

TECHNICAL ASSISTANCE
REPORT

**URBAN SAFETY RESTRAINT USE
BY OCCUPANTS UNDER 16 YEARS OF AGE
IN VIRGINIA:
THE 2001 SURVEY RESULTS**



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

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EXECUTIVE SUMMARY

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 summer, data were collected in 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 mid-size cities with a population between 50,000 and 100,000 were added, as was data collection on safety belt use by occupants under 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 its 2000 session, the Virginia General Assembly extended the provisions of these bills to include all children under 16 regardless of seating position.)

In previous years, child safety seat use was broken into three categories for purposes of analysis: correct use, incorrect use, and nonuse. Correct use and non-use were easy to identify consistently. Incorrect use, although defined the same way every year, was more difficult to determine consistently. It depended largely on how long the observer had to make the determination, how close he or she was to the vehicle, how easy it was to see the seat (based on the seat and interior color and the ambient lighting), and how diligent the observer was in ferreting out incorrect use. Since determining incorrect use involves a degree of subjectivity, this number may vary from year to year based solely on the fact that different observers collected the data. For this reason, this year's analysis will also include total use rates, defined as correct plus incorrect use, a number not biased by the variability inherent in making the correct/incorrect discrimination.

In 2001, total child restraint use for metropolitan areas and mid-size cities combined was 86.4% and correct use was 70.3%. Total seat belt use among 4 to 16 year olds in metropolitan areas and mid-size cities combined was 69.1%, and correct use was 57.8%.

Child Restraint Use in the Metropolitan Areas

As seen in Figure ES-1, total and correct use rates for metropolitan areas followed the same pattern between 1993 and 2000. In 1999 and 2000, both exceeded 80%. However, in 2001, correct use dropped to 69.5% whereas total use remained above 80% at 85.6%. Almost all of the drop in correct metropolitan use rates was accounted for by a 13% increase in incorrect use. As seen in Figure ES-2, correct use fell to 63.1% in the northern area, with the other regions of the state remaining in the low into mid-70s. (Detailed data on child restraint use in metropolitan areas appear in Appendix B.)

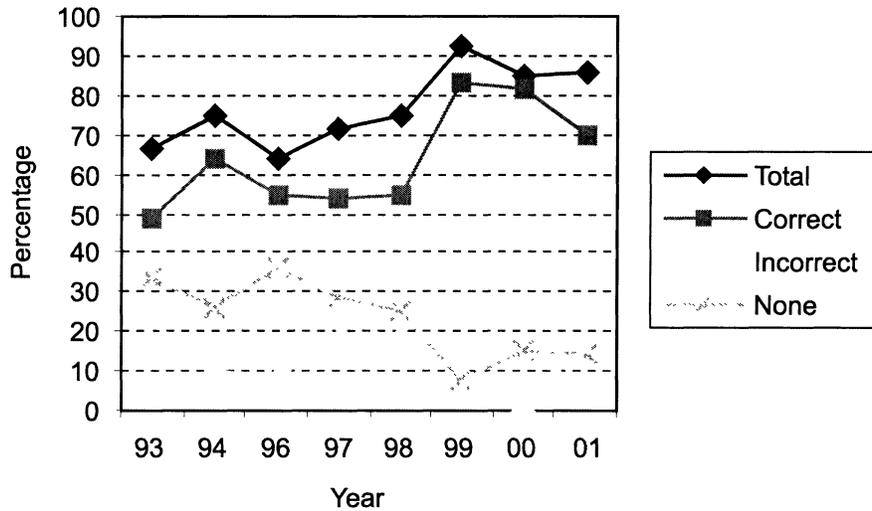


Figure ES-1. Use Rates for Children Under 4 for all Metropolitan Areas (1993-2001)

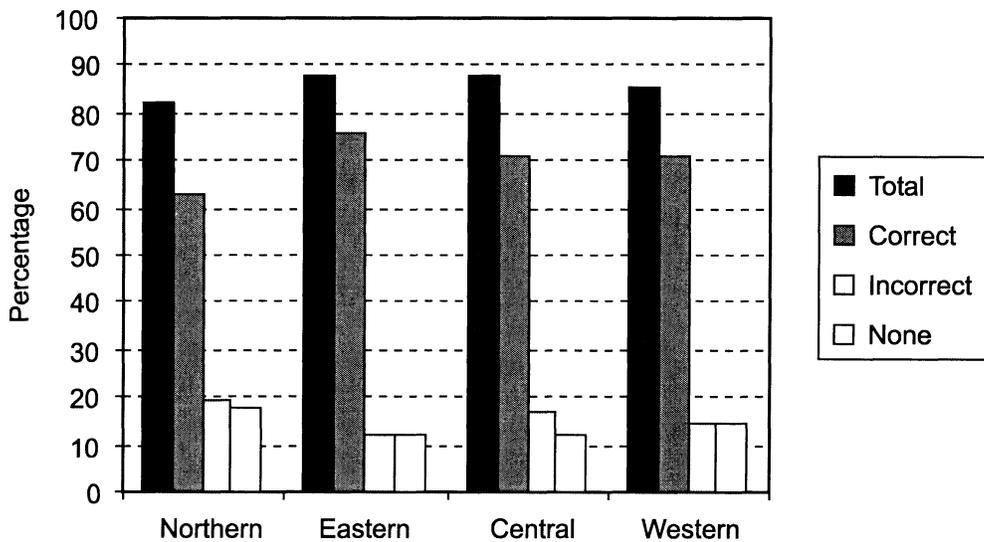


Figure ES-2. Use Rates for Children Under 4 by Metropolitan Areas

Child Restraint Use in Mid-Size Cities

Safety seat use rates in mid-size cities peaked in 2000, with total and correct use rates reaching 92% and with no incorrect use recorded (Figure ES-3). In 2001, correct use declined by about 19 points to 73.1 %, with most of the decrease accounted for by a 17% increase in the incorrect use. On the other hand, total use rates dropped only 2.4 points. As seen in Figure ES-4, 2001 total use rates exceeded 80% in all mid-size cities and ranged from 92.6% in Charlottesville to 85.2% in Danville. (Detailed data on child restraint use in mid-size cities appear in Appendix C.)

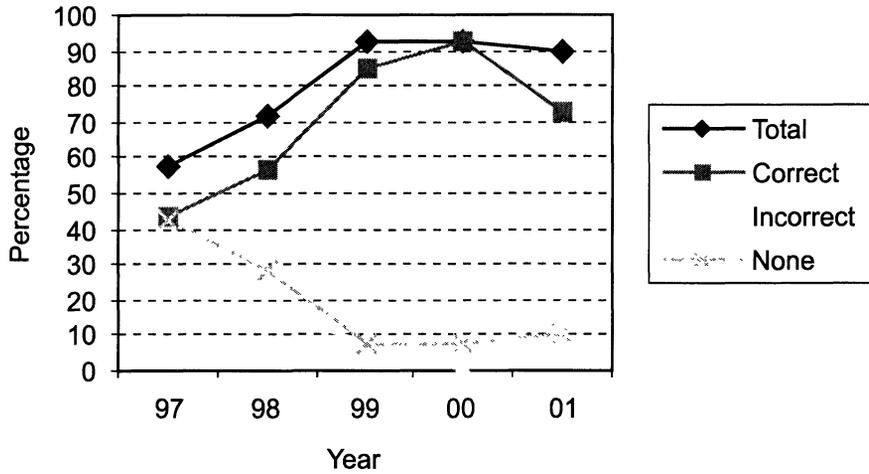


Figure ES-3. Use Rates for Children Under 4 for All Mid-Size Cities

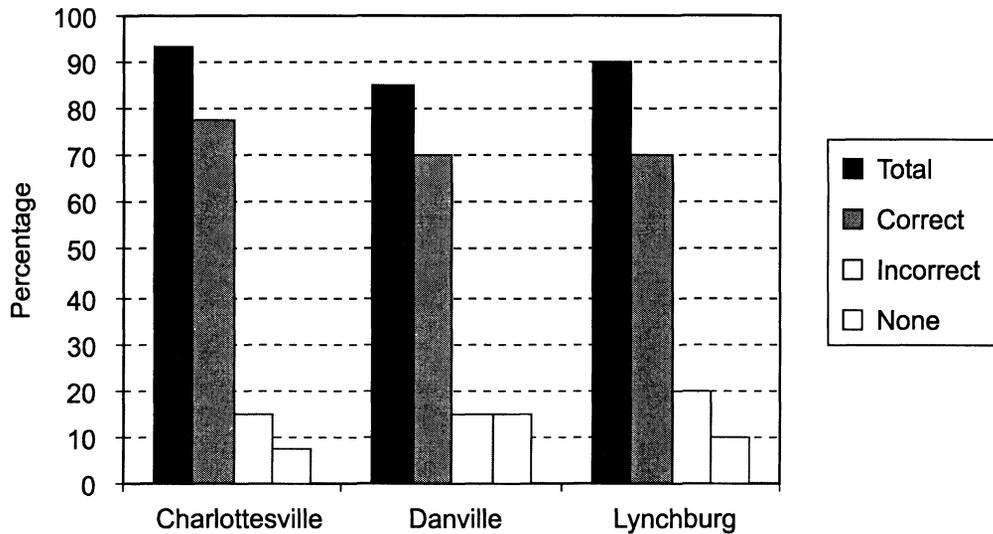


Figure ES-4. Use Rates for Children Under 4 by Mid-Size City

Safety Belt Use Among 4 to 16 Year Olds in the Metropolitan Areas

For occupants 4 to 16 years of age, total restraint use rates in the metropolitan areas of the state increased from 49.2% in 1997 to 68.0% in 2000 but fell slightly in 2001 to 66.0% (Figure ES-5). Correct use also peaked in 2000 at 61.3% but fell about 5 points in 2001 to 56.4%. As seen in Figure ES-6, in 2001, total and correct restraint use rates were highest in the eastern area of the state (68.7% and 61.0%, respectively) and lowest in the western area (60.9% and 44.4%). (Appendix D contains detailed safety belt use rate data for 4 to 16 years olds in all of the metropolitan areas.)

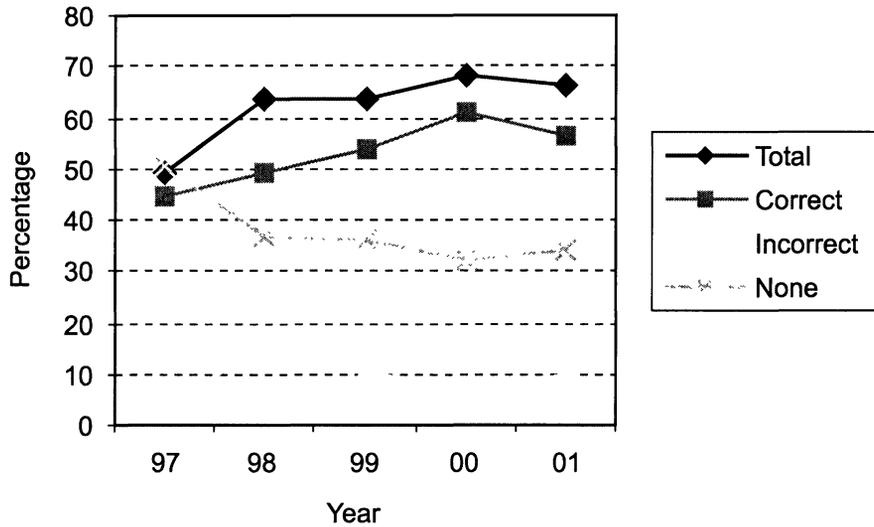


Figure ES-5. Use Rates for 4 to 16 Year Olds in Metropolitan Areas (1997-2001)

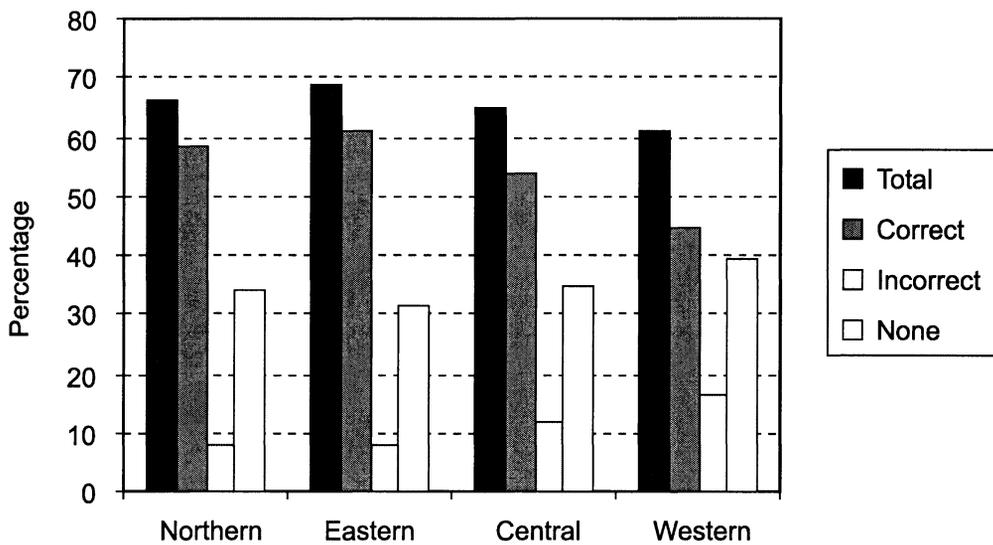


Figure ES-6: Use Rates for 4 to 16 Year Olds by Metropolitan Areas

Safety Belt Use Among 4 to 16 Year Olds in Mid-Size Cities

For occupants between 4 and 16 years in mid-size cities, both total and correct safety belt use had risen from the low- to mid-30s in 1997 to 71.0% and 59.8% in 2000. As was seen throughout the 2001 data, both declined, total use by 2.8 points and correct use by 7.2 points (Figure ES-7). As seen in Figure ES-8, the total 2001 use rates varied from 52.2% in Danville to 74.4% in Charlottesville. (Detailed data on safety belt use among 4 to 16 year olds in mid-size cities appear in Appendix E.)

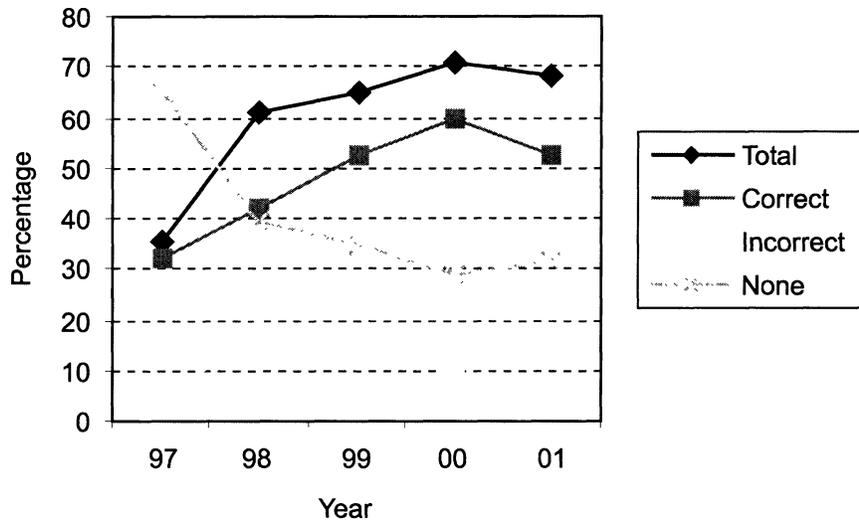


Figure ES-7. Use Rates for 4 to 16 Year Olds in Mid-Size Cities (1997-2001)

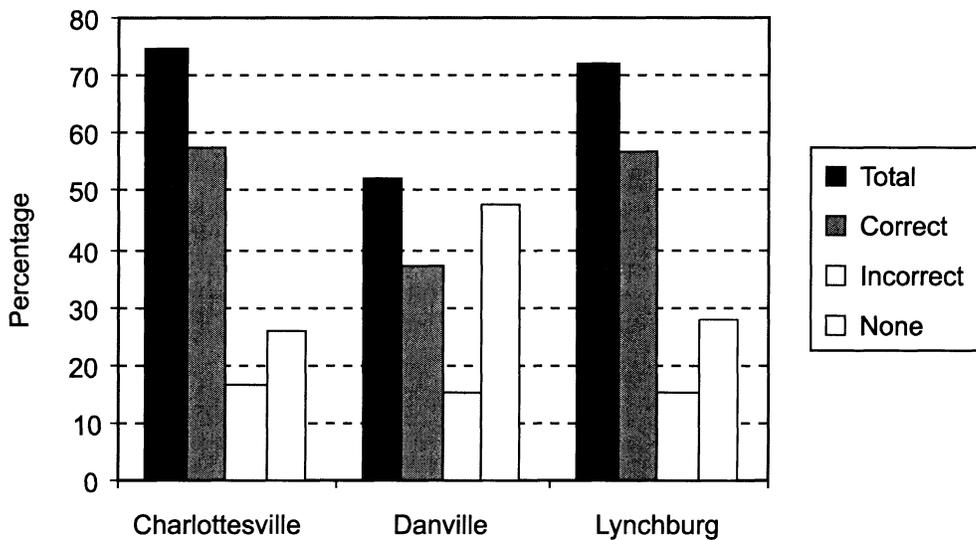


Figure ES-8: Use Rates for 4 to 16 Year Olds by Mid-Size City

Seating of Children in Motor Vehicles

Starting in 1997, safety advocates began recommending that young children occupy only the back seats of vehicles. Because the data for this survey include the child's position in the vehicle, whether adults are taking these recommendations seriously can be determined. The proportion of children under 4 riding in the front seat has decreased from 19.6% in 1997 to 5.5% in 2001 in metropolitan areas and from 14.8% to 10.2% in the mid-size cities over the same time period. In general, the percentage of young children in the front seat increased in 2000 but declined again in 2001. A larger percentage of children aged 4 to 16 sit in the front seat, but

there has still been a modest decline in the metropolitan areas, from 47.8% in 1997 to 41.3% in 2001. Unlike the trends for young children, the 2001 proportions of 4 to 16 year old front seat occupants increased in 2001.

The recommendations coming out of the 2001 child restraint survey include (1) adding additional survey sites throughout the Commonwealth, and especially in mid-size cities, so that this effort can more accurately reflect safety restraint use rates in Virginia; and (2) employing innovative methods on the state and local levels to increase restraint use among 4 to 16 year olds, since use rates for this group have remained largely unchanged since 1998.

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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 (except in 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 at the urban and mid-size city sites. Taken together, they give safety program administrators and public officials an idea concerning changes in use rates over time.

This report contains the set of tables and figures requested by VDH personnel, along with narrative describing the major findings and pointing out areas where more activity may be considered.

METHODOLOGY

The 2000 child safety seat survey was a replication of the 1993 through 2000 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 summers. 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 for 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. (In its 1997 session, the Virginia General Assembly extended the provisions of these bills to include all children under 16 regardless of seating position.)

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 3 in the 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 A and includes the number of occupants observed for each category of use.

There were two data collectors on the 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 define 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 being 16 at the time of the survey.

Data were collected for passenger cars, small pickup trucks, 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. Each member of the survey team observed up to 15 vehicles per traffic light cycle, with the safety of the observer (e.g., staying clear of entrances to businesses) and the traffic volume determining the number of vehicles surveyed. At some intersections, only 5 vehicles were observed because of the signal timing at the site.

When a vehicle stopped for the red signal, the observers left the curb and approached the vehicle from the passenger side front fender. In an effort to put occupants at ease, survey personnel carried a clipboard lettered on the back with the message "Child Safety Seat Survey." 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.

To distinguish persons in the two age groups, a "U" was used to identify those under age 4 and an "O" was used to identify those between 4 and 16 years of age (see Figure 1). An "S"

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 O	S L	C N	I N	U O	S L	C N	I N	U O	S L	C N	I N
2		U O	S L	C N	I N	U O	S L	C N	I N	U O	S L	C N	I N
3		U O	S L	C N	I N	U O	S L	C N	I N	U O	S L	C N	I N
4		U O	S L	C N	I N	U O	S L	C N	I N	U O	S L	C N	I N
5		U O	S L	C N	I N	U O	S L	C N	I N	U O	S L	C N	I N
6		U O	S L	C N	I N	U O	S L	C N	I N	U O	S L	C N	I N
7		U O	S L	C N	I N	U O	S L	C N	I N	U O	S L	C N	I N
8		U O	S L	C N	I N	U O	S L	C N	I N	U O	S L	C N	I N
9		U O	S L	C N	I N	U O	S L	C N	I N	U O	S L	C N	I N
10		U O	S L	C N	I N	U O	S L	C N	I N	U O	S L	C N	I N

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

Figure 1. Survey Form

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 if they were part of the seat, 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.

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 percentage of the incorrect use.

Safety restraint use for occupants between 4 and 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.

In previous years, child safety seat use was broken into three categories for purposes of analysis: correct use, incorrect use, and nonuse. Correct use and non-use were easy to identify consistently. Incorrect use, although defined the same way every year, was more difficult to determine consistently. A correct determination depended largely on how long the observer had to make the determination, how close he or she was to the vehicle, how easy it was to see the seat (based on the seat and interior color and the ambient lighting), and how diligent the observer was in ferreting out incorrect use. Since determining incorrect use involves a degree of subjectivity, this number may vary from year to year based solely on the fact that different observers collected the data. For this reason, the 2001 analysis also included total use rates, defined as correct plus incorrect use, which are not affected by the subjectivity and resultant variability of the correct/incorrect use determination.

RESULTS

Characteristics of the 2000 Sample

The number of occupants observed at each site during the summer of 2001 is shown in the tables in Appendix A. There were 417 occupants under age 4 in the metropolitan areas, 23 in the front seat and 394 in the rear seat. In the mid-size cities, 11 were in the front seat and 97 in the rear seat.

Starting in 1997, safety advocates began recommending that children occupy rear seats only. Because the data from this survey include the child's position in the vehicle, whether adults are taking these recommendations seriously could be determined.

When the data for all four metropolitan areas were combined, 5.5% of the children under 4 occupied the front seat, less than the 1997 figure of 19.6% and the 2000 figure of 12.1%. When the proportions were considered for each of the four metropolitan areas, the same general trend occurred, a decline between 1997 and 1999, an increase in 2000, and another decrease in 2001.

When the data for the three mid-size cities were combined, the proportion of front seat occupants dropped from 14.8% in 1997 to 8.9% in 1999, rose to 21.9% in 2000, and dropped to 10.2% in 2001. However, there were only 11 front seat occupants under 4 years of age observed in these cities in 2001. One would expect considerable variability from year to year in such small numbers.

In 2001, safety restraint use data were collected on 1,058 occupants between 4 and 16 years of age in the four metropolitan areas, with 41.3% sitting in the front seat. In the mid-size cities, 287 of this age group were sampled, with 45.6% in the front seat. In 2001, the percentage of 4 to 16 year olds in the front seat in the metropolitan areas and the mid-size cities increased over previous levels.

Child Safety Seat Use in Metropolitan Areas

The safety seat use rates recorded during summer 2001 are shown in Figure 2. Total and correct use rates for metropolitan areas followed the same pattern between 1993 and 2000. In 1999 and 2000, both exceeded 80%. However, in 2001, correct use dropped to 69.5% whereas total use remained above 80% at 85.6%. Almost all of the drop in correct metropolitan use rates was accounted for by a 13% increase in incorrect use. Breaking the data down by metropolitan area, more than 80% of children under 4 in each of the areas used child restraints in some manner, and in each area, more than 60% used them correctly (Figure 3). Total use ranged from 82.5% in the northern area to 88.2% in the central area. Incorrect use was highest in Northern Virginia, at 19.4%. (Detailed data on child restraint use in metropolitan areas appear in Appendix B.)

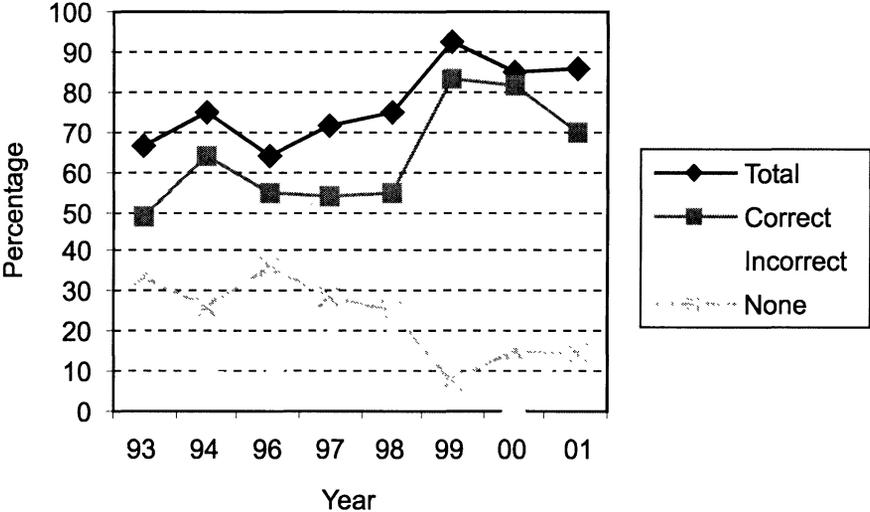


Figure 2. Use Rates for Children Under 4 for All Metropolitan Areas (1993-2001)

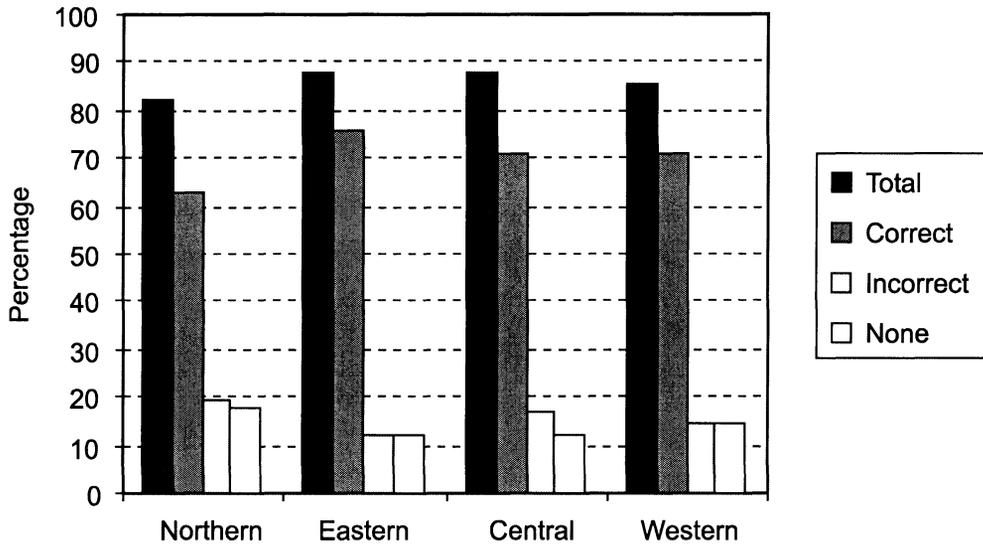


Figure 3. Use Rates for Children Under 4 by Metropolitan Areas

Child Safety Seat Use in the Mid-Size Cities

The safety seat use rates recorded for the 1997 to 2001 surveys are shown in Figure 4. Use rates in mid-sized cities peaked in 2000, with total and correct use rates reaching 92% and with no incorrect use recorded. In 2001, correct use declined by about 19 points to 73.1%, with most of the decrease accounted for by an almost 17% increase in incorrect use. On the other hand, total use rates dropped only 2.4 points. (As mentioned previously, some or all of the difference in incorrect use could be due to different observers in 2000 and 2001.) As seen in Figure 5, 2001 total use rates varied from 92.6% in Charlottesville to 85.2% in Danville. Incorrect use was highest in Lynchburg, at 20%.

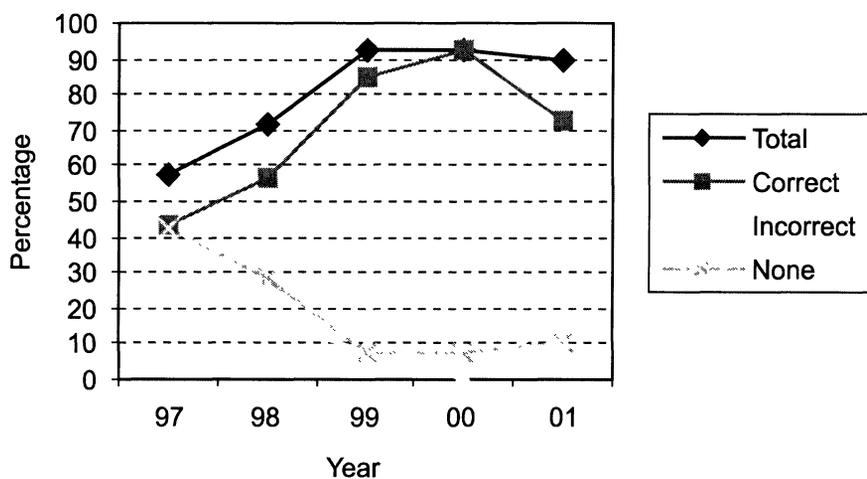


Figure 4. Use Rates for Children Under 4 for All Mid-Size Cities (1997-2001)

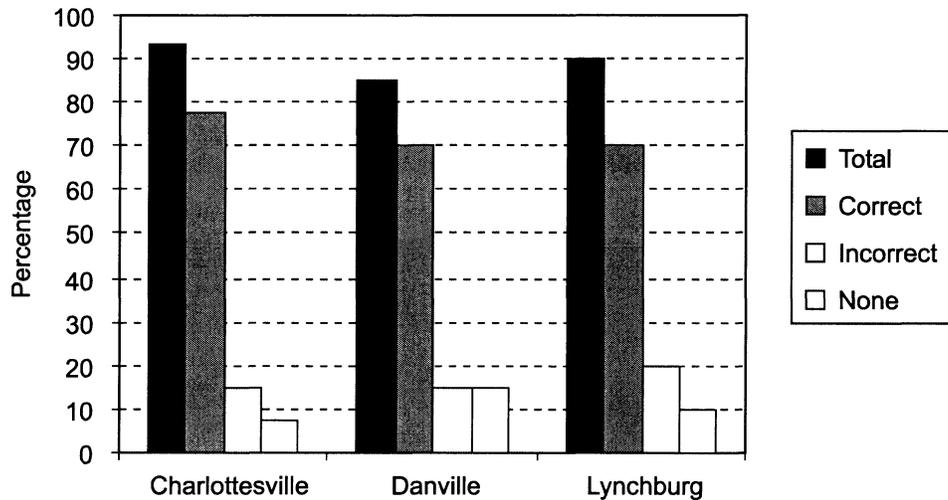


Figure 5. Use Rates for Children Under 4 by Mid-Size City

Sample sizes for children under age 4 have been consistently low in the mid-size cities. Even though the 2001 sample sizes were among the highest of all surveys, 40 in Lynchburg, 27 in Danville, and 41 in Charlottesville, these numbers are still relatively low. The reader is reminded that small numerical changes in small sample sizes could result in a large impact in use rates. (Detailed data on the use of child safety seats in the mid-size cities are provided in Appendix C.)

Safety Restraint Use by Occupants 4 to 16 Years of Age in the Metropolitan Areas

For occupants 4 to 16 years of age, total restraint use rates in the metropolitan areas of the state increased from 49.2% in 1997, the first year of data collection for this age group, to a high of 68.0% in 2000, but they fell slightly in 2001 to 66.0% (Figure 6). Correct use also peaked in 2000 at 61.3% but fell about 5 points in 2001 to 56.4%. Incorrect use rates remained relatively stable around 35-38%, while none use rates were consistently low, around 3-5%.

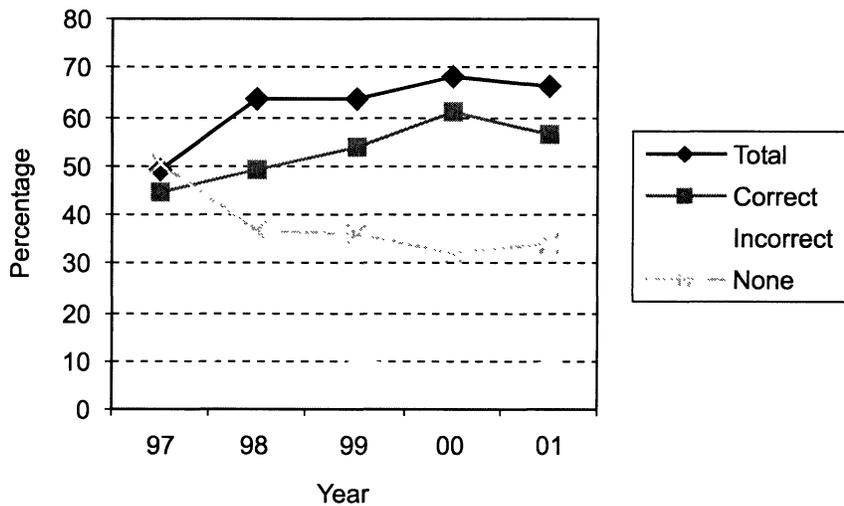


Figure 6. Use Rates for 4 to 16 Year Olds in Metropolitan Areas (1997-2001)

The use rates recorded in each of the metropolitan areas during the summer of 2001 are shown in Figure 7. Both total and correct restraint use rates were highest in the eastern area of the state (68.7 and 61.0, respectively) and lowest in the western area (60.9% and 44.4%). (Appendix D contains detailed restraint use rate data for 4 to 16 years olds in all of the metropolitan areas.)

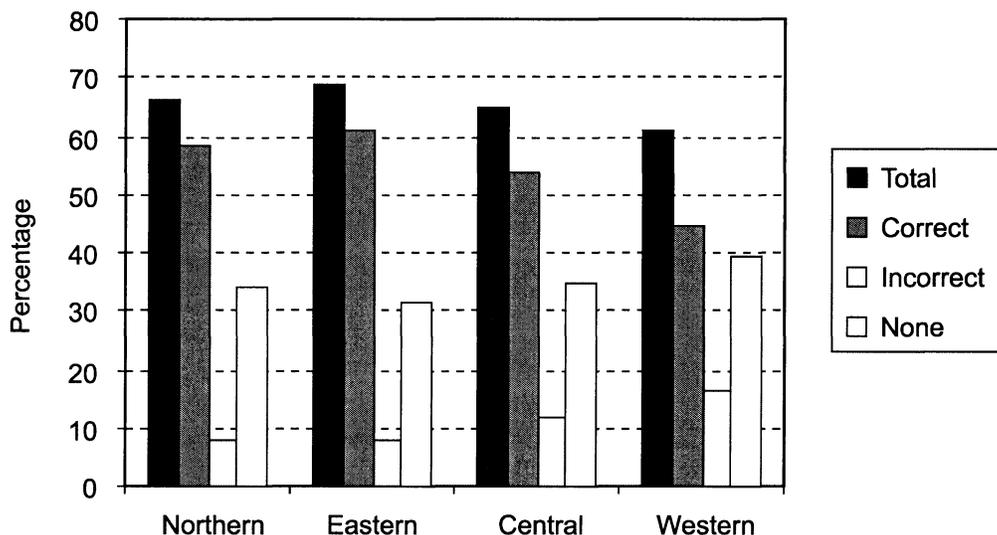


Figure 7. Use Rates for Children 4 to 16 Year Olds by Metropolitan Areas

Front vs. Rear Seat Restraint Use

In 1997, changes in §§ 46.2-1094 and 46.2-1095 of the *Code* required that rear seat occupants aged 4 to 16 use safety restraints. Since this change became effective July 1, 1997, one would expect to see increases in rear seat restraint use not seen among front seat occupants beginning in 1997 and extending to 2000.

As seen in Figure 8, total metropolitan use rates for 4 to 16 year olds seated in the back seat were consistently lower than for children sitting in the front. In 1999 and 2000, rear seat use rates increased as front seat rates declined or stayed the same. Thus, back seat use rates were beginning to “catch up” to front seat rates, perhaps because of the legislation’s influence. However, front seat use rates were still much higher than in the rear, and the discrepancy between front and rear seat use increased in 2001. Rear seat rates declined and front seat rates increased, leaving front seat use about 20 points higher than back seat use. A similar trend was noted with regard to correct use, with back seat rates coming within about 6 points of the front seat rate in 2000 (Figure 9). This discrepancy increased to a 15-point difference in 2001.

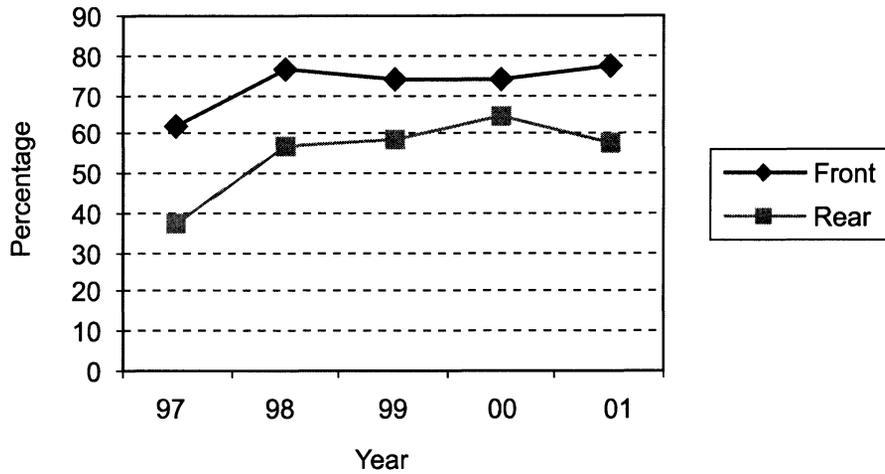


Figure 8. Total Use Rates for 4 to 16 Year Olds in Metropolitan Areas: Front vs. Rear Seats (1997-2001)

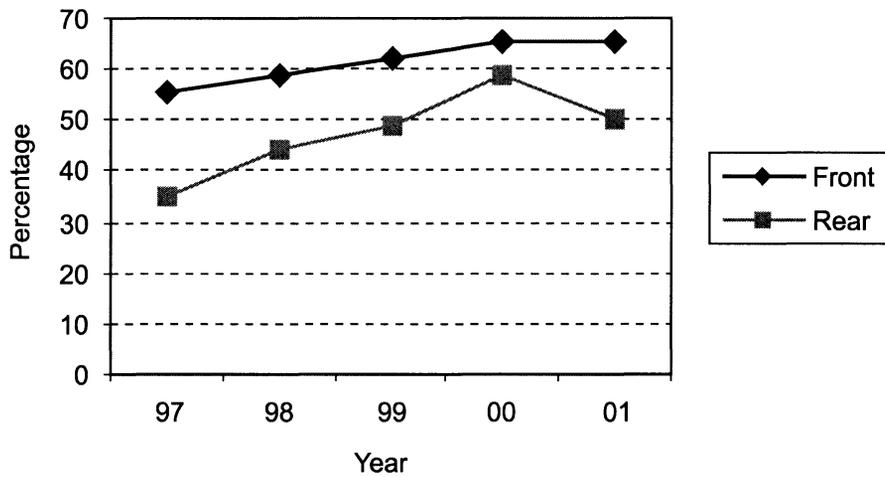


Figure 9. Correct Use Rates for 4 to 16 Year Olds in Metropolitan Areas: Front vs. Rear Seats (1997-2001)

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

As shown in Figure 10, both total and correct safety belt use for occupants 4 to 16 years of age in mid-size cities had risen from the low to mid 30s in 1997 to 71.0% and 59.8% in 2000. As was seen throughout the 2001 data, both figures then declined: total use by 2.8 points and correct use by 7.2 points. As seen in Figure 11, total 2001 use rates varied from 52.2% in Danville to 74.4% in Charlottesville, and correct use rates varied from 37.3% in Danville to 57.7% in Charlottesville. (Detailed safety restraint data for the three mid-size cities are provided in Appendix E.)

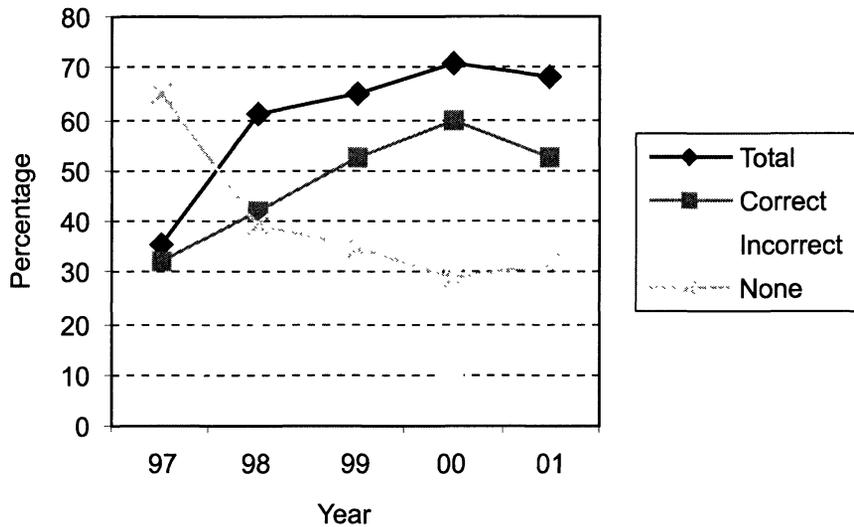


Figure 10. Use Rates for 4 to 16 Year Olds in Mid-Size Cities (1997-2001)

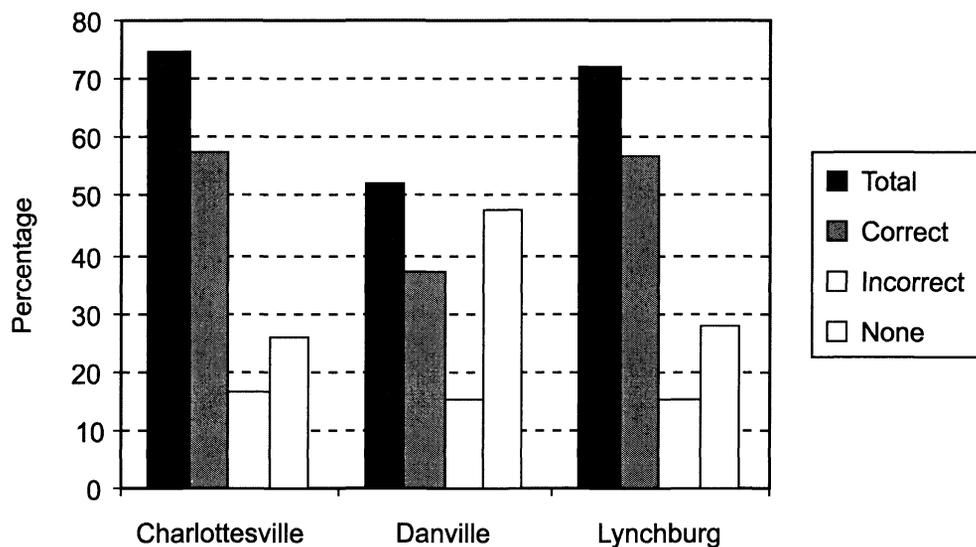


Figure 11. Use Rates for 4 to 16 Year Olds in Mid-Size Cities

Front vs. Rear Seat Restraint Use

The total and correct use rates for the front and rear seat occupants in the mid-size cities during the summer of 2001 are shown in Figure 12. As was the case in metropolitan areas, legislatively mandated rear seat restraint use is consistently lower than front seat restraint use among children 4 to 16. The closest these two figures came to each other was in 1999, when total front seat use was 10.3 points higher. By 2001, total front seat use had risen to 80.1% and total rear seat use had dropped to 58.4%, creating a 21.7-point difference. If the legislative changes applied to this age group had been effective, there should have been marked increases in rear seat use such that front and rear seat use would be similar. The correct use rate for rear seat

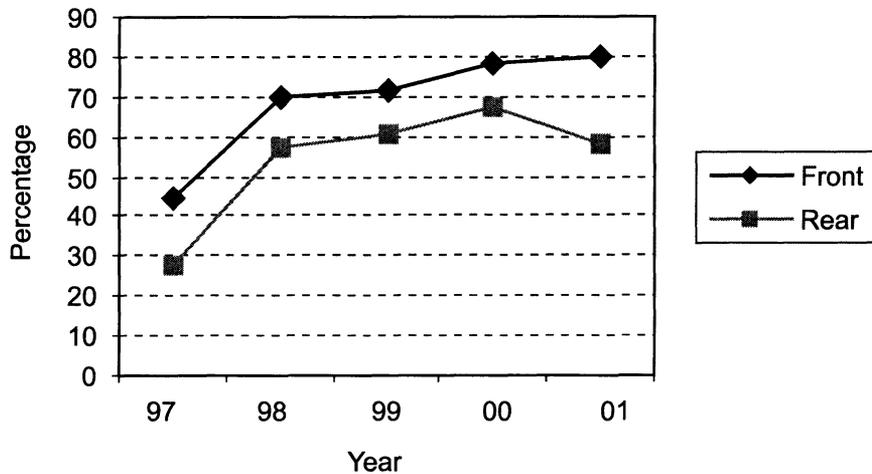


Figure 12. Total Use Rate for 4 to 16 Year Olds in Mid-Size Cities: Front vs. Rear Seats (1997-2001)

occupants did increase to match that for front seat occupants in 1998, the full first year the legislation was in effect. After that, front seat use rates increased at a faster pace.

Quite a different pattern was seen in terms of correct restraint use among 4 to 16 year olds. Although correct front and rear seat use rates began very low in 1997 (38.5% and 26.2%, respectively) correct rear seat use overtook and surpassed front seat use in 1998 (see Figure 13). Between 1998 and 2000, front seat use rose faster than rear seat use, and then both dropped precipitously in 2001. Although both front and rear seat use rates were at least 20 points higher than corresponding 1997 rates, they were still relatively low, at 60.3% and 46.2%, respectively.

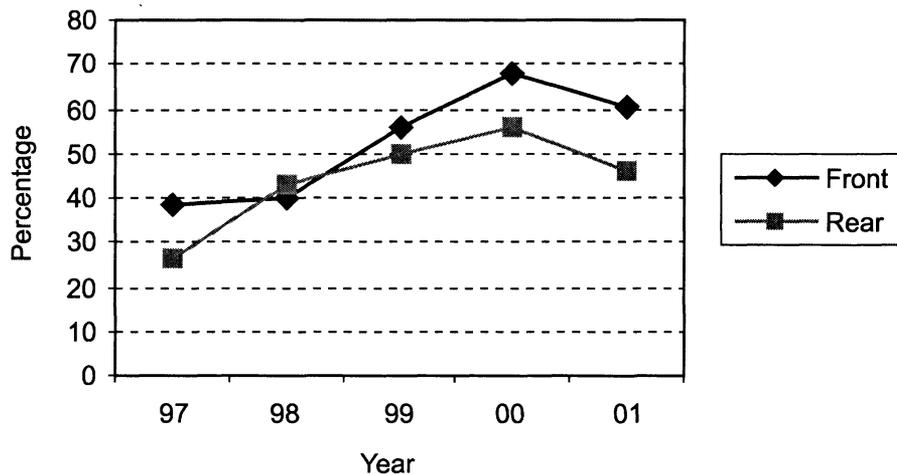


Figure 13. Correct Use Rates for 4 to 16 Year Olds in Mid-Size Cities: Front vs. Rear Seats (1997-2001)

MAJOR FINDINGS FOR 2001

The reader is again cautioned that this was an in-traffic survey and the data are subject to only those use factors that could be verified from outside the vehicle. It is likely that the rates of correct child safety seat use are overestimated, especially when viewed in the context of other studies where observers were able to enter vehicles and check for a loose lap/shoulder belt, the one item found to be most frequently misused. In addition, the reader is alerted to the relatively small number of child safety seat observations, especially in the mid-size cities, and reminded that minor changes in the counts can result in large changes in percentages. In addition, the analysis of the 2001 child restraint and safety belt data included total use rates, in an attempt to mitigate the effect of subjective judgment in assessing incorrect restraint use from year to year.

In 2001, total child restraint use for metropolitan areas and mid-size cities combined was 86.4% and correct use was 70.3%. Total seat belt use among 4 to 16 year olds in metropolitan areas and mid-size cities combined was 69.1%, and correct use was 57.8%

Child Safety Seat Use in Metropolitan Areas

- In 1997, safety advocates began an effort to get parents to move their young children to the back seat. In Virginia metropolitan areas, the proportion of children under 4 seated in the front seat decreased from 19.6% in 1997 to 6.6% in 1999. In 2000, this figure increased to 12.1% but decreased to 5.5% in 2001.
- All four metropolitan areas had a lower proportion of front seat occupants in 2001 than in 2000, with 2001 rates varying from 4.3% (northern) to 9.8% (western).
- In 2001, the total restraint use rate in metropolitan areas for children under age 4 was 85.6%. This represents a slight increase over 2000 but an almost 7 point decrease from the 1999 high. All four metropolitan areas had total use rates of more than 80%.
- The correct use rate in metropolitan areas for 2001 was 69.5%, a 12-point drop from 2000 and a more than 13-point drop from the 1999 high. All four metropolitan areas had correct use rates above 63%.
- Although total and correct use rates declined in all the metropolitan areas in 2001, they were still nearly 20 points higher than their 1993 starting points.

Child Safety Seat Use in Mid-Size Cities

- In 2001, the proportion of children under 4 years of age seated in the front seat declined from the 2000 high of 21.9% to 10.2%. Charlottesville posted the lowest proportion of front seat occupants at 4.9%, and Lynchburg posted the highest at 15%.

- Although total use rates declined by only 2.4 points between 2000 and 2001, correct use declined significantly, from 92.2% in 2000 to 73.1% in 2001. Similar declines were noted in Charlottesville and Lynchburg but not in Danville, where correct use remained in the low 70s. It is unclear how much of this drop was attributable to changes in incorrect use rates because of the subjectivity associated with differentiating between correct and incorrect use.
- Between 1997, when data collection in mid-size cities began, and 2001, total use increased from 58% to 89.8% and correct use increased from 43.2% to 73.1%, an increase of almost 30 points.

Use of Safety Restraints by Occupants 4 to 16 Years of Age in Metropolitan Areas

- When the data for all four metropolitan areas were combined, about 41% of the 4 to 16 year olds observed were seated in the front seats. This represents the highest percentage of front seat occupants in this age group since the 1997 high of 47.8%.
- In 2001, there was a slight decline in total metropolitan use rates, from 68.0% in 2000 to 66.0%. There was a 5-point drop in correct use over the same time period, from 61.3% to 56.4%. This decline was seen particularly in the western area, where total use fell 22 points and correct use fell almost 30 points.
- Between 1997 and 2001, total metropolitan area use increased from 49.2% to 66.0% and correct use increased from 44.7% to more than 56.4 in 2001. Thus, even with the declines in use seen in 2001, improvements have been made in safety belt use among 4 to 16 year olds.
- In the metropolitan areas between 1997 and 2001, correct use rate for front seat occupants increased each year. Although correct belt use improved more for the rear seat than for the front seat, rear seat restraint use among 4 to 16 year olds was still lower than that for front seat occupants.

Use of Safety Restraints by Occupants 4 to 16 Years of Age in Mid-Size Cities

- When the data from all three mid-size cities were combined, about 45% of observed 4 to 16 year old occupants were seated in the front seats. Although the percentage of front seat occupants in this age group declined in several of the interviewing years, there was less than 1 point difference between the 1997 and 2001 figures.
- In 2001, total use rates in the mid-size cities declined less than 3 points from the 2000 high of 71.0% and correct use declined by about 7 points to 52.6%.
- Each city was associated with a different trend. Charlottesville mirrored the trend for the cities combined, peaking in 2000 at total use of 85.3% and correct use at 70.7%. Both

declined in 2001 by about 11 and 13 points, respectively. The 2001 total use rate in Lynchburg (72.3%) was its highest of the 5 years, but correct use declined from 60.7% to 56.9% in 2001. Danville's total and correct use rates remained almost unchanged at 52.2% and 37.3%, respectively, making Danville's rate the lowest of the three cities.

- Between 1997 and 2001, total use for all mid-size cities increased 33 points and correct use by just over 20 points, a substantial improvement.

RECOMMENDATIONS

The marked declines in child safety seat use in 2001 are troubling. In terms of target areas, the western metropolitan area saw the largest drop in total restraint use among children under age 4. Correct use declined in all the cities and metropolitan areas, with the largest drops in the northern and western metropolitan areas and in Charlottesville and Lynchburg. These areas could be considered for additional emphasis.

In terms of children 4 to 16 years of age, most local areas surveyed have seen an increase in the total and correct use rates since 1997, but recent figures mostly hover in the 60s, with an occasional "good year" pushing them over 70%. (One exception is Danville, where total use remains in the 50s and correct use in the 30s.) The revelation that airbags were responsible for the deaths of several small children seated in the front seat seemed to energize parents and caretakers to move their young children to the back seats and to restrain them. The issue of belt use among 4 to 16 year olds needs a similar "shot in the arm" to get use rates moving up again.

It may be that an analysis of crashes among the various cohorts within this age group would reveal "the hook" for such a campaign. In addition, public information could be tailored to the age groups in question, such as the creation of crash videos featuring the newly designed "adolescent" crash dummies. New venues for public information for parents concerning their responsibilities toward their older children could be developed, such as at gas pumps, convenience stores, or inspection stations. Perhaps new enforcement techniques could be developed, such as safety belt use checkpoints outside schools at the beginning or the end of the school day, with parents and adult passengers issued warning tickets and children under 16 receiving "mock" tickets. In addition, VDH could provide incentives to schools for children observed wearing safety belts, making them at least in part responsible for contributing to their own safety. For children 12 to 16 years of age, who have more control over their environment, both incentive and disincentive programs might also be appropriate.

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APPENDIX A

2001 SAFETY RESTRAINT USE BY SITE LOCATION

Table A-1. 2001 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	2	4	0	2	4	0
2 Route 7	0	0	0	3	2	0	3	2	0
3 S. George Mason	0	0	1	13	4	6	13	4	7
4 N. Glebe	0	0	0	12	3	3	12	3	3
5 Rose Hill	0	0	2	11	3	3	11	3	5
6 Jordan	0	0	0	6	1	1	6	1	1
7 Route 1	1	0	0	7	1	3	8	1	3
8 Woodbridge	0	0	3	10	5	1	10	5	4
9 Herndon	0	0	0	6	1	2	6	1	2
10 Vienna	0	0	0	13	2	0	13	2	0
11 Fairfax City	0	0	0	11	1	0	11	1	0
12 Annandale	0	0	0	6	4	3	6	4	3
<i>Northern Area Total</i>	1	0	6	100	31	22	101	31	28
Western Area									
1 Hershberger	0	0	0	5	0	0	5	0	0
2 Orange	1	0	0	8	1	1	9	1	1
3 Vinton	0	0	1	2	1	2	2	1	3
4 Salem	1	0	1	12	4	1	13	4	2
<i>Western Area Total</i>	2	0	2	27	6	4	29	6	6
Central Area									
1 Broad Street	0	0	1	2	2	1	2	2	2
2 Hull Street	1	0	0	6	2	1	7	2	1
3 Chester	0	0	1	6	1	0	6	1	1
4 Petersburg	0	0	0	13	3	4	13	3	4
5 Midlothian	0	0	0	6	1	0	6	1	0
6 Parham Rd.	0	0	0	15	2	0	15	2	0
7 9-Mile Rd.	0	0	1	5	2	0	5	2	1
<i>Central Area Total</i>	1	0	3	53	13	6	54	13	9
Eastern Area									
1 Independence	0	0	0	5	0	2	5	0	2
2 Kempsville	0	1	0	9	2	1	9	3	1
3 Chesapeake	1	0	0	7	0	2	8	0	2
4 Portsmouth	1	0	0	9	3	1	10	3	1
5 Rte. 170	0	0	1	9	1	1	9	1	2
6 Laskin	1	0	1	16	1	2	17	1	3
7 Brambleton	0	0	0	8	2	4	8	2	4
8 Military Circle	0	0	0	13	1	1	13	1	1
9 Denbigh	1	0	0	8	2	0	9	2	0
10 Hampton	1	0	0	10	1	0	11	1	0
11 Route 143	0	0	0	7	3	1	7	3	1
<i>Eastern Area Total</i>	5	1	2	101	16	15	106	17	17
Urban Total	9	1	13	281	66	47	290	67	60
Grand Total									417

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

Table A-2. 2001 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	1	1	0	18	1	1	19	2	1
2 Emmet	0	0	0	13	4	2	13	4	2
<i>Charlottesville Total</i>	1	1	0	31	5	3	32	6	3
Danville									
1 Main	0	0	0	6	1	2	6	1	2
2 Piney Forest	2	0	1	11	3	1	13	3	2
<i>Danville Total</i>	2	0	1	17	4	3	19	4	4
Lynchburg									
1 Candler's Mtn.	3	0	0	5	2	1	8	2	1
2 Oakley	0	1	1	13	4	2	13	5	3
3 Old Forest	1	0	0	6	1	0	7	1	0
<i>Lynchburg Total</i>	4	1	1	24	7	3	28	8	4
Mid-Size Total	7	2	2	72	16	9	79	18	11
Grand Total									108

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

Table A-3. Sample Sizes for the 1997 to 2001 Child Safety Seat Surveys by Area and Seat Location

	Infants									
	1997		1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%	No.	%
Total Metro Area	484		386		46		215		417	
Front	95	19.6	28	7.3	23	6.6	26	12.1	23	5.5
Rear	389	80.4	358	92.7	323	93.4	189	87.9	394	94.5
Northern	151		128		133		60		160	
Front	26	17.2	3	2.3	8	6.0	7	11.7	7	4.3
Rear	125	82.8	125	97.7	125	94.0	53	88.3	153	95.7
Eastern	213		148		109		59		140	
Front	39	18.3	16	10.8	10	9.2	9	15.3	8	5.7
Rear	174	81.7	132	89.2	99	90.8	50	84.7	132	94.3
Central	92		69		71		68		76	
Front	22	23.9	5	7.2	2	2.8	4	5.9	4	5.3
Rear	70	76.1	64	92.8	69	97.2	64	94.1	72	94.7
Western	28		41		33		28		41	
Front	8	28.6	4	9.8	3	9.1	6	21.4	4	9.8
Rear	20	71.4	37	90.2	30	90.9	22	78.6	37	90.2
Total Mid-Size	81		86		123		64		108	
Front	12	14.8	13	15.1	11	8.9	14	21.9	11	10.2
Rear	69	85.2	73	84.9	12	91.1	50	78.1	97	89.8
Danville	21		20		34		15		27	
Front	4	19.0	4	20.0	7	20.6	6	40.0	3	11.1
Rear	17	81.0	16	80.0	27	79.4	9	60.0	24	88.9
Charlottesville	29		47		52		24		41	
Front	3	10.3	7	14.9	1	1.9	1	4.2	2	4.9
Rear	26	89.7	40	85.1	51	98.1	23	95.8	39	95.1
Lynchburg	31		19		37		25		40	
Front	5	16.1	2	10.5	3	8.1	7	28.0	6	15.0
Rear	26	83.9	17	89.5	34	91.9	18	72.0	34	85.0

**Table A-4. 2001 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	9	1	0	20	1	5	29	2	5
2 Route 7	6	0	2	7	1	6	13	1	8
3 S. George Mason	10	1	3	7	3	14	17	4	17
4 N. Glebe	5	0	2	15	3	15	20	3	17
5 Rose Hill	13	1	4	7	1	8	20	2	12
6 Jordan	2	1	7	9	2	10	11	3	17
7 Route 1	11	1	1	3	0	7	14	1	8
8 Woodbridge	8	4	2	10	0	7	18	4	9
9 Herndon	6	1	2	6	2	2	12	3	4
10 Vienna	7	0	1	16	3	9	23	3	10
11 Fairfax City	6	1	3	9	0	5	15	1	8
12 Annandale	9	0	1	9	1	6	18	1	7
<i>Northern Area Total</i>	92	11	28	118	17	94	210	28	122
Western Area									
1 Hershberger	5	1	0	6	4	1	11	5	1
2 Orange	2	1	1	7	3	8	9	4	9
3 Vinton	10	3	5	10	1	13	20	4	18
4 Salem	10	5	12	9	4	12	19	9	24
<i>Western Area Total</i>	27	10	18	32	12	34	59	22	52
Central Area									
1 Broad Street	9	2	1	7	3	9	16	5	10
2 Hull Street	3	0	6	5	1	9	8	1	15
3 Chester	12	6	4	6	0	5	18	6	9
4 Petersburg	12	4	8	11	1	9	23	5	17
5 Midlothian	6	1	0	9	3	5	15	4	5
6 Parham Rd.	13	1	4	16	1	5	29	2	9
7 9-Mile Rd.	2	0	4	3	2	6	5	2	10
<i>Central Area Total</i>	57	14	27	57	11	48	114	25	75
Eastern Area									
1 Independence	0	1	0	3	0	1	3	1	1
2 Kempsville	8	2	2	8	0	7	16	2	9
3 Chesapeake	12	3	4	12	4	7	24	7	11
4 Portsmouth	9	0	5	7	2	12	16	2	17
5 Rte. 170	7	2	0	7	0	4	14	2	4
6 Laskin	24	0	5	14	2	4	38	2	9
7 Brambleton	6	0	2	12	1	9	18	1	11
8 Military Circle	9	1	1	13	1	13	22	2	14
9 Denbigh	20	4	3	11	0	12	31	4	15
10 Hampton	12	1	2	10	0	4	22	1	6
11 Route 143	4	2	2	6	1	11	10	3	13
<i>Eastern Area Total</i>	111	16	26	103	11	84	214	27	110
Urban Total	287	51	99	310	51	260	597	102	359
Grand Total									1058

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

**Table A-5. 2001 Survey Results of Safety Restraint Use by Occupants 4 to 16 Years of Age
in Mid-Size Cities**

Site Location	Front Seat			Rear Seat			Total Vehicle		
	C*	I	N	C	I	N	C	I	N
Charlottesville									
1 High	12	5	3	15	3	4	27	8	7
2 Emmet	14	5	4	11	2	12	25	7	16
<i>Charlottesville Total</i>	26	10	7	26	5	16	52	15	23
Danville									
1 Main	6	3	4	4	0	10	10	3	14
2 Piney Forest	8	2	5	7	5	13	15	7	18
<i>Danville Total</i>	14	5	9	11	5	23	25	10	32
Lynchburg									
1 Candler's Mtn.	8	3	2	10	3	7	18	6	9
2 Oakley	16	4	6	16	4	13	32	8	19
3 Old Forest	15	4	2	9	2	6	24	6	8
<i>Lynchburg Total</i>	39	11	10	35	9	26	74	20	36
Mid-Size Total	79	26	26	72	19	65	151	45	91
Grand Total									287

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

Table A-6. Sample Sizes for 4 to 16 Years Olds for the 1997 to 2001 Surveys by Area and Seat Location

	4 to 16 Years									
	1997		1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%	No.	%
Total Metro Area	1593		1106		1026		698		1058	
Front	761	47.8	340	30.7	359	35.0	261	37.4	437	41.3
Rear	832	52.2	766	69.3	667	65.0	437	62.6	621	58.7
Northern	459		342		367		177		360	
Front	212	46.2	83	24.3	121	33.0	47	26.6	131	36.4
Rear	247	53.8	259	75.7	246	67.0	130	73.4	229	63.6
Eastern	694		442		328		152		351	
Front	336	48.4	114	25.8	113	34.5	49	32.2	153	43.6
Rear	358	51.6	298	67.4	215	65.5	103	67.8	198	56.4
Central	297		224		229		297		214	
Front	145	48.8	77	34.4	81	35.4	138	46.5	98	45.8
Rear	152	51.2	147	65.6	148	64.6	159	53.5	116	54.2
Western	143		98		102		72		133	
Front	68	47.6	36	36.7	44	43.1	27	37.5	55	41.4
Rear	75	52.4	62	63.3	58	56.9	45	62.5	78	58.6
Total Mid-Size	385		289		247		179		287	
Front	179	46.5	85	29.4	104	42.1	56	31.3	131	45.6
Rear	206	53.5	204	70.6	143	57.9	123	68.7	156	54.4
Danville	98		77		70		41		67	
Front	42	42.9	18	23.4	30	42.9	7	17.1	28	41.8
Rear	56	57.1	59	76.6	40	57.1	34	82.9	39	58.2
Charlottesville	152		114		94		82		90	
Front	72	47.4	30	26.3	39	41.5	33	40.2	43	47.8
Rear	80	52.6	84	73.7	55	58.5	49	59.8	47	52.2
Lynchburg	135		98		83		56		130	
Front	65	48.1	37	37.8	35	42.2	16	28.6	60	46.2
Rear	70	51.9	61	62.2	48	57.8	40	71.4	70	53.8

APPENDIX B

METROPOLITAN AREAS CHILD SAFETY SEAT USE RATES FROM 1993 TO 2001

Table B-1. Total Metropolitan Areas Child Safety Seat Use Rates From 1993 to 2001

All Seating Positions								
	1993	1994	1996	1997	1998	1999	2000	2001
Total Use	66.4	74.4	63.5	71.5	74.6	92.4	84.7	85.6
Correct	48.9	64.0	55.0	54.1	54.9	83.2	81.9	69.5
Incorrect	17.5	10.4	8.5	17.4	19.7	9.2	2.8	16.1
None	33.6	25.7	36.5	28.5	25.4	7.5	15.3	14.4
Front Seat								
	1993	1994	1996	1997	1998	1999	2000	2001
Correct	40.8	49.3	44.4	37.9	42.9	65.2	57.7	39.1
Incorrect	16.8	12.7	10.5	20.0	25.0	13.0	11.5	4.3
None	42.4	38.0	45.1	42.1	32.1	21.7	30.8	56.5
Rear Seat								
	1993	1994	1996	1997	1998	1999	2000	2001
Correct	51.6	70.1	57.7	58.1	55.9	84.5	85.2	71.3
Incorrect	17.7	9.4	8.0	16.7	19.3	9.0	1.6	16.8
None	30.7	20.5	39.6	25.2	24.9	6.5	13.2	11.9

Table B-2. Northern Metropolitan Area Child Safety Seat Use Rates, 1993-2001

All Seating Positions								
	1993	1994	1996	1997	1998	1999	2000	2001
Total Use	63.8	69.9	67.3	75.5	77.3	91.0	81.7	82.5
Correct	41.9	59.6	61.2	57.0	49.2	80.5	76.7	63.1
Incorrect	21.9	10.3	6.1	18.5	28.1	10.5	5.0	19.4
None	36.3	30.1	32.7	24.5	22.7	9.0	18.3	17.5
Front Seat								
	1993	1994	1996	1997	1998	1999	2000	2001
Correct	27.6	45.6	50.0	38.5	33.3	50.0	42.9	14.3
Incorrect	27.6	12.3	6.0	23.1	33.3	25.0	28.6	0.0
None	44.8	42.1	44.0	38.5	33.3	25.0	28.6	85.7
Rear Seat								
	1993	1994	1996	1997	1998	1999	2000	2001
Correct	45.0	64.7	63.3	60.8	49.6	82.4	81.1	65.4
Incorrect	20.6	9.6	6.2	17.6	28.0	9.6	1.9	20.3
None	34.4	25.6	30.5	21.6	22.4	8.0	17.0	14.4

Table B-3. Eastern Virginia Metropolitan Area Child Safety Seat Use Rates, 1993 To 2001

All Seating Positions

	1993	1994	1996	1997	1998	1999	2000	2001
Total Use	67.6	86.2	63.7	70.9	66.9	97.3	84.7	87.8
Correct	57.5	78.6	52.2	53.1	52.7	89.0	84.7	75.7
Incorrect	10.1	7.6	11.5	17.8	14.2	8.3	0.0	12.1
None	32.4	13.8	36.3	29.1	33.1	2.8	15.3	12.1

Front Seat

	1993	1994	1996	1997	1998	1999	2000	2001
Correct	46.0	58.1	44.6	41.0	50.0	80.0	33.3	62.5
Incorrect	16.0	14.0	14.3	20.5	18.8	10.0	0.0	12.5
None	38.0	27.9	41.1	38.5	31.3	10.0	66.7	25.0

Rear Seat

	1993	1994	1996	1997	1998	1999	2000	2001
Correct	62.0	86.2	54.2	55.7	53.0	89.9	94.0	76.5
Incorrect	7.8	5.2	10.7	17.2	13.6	8.1	0.0	12.1
None	30.2	8.6	35.0	27.0	33.3	2.0	6.0	11.4

Table B-4. Central Metropolitan Area Child Safety Seat Use Rates, 1993 To 2001

All Seating Positions

	1993	1994	1996	1997	1998	1999	2000	2001
Total Use	61.4	61.0	57.2	72.8	79.7	85.9	82.3	88.2
Correct	47.5	48.8	47.4	58.7	58.0	81.7	77.9	71.1
Incorrect	13.9	12.2	9.8	14.1	21.7	4.2	4.4	17.1
None	38.6	39.0	42.9	27.2	20.3	14.1	17.6	11.8

Front Seat

	1993	1994	1996	1997	1998	1999	2000	2001
Correct	55.2	43.8	35.1	45.5	20.0	50.0	75.0	25.0
Incorrect	6.9	9.4	13.5	13.6	60.0	0.0	25.0	0.0
None	37.9	46.9	51.4	40.9	20.0	50.0	0.0	75.0

Rear Seat

	1993	1994	1996	1997	1998	1999	2000	2001
Correct	44.4	52.0	52.1	62.9	60.9	82.6	78.1	73.6
Incorrect	16.7	14.0	8.3	14.3	18.8	4.3	3.1	18.1
None	38.9	34.0	39.6	22.9	20.3	13.0	18.8	8.3

Table B-5. Western Virginia Metropolitan Area Child Safety Seat Use Rates, 1993 To 2001

All Seating Positions

	1993	1994	1996	1997	1998	1999	2000	2001
Total Use	77.7	79.3	58.4	50.0	85.4	97.0	96.4	85.3
Correct	44.4	58.6	52.8	32.1	75.6	78.8	96.4	70.7
Incorrect	33.3	20.7	5.6	17.9	9.8	18.2	0.0	14.6
None	22.2	20.7	41.7	50.0	14.6	3.0	3.6	14.6

Front Seat

	1993	1994	1996	1997	1998	1999	2000	2001
Correct	23.5	50.0	47.4	0.0	50.0	66.7	100.0	50.0
Incorrect	17.7	20.0	5.3	25.0	0.0	0.0	0.0	0.0
None	58.8	30.0	47.4	75.0	50.0	33.3	0.0	50.0

Rear Seat

	1993	1994	1996	1997	1998	1999	2000	2001
Correct	52.2	63.2	54.7	45.0	78.4	80.0	95.5	73.0
Incorrect	39.1	21.1	5.7	15.0	10.8	20.0	0.0	16.2
None	8.7	15.8	39.6	40.0	10.8	0.0	4.5	10.8

APPENDIX C

MID-SIZE CITIES CHILD SAFETY SEAT USE RATES FROM 1997 TO 2001

Table C-1. Total Mid-Size Cities Child Safety Seat Use Rates, 1997 to 2001

All Seating Positions

	1997		1998		1999		2000		2001	
	No.	%								
Total Use	47	58.0	62	72.1	114	92.7	59	92.2	97	89.8
Correct	35	43.2	49	57.0	104	84.6	59	92.2	79	73.1
Incorrect	12	14.8	13	15.1	10	8.1	0	0.0	18	16.7
None	34	42.0	24	27.9	9	7.3	5	7.8	11	10.2

Front Seats

	1997		1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%	No.	%
Correct	4	33.3	3	23.1	7	63.6	14	100.0	7	63.6
Incorrect	0	0.0	2	15.4	0	0.0	0	0.0	2	18.2
None	8	66.7	8	61.5	4	36.4	0	0.0	2	18.2

Rear Seats

	1997		1998		1999		2000		2001	
	No.	%								
Correct	31	44.9	46	63.0	97	86.6	45	90.0	72	74.2
Incorrect	12	17.4	11	15.1	10	8.9	0	0.0	16	16.5
None	26	37.7	16	21.9	5	4.5	5	10.0	9	9.3

Table C-2. Charlottesville Child Safety Seat Use Rates, 1997 to 2001

All Seating Positions

	1997		1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%	No.	%
Total Use	19	65.5	39	83.0	50	96.2	24	100.0	38	93.6
Correct	15	51.7	36	76.6	46	88.5	24	100.0	32	78.0
Incorrect	4	13.8	3	6.4	4	7.7	0	0.0	6	14.6
None	10	34.5	8	17.0	2	3.8	0	0.0	3	7.3

Front Seats

	1997		1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%	No.	%
Correct	1	33.3	2	28.6	1	100.0	1	100.0	1	50.0
Incorrect	0	0.0	1	14.3	0	0.0	0	0.0	1	50.0
None	2	66.7	4	57.1	0	0.0	0	0.0	0	0.0

Rear Seats

	1997		1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%	No.	%
Correct	14	53.8	34	85.0	45	88.2	23	100.0	31	79.5
Incorrect	4	15.4	2	5.0	4	7.8	0	0.0	5	12.8
None	8	30.8	4	10.0	2	3.9	0	0.0	3	7.7

Table C-3. Danville Child Safety Seat Use Rates, 1997 to 2001

All Seating Positions

	1997		1998		1999		2000		2001	
	No.	%								
Total Use	8	38.1	9	45.0	27	79.4	11	73.0	23	85.2
Correct	5	23.8	6	30.0	24	70.6	11	73.3	19	70.4
Incorrect	3	14.3	3	15.0	3	8.8	0	0.0	4	14.8
None	13	61.9	11	55.0	7	20.6	4	26.7	4	14.8

Front Seats

	1997		1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%	No.	%
Correct	0	0.0	1	25.0	3	42.9	6	100.0	2	66.7
Incorrect	0	0.0	1	25.0	0	0.0	0	0.0	0	0.0
None	4	100.0	2	50.0	4	57.1	0	0.0	1	33.3

Rear Seats

	1997		1998		1999		2000		2001	
	No.	%								
Correct	5	29.4	5	31.3	21	77.8	5	55.6	17	70.8
Incorrect	3	17.6	2	12.5	3	11.1	0	0.0	4	16.7
None	9	52.9	9	56.2	3	11.1	4	44.4	3	12.5

Table C-4. Lynchburg Child Safety Seat Use Rates, 1997 to 2001

All Seating Positions

	1997		1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%	No.	%
Total Use	20	64.5	14	73.6	37	100.0	24	96.0	36	90.0
Correct	15	48.4	7	36.8	34	91.9	24	96.0	28	70.0
Incorrect	5	16.1	7	36.8	3	8.1	0	0.0	8	20.0
None	11	35.5	5	26.3	0	0.0	1	4.0	4	10.0

Front Seats

	1997		1998		1999		2000		2001	
	No.	%	No.	%	No.	%	No.	%	No.	%
Correct	3	60.0	0	0.0	3	100.0	7	100.0	4	66.7
Incorrect	0	0.0	0	0.0	0	0.0	0	0.0	1	16.7
None	2	40.0	2	100.0	0	0.0	0	0.0	1	16.7

Rear Seats

	1997		1998		1999		2000		2001	
	No.	%								
Correct	12	46.2	7	41.2	31	91.2	17	94.4	24	70.6
Incorrect	5	19.2	7	41.2	3	8.8	0	0.0	7	20.6
None	9	34.6	3	17.6	0	0.0	1	5.6	3	8.8

APPENDIX D

Metropolitan Areas Restraint Use Rates by Occupants 4 to 16 Years of Age From 1997 to 2001

Table D-1. Total Metropolitan Areas Restraint Use Rates, Occupants 4 to 16 Years of Age, 1997 to 2001

All Seating Positions

	1997		1998		1999		2000		2001	
	No.	%								
Total Use	783	49.2	700	63.3	656	63.9	475	68.0	699	66.0
Correct	712	44.7	542	49.0	549	53.5	428	61.3	597	56.4
Incorrect	71	4.5	158	14.3	107	10.4	47	6.7	102	9.6
None	810	50.8	406	36.7	370	36.1	223	31.9	309	33.9

Front Seats

	1997		1998		1999		2000		2001	
	No.	%								
Correct	422	55.5	201	59.1	222	61.8	170	65.1	287	65.7
Incorrect	52	6.8	60	17.6	44	12.3	22	8.4	51	11.7
None	287	37.7	79	23.2	93	25.9	69	26.4	99	22.7

Rear Seats

	1997		1998		1999		2000		2001	
	No.	%								
Correct	290	34.9	341	44.5	327	49.1	258	59.0	310	49.9
Incorrect	19	2.3	98	12.8	63	9.3	25	5.7	51	8.2
None	523	62.9	327	42.7	277	41.5	154	35.2	260	41.9

Table D-2. Northern Metropolitan Area Restraint Use Rates, Occupants 4 to 16 Years of Age, 1997 to 2001

All Seating Positions

	1997		1998		1999		2000		2001	
	No.	%								
Total Use	243	53.0	225	65.8	251	68.4	114	64.4	238	66.1
Correct	216	47.1	173	50.6	213	58.0	105	59.3	210	58.3
Incorrect	27	5.9	52	15.2	38	10.4	9	5.1	28	7.8
None	216	47.1	117	34.2	116	31.6	63	35.6	122	33.9

Front Seats

	1997		1998		1999		2000		2001	
	No.	%								
Correct	127	59.9	51	61.4	84	69.4	32	68.1	92	70.2
Incorrect	19	9.0	15	18.1	13	10.7	2	4.3	11	8.4
None	66	31.1	17	20.5	24	19.8	13	27.7	28	21.4

Rear Seats

	1997		1998		1999		2000		2001	
	No.	%								
Correct	89	36.0	122	47.1	129	52.4	73	56.2	118	51.5
Incorrect	8	3.2	37	14.3	25	10.2	7	5.4	17	7.4
None	150	60.7	100	38.6	92	37.4	50	38.5	94	41.0

Table D-3. Eastern Metropolitan Area Restraint Use Rates, Occupants 4 to 16 Years of Age, 1997 to 2001

All Seating Positions

	1997		1998		1999		2000		2001	
	No.	%								
Total Use	332	47.8	291	65.8	221	67.4	114	75.0	241	68.7
Correct	307	44.2	241	54.5	188	57.3	108	71.1	214	61.0
Incorrect	25	3.6	50	11.3	33	10.1	6	3.9	27	7.7
None	362	52.2	151	34.2	107	32.6	38	25.0	110	31.3

Front Seats

	1997		1998		1999		2000		2001	
	No.	%								
Correct	188	56.0	93	64.6	74	65.5	38	77.6	111	72.5
Incorrect	21	6.3	17	11.8	15	13.3	2	4.1	16	10.5
None	127	37.8	34	23.6	24	21.2	9	18.4	26	17.0

Rear Seats

	1997		1998		1999		2000		2001	
	No.	%								
Correct	119	33.2	148	49.7	114	53.0	70	68.0	103	52.0
Incorrect	4	1.1	33	11.1	18	8.4	4	3.9	11	5.6
None	235	65.6	117	39.3	83	38.6	29	28.2	84	42.4

Table D-4. Central Metropolitan Area Restraint Use Rates, Occupants 4 to 16 Years of Age, 1997 to 2001

All Seating Positions

	1997		1998		1999		2000		2001	
	No.	%								
Total Use	153	51.5	118	52.7	133	58.0	187	63.0	139	65.0
Correct	142	47.8	83	37.1	102	44.5	161	54.2	114	53.3
Incorrect	11	3.7	35	15.6	31	13.5	26	8.8	25	11.7
None	144	48.5	106	47.3	96	41.9	110	37.0	75	35.0

Front Seats

	1997		1998		1999		2000		2001	
	No.	%								
Correct	77	53.1	38	49.4	39	48.1	79	57.2	57	58.2
Incorrect	10	6.9	17	22.1	15	18.5	13	9.4	14	14.3
None	58	40.0	22	28.6	27	33.3	46	33.3	27	27.6

Rear Seats

	1997		1998		1999		2000		2001	
	No.	%								
Correct	65	42.8	45	30.6	63	42.6	82	51.6	57	49.1
Incorrect	1	0.7	18	12.2	16	10.8	13	8.2	11	9.5
None	86	56.6	84	57.1	69	46.6	64	40.3	48	41.4

Table D-5. Western Metropolitan Area Restraint Use Rates, Occupants 4 to 16 Years of Age, 1997 to 2001

All Seating Positions

	1997		1998		1999		2000		2001	
	No.	%								
Total Use	55	38.5	66	67.3	51	50.0	60	83.3	81	60.9
Correct	47	32.9	45	45.9	46	45.1	54	75.0	59	44.4
Incorrect	8	5.6	21	21.4	5	4.9	6	8.3	22	16.5
None	88	61.5	32	32.7	51	50.0	12	16.7	52	39.1

Front Seats

	1997		1998		1999		2000		2001	
	No.	%								
Correct	30	44.1	19	52.8	25	56.8	21	77.8	27	49.1
Incorrect	2	2.9	11	30.6	1	2.3	5	18.5	10	18.2
None	36	52.9	6	16.7	18	40.9	1	3.7	18	32.7

Rear Seats

	1997		1998		1999		2000		2001	
	No.	%								
Correct	17	22.7	26	41.9	21	36.2	33	73.3	32	41.0
Incorrect	6	8.0	10	16.1	4	6.9	1	2.2	12	15.4
None	52	69.3	26	41.9	33	56.9	11	24.4	34	43.6

APPENDIX E

**Restraint Use Rates for Mid-Size Cities by Occupants 4 to 16 Years of Age
From 1997 to 2001**

Table E-1. Total Mid-Size Cities Restraint Use Rates, Occupants 4 to 16 Years of Age, 1997 to 2001

All Seating Positions

	1997		1998		1999		2000		2001	
	No.	%								
Total Use	136	35.3	176	60.9	161	65.2	127	71.0	196	68.3
Correct	123	31.9	122	42.2	129	52.2	107	59.8	151	52.6
Incorrect	13	3.4	54	18.7	32	13.0	20	11.2	45	15.7
None	249	64.7	113	39.1	86	34.8	52	29.1	91	31.7

Front Seats

	1997		1998		1999		2000		2001	
	No.	%								
Correct	69	38.5	34	40.0	58	55.8	38	67.9	79	60.3
Incorrect	10	5.6	25	29.4	16	15.4	6	10.7	26	19.8
None	100	55.9	26	30.6	30	28.8	12	21.4	26	19.8

Rear Seats

	1997		1998		1999		2000		2001	
	No.	%								
Correct	54	26.2	88	43.1	71	49.7	69	56.1	72	46.2
Incorrect	3	1.5	29	14.2	16	11.2	14	11.4	19	12.2
None	149	72.3	87	42.6	56	39.2	40	32.5	65	41.7

Table E-2. Charlottesville Restraint Use Rates, Occupants 4 to 16 Years of Age, 1997 to 2001

All Seating Positions

	1997		1998		1999		2000		2001	
	No.	%								
Total Use	73	48.1	77	67.6	75	79.8	70	85.3	67	74.4
Correct	65	42.8	59	51.8	61	64.9	58	70.7	52	57.7
Incorrect	8	5.3	18	15.8	14	14.9	12	14.6	15	16.7
None	79	52.0	37	32.5	19	20.2	12	14.6	23	25.6

Front Seats

	1997		1998		1999		2000		2001	
	No.	%								
Correct	37	51.4	13	43.3	26	66.7	26	78.8	26	60.5
Incorrect	5	6.9	10	33.3	8	20.5	4	12.1	10	23.2
None	30	41.7	7	23.3	5	12.8	3	9.1	7	16.3

Rear Seats

	1997		1998		1999		2000		2001	
	No.	%								
Correct	28	35.0	46	54.8	35	63.6	32	65.3	26	55.3
Incorrect	3	3.8	8	9.5	6	10.9	8	16.3	5	10.7
None	49	61.3	30	35.7	14	25.5	9	18.4	16	34.0

Table E-3. Danville Restraint Use Rates, Occupants 4 to 16 Years of Age, 1997 to 2001

All Seating Positions

	1997		1998		1999		2000		2001	
	No.	%								
Total Use	15	15.3	33	42.9	28	40.0	21	51.2	35	52.2
Correct	14	14.3	23	29.9	18	25.7	15	36.6	25	37.3
Incorrect	1	1.0	10	13.0	10	14.3	6	14.6	10	14.9
None	83	84.7	44	57.1	42	60.0	20	48.8	32	47.8

Front Seats

	1997		1998		1999		2000		2001	
	No.	%								
Correct	6	14.3	5	27.8	9	30.0	2	28.6	14	50.0
Incorrect	1	2.4	3	16.7	5	16.7	2	28.6	5	17.9
None	35	83.3	10	55.6	16	53.3	3	42.9	9	32.1

Rear Seats

	1997		1998		1999		2000		2001	
	No.	%								
Correct	8	14.3	18	30.5	9	22.5	13	38.2	11	28.2
Incorrect	0	0.0	7	11.9	5	12.5	4	11.8	5	12.8
None	48	85.7	34	57.6	26	65.0	17	50.0	23	59.0

Table E-4. Lynchburg Restraint Use Rates, Occupants 4 to 16 Years of Age, 1997 to 2001

All Seating Positions

	1997		1998		1999		2000		2001	
	No.	%								
Total Use	48	35.6	66	67.3	58	69.8	36	64.3	94	72.3
Correct	44	32.6	40	40.8	50	60.2	34	60.7	74	56.9
Incorrect	4	3.0	26	26.5	8	9.6	2	3.6	20	15.4
None	87	64.4	32	32.7	25	30.1	20	35.7	36	27.7

Front Seats

	1997		1998		1999		2000		2001	
	No.	%								
Correct	26	40.0	16	43.2	23	65.7	10	62.5	39	65.0
Incorrect	4	6.2	12	32.4	3	8.6	0	0.0	11	18.3
None	35	53.8	9	24.3	9	25.7	6	37.5	10	16.7

Rear Seats

	1997		1998		1999		2000		2001	
	No.	%								
Correct	18	25.7	24	39.3	27	56.3	24	60.0	35	50.0
Incorrect	0	0.0	14	23.0	5	10.4	2	5.0	9	12.9
None	52	74.3	23	37.7	16	33.3	14	35.0	26	37.1