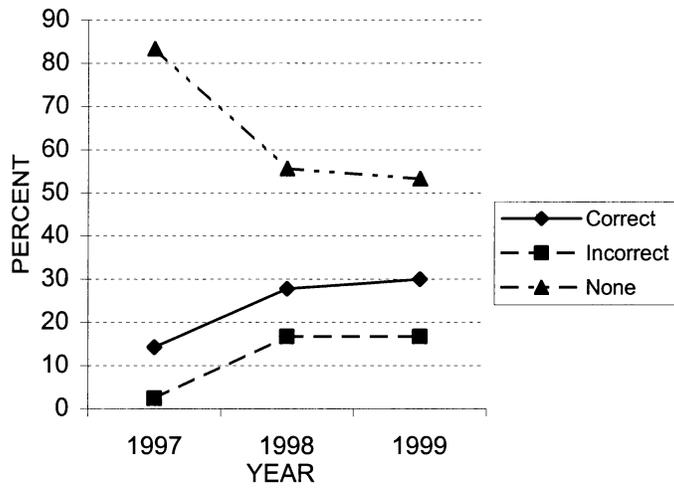


Figure 15b. Danville 4 to 16-Year-Old Restraint Use: Front Seat

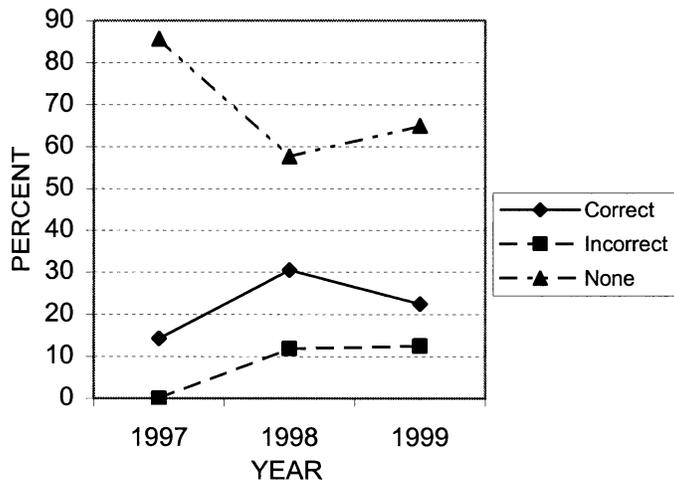


Figure 15c. Danville 4 to 16-Year-Old Restraint Use: Rear Seat

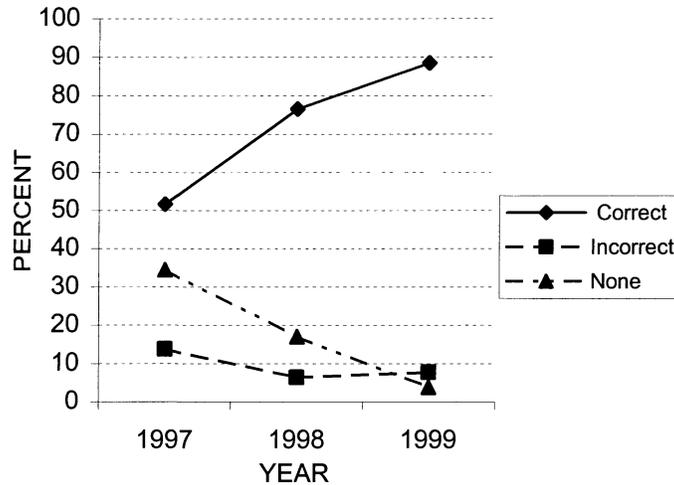


Figure 16. Charlottesville Child Safety Seat Use: All Seating Positions

Total Comparisons

Beyond calling attention to problem areas in each location, some simple attempt needs to be made to put these findings into perspective and to help prioritize the restraint-related needs statewide. Figure 20 compares the percentage of correct use, incorrect use, and nonuse of child safety seats among the seven localities. Although it is difficult to pick out one locality from a cluster of localities, it is relatively easy to identify the outliers—the data points that are clearly different from the others. In terms of correct use, there are two clear clusters: Lynchburg, eastern metropolitan, and Charlottesville with the highest rates of correct use, and central metropolitan, northern metropolitan, and western metropolitan with very good rates. Clearly, Danville is the outlier, with the lowest correct child safety seat use rate. This very simple analysis identifies Danville for additional attention.

Results are not so straightforward for restraint usage by occupants 4 to 16 years of age (Figure 21). Clearly, Danville has the lowest level of correct use and the highest nonuse, but there is a cluster of three localities with the highest incorrect use—Charlottesville, Danville, and the central metropolitan area. The central and western metropolitan areas are second only to Danville. Perhaps VDH could target these communities for additional attention that is related to their particular deficits.

As a final note, since the results presented in this report concerning restraint use in mid-size cities are based on relatively few observations compared to the metropolitan areas, some attempt should be made in future surveys to increase the sample size for these areas and, thus, improve the reliability of the findings.

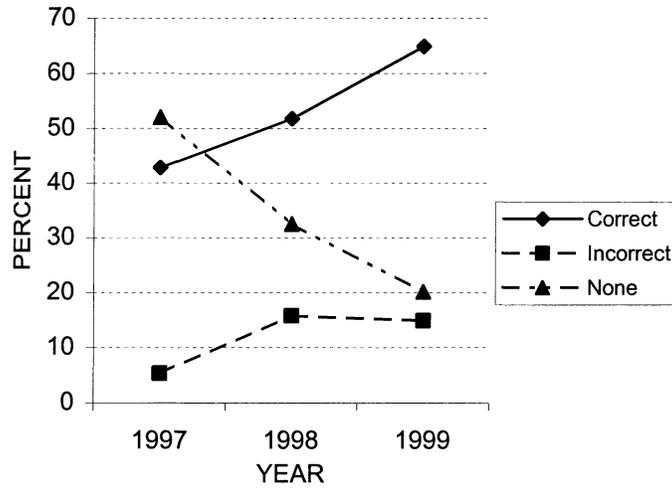


Figure 17a. Charlottesville 4 to 16-Year-Old Restraint Use: All Seating Positions

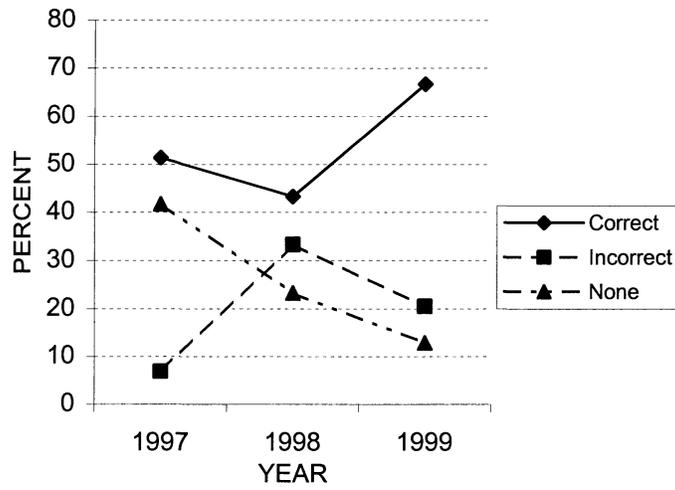


Figure 17b. Charlottesville 4 to 16-Year-Old Restraint Use: Front Seat

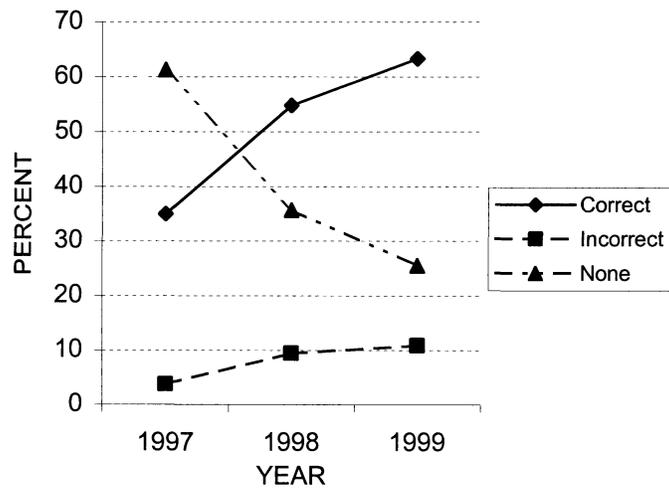


Figure 17c. Charlottesville 4 to 16-Year-Old Restraint Use: Rear Seat

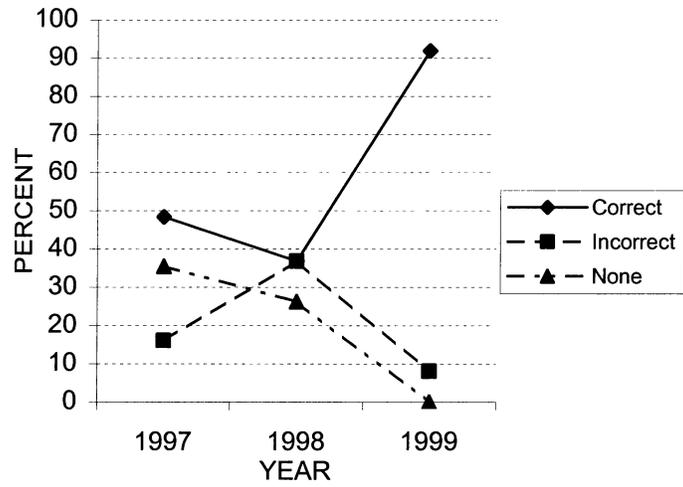


Figure 18. Lynchburg Child Safety Seat Use: All Seating Positions

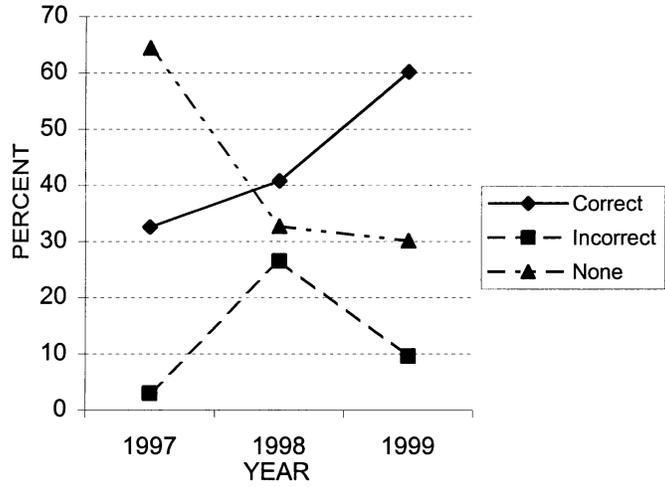


Figure 19a. Lynchburg 4 to 16-Year-Old Restraint Use: All Seating Positions

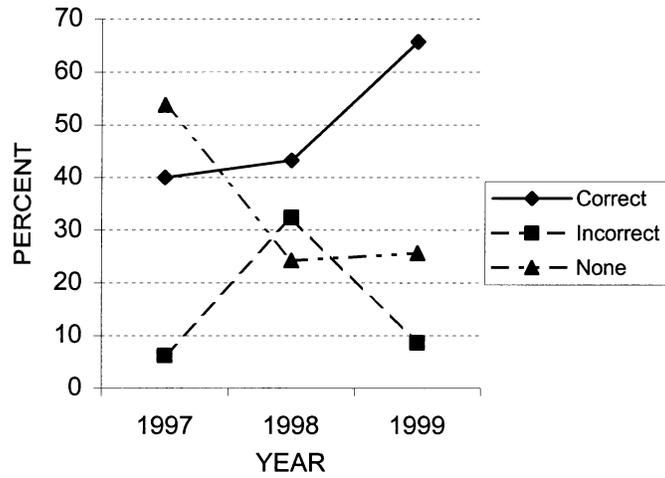


Figure 19b. Lynchburg Restraint Use by 4 to 16-Year-Olds: Front Seat

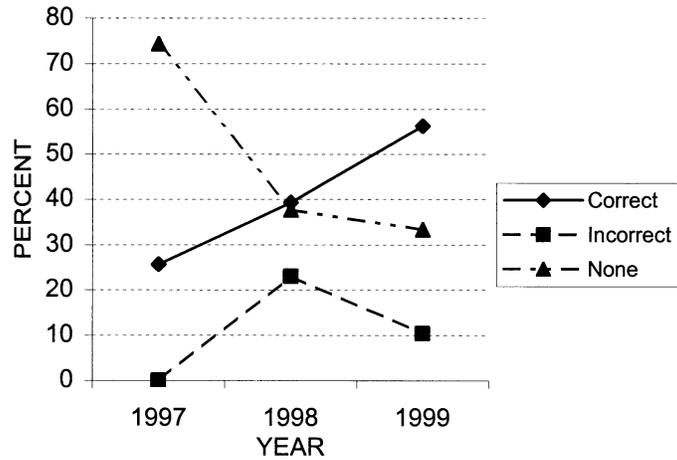


Figure 19c. Lynchburg Restraint Use by 4 to 16-Year-Olds: Rear Seat

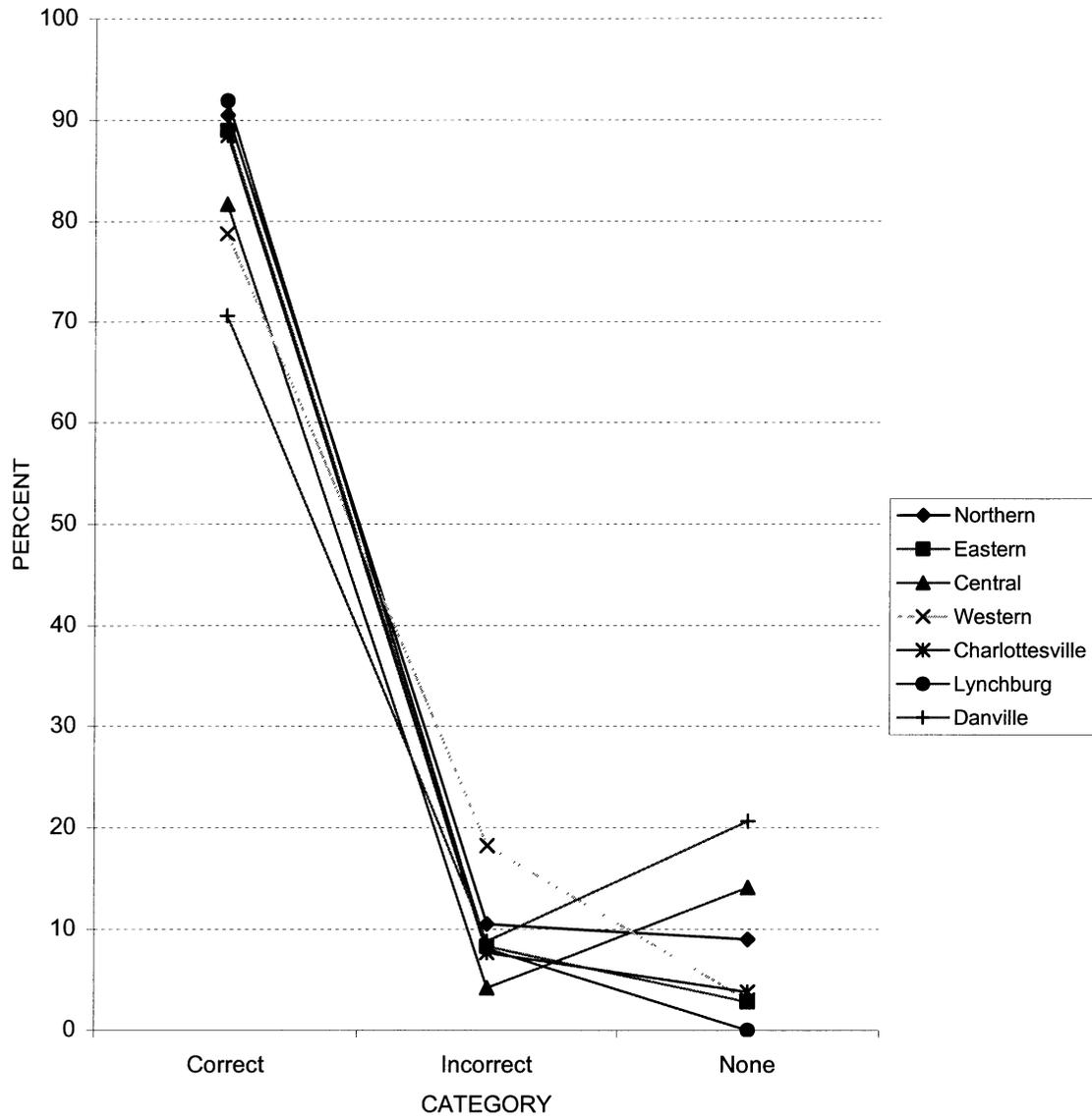


Figure 20. 1999 Child Safety Seat Use Comparison By Area

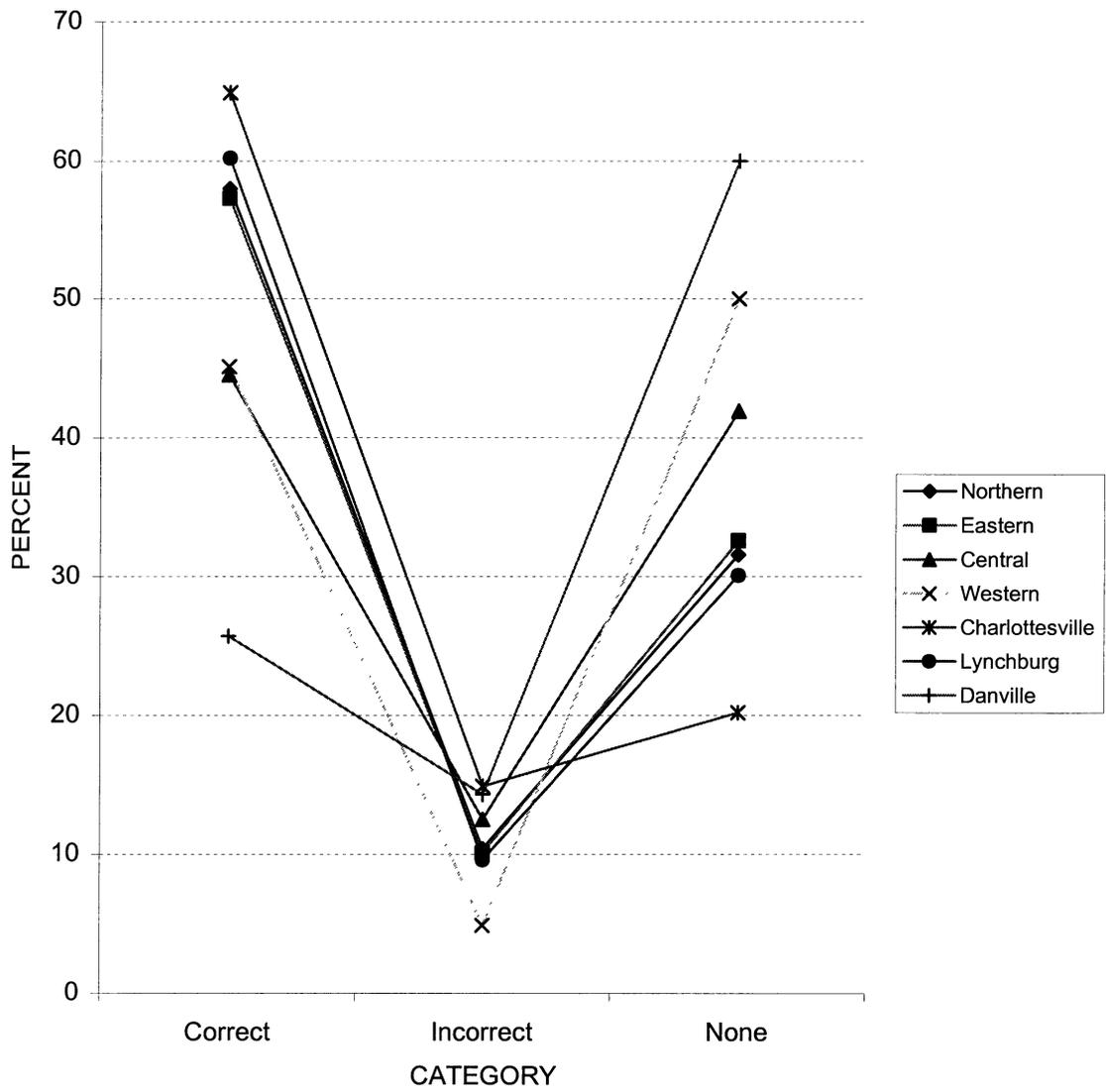


Figure 21. 1999 4 to 16-Year-Old Restraint Use Comparison By Area

ACKNOWLEDGMENTS

The authors thanks Kate Spence and Craig Twyman, who spent many hours traveling around the state, working from early morning to late afternoon, including weekends, to collect the data used in this report. Also, Ross Campbell was invaluable in preparing the figures and reviewing the draft report.

Thanks also to Ann McDaniel who prepared the report, including the many tables that appear in the body and appendices.

APPENDIX A

Safety Restraint Use by Site Location and Seat Position

Table A-1

1999 Child Safety Seat Survey Results for Metropolitan Areas

Site Location	Front Seat			Rear Seat			Total Vehicle		
	C*	I	N	C	I	N	C	I	N
Northern Area									
1 Rolling Road	0	0	0	3	0	0	3	0	0
2 Route 7	0	1	0	4	1	0	4	2	0
3 S. George Mason	0	1	0	19	3	5	19	4	5
4 N. Glebe	1	0	2	15	3	2	16	3	4
5 Rose Hill	1	0	0	5	3	0	6	3	0
6 Jordan	0	0	0	2	0	0	2	0	0
7 Route 1	0	0	0	9	0	2	9	0	2
8 Woodbridge	0	0	0	5	1	0	5	1	0
9 Herndon	1	0	0	5	0	0	6	0	0
10 Vienna	0	0	0	13	0	0	13	0	0
11 Fairfax City	0	0	0	10	1	0	10	1	0
12 Annandale	1	0	0	13	0	1	14	0	1
<i>Northern Area Total</i>	4	2	2	103	12	10	107	14	12
Western Area									
1 Hershberger	0	0	0	5	2	0	5	2	0
2 Orange	0	0	0	0	1	0	0	1	0
3 Vinton	0	0	1	9	1	0	9	1	1
4 Salem	2	0	0	10	2	0	12	2	0
<i>Western Area Total</i>	2	0	1	24	6	0	26	6	1
Central Area									
1 Broad Street	0	0	1	6	0	0	6	0	1
2 Hull Street	0	0	0	6	2	1	6	2	1
3 Chester	1	0	0	10	1	0	11	1	0
4 Petersburg	0	0	0	10	0	4	10	0	4
5 Midlothian	0	0	0	4	0	0	4	0	0
6 Parham Rd.	0	0	0	17	0	0	17	0	0
7 9-Mile Rd.	0	0	0	4	0	4	4	0	4
<i>Central Area Total</i>	1	0	1	57	3	9	58	3	10
Eastern Area									
1 Independence	0	0	0	5	0	0	5	0	0
2 Kempsville	1	0	0	7	0	0	8	0	0
3 Chesapeake	1	0	0	9	0	0	10	0	0
4 Portsmouth	0	1	0	3	0	0	3	1	0
5 Rte. 170	1	0	1	5	0	0	6	0	1
6 Laskin	1	0	0	23	2	0	24	2	0
7 Brambleton	0	0	0	0	0	0	0	0	0
8 Military Circle	1	0	0	13	2	0	14	2	0
9 Denbigh	2	0	0	5	0	0	7	0	0
10 Hampton	1	0	0	15	3	2	16	3	2
11 Route 143	0	0	0	4	1	0	4	1	0
<i>Eastern Area Total</i>	8	1	1	89	8	2	97	9	3
Urban Total	15	3	5	273	29	21	288	32	26
Grand Total									346

*C = correct use; I = incorrect use; N = none

Table A-2

1999 Child Safety Seat Survey Results for Mid-Size Cities

Site Location	Front Seat			Rear Seat			Total Vehicle		
	C*	I	N	C	I	N	C	I	N
Charlottesville									
1 High	0	0	0	20	0	0	20	0	0
2 Emmet	1	0	0	25	4	2	26	4	2
<i>Charlottesville Total</i>	1	0	0	45	4	2	46	4	2
Danville									
1 Main	2	0	3	10	3	3	12	3	6
2 Piney Forest	1	0	1	11	0	0	12	0	1
<i>Danville Total</i>	3	0	4	21	3	3	24	3	7
Lynchburg									
1 Candler's Mtn.	3	0	0	6	1	0	9	1	0
2 Oakley	0	0	0	23	2	0	23	2	0
3 Old Forest	0	0	0	2	0	0	2	0	0
<i>Lynchburg Total</i>	3	0	0	31	3	0	34	3	0
Mid-Size Total	7	0	4	97	10	5	104	10	9
Grand Total									123

*C = correct use; I = incorrect use; N = none

Table A-3

**1999 Survey Results of Safety Restraint Use by Occupants 4 to 16 Years of Age
in the Metropolitan Areas**

Site Location	Front Seat			Rear Seat			Total Vehicle		
	C*	I	N	C	I	N	C	I	N
Northern Area									
1 Rolling Road	5	0	0	10	2	2	15	2	2
2 Route 7	1	0	1	5	1	6	6	1	7
3 S. George Mason	6	3	7	21	6	25	27	9	32
4 N. Glebe	7	0	3	6	4	10	13	4	13
5 Rose Hill	10	2	2	9	1	6	19	3	8
6 Jordan	1	1	2	10	1	7	11	2	9
7 Route 1	5	3	1	9	2	8	14	5	9
8 Woodbridge	9	0	2	12	1	6	21	1	8
9 Herndon	4	2	1	8	0	1	12	2	2
10 Vienna	10	0	0	18	2	4	28	2	4
11 Fairfax City	14	1	0	11	0	6	25	1	6
12 Annandale	12	1	5	10	5	11	22	6	16
<i>Northern Area Total</i>	84	13	24	129	25	92	213	38	116
Western Area									
1 Hershberger	5	0	4	3	1	2	8	1	6
2 Orange	5	0	3	5	1	5	10	1	8
3 Vinton	5	0	7	6	0	6	11	0	13
4 Salem	10	1	4	7	2	20	17	3	24
<i>Western Area Total</i>	25	1	18	21	4	33	46	5	51
Central Area									
1 Broad Street	3	1	1	4	1	2	7	2	3
2 Hull Street	3	0	6	4	0	25	7	0	31
3 Chester	5	0	8	6	3	6	11	3	14
4 Petersburg	6	5	6	21	9	19	27	14	25
5 Midlothian	7	0	2	5	0	4	12	0	6
6 Parham Rd.	12	3	1	19	3	1	31	6	2
7 9-Mile Rd.	3	6	3	4	0	12	7	6	15
<i>Central Area Total</i>	39	15	27	63	16	69	102	31	96
Eastern Area									
1 Independence	4	1	0	2	0	0	6	1	0
2 Kempsville	6	2	4	16	0	0	22	2	4
3 Chesapeake	7	3	1	12	2	7	19	5	8
4 Portsmouth	4	1	2	4	3	8	8	4	10
5 Rte. 170	6	0	2	8	1	7	14	1	9
6 Laskin	15	3	4	22	8	10	37	11	14
7 Brambleton	2	0	1	4	0	4	6	0	5
8 Military Circle	2	0	2	12	1	7	14	1	9
9 Denbigh	13	2	2	11	1	6	24	3	8
10 Hampton	10	2	4	20	2	24	30	4	28
11 Route 143	5	1	2	3	0	10	8	1	12
<i>Eastern Area Total</i>	74	15	24	114	18	83	188	33	107
Urban Total	222	44	93	327	63	277	549	107	370
Grand Total									1026

*C = correct use; I = incorrect use; N = none

Table A-4

**1999 Survey Results of Safety Restraint Use by Occupants 4 to 16 Years of Age
in the Mid-Size Cities**

Site Location	Front Seat			Rear Seat			Total Vehicle		
	C*	I	N	C	I	N	C	I	N
Charlottesville									
1 High	8	5	0	12	1	4	20	6	4
2 Emmet	18	3	5	23	5	10	41	8	15
<i>Charlottesville Total</i>	26	8	5	35	6	14	61	14	19
Danville									
1 Main	2	5	9	3	3	18	5	8	27
2 Piney Forest	7	0	7	6	2	8	13	2	15
<i>Danville Total</i>	9	5	16	9	5	26	18	10	42
Lynchburg									
1 Candler's Mtn.	5	1	2	2	0	4	7	1	6
2 Oakley	14	1	5	19	3	11	33	4	16
3 Old Forest	4	1	2	6	2	1	10	3	3
<i>Lynchburg Total</i>	23	3	9	27	5	16	50	8	25
Mid-Size Total	58	16	30	71	16	56	129	32	86
Grand Total									247

*C = correct use; I = incorrect use; N = none

APPENDIX B

Child Safety Seat Use Rates From 1993 to 1999 by Seating Position for Metropolitan Areas

Table B-1

**TOTAL VIRGINIA METROPOLITAN AREAS
Child Safety Seat Use Rates 1993-1999**

All Seating Positions

	1993	1994	1996	1997	1998	1999
Correct	48.9	64.0	55	54.1	54.9	83.2
Incorrect	17.5	10.4	8.5	17.4	19.7	9.2
None	33.6	25.7	36.5	28.5	25.4	7.5

Front Seat

	1993	1994	1996	1997	1998	1999
Correct	40.8	49.3	44.4	37.9	42.9	65.2
Incorrect	16.8	12.7	10.5	20.0	25.0	13.0
None	42.4	38.0	45.1	42.1	32.1	21.7

Rear Seat

	1993	1994	1996	1997	1998	1999
Correct	51.6	70.1	57.7	58.1	55.9	84.5
Incorrect	17.7	9.4	8.0	16.7	19.3	9.0
None	30.7	20.5	39.6	25.2	24.9	6.5

Table B-2

**NORTHERN VIRGINIA METROPOLITAN AREA
Child Safety Seat Use Rates 1993-1999**

All Seating Positions

	1993	1994	1996	1997	1998	1999
Correct	41.9	59.6	61.2	57.0	49.2	80.5
Incorrect	21.9	10.3	6.1	18.5	28.1	10.5
None	36.3	30.1	32.7	24.5	22.7	9.0

Front Seat

	1993	1994	1996	1997	1998	1999
Correct	27.6	45.6	50.0	38.5	33.3	50.0
Incorrect	27.6	12.3	6.0	23.1	33.3	25.0
None	44.8	42.1	44.0	38.5	33.3	25.0

Rear Seat

	1993	1994	1996	1997	1998	1999
Correct	45.0	64.7	63.3	60.8	49.6	82.4
Incorrect	20.6	9.6	6.2	17.6	28.0	9.6
None	34.4	25.6	30.5	21.6	22.4	8.0

Table B-3

**EASTERN VIRGINIA METROPOLITAN AREA
Child Safety Seat Use Rates 1993-1999**

All Seating Positions

	1993	1994	1996	1997	1998	1999
Correct	57.5	78.6	52.2	53.1	52.7	89.0
Incorrect	10.1	7.6	11.5	17.8	14.2	8.3
None	32.4	13.8	36.3	29.1	33.1	2.8

Front Seat

	1993	1994	1996	1997	1998	1999
Correct	46.0	58.1	44.6	41.0	50.0	80.0
Incorrect	16.0	14.0	14.3	20.5	18.8	10.0
None	38.0	27.9	41.1	38.5	31.3	10.0

Rear Seat

	1993	1994	1996	1997	1998	1999
Correct	62.0	86.2	54.2	55.7	53.0	89.9
Incorrect	7.8	5.2	10.7	17.2	13.6	8.1
None	30.2	8.6	35.0	27.0	33.3	2.0

Table B-4

**CENTRAL VIRGINIA METROPOLITAN AREA
Child Safety Seat Use Rates 1993-1999**

All Seating Positions

	1993	1994	1996	1997	1998	1999
Correct	47.5	48.8	47.4	58.7	58.0	81.7
Incorrect	13.9	12.2	9.8	14.1	21.7	4.2
None	38.6	39.0	42.9	27.2	20.3	14.1

Front Seat

	1993	1994	1996	1997	1998	1999
Correct	55.2	43.8	35.1	45.5	20.0	50.0
Incorrect	6.9	9.4	13.5	13.6	60.0	0.0
None	37.9	46.9	51.4	40.9	20.0	50.0

Rear Seat

	1993	1994	1996	1997	1998	1999
Correct	44.4	52.0	52.1	62.9	60.9	82.6
Incorrect	16.7	14.0	8.3	14.3	18.8	4.3
None	38.9	34.0	39.6	22.9	20.3	13.0

Table B-5

**WESTERN VIRGINIA METROPOLITAN AREA
Child Safety Seat Use Rates 1993-1999**

All Seating Positions

	1993	1994	1996	1997	1998	1999
Correct	44.4	58.6	52.8	32.1	75.6	78.8
Incorrect	33.3	20.7	5.6	17.9	9.8	18.2
None	22.2	20.7	41.7	50.0	14.6	3.0

Front Seat

	1993	1994	1996	1997	1998	1999
Correct	23.5	50.0	47.4	00.0	50.0	66.7
Incorrect	17.7	20.0	5.3	25.0	00.0	00.0
None	58.8	30.0	47.4	75.0	50.0	33.3

Rear Seat

	1993	1994	1996	1997	1998	1999
Correct	52.2	63.2	54.7	45.0	78.4	80.0
Incorrect	39.1	21.1	5.7	15.0	10.8	20.0
None	8.7	15.8	39.6	40.0	10.8	00.0

APPENDIX C

**Child Safety Seat Use Rates
From 1997 to 1999 by Seating Position
for Mid-Size Cities**

Table C-1

TOTAL MID-SIZE CITIES
Child Safety Seat Use Rates 1997-1999

All Seating Positions

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	35	43.2	49	57.0	104	84.6
Incorrect	12	14.8	13	15.1	10	8.1
None	34	42.0	24	27.9	9	7.3

Front Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	4	33.3	3	23.1	7	63.6
Incorrect	0	0.00	2	15.4	0	0.0
None	8	66.7	8	61.5	4	36.4

Rear Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	31	44.9	46	63.0	97	86.6
Incorrect	12	17.4	11	15.1	10	8.9
None	26	37.7	16	21.9	5	4.5

Table C-2

DANVILLE
Child Safety Seat Use Rates 1997-1999

All Seating Positions

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	5	23.8	6	30.0	24	70.6
Incorrect	3	14.3	3	15.0	3	8.8
None	13	61.9	11	55.0	7	20.6

Front Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	0	0.0	1	25.0	3	42.9
Incorrect	0	0.0	1	25.0	0	0.0
None	4	100.0	2	50.0	4	57.1

Rear Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	5	29.4	5	31.3	21	77.8
Incorrect	3	17.6	2	12.5	3	11.1
None	9	52.9	9	56.2	3	11.1

Table C-3

CHARLOTTESVILLE
Child Safety Seat Use Rates 1997-1999

All Seating Positions

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	15	61.7	36	76.6	46	88.5
Incorrect	4	13.7	3	6.4	4	7.7
None	10	34.5	8	17.0	2	3.8

Front Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	1	33.3	2	28.6	1	100.0
Incorrect	0	0.0	1	14.3	0	0.0
None	2	66.7	4	57.4	0	0.0

Rear Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	14	52.8	34	85.0	45	88.2
Incorrect	4	15.4	2	5.0	4	7.8
None	8	30.8	4	10.0	2	3.9

Table C-4

LYNCHBURG
Child Safety Seat Use Rates 1997-1999

All Seating Positions

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	15	48.4	7	36.8	34	91.9
Incorrect	5	16.1	7	36.8	3	8.1
None	11	35.5	5	26.3	0	0.0

Front Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	3	60.0	0	0.0	3	100.0
Incorrect	0	0.0	0	0.0	0	0.0
None	2	40.0	2	100.0	0	0.0

Rear Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	12	46.2	7	41.2	31	91.2
Incorrect	5	19.2	7	41.2	3	8.8
None	9	34.6	3	17.6	0	0.0

APPENDIX D

**Restraint Use Rates
From 1997 to 1999 by Occupants 4 to 16 Years of Age
for Metropolitan Areas**

Table D-1

TOTAL METROPOLITAN AREAS
Restraint Use Rates, Occupants 4 to 16 Years of Age, 1997-1999

All Seating Positions

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	712	44.7	542	49.0	549	53.5
Incorrect	71	4.5	158	14.3	107	10.4
None	810	50.8	406	36.7	370	36.1

Front Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	422	55.5	201	59.1	222	61.8
Incorrect	52	6.8	60	17.6	44	12.3
None	287	37.7	79	23.2	93	25.9

Rear Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	290	34.9	341	44.5	327	49.0
Incorrect	19	2.3	98	12.8	63	9.3
None	523	62.9	327	42.7	277	41.5

Table D-2

NORTHERN METROPOLITAN AREA
Restraint Use Rates, Occupants 4 to 16 Years of Age, 1997-1999

All Seating Positions

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	216	47.1	173	50.6	213	58.0
Incorrect	27	5.9	52	15.2	38	10.4
None	216	47.1	117	34.2	116	31.6

Front Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	127	59.9	51	61.4	84	69.4
Incorrect	19	9.0	15	18.1	13	10.7
None	66	31.1	17	20.5	24	19.8

Rear Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	89	36.0	122	47.1	129	52.4
Incorrect	8	3.2	37	14.3	25	10.2
None	150	60.7	100	38.6	92	37.4

Table D-3

**EASTERN METROPOLITAN AREA
Restraint Use Rates, Occupants 4 to 16 Years of Age, 1997-1999**

All Seating Positions

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	307	44.2	241	54.5	188	57.3
Incorrect	25	3.6	50	11.3	33	10.1
None	362	52.2	151	34.2	107	32.6

Front Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	188	56.0	93	64.6	74	65.5
Incorrect	21	6.3	17	11.8	15	13.3
None	127	37.8	34	23.6	24	21.2

Rear Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	119	33.2	148	49.7	114	53.0
Incorrect	4	1.1	33	11.1	18	8.4
None	235	65.6	117	39.3	83	38.6

Table D-4

CENTRAL METROPOLITAN AREA
Restraint Use Rates, Occupants 4 to 16 Years of Age, 1997-1999

All Seating Positions

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	142	47.8	83	37.1	102	44.5
Incorrect	11	3.7	35	15.6	31	13.5
None	144	48.5	106	47.3	96	41.9

Front Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	77	53.1	38	49.4	39	48.1
Incorrect	10	6.9	17	22.1	15	18.5
None	58	40.0	22	28.6	27	33.3

Rear Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	65	42.8	45	30.6	63	42.6
Incorrect	1	0.7	18	12.2	16	10.8
None	86	56.6	84	57.1	69	46.6

Table D-5

**WESTERN METROPOLITAN AREA
Restraint Use Rates, Occupants 4 to 16 Years of Age, 1997-1999**

All Seating Positions

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	47	32.9	45	45.9	46	45.1
Incorrect	8	5.6	21	21.4	5	4.9
None	88	61.5	32	32.7	51	50.0

Front Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	30	44.1	19	52.8	25	56.8
Incorrect	2	2.9	11	30.6	1	0.0
None	36	52.9	6	16.7	18	40.9

Rear Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	17	22.7	26	41.9	21	36.2
Incorrect	6	8.0	10	16.1	4	6.9
None	52	69.3	26	41.9	33	56.9

APPENDIX E

**Restraint Use Rates
From 1997 to 1999 by Occupants 4 to 16 Years of Age
for Mid-Size Cities**

Table E-1

TOTAL MID-SIZE CITIES
Use Rates, Occupants 4 to 16 Years of Age, 1997-1999

All Seating Positions

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	123	31.9	122	42.2	129	52.2
Incorrect	13	3.4	54	18.7	32	13.0
None	249	64.7	113	39.1	86	34.8

Front Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	69	38.5	34	40.0	58	55.8
Incorrect	10	5.6	25	29.4	16	15.4
None	100	55.9	26	30.6	30	28.8

Rear Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	54	26.2	88	43.1	71	49.7
Incorrect	3	1.5	29	14.2	16	11.2
None	149	72.3	87	42.6	56	39.2

Table E-2

DANVILLE
Use Rates, Occupants 4 to 16 Years of Age, 1997-1999

All Seating Positions

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	14	14.3	23	29.9	18	25.7
Incorrect	1	1.0	10	13.0	10	14.3
None	83	84.7	44	57.1	42	60.0

Front Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	6	14.3	5	27.8	9	30.0
Incorrect	1	2.4	3	16.7	5	16.7
None	35	83.3	10	55.6	16	53.3

Rear Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	8	14.3	18	30.5	9	22.5
Incorrect	0	0.0	7	11.9	5	12.5
None	48	85.7	34	57.6	26	65.0

Table E-3

CHARLOTTESVILLE
Use Rates, Occupants 4 to 16 Years of Age, 1997-1999

All Seating Positions

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	65	42.8	59	51.8	61	64.9
Incorrect	8	5.3	18	15.8	14	14.9
None	79	52.0	37	32.5	19	20.2

Front Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	37	51.4	13	43.3	26	66.7
Incorrect	5	6.9	10	33.3	8	20.5
None	30	41.7	7	23.3	5	12.8

Rear Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	28	35.0	46	54.8	35	63.6
Incorrect	3	3.8	8	9.5	6	10.9
None	49	61.3	30	35.7	14	25.5

Table E-4

LYNCHBURG
Use Rates, Occupants 4 to 16 Years of Age, 1997-999

All Seating Positions

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	44	32.6	40	40.8	50	60.2
Incorrect	4	3.0	26	26.5	8	9.6
None	87	64.4	32	32.7	25	30.1

Front Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	26	40.0	16	43.2	23	65.7
Incorrect	4	6.2	12	32.4	3	8.6
None	35	53.8	9	24.3	9	25.7

Rear Seats

	1997		1998		1999	
	No.	%	No.	%	No.	%
Correct	18	25.7	24	39.3	27	56.3
Incorrect	0	0.0	14	23.0	5	10.4
None	52	74.3	23	37.7	16	33.3