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# Restraint System Usage in the Traffic Population

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<p>16. Abstract</p> <p>This report presents findings from four independent studies on occupant restraint use for various segments of the traffic population. Field observations, collected in 19 U.S. cities from January through December, 1984, are the basis for this report. The four studies and their findings are as follows:</p> <ol style="list-style-type: none"> <li>1. <u>Driver Safety Belt Use:</u> A total of 130,207 drivers stopped for traffic signals were observed during the 12 month period. 15.3 percent were observed to wear safety belts during the last data collection period (July to December).</li> <li>2. <u>Passenger Safety Belt and Child Safety Seat Use:</u> Findings from this study are based on 108,076 passengers observed at shopping mall entrances and exists. Child safety seat usage (for infants and toddlers) increased throughout 1984, reaching a high in the third quarter (July to December) of 49.3 percent. The percent of toddlers, subteens, teens, and adults wearing safety belts during the third quarter was observed to be 8.1, 15.2, 7.2, and 13.4 percent, respectively.</li> <li>3. <u>Safety Seat Installation Characteristics:</u> Observations were recorded on a total of 3,476 child safety seats in vehicles parked at shopping malls and 88.1 percent were observed in the toddler mode. For toddler seats that require securing by only the vehicle safety belt, 56.4 percent were used correctly. However, only 8.7 percent of toddler seats that require the safety belt and tether were used correctly.</li> <li>4. <u>Helmet Use by Operators and Passengers of Motorcycles and Mopeds:</u> Driver and passenger helmet use was observed to be 66.6 and 54.0 percent, respectively, for 14,898 motorcycle observations. Moped observations totalled 1,085 and helmet use among drivers and passengers was observed to be 42.1 and 35.0 percent, respectively.</li> </ol>			
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## SUMMARY

Four observational studies for various segments of the traffic population were continued in 19 cities throughout the nation. Data obtained through daytime observations at approximately 30 traffic intersections and 3 major shopping centers in each city are used to: (1) determine the extent to which drivers of automobiles wear safety belts; (2) determine the use of safety belts and child safety seats by passengers of automobiles; (3) determine safety seat installation characteristics; and (4) determine the extent to which helmets are used by operators and passengers of motorcycles and mopeds.

This report documents the procedures used to conduct the observational studies and the study findings for the period January through December, 1984.

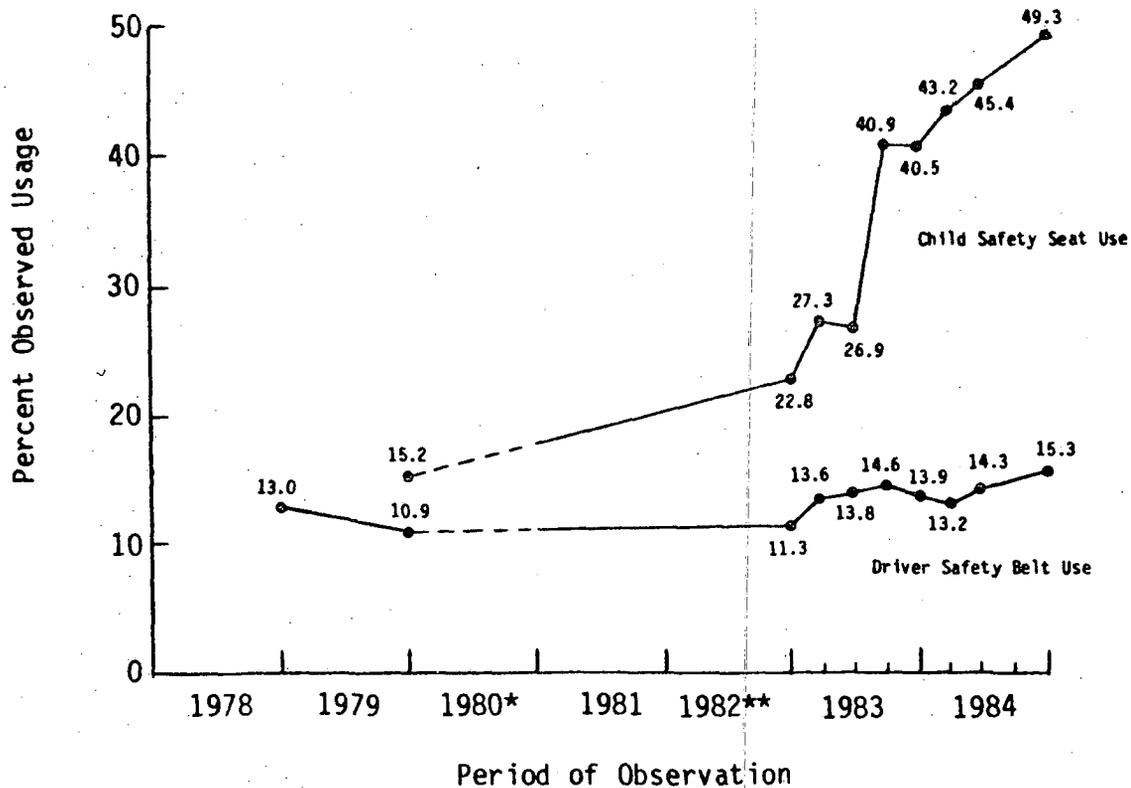
### Driver Study Findings

Based on a total of 130,207 observations of drivers stopped for traffic signals, the following major findings associated with driver safety belt usage were:

- Driver safety belt usage increased to 15.3 percent during the last quarter of calendar year 1984 (Figure 1).
- Driver safety belt usage increased as vehicle model year increased.
- Drivers of imported vehicles were observed to have higher safety belt usage rates than drivers of domestic vehicles.
- Driver safety belt usage increased as vehicle size decreased.
- Female driver safety belt usage was consistently higher than male driver safety belt usage.
- Driver safety belt usage was observed to be highest among the 25 to 49 year age group.
- Driver safety belt usage in the West region was consistently higher than in any other region.

### Passenger Study Findings

A total of 108,076 passengers were observed at shopping mall entrances/exits during a separate study. Figure 1 shows the upward trend in use of child safety seats during 1984, with usage increasing to 49.3 percent. By the end of 1984, 69.2 percent of infants and 47.4 percent of toddlers were observed travelling in a child safety seat. Passenger safety belt use during the same period (July to December) was observed to be 8.1 percent for toddlers, 15.2 percent for subteens, 7.2 percent for teens, and 13.4 percent for adults.



\*Data not collected in 1980.  
 \*\*Represents data collected in 1981 and 1982.

Figure 1. Driver safety belt and child safety seat use.

### Safety Seat Installation Findings

A total of 3,476 safety seats were observed in vehicles parked at shopping malls. Seats installed in the infant mode were observed in 327 of the observations while 3,064 seats were observed in the toddler mode. The remaining 85 observations involved booster seats. For toddler seats that require installation using only the vehicle safety belt, 56.4 percent appeared to be installed properly and seat belts were used incorrectly in 36.7 percent of the observations. For toddler seats that require belting and tethering, only 8.7 percent were observed to be correctly installed. Tethers were not used or used incorrectly in over 85 percent of observations. Incorrect belting was similar (35.4 percent) to that observed for the "belt-only" seats.

### Helmet Study Findings

Of the 14,898 motorcycle observations, driver and passenger helmet use was observed to be 66.6 and 54.0 percent, respectively. Helmet use for drivers and passengers of 1,085 moped observations was observed to be 42.1 and 35.0 percent, respectively.

## INTRODUCTION

This report presents the annual findings of the study, Restraint System Usage in the Traffic Population. The report is based on field observations collected over a 12-month period from January through December, 1984. During this period the use of occupant restraints including both safety belts and child safety seats was observed for over 238,000 drivers and passengers in over 206,000 passenger vehicles in 19 cities across the nation. Also during this time, helmet usage was recorded for operators and passengers of over 14,000 motorcycles.

### Study Objective

The objective of this study was to observe, record, and report the use of occupant restraints and motorcycle helmets in 19 cities throughout the country.

### Study Description

The study consisted of conducting four independent studies on occupant restraint use for various segments of the traffic population. The studies are: (1) driver safety belt use; (2) passenger safety belt and child safety seat use; (3) installation characteristics of child safety seats; and (4) helmet use by operators and passengers of motorcycles and mopeds. Each observational study is described below.

### Drivers in the Traffic Population (Driver Study)

The purpose of this study is to monitor the use of safety belts by drivers of privately-owned passenger cars at designated intersection and freeway exit locations. The data collected for each vehicle and driver are:

- License plate number
- Make/model of car
- Estimated age of driver and passengers
- Driver sex
- Observed driver safety belt usage
- The presence of automatic safety belts
- Seating position of passengers

### Passengers in the Traffic Population (Passenger Study)

The purpose of this study is to monitor the use of occupant restraint systems by passengers of private passenger cars at exits/entrances of selected shopping malls. Special emphasis is placed on observing child safety seat use by infants (less than 1 year of age) and toddlers (ages 1 to 4). The data collected for each passenger are:

- Estimated age.
- Seating position.
- Occupant restraint system used by each passenger.
- Safety seat usage characteristics for infants and toddlers.

### Installation Characteristics of Child Safety Seats (Parking Lot Study)

This study consists of observing infant, toddler and booster safety seats in parked cars located in shopping centers to obtain more detailed information on the installation of child safety seats in automobiles. The data collected in this study element are:

- Position of safety seat in vehicle.
- Tether usage (for toddler seats that require the use of tethers).
- Belt usage (for toddler seats that require that the lap belt be attached to the undercarriage of the toddler seat).
- Shield requirement on toddler seats (if the seat is a shield-type toddler seat).
- Toddler safety seat model (type of seat).
- Infant safety seat model (type of seat).

### Motorcycle/Moped Operators in the Traffic Population (Helmet Study)

The purpose of this study element is to monitor the use of helmets by operators and passengers of motorcycles and mopeds observed on the roadways.

#### METHODOLOGY

This study is a continuation of earlier studies conducted for the National Highway Traffic Safety Administration (NHTSA). In the current study, data are to be collected over a 24-month period from November, 1982 through October, 1984 in the same 19 cities that were used in the previous study.

The major elements of the study methodology are listed below and described in the following sections.

- Develop observation and training procedures.
- Train observers and supervisors.
- Collect data.
- Analyze data.

#### Observation and Training Procedures

At the outset of the study, plans were established for implementing the 24-month data collection effort. This involved the development of a data collection plan and training procedure for field personnel.

## Data Collection Plan

The primary objective of the data collection plan was to achieve maximum consistency between the current and previous study. Therefore, the cities, data collection sites, and data collection procedures that were used in the previous study were adopted or used as a foundation in the current effort.

### **Data Collection Sites**

The 19 cities in which data are currently collected are identical to those used in the previous study. The cities and corresponding data collection regions are listed below and shown geographically on Figure 2.

#### New England Region

Boston, MA  
Providence, RI

#### Mid-Atlantic Region

New York, NY  
Baltimore, MD  
Pittsburgh, PA

#### Southeast Region

Atlanta, GA  
Miami, FL  
Birmingham, AL  
New Orleans, LA

#### Southwest Region

Houston, TX  
Dallas, TX

#### Northcentral Region

Minneapolis-St. Paul, MN  
Chicago, IL  
Fargo, ND-Moorhead, MN

#### West Region

Seattle, WA  
San Francisco, CA  
San Diego, CA  
Phoenix, AZ  
Los Angeles, CA

The 19 cities selected for this study are from each geographical region of the country and provide a variety of climate and driving conditions. These cities are not considered a nationally representative sample of all U.S. cities. They were purposively selected to provide long term, cost-effective trend data. The same cities and sites within each city have been used since 1974 in successive observations.

### **Data Collection Schedule**

Initially, data collection schedules were established in strict conformance to the previous NHTSA studies. However, changes were made in response to new data reporting requirements.

The current schedule is based on the requirement to complete data collection activities at all sites in all cities during a 3-month period. To achieve this, 5 cities are completed each month along with 5 partially completed cities (approximately one-third of the partial cities are completed each month).

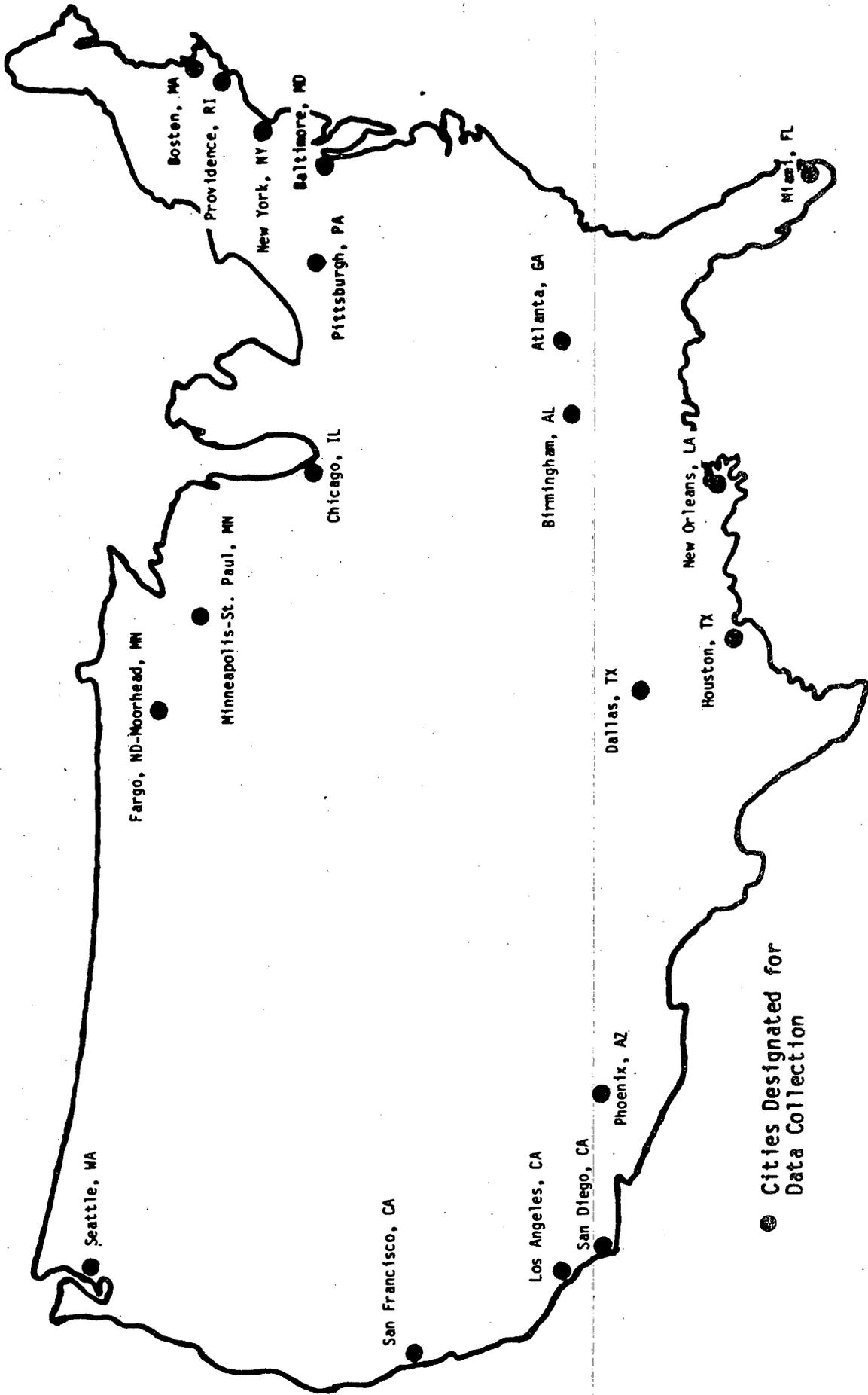


Figure 2. Location of the 19 cities for restraint usage observation.

Each city requires approximately 13.5 days of data collection for completion, consisting of approximately 7.5 days of driver study and 6 days of passenger study. Helmet study observations are recorded throughout the data collection stay as motorcycles and mopeds are observed.

The sites used for data collection in the driver study are primary road intersections and freeway exits. The sites were selected to be representative of a city as practically possible within self-imposed constraints. The sites were originally selected by Opinion Research Corporation (1) in an earlier study by a selection process that involved subdividing each city area (the corporate city, along with the contiguous suburban area) into a series of grids. The square grids were classified as being one of three groups: (1) squares in open country areas containing few or no primary road intersections; (2) squares containing one or more freeway exits; and (3) squares containing primary roads but no freeway exits.

Those squares in group 1 were not selected for sampling purposes. The squares in groups 2 and 3 were used to randomly select 22 primary road squares and 11 freeway squares. This stratification process was used to ensure that two different types of traffic would be sampled (i.e., high speed freeway traffic and slower speed arterial traffic).

For each of the selected 22 primary and 11 freeway grids, a list of 10 sites from randomly selected, controlled intersections were given to the observer. On the first trip to the city, the observer went to the first site listed within his pre-assigned grid. If the site was suitable for safety belt observation (i.e., a curb to stand on, sufficient traffic, safety for the observer, no construction, etc.), this site was used to represent the grid and the other sites were not used. If the first site on the list was unacceptable for safety belt observation, the observer would go to the next site on the list and repeat the process until an acceptable site was found.

In the current study, data are collected at 30 driver study sites (70 percent arterial and 30 percent freeway exit) in each city. In addition, 3 passenger study locations (shopping malls) were selected within each city by Opinion Research Corporation (1) and are used in the present study. These malls were originally selected to provide a mix of socioeconomic levels while at the same time providing sufficient traffic flow and good vantage points for conducting observations.

A data collection day consists of a minimum of six hours of data collection. For the driver study, 1.5 hours are spent at each of 4 sites per day. The passenger study requires 6 hours per day at a single shopping center during hours of operation. The driver study is usually conducted on Monday through Thursday. The passenger study is usually conducted on Friday through Sunday.

## Data Forms and Procedures

Data collection forms and procedures were also based on those used in the previous study. Minor modifications were made in the data collection forms to incorporate new data elements desired by NHTSA, to remove undesired data elements, and to facilitate data collection activities. The current data forms and instructions for their completion are provided in Appendix C.

Driver study procedures require data observers to collect data for a minimum of six hours per day; 1.5 hours at each of four sites. Collection site assignments are made by supervisory staff and consist of a specific date and time of day for each location. Time of day assignments correspond to one of the following time periods:

7:00 a.m. - 10:00 a.m.  
10:00 a.m. - 1:00 p.m.  
1:00 p.m. - 4:00 p.m.  
4:00 p.m. - 7:00 p.m.

To the extent practical, collectors are deployed to a given site on the same day and during the same time period each time the city is visited.

To the extent possible, only privately-owned passenger cars and station wagons with in-state license plates are eligible for the driver study. Trucks, taxi cabs, and marked company-owned cars (i.e., those used for commercial purposes) are not eligible.

The target observation at signalized intersections is the second car that stops at the traffic light in the near lane (curb lane). If time permits, additional observations are made (i.e., the third and fourth stopped cars). However, if only one car stops for a traffic light, that vehicle is observed. Any vehicle that stops for a stop sign can be observed. Observers do not go on the roadway and are only responsible for observing the cars in the curb lane.

Passenger study procedures require data observers to conduct six hours of data collection for each day of the passenger study. Data are collected on Saturdays, Sundays, and at times on Fridays during hours when the shopping center is open for business. These days maximize the chances of obtaining observations on infants and toddlers. For each quarter, six passenger study days are conducted in each city.

Only non-commercial passenger cars and station wagons are eligible for the passenger study. The primary target observations are vehicles with children in the car. When primary target vehicles are not available for observation, safety belt usage for all adult passengers in a particular vehicle is recorded.

Data collectors are positioned at curbside, at a stop sign or signal controlled exit from the shopping center with the greatest flow of traf-

fic. Observers do not go on the roadway and are only responsible for observing the cars in the curb lane.

Procedures for the study of child safety seat installation requires observers to observe parked vehicles which contain one or more safety seats (i.e., infant, toddler or booster safety seats) in shopping center parking lots. The study is conducted at the passenger study shopping centers. This study is conducted for approximately two hours per week at each shopping center on the normally scheduled days of the passenger restraint study. Upon completion of this study, the passenger study is conducted for the remainder of the day. This study does not change the daily, weekly or monthly data collection schedule.

The helmet study is conducted as a "second priority" activity to all other study elements. Target vehicles are any motorcycle, moped or motorized bike observed on the highway or freeway during driver and passenger study data collection periods. Observations regarding helmet use are recorded for both drivers and passengers.

### Development of Training Procedures

Training procedures were developed during the initial phases of the study and approved by NHTSA prior to conducting training activities. All procedures were developed around those used in the previous study to maximize consistency between the study efforts. Training included the study of an observer's manual, class room instructions, and in-field training. The total training program consisted of a 3 to 5 day training session, culminating in the certification of the observer for data collection activities.

### Observer and Supervisor Training

Field personnel consist of five field data observers and one supervisor. Prior to deployment, observers and the supervisor received the 3 to 5 days of training either in Detroit or at field locations. Additional training of up to a week is conducted by the supervisor in the region assigned to a particular observer. All observer training was conducted by the supervisor and/or senior staff members. Follow-up supervisor field visits are made at least twice per year and more frequently when the need arises.

### Data Collection

One data collection cycle (i.e., data collected at all sites in all 19 cities) is completed every three months. Field observers are permanently assigned to a city within one of five geographic regions of the country. Each observer has 3 to 4 cities within each region.

The supervisor is stationed in Detroit and is responsible for scheduling observer activities, supervising data entry and conducting data

quality control activities at field locations. Supervisory visits to each region are made on a routine basis or when the data collector or supervisor feels such a visit is warranted. During 1984, 22 days of supervisor visits were conducted. During these visits, field activities and observation techniques are monitored, procedural questions are answered, and observer accuracy and productivity is reviewed. Accuracy checks consists of the supervisor and observer collecting data independently on the same vehicles for both the driver and passenger study. Discrepancies are identified and discussed during the accuracy review.

### Data Analysis

At the end of each week, data forms are submitted by field observers for review and entered to computer files. Data summaries are generated on a monthly basis and submitted to NHTSA. NHTSA-initiated requests for information are also responded to.

## ANNUAL FINDINGS

The annual findings presented in this chapter are based on an analysis of data collected during the period January through December, 1984.

### Driver Study Findings

The following data summaries illustrate the total number of drivers observed (referred to as "Base") and the percentage of the total base observed using either lap and shoulder belt or lap belt only (referred to as "Percent Restrained"). The percent restrained figures represent usage rates for the combined 19-city base, with each observation receiving equal weight. This procedure was employed in previous NHTSA studies and thus allows for consistency in the comparison of results.

### Safety Belt Usage Trends

Annual driver safety belt usage rates from previous NHTSA studies show a slight trend upward during the period 1978 through 1984. The highest rate (14.4 percent) was observed in 1984. This driver safety belt usage rate of 14.4 percent consisted of 13.4 percent for lap and shoulder belt use and 1.0 percent for lap belt use only.

### Safety Belt Use by City and Quarter

In 1984, driver safety belt usage for the 19 cities was 14.4 percent. Driver safety belt usage rates by city and quarter are shown in Table 1. Annual usage rates ranged from a high of 30.1 percent in Seattle to a low of 7.1 percent in Providence (Table 1). The rank ordering of city usage rates shown in Table 1 was similar to the data collected in 1983 and 1981-82 driver usage rates.

Table 1. Driver safety belt usage by city and quarter.

City	First Quarter		Second Quarter		Third Quarter*		Total	
	Base	Percent Restrained	Base	Percent Restrained	Base	Percent Restrained	Base	Percent Restrained
Seattle	2,369	29.4	2,155	30.5	2,578	30.4	7,102	30.1
San Francisco	2,687	23.1	2,870	23.3	2,489	26.4	8,046	24.2
San Diego	2,928	18.8	2,976	23.0	2,617	19.8	8,521	20.6
Phoenix	1,710	18.6	2,049	19.5	2,048	22.7	5,807	20.3
Minn./St. Paul	2,915	20.5	2,971	20.4	2,212	19.7	8,098	20.2
Los Angeles	1,185	19.2	1,940	17.2	2,479	19.3	5,604	18.6
Pittsburgh	1,784	9.0	2,728	15.9	2,821	19.4	7,333	15.6
Houston	1,675	12.1	1,940	12.3	1,950	14.6	5,565	13.0
Dallas	1,808	10.7	1,938	13.0	2,041	14.4	5,787	12.8
Baltimore	1,690	13.9	2,554	11.9	2,392	10.2	6,636	11.8
Atlanta	2,187	9.4	2,425	10.4	2,429	13.5	7,041	11.1
Chicago	2,877	9.5	2,183	10.8	2,456	11.2	7,516	10.4
Miami	2,039	7.1	2,626	9.1	2,385	14.5	7,050	10.4
Boston	2,108	9.8	2,383	11.2	2,313	7.9	6,804	9.6
New Orleans	2,152	8.6	2,478	6.8	2,580	11.3	7,210	9.0
Birmingham	1,872	8.1	2,238	8.2	1,976	10.1	6,086	8.8
New York	1,888	8.1	2,358	8.3	2,400	8.2	6,646	8.2
Fargo/Moorhead	1,636	5.9	2,277	8.3	2,176	8.5	6,089	7.7
Providence	2,581	7.2	2,278	7.1	2,407	6.9	7,266	7.1
Totals	40,091	13.2	45,367	14.3	44,749	15.3	130,207	14.4

\* Note: The third quarter comprised the period July to December, 1984.

### Safety Belt Use by Region

Driver safety belt usage rates for the five data collection regions are shown in Table 2. The West region exhibited the highest rate while small differences were observed between other regions. This finding is supported by 1983 study results.

Table 2. Driver safety belt usage by region.

<u>Region</u>	<u>Base</u>	<u>Percent Restrained</u>
New England	14,070	8.3
Mid-Atlantic	20,615	12.0
Southeast	27,387	9.8
Southwest	11,352	12.9
Northcentral	21,703	13.3
West	<u>35,080</u>	<u>23.0</u>
Total	130,207	14.4

### Safety Belt Use by Vehicle Model Year

License plate numbers recorded during the driver study for the period January through September, 1984 were submitted to the various state departments of motor vehicles (DMV's) for the purpose of obtaining vehicle information. A total of 113,904 license plate numbers were submitted to 15 states DMV's. The DMV's returned 96,851 vehicle records which were processed with the "Vindicator" program furnished by the Highway Loss Data Institute of Washington, D.C. (3). The Vindicator program produced valid vehicle information for 80,286 vehicles (including vehicle make, model, model year, and size) for the model years 1967-1984 (pre-1967 vehicles were observed but could not be processed by the Vindicator program).

Table 3 gives driver safety belt usage rates for vehicles observed between January, 1984 and September, 1984. Overall 14.2 percent of drivers in this data subset were observed using safety belts. It can be seen that drivers of newer model cars, beginning in 1980, are more likely to wear safety belts than their counterparts in early model years. Driver safety belt usage by manufacturer's division for model years 1976-1984 can be found in Appendix A.

Table 3. Driver safety belt usage by model year.

<u>Model Year</u>	<u>Base</u>	<u>Percent Restrained</u>
1967	313	9.9
1968	405	11.4
1969	670	10.1
1970	841	8.3
1971	1,091	7.1
1972	1,748	8.1
1973	2,681	7.9
1974	3,193	9.0
1975	3,245	8.8
1976	4,956	9.2
1977	6,749	10.5
1978	7,802	11.8
1979	8,481	12.9
1980	7,518	15.5
1981	7,721	17.7
1982	7,888	20.0
1983	8,751	19.4
1984	6,233	18.8
Total	80,286	14.2

Safety Belt Use By Restraint System Type

Observed safety belt usage, stratified by type of safety belt system is shown in Table 4. Passive (automatic) safety belt systems comprised less than 1 percent of all driver observations and resulted in a usage rate of 88.0 percent. Manual system usage varied from 8.3 percent for separate systems to 14.5 percent for combination systems. Due to model year limitations of the Vindicator program, rates for pre-1967 model years which have only lap belt restraints, could not be determined. Both the percentage of passive systems in the traffic population and the usage rates of manual safety belts are comparable with the 1983 study.

Table 4. Driver safety belt usage by safety belt system type.

<u>Safety Belt System Type</u>	<u>Base</u>	<u>Percent Restrained</u>
Automatic (Passive) System	267	88.0
Lap/Shoulder Combination (Model Years 1974-1984)	72,269	14.5
Lap/Shoulder Separate (Model Years 1968-1973)	7,436	8.3

A summary of the specific vehicle types for which passive safety belt systems are an option is shown in Table 5. It can be seen that Toyota experiences the highest rates of passive safety belt usage with 97.5 percent while the VW Rabbit/Jetta has the lowest at 76.6 percent.

Table 5. Driver safety belt usage for vehicles with passive safety belt systems.

<u>Vehicles Make/System Type</u>	<u>Base</u>	<u>Percent Restrained</u>
Chevette - Automatic	23	82.6
Chevette - Manual	1,961	11.6
VW Rabbit/Jetta - Automatic	491	76.6
VW Rabbit/Jetta - Manual	1,341	28.4
Toyota - Automatic	240	97.5
Toyota - Manual	8,002	22.5

### Safety Belt Use by Driver Sex

Observed safety belt use stratified by driver sex is shown in Table 6. As in the 1983 study, female drivers are more likely to wear safety belts. In addition, the percentage of safety belt usage and difference in usage rates between driver sex is in similar proportions to the 1983 data. That is, the 1983 study rates were 12.4 percent for males versus 16.4 percent for females usage rates whereas, the current data indicates 12.7 percent for males versus 17.0 percent for females.

Table 6. Driver safety belt usage by driver sex.

<u>Driver Sex</u>	<u>Base</u>	<u>Percent Restrained</u>
Male	78,881	12.7
Female	51,326	17.0
Total	130,207	14.4

### Safety Belt Use by Driver Age

Table 7 shows that safety belt usage is highest among the 25 to 49 year age group (16.0 percent) and is the only "above average" group. The relative rankings between age groups are similar to 1983 results.

Table 7. Driver safety belt usage by age group.

<u>Age Group</u>	<u>Base</u>	<u>Percent Restrained</u>
Under 20	3,747	10.1
20-24	13,664	12.5
25-49	80,408	16.0
50 or over	32,369	11.8
Unknown	19	0.0
Total	130,207	14.4

## Safety Belt Use by Car Size

Using data generated from the Vindicator program, driver safety belt usage was stratified by vehicle size as shown in Tables 8 and 9. When all model years are included, drivers of smaller size vehicles with less than 111-inch wheelbases are much more likely to wear safety belts than drivers in larger vehicles (Table 8).

Table 8. Driver safety belt usage by vehicle size for all model years.

<u>Vehicle Size</u>	<u>Base</u>	<u>Percent Restrained</u>
Subcompact (wheelbase less than 101 inches)	28,770	19.8
Compact (wheelbase 101-111 inches)	25,564	14.3
Intermediate (wheelbase less 112-120 inches)	18,829	8.5
Full Size (wheelbase more than 120 inches)	7,123	6.3
Total	80,286	14.2

When only newer model cars (1976-1984) are considered, similar but slightly higher usage rates were observed. This is shown in Table 9.

Table 9. Driver safety belt usage by vehicle size for 1976-1984 model years.

<u>Vehicle Size</u>	<u>Base</u>	<u>Percent Restrained</u>
Subcompact (wheelbase less than 101 inches)	25,242	20.6
Compact (wheelbase 101-111 inches)	22,201	14.9
Intermediate (wheelbase 112-120 inches)	15,101	9.1
Full size (wheelbase more than 120 inches)	3,555	7.4
Total	66,099	15.4

### Safety Belt Use by Vehicle Make (Domestic versus Import)

Drivers of imported vehicles were observed to be twice as likely to wear safety belts than their domestic vehicle counterparts. Driver safety belt usage by vehicle make, generated from the Vindicator program, are shown in Tables 10 and 11. Table 10 shows that usage rates of 24.7 percent were observed for drivers of imported vehicles as opposed to 10.6 percent for domestic vehicles. The data summary is based on all model years observed.

Table 10. Driver safety belt usage by vehicle make for all model years.

<u>Vehicle Make</u>	<u>Base</u>	<u>Percent Restrained</u>
Domestic	60,113	10.6
Import	20,173	24.7
Total	80,286	14.2

Slightly higher usage rates for drivers of newer model cars (1976-1984) are shown in Table 11.

Table 11. Driver safety belt usage by vehicle make for 1976-1984 model years.

<u>Vehicle Make</u>	<u>Base</u>	<u>Percent Restrained</u>
Domestic	48,660	11.6
Import	17,439	26.0
Total	66,099	15.4

### Safety Belt Use by Vehicle Manufacturer

Summaries of driver safety belt use by vehicle manufacturer for all model years (based on data from the Vindicator program) and newer model years (1976-1984) are shown in Tables 12 and 13, respectively. Drivers of Volkswagen were observed wearing safety belts in 28.8 and 37.6 percent of the observations; the highest of any manufacturer. Drivers of Chrysler products experienced the highest usage rates of the domestic vehicle manufacturers. These manufacturers showed the highest rates for import and domestic vehicles in the 1983 study.

When the older model vehicles were removed from the data summaries, Volkswagen and Chrysler showed the greatest increase in driver usage rates. Safety belt usage for all other manufacturers remained relatively constant.

Table 12. Driver safety belt usage by vehicle manufacturer for all model years.

<u>Vehicle Manufacturer</u>	<u>Base</u>	<u>Percent Restrained</u>
AMC	1,117	9.9
Chrysler	7,800	13.5
Ford	13,995	9.9
GM	38,197	10.6
VW	2,697	28.8
Toyota	5,066	24.6
Datsun/Nissan	4,006	19.3
Other Imports	7,408	26.7
Total	80,286	14.2

Table 13. Driver safety belt usage by vehicle manufacturer for 1976 - 1984 model years.

<u>Vehicle Manufacturer</u>	<u>Base</u>	<u>Percent Restrained</u>
AMC	777	9.3
Chrysler	5,896	15.1
Ford	10,984	10.7
GM	31,791	11.5
VW	1,629	37.6
Toyota	4,559	25.7
Datsun/Nissan	3,569	19.8
Other Imports	6,894	27.1
Total	66,099	15.4

Since the three largest domestic manufacturers (GM, Ford and Chrysler) have a number of divisions under them (i.e., Dodge, Chrysler and Plymouth are divisions of Chrysler Corporation), driver safety belt usage was recorded for each division. Tables 14 and 15 illustrate driver safety belt usage rates for all model years (based on the Vindicator program outputs) and for newer model years (1976 - 1984), respectively. Table 14 shows that the Plymouth and Dodge divisions of Chrysler Corporation have the highest usage rates while the Lincoln division of Ford Motor Company has the lowest among the three largest domestic manufacturers. Table 15 shows similar usage rates for the subset of newer model years from 1976 to 1984. Divisions showing significantly higher usage rates for the newer models as compared to all models include Plymouth and Dodge. Driver safety belt usage by manufacturer's division and model year (1976-1984) are provided in Appendix A and safety belt usage by car series can be found in Appendix B.

Table 14. Driver safety belt usage by manufacturer's division for all model years.

<u>Manufacturer's Division</u>	<u>Base</u>	<u>Percent Restrained</u>
● Chrysler		
Chrysler	1,546	9.8
Dodge	2,595	13.3
Plymouth	2,749	13.5
● Ford		
Ford	10,694	10.5
Lincoln	896	5.4
Mercury	2,229	8.3
● GM		
Buick	7,198	11.6
Cadillac	3,360	8.3
Chevrolet	14,716	10.6
Oldsmobile	8,104	11.5
Pontiac	4,405	9.0

Table 15. Driver safety belt usage by manufacturer's division for 1976 - 1984 model years.

<u>Manufacturer's Division</u>	<u>Base</u>	<u>Percent Restrained</u>
● Chrysler		
Chrysler	1,318	10.5
Dodge	1,852	15.6
Plymouth	1,885	15.2
● Ford		
Ford	8,181	11.5
Lincoln	783	6.0
Mercury	1,926	9.0
● GM		
Buick	6,196	12.3
Cadillac	2,841	8.9
Chevrolet	11,687	11.7
Oldsmobile	7,092	12.4
Pontiac	3,652	10.1

Note: Manufacturer's division for which fewer than 50 vehicles were observed, are not reported in this table.

### Safety Belt Use By Time of Day

Three time related variables were examined with respect to driver safety belt use. Table 16 compares 1983 and 1984 usage rates stratified by the four daily data collection periods described earlier. It can be seen that in 1984, drivers are more likely to use safety belts during the evening commute followed by the morning commute. This finding is not consistent with the 1983 study which showed drivers are more likely to use safety belts primarily during the morning commute only.

Table 16. Driver safety belt usage by time period.

<u>Time Period</u>	1983		1984	
	<u>Base</u>	<u>Percent Restrained</u>	<u>Base</u>	<u>Percent Restrained</u>
7 - 10 a.m.	30,013	15.4	32,007	14.3
10 a.m. - 1 p.m.	42,976	13.4	38,312	13.6
1 - 4 p.m.	50,372	13.8	40,954	13.9
4 - 7 p.m.	22,944	13.9	18,934	17.3
Total	146,305	14.0	130,207	14.4

### Safety Belt Use By Site Characteristics

Tables 17 and 18 show safety belt usage rates stratified by site type and area type, respectively. Table 17 indicates that driver safety belt usage is higher on freeways than on non-freeway facilities. This characteristic was found in the 1983 study.

Table 17. Driver safety belt usage by site type.

<u>Site Type</u>	<u>Base</u>	<u>Percent Restrained</u>
Primary Road	93,971	13.4
Freeway Exit	36,236	17.1
Total	130,207	14.4

Safety belt use in city areas versus suburbs is shown in Table 18. City areas are characterized as central business district areas while suburb areas include heavy commercial, industrial or residential areas outside of the central city area. The current rates are higher than the 1983 study. The difference in rates between the strata are, however, similar.

Table 18. Driver safety belt usage by area type.

<u>Area Type</u>	<u>Base</u>	<u>Percent Restrained</u>
City	85,697	14.6
Suburb	44,510	14.0
Total	130,207	14.4

### Vehicle Occupancy

Safety belt use observations were only recorded for drivers in the driver study. However, information was recorded on the number of passengers in each vehicle for which a driver observation was made. Over 71 percent of the 130,207 vehicles observed were occupied by only the driver. Table 19 shows the passenger occupancy rates for all observed vehicles.

Table 19. Occupancy for vehicles observed in the driver study.

<u>Passenger Occupancy Per Vehicle</u>	<u>Observed</u>	<u>Percent of Total</u>
0	92,692	71.2
1	28,906	22.2
2	6,004	4.6
3	1,871	1.4
4 or more	734	0.6
Total	130,207	100.0

Table 20 shows the age distribution of passengers as observed in the driver study. Of the 130,207 vehicles observed, less than one percent had an infant passenger. The percentage of cars with passengers in the four other age categories were: toddlers 2.8 percent; subteens 3.3 percent; teens 2.7 percent; and adults 22.9 percent. These percentages are not representative of the distributions of passengers in the passenger study since in the passenger study observers are instructed to concentrate primarily on vehicles with toddlers and infants. In the driver study, the observers sample from the second car stopped for a traffic light.

Table 20. Percent of cars with passengers by age group in the driver study.

<u>Age Group</u>	<u>Percent of Vehicles</u>
Infants (less than 1 year)	0.2
Toddlers (1-4 years)	2.8
Subteens (5-12 years)	3.3
Teens (13-19 years)	2.7
Adults (20 and older)	22.9

## Analysis of Key Variables

In both the 1981-82 study (1) and the 1983 study (2), a number of key variables were identified as "predictors" of driver safety belt usage. The identified variables were:

- Model year of car (1976 and newer).
- Make of car (i.e., domestic or foreign).
- Size of car.
- Driver sex.
- Driver age.
- Data collection region.

To allow a basis for comparison between the 1983 study and current study, the above listed variables are presented in a series of pair-wise summaries, in a fashion similar to the 1983 study. For each of Tables 21-35 a summary of the major findings are provided in the following sections.

The data summaries are based on a "verified" subset of driver safety belt usage data. Verified data include those observations for which vehicle information was received from state DMV's. Data received from the various DMV's were analyzed using the "Vindicator" program furnished by the Highway Loss Data Institute (3). Vindicator program output allowed an analysis of driver study information with vehicle information such as model year of vehicle, make of the vehicle, and vehicle size (based on wheelbase length).

The verified data base consisted of 66,099 observations recorded over a nine-month period from January through September, 1984. A total of 113,904 driver observations were made during the nine-month period and submitted to various state DMV's. However, data submitted to Pennsylvania and Florida, totalling 11,998 observations, were not returned in time to be included as part of the verified data base. Therefore, the 66,099 observations represent 64.9 percent of the 101,906 observations made in 17 of the 19 cities (i.e., excluding Pittsburgh, PA and Miami, FL). The remaining 35.1 percent were not considered verified data due to a variety of reasons including data collector errors in recording vehicle license plate numbers, inaccuracies/inconsistencies in state DMV data base, inconsistencies between observed vehicle characteristics and vehicle characteristics contained in the DMV data bases, and limitations of the Vindicator data base. The driver safety belt usage rate for this data base was 14.2 percent compared to 14.4 percent for the 130,207 observations that represent the entire 1984 driver study data base.

#### **Driver Safety Belt Usage by Model Year and Driver Sex (Table 21)**

- Driver safety belt usage increased consistently among each sex as model year increased.
- Safety Belt usage for female drivers of 1976-1984 model year cars is consistently higher than male driver safety belt usage for the equivalent model years.
- The findings of this comparison are similar to the findings from the 1983 study.

#### **Driver Safety Belt Usage by Model Year and Driver Age (Table 22)**

- Driver safety belt usage increases were relatively consistent among each age group as vehicle model year increased.
- The age group of 25 to 49 experienced the highest driver safety belt usage for each model year.
- The findings of this comparison are similar to the findings of the 1983 study.

#### **Driver Safety Belt Usage by Model Year and Make (Table 23)**

- Driver safety belt usage increased consistently as model year increased for each make of vehicle (domestic or imported).
- Driver safety belt usage for imports was higher than safety belt usage for domestic cars during the same model year.
- The findings of this comparison are similar to the findings from the 1983 study.

#### **Driver Safety Belt Usage by Model Year and Region (Table 24)**

- Driver safety belt usage increased consistently for all regions as model year increased.
- Driver safety belt usage in the West region was higher for each model year than any other region.
- The findings of this comparison are similar to the findings from the 1983 study.

#### **Driver Safety Belt Usage by Model Year and Vehicle Size (Table 25)**

- Driver safety belt usage increased consistently for all vehicle sizes as model year increased.
- Driver safety belt usage increased consistently as vehicle size decreased for each model year.
- The findings of this comparison are similar to the findings of the 1983 study.

Table 21. Driver safety belt usage by model year (1976-1984) and driver sex.

<u>Driver Sex</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>Total</u>
Male	7.8% (2,857)	9.1% (3,890)	10.3% (4,227)	11.3% (4,655)	14.0% (4,069)	15.4% (4,293)	18.7% (4,566)	17.3% (5,294)	18.2% (4,095)	13.0% (37,946)
Female	11.0% (2,099)	12.5% (2,859)	13.6% (3,575)	14.9% (3,826)	17.4% (3,449)	20.5% (3,428)	21.8% (3,322)	22.7% (3,457)	19.8% (2,138)	17.3% (28,153)
Total	9.2% (4,956)	10.5% (6,749)	11.8% (7,802)	12.9% (8,481)	15.5% (7,518)	17.7% (7,721)	20.0% (7,888)	19.4% (8,751)	18.8% (6,233)	(66,099)

Note: The percentages indicate the safety belt usage rates of the base number of observations shown parenthetically.

Table 22. Driver safety belt usage by model year (1976-1984) and driver age.

<u>Driver Age</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>Total</u>
19 or under	5.4% (205)	4.7% (213)	8.7% (208)	12.6% (214)	9.3% (183)	15.3% (150)	11.7% (137)	20.7% (121)	11.9% (84)	10.4% (1,515)
20-24	7.4% (624)	10.5% (745)	10.9% (843)	10.3% (856)	13.1% (826)	15.7% (740)	15.2% (724)	16.2% (733)	13.8% (463)	12.5% (6,554)
25-49	10.3% (2,887)	11.6% (4,014)	13.1% (4,761)	14.5% (5,253)	17.0% (4,678)	18.9% (4,970)	22.1% (5,342)	21.4% (5,808)	21.0% (14,181)	17.1% (41,894)
50 or over	8.1% (1,238)	8.9% (1,775)	9.5% (1,989)	10.2% (2,155)	13.4% (1,830)	15.4% (1,861)	16.1% (1,684)	15.2% (2,089)	14.5% (1,503)	12.4% (16,124)
Total	9.2% (4,954)	10.5% (6,747)	11.8% (7,801)	12.9% (8,478)	15.5% (7,517)	17.7% (7,721)	20.0% (7,887)	19.4% (8,751)	18.8% (6,231)	(66,087)*

\* Age information were available for 66,087 of the 66,099 total observations.

Note: The percentages indicate the safety belt usage rates of the base number of observations shown parenthetically.

Table 23. Driver safety belt usage by model year (1976-1984) and make.

<u>Make</u>	<u>Model Year</u>									<u>Total</u>
	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	
Domestic	6.6% (4,062)	7.9% (5,575)	8.5% (6,074)	9.7% (6,685)	11.8% (5,244)	13.4% (5,158)	15.2% (5,107)	15.0% (5,895)	16.1% (4,860)	11.6% (48,660)
Import	20.7% (894)	22.8% (1,174)	23.4% (1,728)	25.1% (1,796)	24.2% (2,274)	26.4% (2,563)	28.8% (2,781)	28.6% (2,856)	28.3% (1,373)	26.0% (17,439)
Total	9.2% (4,956)	10.5% (6,749)	11.8% (7,802)	12.9% (8,481)	15.5% (7,518)	17.7% (7,721)	20.0% (7,888)	19.4% (8,751)	18.8% (6,233)	(66,099)

Note: The percentages indicate the safety belt usage rates of the base number of observations shown parenthetically.

Table 24. Driver safety belt usage by model year (1976-1984) and region.

Region	Model Year										Total
	1976	1977	1978	1979	1980	1981	1982	1983	1984		
New England	4.5% (671)	5.4% (808)	6.9% (981)	7.1% (1,005)	10.4% (933)	12.4% (980)	13.9% (996)	11.0% (1,179)	11.0% (1,001)	9.5% (8,554)	
Mid-Atlantic	5.1% (768)	5.2% (949)	8.1% (1,040)	8.0% (1,136)	12.0% (1,043)	14.7% (1,003)	14.7% (1,057)	16.0% (1,137)	13.9% (844)	11.0% (8,977)	
Southeast	4.6% (763)	7.2% (993)	6.0% (1,108)	7.2% (1,145)	9.6% (1,059)	12.9% (1,047)	15.1% (1,044)	17.2% (1,165)	16.4% (675)	10.7% (8,999)	
Southwest	5.0% (401)	6.2% (727)	9.0% (912)	9.1% (1,000)	12.7% (907)	15.2% (1,008)	18.2% (1,126)	16.8% (1,205)	14.5% (860)	12.8% (8,146)	
Northcentral	9.1% (1,071)	9.1% (1,420)	11.1% (1,459)	10.4% (1,683)	13.1% (1,349)	16.0% (1,409)	16.4% (1,362)	17.5% (1,669)	16.3% (1,176)	13.3% (12,598)	
West	18.2% (1,282)	20.1% (1,852)	19.9% (2,302)	23.3% (2,512)	24.7% (2,227)	25.6% (2,274)	30.3% (2,303)	29.0% (2,396)	30.7% (1,677)	24.9% (18,825)	
Total	9.2% (4,956)	10.5% (6,749)	11.8% (7,802)	12.9% (8,481)	15.5% (7,518)	17.7% (7,721)	20.0% (7,888)	19.4% (8,751)	18.8% (6,233)	(56,099)	

Note: The percentages indicate the safety belt usage rates of the base number of observations shown parenthetically.

Table 25. Driver safety belt usage by model year (1976-1984) and vehicle size.

<u>Vehicle Size</u>	<u>Model Year</u>									<u>Total</u>
	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	
Subcompact	14.4% (1,227)	19.4% (1,460)	19.4% (2,210)	19.7% (2,680)	20.4% (3,237)	21.6% (3,524)	22.1% (4,137)	22.1% (4,011)	20.7% (2,756)	20.6% (25,242)
Compact	9.8% (1,175)	10.8% (1,173)	9.4% (2,977)	11.2% (2,950)	12.8% (3,010)	15.9% (3,073)	20.0% (2,486)	20.3% (3,138)	20.4% (2,219)	14.9% (22,201)
Intermediate	6.0% (1,589)	7.5% (3,393)	8.9% (2,028)	8.8% (2,487)	9.7% (1,104)	10.0% (971)	13.1% (1,082)	11.1% (1,359)	12.2% (1,088)	9.1% (15,101)
Full Size	6.8% (965)	6.4% (723)	5.5% (587)	6.0% (364)	8.4% (167)	11.1% (153)	12.6% (183)	11.5% (243)	8.8% (170)	7.4% (3,555)
Total	9.2% (4,956)	10.5% (6,749)	11.8% (7,802)	12.9% (8,481)	15.5% (7,518)	17.7% (7,721)	20.0% (7,888)	19.4% (8,751)	18.8% (6,233)	(66,099)

Note: The percentages indicate the safety belt usage rates of the base number of observations shown parenthetically.

#### **Driver Safety Usage by Vehicle Make and Driver Sex (Table 26)**

- Driver safety belt usage among imports was higher than safety belt usage among domestic cars for each sex.
- Safety belt usage among female drivers was higher than male driver safety belt usage for both domestic and imported cars.
- The findings of this comparison are similar to the findings from the 1983 study.

#### **Driver Safety Belt Usage by Vehicle Make and Driver Age (Table 27)**

- Driver safety belt usage among imports was higher than restraint usage among domestic cars for each age group.
- The age group of 25 to 49 experienced the highest driver safety belt usage for each make.
- The findings of this comparison are similar to the findings from the 1983 study.

#### **Driver Safety Belt Usage by Vehicle Make and Region (Table 28)**

- Driver safety belt usage among imports was higher than safety belt usage among domestic cars for each data collection region.
- Driver safety belt usage in the West region was higher for each vehicle make than any other region.
- The findings of this comparison are similar to the findings from the 1983 study.

#### **Driver Safety Belt Usage by Vehicle Make and Vehicle Size (Table 29)**

- Driver safety belt usage among imports was higher than safety belt usage for drivers of domestic cars for each vehicle size.
- Driver safety belt usage generally increases as vehicle size decreases with each vehicle make.
- The findings of this comparison are similar to the findings from the 1983 study.

Table 26. Driver safety belt usage by vehicle make and driver sex.  
(1976-1984 model years)

<u>Driver Sex</u>	<u>Vehicle Make</u>		<u>Total</u>
	<u>Domestic</u>	<u>Import</u>	
Male	10.7% (28,490)	23.7% (9,456)	13.9% (37,946)
Female	12.8% (20,170)	28.8% (7,983)	17.3% (28,153)
Total	11.6% (48,660)	26.0% (17,439)	(66,099)

Table 27. Driver safety belt usage by vehicle make and driver age.  
(1976-1984 model years)

<u>Driver Age</u>	<u>Vehicle Make</u>		<u>Total</u>
	<u>Domestic</u>	<u>Import</u>	
19 or under	8.6% (1,146)	15.7% (369)	10.4% (1,515)
20-24	8.9% (4,238)	19.1% (2,316)	12.5% (6,554)
25-49	12.5% (29,168)	27.9% (12,726)	17.1% (41,894)
50 or over	10.7% (14,097)	24.3% (2,027)	12.4% (16,124)
Total	11.6% (48,649)	26.0% (17,438)	(66,087)*

\* Age information were available for 66,087 of the 66,099 total observations.

Note: Percentages indicate the safety belt usage rates of the base number of observations shown parenthetically.

Table 28. Driver safety belt usage by vehicle make and region.

(1976-1984 model years)

<u>Region</u>	<u>Vehicle Make</u>		<u>Total</u>
	<u>Domestic</u>	<u>Import</u>	
New England	6.4% (6,366)	18.5% (2,188)	9.5% (8,554)
Mid-Atlantic	7.3% (6,803)	22.7% (2,174)	11.0% (8,977)
Southeast	8.4% (7,032)	18.8% (1,967)	10.7% (8,999)
Southwest	10.1% (6,374)	22.3% (1,772)	12.8% (8,146)
Northcentral	11.5% (10,829)	24.1% (1,769)	13.3% (12,598)
West	19.9% (11,256)	32.4% (7,569)	24.9% (18,825)
Total	11.6% (48,660)	26.0% (17,439)	(66,099)

Table 29. Driver safety belt usage by vehicle make and vehicle size.

(1976-1984 model years)

<u>Vehicle Size</u>	<u>Vehicle Make</u>		<u>Total</u>
	<u>Domestic</u>	<u>Import</u>	
Subcompact	14.3% (10,201)	24.9% (15,041)	20.6% (25,242)
Compact	12.8% (19,931)	34.0% (2,270)	14.9% (22,201)
Intermediate	9.1% (14,984)	13.7% (117)	9.1% (15,101)
Full Size	7.4% (3,544)	18.2% (11)	7.4% (3,555)
Total	11.6% (48,660)	26.0% (17,439)	(66,099)

Note: The percentages indicate the safety belt usage rates of the base number of observations shown parenthetically.

#### **Driver Safety Belt Usage by Vehicle Size and Driver Sex (Table 30)**

- Driver safety belt usage for each sex decreased as vehicle size increased.
- Safety belt usage among female drivers was consistently higher than male driver safety belt usage for each vehicle size.
- The findings of this comparison are similar to the findings from the 1983 study.

#### **Driver Safety Belt Usage by Vehicle Size and Driver Age (Table 31)**

- Driver safety belt usage for each age group generally decreased as vehicle size increased.
- On a total basis, those drivers aged 25 to 49 years have a higher safety belt usage than any other age group.
- The findings of this comparison are similar to the findings from the 1983 study.

#### **Driver Safety Belt Usage by Vehicle Size and Region (Table 32)**

- Driver safety belt usage for each region consistently decreased as vehicle size increased.
- Driver safety belt usage in the West region was consistently higher than any other region by vehicle size.
- The findings of this comparison are similar to the findings from the 1983 study.

Table 30. Driver safety belt usage by vehicle size and driver sex.  
(1976-1984 model years)

Driver Sex	Vehicle Size				
	Subcompact	Compact	Intermediate	Full Size	Total
Male	19.1% (13,598)	13.8% (12,772)	8.3% (9,286)	6.8% (2,290)	13.9% (37,946)
Female	22.4% (11,644)	16.5% (9,429)	10.4% (5,815)	8.5% (1,265)	17.3% (28,153)
Total	20.6% (25,242)	14.9% (22,201)	9.1% (15,101)	7.4% (3,555)	(66,099)

Table 31. Driver safety belt usage by vehicle size and driver age.  
(1976-1984 model years)

Driver Age	Vehicle Size				
	Subcompact	Compact	Intermediate	Full Size	Total
19 or under	12.5% (791)	8.6% (408)	7.2% (263)	7.5% (53)	10.4% (1,515)
20-24	14.8% (3,847)	10.4% (1,752)	6.9% (825)	8.5% (130)	12.5% (6,554)
25-49	22.7% (17,270)	16.6% (13,949)	9.2% (8,796)	7.0% (1,879)	17.1% (41,894)
50 or over	18.5% (3,331)	12.8% (6,090)	9.5% (5,211)	7.8% (1,492)	12.4% (16,124)
Total	20.6% (25,239)	14.9% (22,199)	9.1% (15,095)	7.4% (3,554)	(66,087)

Note: The percentages indicate the safety belt usage rates of the base number of observations shown parenthetically.

Table 32. Driver safety belt usage by vehicle size and region.  
(1976-1984 model years)

Region	Vehicle Size				Total
	Subcompact	Compact	Intermediate	Full Size	
New England	13.7% (3,434)	8.2% (3,106)	4.4% (1,678)	3.9% (336)	9.5% (8,554)
Mid-Atlantic	17.3% (3,279)	9.9% (3,010)	5.0% (2,116)	3.0% (572)	11.0% (8,977)
Southeast	15.1% (2,863)	10.6% (3,017)	7.3% (2,515)	4.5% (604)	10.7% (8,999)
Southwest	16.6% (2,419)	13.4% (2,818)	9.1% (2,376)	7.9% (533)	12.8% (8,146)
Northcentral	17.5% (3,872)	14.6% (4,272)	8.6% (3,568)	6.9% (886)	13.3% (12,598)
West	28.4% (9,375)	24.1% (5,978)	17.3% (2,848)	16.5% (624)	24.9% (18,825)
Total	20.6% (25,242)	14.9% (22,201)	9.1% (15,101)	7.4% (3,555)	(66,099)

Note: The percentages indicate the safety belt usage rates of the base number of observations shown parenthetically.

#### **Driver Safety Belt Usage by Driver Sex and Region (Table 33)**

- Driver safety belt usage among females was higher than male driver safety belt usage in each region except the Southeast.
- Driver safety belt usage in the West region was higher than any other region among each sex.
- The findings of this comparison are relatively similar to the findings from the 1983 study.

#### **Driver Safety Belt Usage by Driver Sex and Driver Age (Table 34)**

- Driver safety belt usage among females was higher than male driver safety belt usage for each age group.
- Driver safety belt usage for those 25 to 49 years old was higher than any other age group for each sex.
- The findings of this comparison are similar to the findings from the 1983 study.

#### **Driver Safety Belt Usage by Driver Age and Region (Table 35)**

- Driver safety belt usage in every region except the Northcentral were highest for those 24 to 49 years old.
- Driver safety belt usage in the West region was higher than any other region for each age group.
- The findings of this comparison are relatively similar to the findings from the 1983 study.

Table 33. Driver safety belt usage by driver sex and region,  
(1976-1984 model years)

<u>Region</u>	<u>Male</u>	<u>Female</u>	<u>Total</u>
New England	7.9% (5,165)	11.8% (3,389)	9.5% (8,554)
Mid-Atlantic	9.2% (5,523)	14.0% (3,454)	11.0% (8,977)
Southeast	10.9% (4,942)	10.4% (4,057)	10.7% (8,999)
Southwest	12.7% (4,206)	12.8% (3,940)	12.8% (8,146)
Northcentral	11.7% (7,710)	15.7% (4,888)	13.3% (12,598)
West	23.0% (10,400)	27.3% (8,425)	24.9% (18,825)
Total	13.9% (37,946)	17.3% (28,153)	(66,099)

Table 34. Driver safety belt usage by driver sex and driver age.  
(1976-1984 model years)

<u>Driver Age</u>	<u>Driver Sex</u>		<u>Total</u>
	<u>Male</u>	<u>Female</u>	
19 or under	9.1% (792)	11.8% (723)	10.4% (1,515)
20-24	10.8% (3,367)	14.3% (3,187)	12.5% (6,554)
25-49	15.7% (23,288)	18.9% (18,606)	17.1% (41,894)
50 or over	11.3% (10,495)	14.5% (5,629)	12.4% (16,124)
Total	13.9% (37,942)	17.3% (28,145)	(66,087)

Note: The percentages indicate the safety belt usage rates of the base number of observations shown parenthetically.

Table 35. Driver safety belt usage by driver age and region.

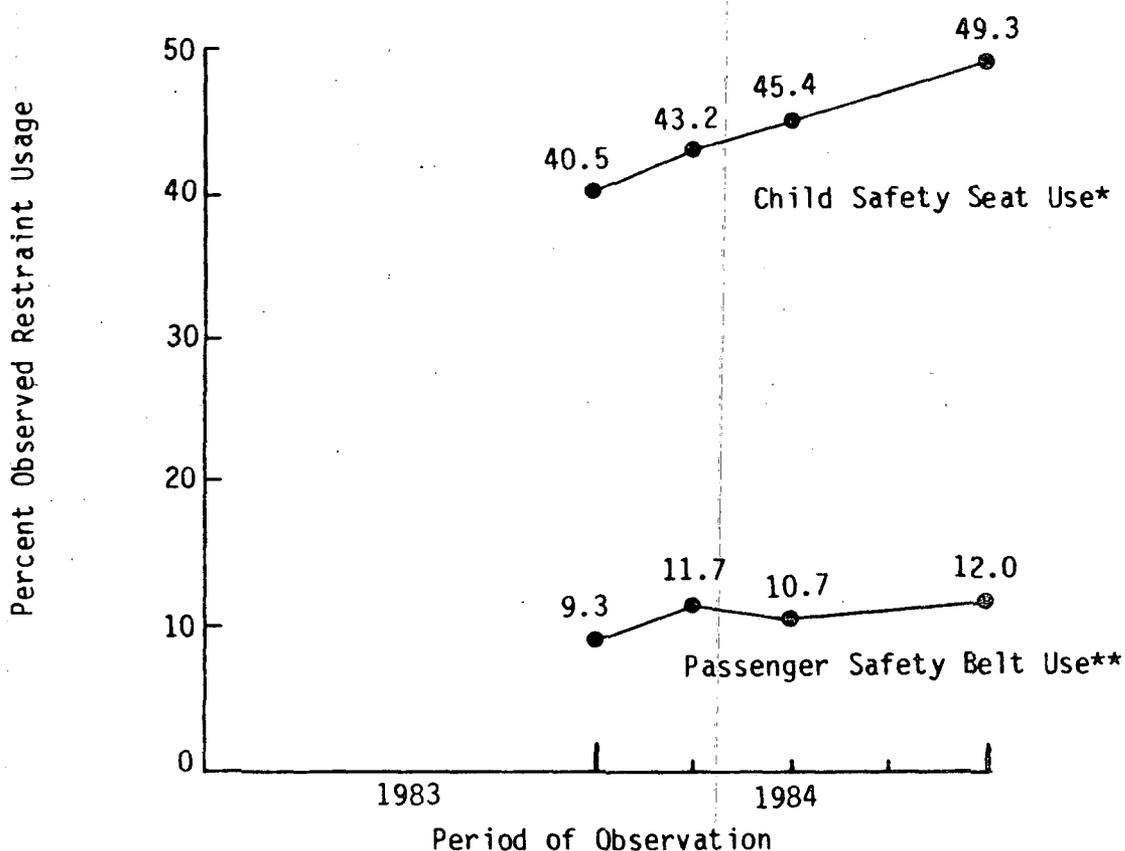
(1976-1984 model years)

Region	Driver Age				Total
	19 or under	20-24	24-49	50 or over	
New England	3.0% (100)	7.6% (1,151)	11.9% (4,904)	5.6% (2,399)	9.5% (8,554)
Mid-Atlantic	11.5% (78)	10.5% (956)	12.2% (5,819)	8.0% (2,124)	11.0% (8,977)
Southeast	6.5% (292)	9.9% (923)	11.8% (5,322)	9.1% (2,461)	10.7% (8,998)
Southwest	0.0% (22)	7.1% (567)	13.4% (6,170)	12.4% (1,382)	12.8% (8,141)
Northcentral	12.0% (911)	16.5% (1,617)	14.4% (6,643)	10.0% (3,425)	13.3% (12,596)
West	15.2% (112)	17.6% (1,340)	26.7% (13,036)	22.2% (4,333)	24.9% (18,821)
Total	10.4% (1,515)	12.5% (6,554)	17.1% (41,894)	12.4% (16,124)	13.3% (66,087)

Note: The percentages indicate the safety belt usage rates of the base number of observations shown parenthetically.

### Passenger Study Findings

A total of 108,076 passengers were observed in 76,022 vehicles during 1984. The data collection effort recognized three specific age groups within the "child" population: infants under one year old; toddlers from ages 1 to 4; and subteens from ages 5 to 12. Observers categorized children within one of these groups to the best of their ability. However, this observation is relatively difficult and prone to inaccuracies and, therefore, age group designation should be considered as approximate. Other age categories included teens (13-19 years old) and adults (20 years and older). Passenger safety belt and child safety seat use (children age 4 and under) are shown by calendar year for 1983 and by quarter for 1984 in Figure 3. The percentages contained in Figure 3 were obtained from the quarterly summaries presented in Appendix D. The highest child safety seat usage rate, 49.3 percent was observed in the third quarter (July through December) of 1984, based on 6,019 observations. The third quarter child safety seat usage rate is comprised of 69.2 percent for infants (526 observations) and 47.4 percent for toddlers (5,493 observations). Passenger safety belt use in the third quarter of 1984 was observed to be 12.0 percent based on 31,984 observations.



- \* Comprised of children age 4 and under (i.e., toddlers and infants).
- \*\* Comprised of passengers over 1 year of age (i.e., excluding infants).

Figure 3. Observed use of restraint system by quarter.

Table 36 summarizes 1984 passenger restraint system use for the various age groups. Observed safety belt use for subteens increased nearly 5 percent from 1983 and may be attributable to secondary effects of child restraint laws. Detailed summaries of the passenger study observations are provided in the next sections for each age group.

Table 36. Passenger restraint system by age group.

<u>Age Group</u>	<u>Base</u>	<u>Safety Seat</u>	<u>Safety Belt</u>	<u>Total</u>
Infant	1,493	66.4	0.5	66.9
Toddler	16,873	46.1	7.4	53.5
Subteen	14,346	1.2	13.5	14.7
Teen	13,575	N/A	7.2	7.2
Adult	61,789	N/A	13.0	13.0

#### Infants (Under 1 Year)

Infant observations consisted of recording the seating position and type of restraint for children estimated to be younger than 1 year of age. Possible observations for infant restraint type include:

- Safety belt
- Approved safety seat
- Unsafe seat (flimsy seat)
- No restraint

A total of 1,493 infants were observed in the passenger study. Of this total, 66.4 percent were observed in approved safety seats. Of the 502 infants not observed in safety seats, unused safety seats were observed in 102 (20.3 percent) of the observations. In addition, 28.4 percent of infants observed were held on passengers' laps. Flimsy (unapproved) seats were observed in 2.0 percent of the observations. Table 37 summarizes infant observations.

Table 37. Methods of restraining infants.

<u>Type of Restraint</u>	<u>Number</u>	<u>Percent</u>
Approved Infant Seat	991	66.4
Safety Belt	7	0.5
None or Unsafe Seats	495	33.1
On Lap	424	28.4
Unrestrained	41	2.7
Unsafe Seat	30	2.0
Total	1,493	100.0

If an infant was observed in an approved safety seat, use of the safety seat harness and safety belt attachment to the safety seat for non-convertible safety seats was recorded. If the infant was observed to be properly harnessed, belted, and facing toward the rear of the vehicle, the restraint condition was classified as "Appears Correct". If improper harnessing, belting or positioning is observed, the condition was classified as "Obviously Incorrect". Approximately 48 percent of observed infant seat observations were of the non-convertible type. Thus, the assessment of correct/incorrect belt use could be made accurately for these observations since the belt crosses in front of the infants.

Table 38 shows infant safety seat usage by city. Overall 37.8 percent of all infants were observed to be correctly harnessed in an approved safety seat.

Table 38. Infant safety seat usage by city.

<u>City</u>	<u>Base</u>	<u>Percent In Safety Seat</u>	<u>Percent Appears Correct</u>
San Diego	134	86.6	53.7
Chicago	71	81.7	45.1
Providence	45	80.0	51.1
Baltimore	79	78.5	51.9
Seattle	112	75.0	59.8
Atlanta	112	72.3	43.8
Boston	72	72.2	50.0
San Francisco	129	72.1	48.1
Fargo/Moorhead	44	68.2	22.7
Minneapolis/St. Paul	106	63.2	18.9
Miami	67	62.7	34.3
Birmingham	106	60.4	34.0
Houston	45	60.0	33.3
Pittsburgh	67	58.2	13.4
New York	49	57.1	38.8
Phoenix	28	53.6	25.0
Dallas	42	52.4	31.0
Los Angeles	48	45.8	22.9
New Orleans	137	38.7	14.6
Total	1,493	66.4	37.8

A comparison with the 1983 study results indicates an increase in the percentage of infants in safety seats. The 1983 study reported 60.4 percent in safety seats as compared to 66.4 in the current study.

For the 991 infants observed in safety seats, 57.0 percent were observed to be correctly harnessed (and belted for non-convertible seats). Table 39 shows the types of observed improper uses of infant safety seats.

Table 39. Characteristics of infants observed in safety seats.

<u>Safety Seat Usage</u>	<u>Number</u>	<u>Percent</u>
Correctly Used	565	57.0
No Harness	24	2.4
No Belt	150	15.2
No Harness or Belt	79	8.0
Other Unsafe Usage (primarily forward facing)	147	14.8
Unsure	26	2.6
Total	991	100.0

Table 40 shows that the 1,493 infants observed in the passenger study were more commonly transported in the front seat, with the front seat outboard position being the most likely position for an infant. Table 40 also shows that an infant in the back seat is more likely to be in an approved safety seat and properly transported in the seat than infants observed in the front seat. This phenomenon was also found in 1983.

Table 40. Safety seat usage for infants by seat position.

<u>Seat Position</u>	<u>Base</u>	<u>Percent Observed in Safety Seat</u>	<u>Percent Appears Correct</u>
Front Seat - Center	193	80.3	28.5
Front Seat - Outboard	770	52.1	35.5
Total Front Seat	963	57.7	34.1
Back Seat - Driver	192	82.3	40.6
Back Seat - Center	114	88.6	51.8
Back Seat - Outboard	222	78.4	44.6
Total Back Seat	528	82.0	44.7
Rear (for station wagons & hatchbacks)	2	100.0	50.0
Total	1,493	66.4	37.8

### Toddlers (Ages 1 to 4 Years)

Toddler observations consisted of recording the same types of data as collected for infants. However, due to the difficulty of observing the belting of the toddler safety seat (and in some cases the tether), the correct usage of the toddler seats was based on an observation of the harness or shield. In addition, some children who were classified as toddlers, were observed in booster seats.

A total of 16,873 toddlers were observed during the passenger study. Of these, 7,469 (44.3 percent) were observed in either a toddler seat or booster seat. Of the 9,404 toddlers that were not in safety seats, unused safety seats were observed in 9.4 percent of the vehicles. Table 41 summarizes the toddler observations.

Table 41. Methods of restraining toddlers.

<u>Type of Restraint</u>	<u>Number</u>	<u>Percent</u>
Approved Toddler Seat	7,060	41.9
Approved Booster Seat	409	2.4
Safety Belt	1,251	7.4
None or Unsafe Seats	8,153	48.3
On Lap	1,786	10.6
Unrestrained	6,334	37.5
Unsafe Seats	33	0.2
Total	16,873	100.0

A comparison of the above findings with those of 1983 indicates an increase in the percentage of toddlers in safety seats. Safety seat usage increased from 37.8 to 44.3 percent. Also, an increase was observed in the use of safety belts by toddlers from 5.3 percent to 7.4 percent and the use of flimsy seats decreased from less than 1 percent (in 1983) to 0.2 percent.

Table 42 shows the type of restraint usage by toddlers and the percentage of correct usage of safety seats by city. Overall, 31.7 percent of observed toddlers were correctly harnessed or shielded in a child safety seat.

Table 42. Restraint usage by city for toddlers.

<u>City</u>	<u>Base</u>	<u>Percent Observed Using Safety Belt</u>	<u>Percent Observed In Toddler Seats</u>	<u>Percent Harnesses/ Shielded In Toddler Seats</u>	<u>Percent Observed In Booster Seats</u>	<u>Percent Appears Correct In Booster Seats</u>	<u>Percent Observed In Safety Seats</u>
Miami	643	0.8	74.2	56.5	0.3	0.2	74.5
Atlanta	699	3.9	66.2	54.9	2.0	1.1	68.2
San Diego	1,061	10.1	61.7	51.0	5.0	2.4	66.7
Chicago	664	8.1	58.3	49.8	4.8	2.0	63.1
Birmingham	629	2.1	59.0	43.4	0.8	0.2	59.8
Seattle	913	14.1	55.0	42.5	5.7	2.0	57.1
Minneapolis/St. Paul	932	8.7	50.2	40.8	6.7	2.3	56.9
Providence	818	4.3	45.4	39.4	2.2	0.6	47.6
Boston	923	3.5	45.4	42.4	1.2	0.9	46.6
Baltimore	944	4.8	45.1	41.7	1.0	0.6	46.1
New York	716	4.2	44.1	38.8	1.4	0.7	45.5
Pittsburgh	818	13.4	36.7	28.6	5.1	1.2	41.8
San Francisco	1,440	8.5	39.0	26.1	2.7	1.2	41.7
Fargo/Moorhead	746	9.2	30.7	26.1	2.4	0.7	33.1
New Orleans	992	6.1	27.9	21.3	1.9	0.5	29.8
Los Angeles	1,047	9.6	22.3	14.0	1.3	0.3	23.6
Houston	942	8.4	21.9	12.7	0.1	0.0	22.0
Phoenix	967	8.7	21.3	12.7	0.1	0.0	21.4
Dallas	979	6.8	19.4	12.8	0.4	0.0	19.8
Total	16,873	7.4	41.8	33.2	2.4	0.9	44.3

Table 43 shows the result of the other observation categories for toddlers observed in toddler safety seats. Factors such as insufficient time or too many children affect the ability to make a positive observation regarding harnessing or shielding. These observations are reported as "unsure". Similarly, Table 44 summarizes the observations of toddlers in approved booster seats.

Table 43. Characteristics of toddlers observed in toddler safety seats.

<u>Toddler Seat Usage</u>	<u>Number</u>	<u>Percent</u>
Correctly Harnesses/Shielded	5,518	78.0
No Harness or Shield	1,455	20.6
Unsure	87	1.2
Total	7,060	100.0

Table 44. Characteristics of toddlers observed in booster seats.

<u>Booster Seat Usage</u>	<u>Number</u>	<u>Percent</u>
Correctly Used	152	37.1
Harness/Lap Belt	70	17.1
Shoulder/Lap Belt	82	20.0
Lap Belt Only	196	47.9
No Harness/Belt	51	12.5
Unsure	10	2.4
Total	409	100.0

The relationship between seating position and safety belt/seat use is summarized in Table 45. As was the case for infants, toddlers in approved safety seats are more likely to be observed in the back seat than in the front; 57.5 percent in back compared to 21.0 percent in the front seat. Similarly, correct usage was high for toddlers positioned in the back seat. This phenomenon was also reported in 1983.

Table 45. Safety seat/belt usage by seat position for toddlers.

<u>Seat Position</u>	<u>Base</u>	<u>Percent Observed Using Safety Belt</u>	<u>Percent Observed In Toddler Seats</u>	<u>Percent Harnessed/ Shielded In Toddler Seats</u>	<u>Percent Observed In Booster Seats</u>	<u>Percent Appears Correct In Booster Seats</u>	<u>Percent Observed In Safety Seats</u>
Front Seat - Center	1,428	5.0	13.7	10.3	1.1	0.1	14.8
Front Seat - Outboard	4,341	9.6	20.4	15.7	2.7	1.7	23.1
Front Seat - Total	5,769	8.4	18.8	14.4	2.3	1.3	21.0
Back Seat - Driver	3,435	9.3	56.4	44.3	3.3	0.7	59.7
Back Seat - Center	3,244	2.6	46.8	38.5	1.4	0.3	48.1
Back Seat - Outboard	4,179	8.1	60.0	47.8	2.9	0.9	62.9
Back Seat - Total	10,858	7.0	54.9	43.9	2.6	0.7	57.5
Rear	246	1.6	5.3	4.5	0.4	0.4	5.7
Total	16,873	7.4	41.8	33.2	2.4	0.9	44.3

### Subteens (Ages 5 to 12 Years)

A total of 14,346 subteens were observed in the 19 cities during the passenger study. Use of the booster seats were observed in approximately 1.1 percent of the cases. Safety belt use for this age group was found to be 13.5 percent. This compares to 8.6 percent in 1983. Table 46 shows safety belt usage by city for the subteen age group.

Table 46. Passenger safety belt usage by city for subteens.

<u>City</u>	<u>Base</u>	<u>Percent Restrained</u>
Seattle	529	31.4
San Diego	718	28.0
Chicago	810	20.9
Pittsburgh	798	16.5
Minneapolis/St. Paul	1,119	16.4
Atlanta	1,192	13.8
San Francisco	712	13.5
Baltimore	624	13.5
Miami	667	13.2
Boston	686	12.7
Providence	398	11.6
Fargo/Moorhead	665	10.4
Birmingham	1,154	10.0
New York	760	8.6
Los Angeles	572	8.4
Dallas	654	7.8
Phoenix	749	7.7
Houston	649	7.7
New Orleans	890	7.2
Total	14,346	13.5

Table 47 shows subteen safety belt usage by seating position. The current study indicates that the majority of subteens were observed in front seat positions. The 1983 study reported the same finding. Comparisons of safety belt usage did, however, indicate different findings. In the current study, there is about a four percent difference between front and back seat safety belt usage for subteens. In the 1983 effort, subteens were observed to be over twice as likely to wear safety belts in the front seat.

Table 47. Passenger safety belt usage for subteens by seat position.

<u>Seat Position</u>	<u>Base</u>	<u>Percent Restrained</u>
Front Seat - Center	837	4.1
Front Seat - Outboard	5,096	18.2
Total Front Seat	5,933	16.2
Back Seat - Driver	2,674	15.3
Back Seat - Center	2,332	4.8
Back Seat - Outboard	3,017	14.7
Total Back Seat	8,023	12.1
Rear (i.e., station wagons & hatchbacks)	390	1.8
Total	14,346	13.5

#### Teens (Ages 13 to 19 Years)

This age group was observed to have the lowest safety belt usage of the age groups for which safety belts are designed. Of a total of 13,575 teens, only 7.2 percent were observed using safety belts. This compares with 7.0 percent for 10,937 teens observed in the 1983 study. Table 48 shows teen safety belt usage by city for each of the 19 cities. The percentage of use range from a high of 19.0 percent for Seattle to a low of 2.6 percent for Baltimore.

Safety belt use by seating position (Table 49) indicates that teens in front seat positions were about three times more likely to be observed wearing safety belts than those in back seat positions. Also, the majority of teens were observed in the front seat. Similar distribution of seating positions and the differential in the front versus back seat usage rates were observed in the 1983 study.

Table 48. Passenger safety belt usage for teens by city.

<u>City</u>	<u>Base</u>	<u>Percent Restrained</u>
Seattle	321	19.0
San Diego	477	14.5
Minneapolis/St. Paul	1,650	12.3
Chicago	584	9.1
Pittsburgh	1,366	7.7
Atlanta	961	7.6
Birmingham	787	7.6
San Francisco	133	6.8
Houston	636	6.0
Boston	600	6.0
Los Angeles	456	5.9
Fargo/Moorhead	1,121	5.6
Miami	713	5.6
New Orleans	789	4.9
Providence	734	4.0
Dallas	645	3.7
Phoenix	642	3.6
New York	536	3.2
Baltimore	424	2.6
Total	13,575	7.2

Table 49. Passenger safety belt usage for teens by seat position.

<u>Seat Position</u>	<u>Base</u>	<u>Percent Restrained</u>
Front Seat - Center	573	0.0
Front Seat - Outboard	8,819	9.7
Total Front Seat	9,392	9.1
Back Seat - Driver	1,324	3.7
Back Seat - Center	745	1.2
Back Seat - Outboard	2,074	3.0
Total Back Seat	4,143	2.9
Rear (i.e., station wagon & hatchbacks)	40	0.0
Total	13,575	7.2

### Adults (20 Years and Older)

Adult passengers were observed wearing safety belts in 13.0 percent of 61,789 observations. This compares with 10.5 percent usage rates for the 1983 study. Table 50 shows the number of observations and percent safety belt usage for each of the 19 cities. The highest safety belt usage was observed in Seattle (30.4 percent) and the lowest was observed in Providence (6.1 percent).

Table 50. Passenger safety belt usage for adults by city.

<u>City</u>	<u>Base</u>	<u>Percent Restrained</u>
Seattle	2,856	30.4
San Diego	3,254	28.9
Minneapolis/St. Paul	3,617	18.2
San Francisco	1,931	17.1
Phoenix	3,730	17.0
Chicago	2,279	15.3
Dallas	3,439	13.8
Pittsburgh	3,222	13.4
Los Angeles	2,578	12.9
Houston	3,602	11.6
Atlanta	4,485	10.9
Fargo/Moorhead	2,576	10.2
Miami	3,645	9.0
Boston	3,916	8.6
Birmingham	3,098	8.0
New Orleans	3,132	7.5
Baltimore	3,186	7.3
New York	3,664	7.0
Providence	3,579	6.1
Total	61,789	13.0

Adults observed in the front seat were observed to use safety belts in 14.5 percent of the observations while only 2.1 percent safety belt usage was observed for back seat adult passengers (Table 51). This finding was supported by the 1983 data.

Table 51. Passenger safety belt usage for adults by seat position.

<u>Seat Position</u>	<u>Base</u>	<u>Percent Restrained</u>
Front Seat - Center	897	0.8
Front Seat - Outboard	53,548	14.7
Total Front Seat	54,445	14.5
Back Seat - Driver	2,319	2.3
Back Seat - Center	549	0.9
Back Seat - Outboard	4,459	2.1
Total Back Seat	7,327	2.1
Rear (i.e., station wagons and hatchbacks)	17	0.0
Total	61,789	13.0

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Total Back Seat	7,327	2.1
Rear (i.e., station wagons and hatchbacks)	17	0.0
Total	61,789	13.0

## Study of Child Safety Seat Installation

Passenger study observations are made from curb locations, near the exit points of selected shopping malls. Due to the limited time available to make an observation from such a vantage point, the assessment of several aspects of child safety seats are difficult or impossible to observe. For example, observations of the make of safety seat, the correctness of the vehicle safety belt use and the correctness or need for tethering are difficult to make. As a result, the primary toddler safety seat observation in the passenger study is that of observing how the child is harnessed in the safety seat and whether a shield is properly used (for those safety seats designed with shields). In order to better determine the usage characteristics of child safety seats, a study was designed to provide information on safety seat installation that could not be obtained as part of the passenger study.

During the special study, 3,476 safety seats were observed in parked vehicles at selected shopping malls. The type of safety seat and the observed mode of use are shown in Table 52. Of the 327 seats observed in an infant mode (rearward facing), 163 (49.8 percent) were of the "infant-only" (non-convertible) variety. That is, the seats cannot be converted between infant and toddler modes. For infant-only seats, relatively similar numbers of the INFANT LOVE SEAT and DYN-0-MITE seats were observed. The most prominent "convertible" seat, observed in the infant mode was the STROLEE seat. STROLEE was also the most frequently observed seat in the toddler mode. CENTURY BOOSTER seats were observed in use in 38.8 percent of the booster seat observations. Overall, STROLEE safety seats were observed most often (34.8 percent).

Table 52. Types of child safety seats observed during special study  
(percentage of safety seat observations  
by mode is shown parenthetically).

<u>Name/ Manufacturer</u>	<u>Observed Mode</u>			<u>All Safety Seats</u>
	<u>Infant</u>	<u>Toddler</u>	<u>Booster</u>	
Infant Love Seat	96(29.4)	N/A	N/A	96( 2.8)
Dyn-0-Mite	59(18.0)	N/A	N/A	59( 1.7)
Other Infant Seat	8( 2.4)	N/A	N/A	8( 0.2)
Bobby-Mac	13( 4.0)	198( 6.5)	0( 0.0)	211( 6.1)
Century	35(10.7)	710(23.2)	33(38.8)	778(22.4)
Cosco	26( 8.0)	293( 9.6)	4( 4.7)	323( 9.3)
Questor (Kantwet)	35(10.7)	509(16.6)	0( 0.0)	544(15.6)
Strolee	45(13.8)	1,152(37.6)	12(14.1)	1,209(34.8)
Kolcraft	6( 1.8)	84( 2.7)	32(37.6)	122( 3.5)
Teddytot (Astroseat)	4( 1.2)	118( 3.9)	4( 4.7)	126( 3.6)
Totals	327(100.0)	3,064(100.0)	85(100.0)	3,476(100.0)

Within the toddler seat category, two types of systems are available for securing the safety seat to the vehicle seat; (1) securing with the safety belt only, and (2) securing with the safety belt and a tether. Of the 3,064 toddler seats, 64.2 percent of the belt only and 35.8 percent of the belt and tether systems were observed.

A total of 1,968 toddler seats were observed that require securing with safety belts only. Observations of how these seats were secured is shown in Table 53. In 56.4 percent of the observations, the safety belt was properly used to secure the toddler seat. The safety belt was observed not to be in use in 6.9 percent of the observations and improperly used 36.7 percent of the time.

Table 53. Toddler seat use characteristics by manufacturer (for toddler seats that require securing by only the vehicle safety belt).

<u>Manufacturer</u>	<u>Base</u>	<u>Percent Appears Correct</u>	<u>Percent Car Belt Not Used</u>	<u>Percent Car Belt Used Incorrectly</u>
Bobby Mac	198	97.0*	1.5	1.5
Century	613	50.6*	5.4	44.0
Cosco	293	56.0	6.5	37.5
Questor (Kantwet)	509	47.0	9.6	43.4
Strolee	153	64.7	4.6	30.7
Kolcraft	84	53.6	25.0	21.4
Teddytot (Astroseat)	118	50.8	2.5	46.6
Total	1,968	56.4	6.9	36.7

\* Some safety seats require safety belt attachment around the child as opposed to direct attachment to the safety seat. These seats were coded as "Appears Correct".

For the 1,096 toddler seats that require both a safety belt and tether for proper securing, 8.7 percent were observed to be properly secured in the vehicle (see Table 54). Failure to tether the seat was the most predominant type of misuse observed. However, when a tether was used, it was used improperly in only 1.9 percent of the observations. On the otherhand, the safety belt was used in 91.7 percent of all observations (8.3 percent unused), however in over 35 percent of the observations, the safety belt was incorrectly attached to the toddler seat.

Table 54. Toddler seat use characteristics by manufacturer  
(for toddler seats that require the vehicle  
safety belt and tether strap).

<u>Manufacturer</u>	<u>Base</u>	<u>Percent Appears Correct</u>	<u>Percent Tether Not Used</u>	<u>Percent Tether Used In- correctly</u>	<u>Percent Belt Not Used</u>	<u>Percent Car Belt Used In- correctly</u>
Century	97	12.4	77.3	4.1	2.1	10.3
Strolee	999	8.3	84.1	1.7	8.9	38.8
Total	1,096	8.7	83.5	1.9	8.3	35.4

### Helmet Study Findings

During the period January to December, 1984, 18,094 observations were made of helmet use by operators and passengers of motorcycles and mopeds. Of 14,898 motorcycle drivers, 66.6 percent were observed wearing helmets compared to 42.1 percent for drivers of mopeds (motorized bicycle). Passengers of motorcycles and mopeds were less likely to be observed wearing helmets with 54.0 and 35.0 percent of their respective bases. Tables 55 and 56 show the helmet usage rates in each city for motorcycles and mopeds respectively.

In order to examine differences in helmet use given the existence of mandatory helmet use laws, motorcycle usage rates were stratified into a group with mandatory helmet use laws and a group with no or limited helmet laws. Table 57 shows the seven cities in which mandatory helmet laws exist. Helmet use for drivers and passengers were recorded to be 99.7 and 98.4 percent, respectively.

Table 58 lists the twelve cities with no or limited laws. Driver and passenger helmet use rates were observed to be 51.3 and 34.8 percent respectively.

The helmet use rates shown in Tables 57 and 58 were similar to those reported in the previous study.

Table 55. Helmet use for motorcycle operators and passengers.

<u>City</u>	<u>Driver Base</u>	<u>Percent Helmet On</u>	<u>Passenger Base</u>	<u>Percent Helmet On</u>
Boston	281	97.5	37	89.2
Providence	378	36.0	47	80.9
New York	363	99.4	60	93.3
Baltimore	269	53.2	43	44.2
Pittsburgh	294	100.0	44	100.0
Chicago	984	36.1	140	23.6
Minneapolis/St. Paul	641	51.5	89	32.6
Fargo/Moorhead	1,129	44.0	126	32.5
Miami	1,143	99.7	140	99.3
Atlanta	1,060	100.0	94	100.0
Birmingham	850	100.0	130	100.0
New Orleans	734	99.7	102	99.0
Seattle	692	74.4	73	65.8
San Francisco	1,179	54.1	166	38.0
San Diego	2,223	64.6	272	40.8
Los Angeles	974	41.7	178	16.9
Phoenix	887	44.5	161	29.8
Houston	394	47.0	50	26.0
Dallas	423	42.6	59	25.4
Total	14,898	66.6	2,011	54.0

Table 56. Helmet use for moped operators and passengers.

<u>City</u>	<u>Driver Base</u>	<u>Percent Helmet On</u>	<u>Passenger Base</u>	<u>Percent Helmet On</u>
Boston	8	62.5	1	0.0
Providence	14	7.1	0	--
New York	20	90.0	2	100.0
Baltimore	8	25.0	0	--
Pittsburgh	3	66.7	0	--
Chicago	46	19.6	3	0.0
Minneapolis/St. Paul	20	25.0	4	0.0
Fargo/Moorhead	17	17.6	2	0.0
Miami	91	49.5	10	60.0
Atlanta	30	93.3	4	100.0
Birmingham	33	100.0	3	100.0
New Orleans	72	90.3	11	90.9
Seattle	52	53.8	5	40.0
San Francisco	171	37.4	10	30.0
San Diego	379	31.4	28	10.7
Los Angeles	86	23.3	17	11.8
Phoenix	23	17.4	0	--
Houston	1	0.0	0	--
Dallas	11	54.5	0	--
Total	1,085	42.1	100	35.0

Table 57. Motorcycle helmet use in cities with mandatory helmet use laws.

<u>City</u>	<u>Driver Base</u>	<u>Percent Helmet On</u>	<u>Passenger Base</u>	<u>Percent Helmet On</u>
Boston	281	97.5	37	89.2
New York	363	99.4	60	93.3
Pittsburgh	294	100.0	44	100.0
Miami	1,143	99.7	140	99.3
Atlanta	1,060	100.0	94	100.0
Birmingham	850	100.0	130	100.0
New Orleans	734	99.7	102	99.0
Total	4,725	99.7	607	98.4

Table 58. Motorcycle helmet use in cities with no or limited helmet use laws.

<u>City</u>	<u>Driver Base</u>	<u>Helmet On</u>	<u>Passenger Base</u>	<u>Helmet On</u>
Providence	378	36.0	47	80.9
Baltimore	269	53.2	43	44.2
Chicago	984	36.1	140	23.6
Minneapolis/St. Paul	641	51.5	89	32.6
Fargo/Moorhead	1,129	44.0	126	32.5
Seattle	692	74.4	73	65.8
San Francisco	1,179	54.1	166	38.0
San Diego	2,223	64.6	272	40.8
Los Angeles	974	41.7	178	16.9
Phoenix	887	44.5	161	29.8
Houston	394	47.0	60	26.0
Dallas	423	42.6	59	25.4
Total	10,173	51.3	1,404	34.8

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3. Vindicator 84 User's Guide, Release No. 1, Highway Loss Data Institute, December, 1983.

APPENDIX A - DRIVER SAFETY BELT USAGE BY MANUFACTURER'S DIVISION AND  
MODEL YEAR (1976-1984)

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Table A.1. Driver safety belt usage for American Motors by model year.

<u>Model Year</u>	<u>Base</u>	<u>Percent Belted</u>
1976	125	4.0
1977	99	7.1
1978	81	3.7
1979	76	6.6
1980	100	13.0
1981	73	6.8
1982	50	16.0
1983	30	13.3
1984	<u>12</u>	<u>16.7</u>
Total	646	8.0

Table A.2. Driver safety belt usage for Plymouth by model year.

<u>Model Year</u>	<u>Base</u>	<u>Percent Belted</u>
1976	224	11.2
1977	277	10.5
1978	233	12.9
1979	204	12.3
1980	138	15.2
1981	256	20.7
1982	176	20.5
1983	217	18.4
1984	<u>160</u>	<u>17.5</u>
Total	1,885	15.2

Table A.3. Driver safety belt usage for Dodge by model year.

<u>Model Year</u>	<u>Base</u>	<u>Percent Belted</u>
1976	194	13.9
1977	251	8.4
1978	207	16.4
1979	229	16.2
1980	170	15.3
1981	190	20.0
1982	164	15.9
1983	270	18.1
1984	<u>177</u>	<u>16.9</u>
Total	1,852	15.6

Table A.4. Driver safety belt usage for Chrysler by model year.

<u>Model Year</u>	<u>Base</u>	<u>Percent Belted</u>
1976	110	7.3
1977	170	9.4
1978	203	9.4
1979	211	7.6
1980	70	7.1
1981	62	11.3
1982	114	11.4
1983	221	13.6
1984	<u>157</u>	<u>15.9</u>
Total	1,318	10.5

Table A.5. Driver safety belt usage for Buick by model year.

<u>Model Year</u>	<u>Base</u>	<u>Percent Belted</u>
1976	407	5.2
1977	633	6.5
1978	624	9.8
1979	670	8.5
1980	783	12.0
1981	754	14.7
1982	791	15.5
1983	879	16.6
1984	<u>655</u>	<u>16.3</u>
Total	6,196	12.3

Table A.6. Driver safety belt usage for Chevrolet by model year.

<u>Model Year</u>	<u>Base</u>	<u>Percent Belted</u>
1976	957	6.6
1977	1,335	9.4
1978	1,617	8.1
1979	1,626	9.9
1980	1,575	12.4
1981	1,308	12.3
1982	1,141	15.0
1983	1,211	15.6
1984	<u>917</u>	<u>18.1</u>
Total	11,687	11.7

Table A.7. Driver safety belt usage for Cadillac by model year.

<u>Model Year</u>	<u>Base</u>	<u>Percent Belted</u>
1976	256	5.9
1977	341	9.4
1978	367	7.4
1979	447	9.4
1980	273	9.2
1981	231	8.7
1982	299	11.7
1983	356	9.6
1984	<u>271</u>	<u>8.5</u>
Total	2,841	8.9

Table A.8. Driver safety belt usage for Oldsmobile by model year.

<u>Model Year</u>	<u>Base</u>	<u>Percent Belted</u>
1976	436	5.5
1977	725	7.3
1978	747	8.8
1979	980	11.0
1980	764	12.4
1981	840	13.8
1982	765	16.5
1983	1,026	15.4
1984	<u>809</u>	<u>16.2</u>
Total	7,092	12.4

Table A.9. Driver safety belt usage for Pontiac by model year.

<u>Model Year</u>	<u>Base</u>	<u>Percent Belted</u>
1976	269	4.1
1977	420	6.9
1978	493	7.7
1979	557	6.1
1980	423	11.1
1981	381	11.3
1982	407	14.7
1983	388	13.9
1984	<u>314</u>	<u>17.2</u>
Total	3,652	10.1

Table A.10. Driver safety belt usage for Ford by model year.

<u>Model Year</u>	<u>Base</u>	<u>Percent Belted</u>
1976	821	6.7
1977	954	7.3
1978	1,115	7.7
1979	1,185	11.2
1980	729	10.8
1981	790	13.2
1982	884	15.2
1983	848	15.7
1984	<u>855</u>	<u>17.2</u>
Total	8,181	11.5

Table A.11. Driver safety belt usage for Mercury by model year.

<u>Model Year</u>	<u>Base</u>	<u>Percent Belted</u>
1976	192	6.8
1977	242	5.4
1978	254	6.3
1979	328	5.2
1980	136	5.9
1981	174	13.8
1982	178	16.9
1983	210	12.9
1984	<u>212</u>	<u>12.3</u>
Total	1,926	9.0

Table A.12. Driver safety belt usage for Lincoln by model year.

<u>Model Year</u>	<u>Base</u>	<u>Percent Belted</u>
1976	55	1.8
1977	87	1.1
1978	95	4.2
1979	119	5.9
1980	51	5.9
1981	52	5.8
1982	91	6.6
1983	100	3.0
1984	<u>133</u>	<u>14.3</u>
Total	783	6.0

Table A.13. Driver safety belt usage for Volkswagen by model year.

<u>Model Year</u>	<u>Base</u>	<u>Percent Belted</u>
1976	125	32.0
1977	159	30.8
1978	206	35.4
1979	226	46.9
1980	297	39.7
1981	220	43.6
1982	190	35.8
1983	107	34.6
1984	<u>99</u>	<u>26.3</u>
Total	1,629	37.6

Table A.14. Driver safety belt usage for Toyota by model year.

<u>Model Year</u>	<u>Base</u>	<u>Percent Belted</u>
1976	234	20.9
1977	423	20.3
1978	521	19.8
1979	476	20.0
1980	689	22.5
1981	689	28.0
1982	741	30.9
1983	785	33.4
1984	<u>1</u>	<u>100.0</u>
Total	4,559	25.7

Table A.15. Driver safety belt usage for Datsun/Nissan by model year.

<u>Model Year</u>	<u>Base</u>	<u>Percent Belted</u>
1976	221	17.2
1977	247	21.1
1978	368	20.9
1979	357	17.9
1980	537	15.6
1981	505	19.2
1982	551	21.1
1983	524	22.9
1984	<u>259</u>	<u>22.8</u>
Total	3,569	19.8

Table A.16. Driver safety belt usage for other imports by model year.

<u>Model Year</u>	<u>Base</u>	<u>Percent Belted</u>
1976	235	19.1
1977	190	22.1
1978	443	23.5
1979	444	25.2
1980	438	24.0
1981	700	24.7
1982	810	29.8
1983	926	25.9
1984	<u>696</u>	<u>27.9</u>
Total	4,882	25.7

APPENDIX B - DRIVER SAFETY BELT USAGE BY CAR SERIES BY  
MANUFACTURER'S DIVISION

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The tables in Appendix B show driver safety belt usage for 1976-1984 model years by car series for each manufacturer. Only those models that have 50 or more observations are presented.

<u>Manufacturer/Series</u>	<u>Base</u>	<u>Percent Belted</u>
<u>American Motors</u>		
Concord	231	8.7
Eagle	65	9.2
Gremlin	58	3.4
Pacer	101	6.9
Spirit	95	10.5
<u>Plymouth</u>		
Fury	115	5.2
Horizon	474	19.8
Reliant	555	19.8
Volare	665	10.5
<u>Dodge</u>		
Aries	422	19.2
Aspen	519	12.5
Diplomat	136	10.3
Omni	417	21.1
400	58	17.2
<u>Chrysler</u>		
Cordoba	353	8.8
LeBaron	462	11.3
New Yorker	326	8.9

<u>Manufacturer/Series</u>	<u>Base</u>	<u>Percent Belted</u>
<u>Buick</u>		
Century	968	17.0
Electra	697	9.8
Le Sabre	967	9.5
Regal	1,983	10.0
Riviera	349	8.0
Skyhawk	203	19.2
Skylark	954	16.2
<u>Chevrolet</u>		
Camaro	984	10.6
Caprice	1,562	11.6
Cavalier	576	19.6
Celebrity	488	23.0
Chevelle	307	5.9
Chevette (Regular)	1,527	11.1
Citation	1,128	17.9
Corvette	98	5.1
Impala	1,017	9.6
Malibu	1,352	12.7
Monte Carlo	1,581	6.4
Monza	284	7.7
Nova	679	8.5
Vega	73	9.6

<u>Manufacturer/Series</u>	<u>Base</u>	<u>Percent Belted</u>
<u>Cadillac</u>		
Brougham	366	10.9
Deville	1,466	7.6
Eldorado	528	8.3
Seville	436	12.8
<u>Oldsmobile</u>		
Custom Cruiser	157	15.3
Cutlass	3,706	11.5
Delta 88	1,235	10.7
Firenza	106	25.5
Ninety-Eight	767	10.0
Omega	425	17.2
Toronado	199	9.5
Ciera	458	21.0
<u>Pontiac</u>		
Bonneville	612	10.3
Catalina	150	12.0
Firebird	492	7.5
GrandPrix	953	5.9
Grand Le Mans	162	15.4
J 2000/2000	202	18.8
Le Mans	132	6.8
Phoenix	286	14.7
Sunbird	212	5.2
T 1000/1000	136	6.6
6000	190	23.7

<u>Manufacturer/Series</u>	<u>Base</u>	<u>Percent Belted</u>
<u>Ford</u>		
Elite	55	3.6
Escort	1,019	15.2
EXP	88	19.3
Fairmont	1,111	14.3
Fiesta	151	15.2
Ford Wagon	188	12.2
Granada	1,179	8.5
LTD	1,260	10.6
LTD II	219	3.7
Maverick	123	12.2
Mustang	1,177	11.1
Pinto	449	11.6
Tempo	242	20.7
Thunderbird	831	7.8
Torino	67	9.0
<u>Mercury</u>		
Capri	140	7.1
Cougar	536	6.7
Lynx	145	13.8
Marquis	544	9.6
Monarch	230	8.3
Zephyr	197	10.7

<u>Manufacturer/Series</u>	<u>Base</u>	<u>Percent Belted</u>
<u>Lincoln</u>		
Continental	461	5.9
Mark Series	294	6.5
<u>Foreign Models</u>		
Audi	443	28.2
BMW	250	27.6
Datsun/Nissan	3,569	19.8
Fiat	182	22.0
Honda	2,800	28.3
Mazda	1,020	24.6
Mercedes Benz	213	20.2
Peugeot	50	20.0
Porsche	96	27.1
Renault	229	20.5
Saab	112	31.3
Subaru	481	19.8
Toyota	4,559	25.7
Volkswagen Rabbit	1,166	41.7
Volkswagen Other	463	27.4
Volvo	841	36.9

**APPENDIX C - DATA FORMS AND INSTRUCTIONS**

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## Driver Study Data Form

Printed data forms entitled "Driver Restraint Observation: Form #1" will be used in the study (Figure C.1). Fifty observations can be recorded on the front and back of the form. Use as many forms as necessary but always use a new form when you change to a new site. Send all completed forms to Goodell-Grivas, Inc. using the addressed envelopes provided at the end of each week.

### General Information

The top portion of each form provides a description of observer, location, date and environmental conditions. This information is very important to the study and should be completed prior to each collection period at a location.

1. Observer: Write in your last name.
2. City: Write in the city.
3. Day: Circle the appropriate day of the week.
4. Date: Write in the month, date, and year. For example write in 11/15/82 for November 15, 1982.
5. Area Type: Circle the appropriate description of the area.  
City - Downtown, central city area  
Suburban - Heavy commercial, industrial or highly residential area outside the central city area.
6. Location No: Record the number shown on your site listing or map.
7. Site: Circle the appropriate description of primary road or freeway exit.
8. Location: Write in the street name on which data are collected and the direction (north, east, south, west) and name of the nearest cross-street.
9. Roadway Conditions: Circle the condition which best describes the road condition at the time of observation.
10. Start Time: Specify the hour and minutes, and circle AM or PM for the start of the collection period.
11. End Time: Specify the hour and minutes, and circle AM or PM for the ending of the collection period.

DRIVER RESTRAINT OBSERVATION: FORM #1

1. Observer: \_\_\_\_\_ 2. City: \_\_\_\_\_  
 3. Day: Su M Tu W Th F Sa 4. Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_  
 5. Area Type: City Suburb 6. Location No.: \_\_\_\_\_  
 7. Site: Primary Road Freeway Exit  
 8. Location: On \_\_\_\_\_ N E S W Of \_\_\_\_\_  
 (Street Name) (Nearest X-Street)  
 9. Road Conditions: Dry Wet Snow/Ice  
 10. Start Time: \_\_\_\_\_ AM PM 11. End Time: \_\_\_\_\_ AM PM

No.	License number	Make (Model)	Model Code	Driver Sex 1 M 2 F	Adult Seat 1 Both 2 Lap 3 None	Automatic Restraint System 1 Yes 2 No	Driver and Passenger Position by Age Group			Rear of Sta. Wagon Hatchback Number of Children
							Driver	Center	Outboard	
1.										
2.										
3.										
4.										
5.										
6.										
7.										
8.										
9.										
10.										
11.										
12.										
13.										
14.										
15.										
16.										
17.										
18.										
19.										
20.										

Age Group: 1-Infant (Under 1 yr) 2-Toddler (1-4 yrs) 3-Subteen (5-12) 4-Teenager (13-19) 5-Adult (20-24) 6-Adult (25-49) 7-Adult (50 yr over) 8-Child on Lap

**Figure C.1. Driver study data form.**

## Observation Data

Complete one line on the form for each vehicle observed. Start with the second car stopped for the traffic light. Obtain an additional observation during the red light if time permits. If only one car stops at the light, observe that car.

1. License Number: The license numbers of the cars you observe are a very important part of the information you collect. By comparing the license numbers with records of the Department of Motor Vehicles (DMV's), we will be able to ascertain model year and obtain other needed information about the car observed.

Be sure to print the license number so it is both accurate and legible. Print in bold letters and numbers, i.e., DXU 613. Be careful when printing "U" and "V".

2. Make (Model): We are interested in the general make categories. For example, under the make of Chevrolet, there are several specific models such as: Caprice, Impala, BelAir, Chevelle, Nova, Vega, Camaro, Monte Carlo, and Corvette. All of these should be listed as Chevrolet. Other makes like Ford, AMC, etc., have similar categories. Models within a given make category differ in size as well as name. They may also differ in type of safety belt installation. These differences are important.

Most cars carry the model identification on the car. For these cars, you will be able to obtain the make identification by simply reading it off the car. If the make is not readily apparent, as is possible on some older or damaged cars, you will have to settle for the general car make (domestic or foreign). Where possible, we prefer a specific make category. However, if the rest of the data is good, an observation with general car model, is still usable information.

3. Model Code: At the end of the observation period or day, for each make name recorded, insert the appropriate two-digit code in the space provided. You will be provided with a list of model names and codes to assist you in the coding task. If the model name that you have recorded is not on the list, use code 29 for other domestic make and code 59 for other import make.

4. Driver Sex: Write in the code to describe the sex of the driver.

5. Observed Driver Restraint System Usage: There are only three possible code categories for describing the drivers use of shoulder harness and lap belts. These are:

Both On (Code 1)

This means that a positive observation has been made that the lap belt is across the driver's waist or lap and that the shoulder harness is over the driver's left shoulder.

Lap Belt Only (Harness Off) (Code 2)

The driver has the lap belt across the waist or lap but does not have the shoulder harness over the left shoulder. In cars that have a one-piece harness and belt, drivers who are buckled up but are not wearing the shoulder harness over the left shoulder may either have the harness under the arm or behind the back. This is not the proper way to wear the harness, and if it is in either of these positions, you should record Code 2.

In cars that have a two-piece harness and belt, the shoulder harness is a separate strap that is stored in a clip attached to the car's headliner or simply left dangling if it is not stored properly. If you observe that the shoulder harness is not being worn or not being worn properly, but that the lap belt has been buckled, you should record Code 2.

NOTE: In older model cars that have only a lap belt, record Code 2 if the driver is belted and record Code 3 if the driver is not belted. You will never use Code 1 if the car contains only a lap belt.

None (Code 3)

If the driver is not wearing either the lap belt or shoulder harness, record Code 3.

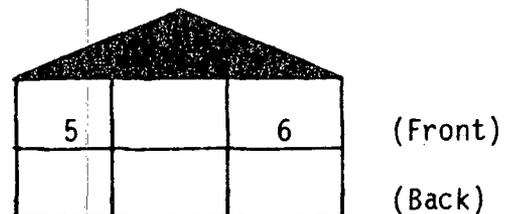
**6. Automatic Restraint System:** The automatic safety belt system will be found mainly in newer Volkswagon Rabbits and Jettas, Chevrolet Chevettes, and Toyota Cressidas. When observing these three makes, you will have to determine whether the belt system is an "automatic" system (Code 1) or a regular lap and shoulder combination system (Code 2). The automatic belt is designed to fit across the driver and front seat passenger each time he/she enters the car and closes the door. Each time he/she leaves the car by opening the door, the belt is designed to let the driver or passenger exit without unbuckling. When observing the type of belt system, particularly in Rabbits, Jettas, Chevettes and Toyotas, if you see that the safety belt is attached to the door or there is a buckle on the door with no belt attached to it, you can be fairly certain that the car has an automatic belt system.

An automatic shoulder harness is standard equipment in the Toyota Cressida, which is the only Toyota model which has an automatic restraint device. This vehicle also is equipped with a separate lap belt which has to be manually fastened. Automatic safety belts are also currently available in the diesel VW Rabbit and Jetta models but were discontinued as an option in the Chevrolet Chevette in 1981. Although it has been discontinued there are still some Chevettes with automatic safety belts in the traffic population.

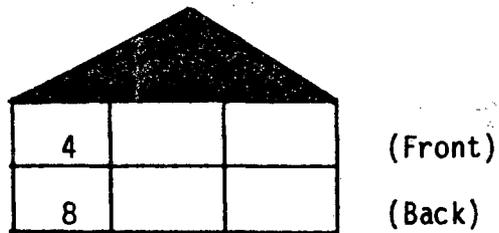
**7. Driver and Passenger Position by Age Group:** Record the age group code shown at bottom of the form in one of the six seat position boxes on the observation form. The six boxes are intended to illustrate the six seat positions of the passenger car with the driver side on the left, and the outboard on the right as indicated on the form.

Examples:

Adult driver (age 20-24) and  
adult passenger (age 25-49)  
on front seat:



Teen driver and adult passenger  
with infant on lap in back seat  
on driver's side:



The age groups codes for the driver and/or passengers are:

1 = Infant (under 1 yr.)	2 = Toddler (1-4 yrs.)	3 = Subteen (5-12 yrs.)	4 = Teen (13-19 yrs.)
5 = Adult (20-24 yrs.)	6 = Adult (25-49 yrs.)	7 = Adult (50 or over)	8 = Child on Lap

**8. Rear of Station Wagon or Hatchback:** Record number of children who are riding behind the back seat of a station wagon or hatchback.

## Passenger Study Data Form

Printed data forms entitled "Passenger Restraint Observation: Form #2" will be used in this study (Figure C.2). Fifty passenger observations can be recorded on the front and back of the form. Use as many forms as necessary for a study period but begin each collection period with a new form. For example, if you collect data for a two-hour period and then take a break, use a new data form to show the start and end time for the next collection period. Send all completed forms to Goodell-Grivas, Inc. on Friday every week.

### General Information

The top portion of each form provides a description of observer, location, date and environmental conditions. This information is very important to the study and should be completed prior to each collection period at a location.

The general information needed is similar to that required for the Driver Study form. The exceptions are items 7 and 8. For item 7, write in the name of the shopping center shown on your list of locations. For item 8, write in the street name onto which the vehicles are exiting. If you change locations, begin a new data form.

### Observation Data

Complete one line on the form for each passenger (not including the driver) observed. For example, if an observed vehicle has a driver and three passengers, three lines will be coded for the observation.

1. Total Passengers: Write total number of passengers in the car. Do not count the driver. This is only recorded once for each vehicle when recording data for the first passenger in the vehicle.
2. Age Group: Write in the age group code for each passenger. Refer to bottom of the form for a description of the age range for each group.
3. Seat: Write in the seat code number 1 for front seat, 2 for back seat, and 3 for the rear of station wagons or hatchbacks, for each passenger.

PASSENGER RESTRAINT OBSERVATION: FORM #2

1. Observer: \_\_\_\_\_ 2. City: \_\_\_\_\_  
 3. Day: Su M Tu W Th F Sa 4. Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_  
 5. Area Type: City Suburb 6. Location No.: \_\_\_\_\_  
 7. Shopping Center: \_\_\_\_\_  
 8. Exit To: \_\_\_\_\_  
 (Street Name)  
 9. Road Conditions: Dry Wet Snow/Ice  
 10. Start Time: \_\_\_\_\_ AM PM 11. End Time: \_\_\_\_\_ AM PM

No.	Total Passengers	Age Group*	Seat			Position	Passenger Restraint	Infant Seat	Toddler Seat	Booster Seat
			1 Front	2 Back	3 Rear		1 L/S Belt	1 Harness/Car Belt	1 Harness/Shield	1 Harness/Lap Belt
1.										
2.										
3.										
4.										
5.										
6.										
7.										
8.										
9.										
10.										
11.										
12.										
13.										
14.										
15.										
16.										
17.										
18.										
19.										
20.										

\*Age Group: 1 - Infant (Under 1 yr) 2 - Toddler (1-4 yrs) 3 - Subteen (5-12) 4 - Teenager (13-19) 5 - Adult (20-24) 6 - Adult (25-49) 7 - Adult (50 or over)

Figure C.2. Passenger study data form.

4. Position: Write in the position code number 1, if passenger is located on the driver side, 2 for center, or 3 for outboard seat for each passenger.
5. Passenger Restraint: Write in the code number showing the restraint system observed for each passenger.

Lap/Shoulder Belt (Code 1)

This means that a positive observation has been made that the lap belt is across the passengers waist or lap and that the shoulder harness is over the passengers shoulder.

Lap Belt Only (Shoulder Harness Off) (Code 2)

The passenger has the lap belt across the waist or lap but does not have the shoulder harness over the shoulder.

In cars that have a one-piece harness and belt, passengers who are buckled up but are not wearing the shoulder harness over the shoulder may either have the harness under the arm or behind the back. This is not the proper way to wear the harness, and if it is in either of these positions, you should record Code 2.

If you observe that the shoulder harness is not being worn or not being worn properly, but that the lap belt has been buckled, you should record Code 2.

NOTE: In older model cars that have only a lap belt, you record Code 2 if the passenger is belted and record Code 7 if the passenger is not belted. You will never use Code 1 if the car contains only a lap belt.

Infant Safety Seat (Code 3)

Infant safety seats are generally designed for infants less than 1 year old, and are designed to face the rear of the vehicle. This position allows the back of the infant to absorb the force of a crash. Infant safety seats are equipped with a five-point harness (straps) to secure the infant to the safety seat and have provisions for using the auto safety belt system to secure the seat to the car. The principle for the 5-point

system in an infant safety seat is the same. The 5-point system includes a pair of straps that over the infants shoulders, lap belts and a crotch strap. Note that no infant safety seats are designed to face forward. There are also convertible safety seats which can be used for toddlers or can be used in the infant position (rearward facing). Consult the list of infant seats to determine if the safety seat is approved by NHTSA. You are not responsible for identifying the specific type (brand) of safety seat but you should be able to distinguish between a NHTSA approved safety seat and an unapproved seat which is referred to as a flimsy seat (refer to Code 6).

#### Toddler Safety Seats (Code 4)

Toddler safety seats are generally designed for small children between the ages of 1-4 years old. Toddler seats face forward and most have a five-point harness system (straps) to secure the toddler to the seat. Some models use a shield or a combination of a harness system and shield to secure the toddler. All models have provisions for securing the safety seat to the car through auto safety belts. Some models have a tether strap which is to be attached to the rear safety belt or deck lid to prevent pivoting (tipping forward). Also consult the list of NHTSA approved toddler safety seats provided to you. Again, you are not responsible for identifying the exact type of safety seat in this particular study, but you should be aware of the models that have tether straps and shields.

#### Booster Seats (Code 5)

Boosters are strong, firm seats which usually have no back. Booster seats designed for use in a vehicle all have a device to secure an auto lap belt. They must be used with a lap belt and some type of upper-body harness. This can be either the auto lap/shoulder safety belt or the auto lap belt used with the two-strap harness sold with the booster seat, which is fastened with a tether strap.

### Unsafe Seat (Flimsy Seat) (Code 6)

There are several types of seats that are erroneously considered as safety seats for infants and small children. These seats are intended for use in the home and do not provide occupant protection in the event of an accident. The seats are usually made of thin plastic and are usually equipped with thin plastic straps. They have no provisions for attachment to the car using safety belts. The seats are not designed to withstand the stresses and impacts associated with an accident and are not NHTSA approved for use as safety seats in autos. There are also some older type infant/toddler seats originally designed to be used in the car which may still be used, but are not dynamically tested nor provide ample protection in the event of a collision. Any child seat with "hooks" that are designed to hang over the car seat or child seats that have attachments that fit between the car seat cushion and back should be considered an unsafe seat. Devices such as car beds are also not acceptable as a child safety seat and should be given a Code 6.

### None (Code 7)

If the passenger is not wearing either the lap belt or shoulder harness, not placed in a safety seat, record Code 7.

### Child on Lap (Code 8)

If an infant, toddler or subteen is observed being held in the arms of another passenger use a code 8 signifying child on lap. Do not use a code 8 for the adult holding the child, instead use code 1, 2 or 7 depending on the adults restraint usage.

**7. Child Safety Seat Use:** Indicate the code that describes the way in which the infant, toddler or booster safety seat is used. Provide a code in the column specifically related to whatever type device being observed only when Passenger Restraint observation (Item 6) indicates that an infant or child is being transported in a NHTSA approved infant (Code 3), toddler (Code 4), or booster (Code 5) safety seat. Since the codes vary based on the restraint system used, each will be described separately.

### Infant Seat

This column should only be used when an infant safety seat is being used (Code 3 for Passenger restraint) or when an unused infant safety seat is observed.

#### Harness/Car Belt (Code 1)

Use this code if the infant is in an approved infant safety seat, and is restrained by a 5-point harness (straps), the auto safety belt is properly used, and the seat is rearward facing.

#### Harness Only (Code 2)

Use this code if the infant is properly restrained in the seat by a 5-point system but the safety seat is not secured by the auto safety belt.

#### Car Belt Only (Code 3)

Use this code if the infant safety seat is secured by the auto safety belt, but the infant is not restrained by the harness on the safety seat.

#### No Harness/Car Belt (Code 4)

Use this code if the infant is in an approved infant safety seat, but the seat is not secured by an auto safety belt and the infant is not restrained by the harness on the safety seat.

#### Facing Wrong Direction (Code 5)

Use this code if the infant safety seat is observed being used facing forward or sideways.

#### Unsure (Code 6)

If you can not make a position verification on the use of the safety seat, use code 6.

#### Unused Seat (Code 7)

If there is an infant in the vehicle not using a safety seat and the car also contains an unused seat, use a code 7.

## Toddler Seat

This column should only be used when a toddler seat is being used (Code 4 for Passenger Restraint) or when an unused toddler safety seat is observed. When observing toddler safety seats, you need not assess the use of the auto safety belt to secure the toddler seat to the car. Therefore, the only possible toddler seat codes are 1, 4, 5, 6 and 7.

### Harness/Shield (Code 1)

Use this code if the toddler is in an approved toddler safety seat and is restrained by a 5-point harness or shield (if applicable). Some toddler safety seats come equipped with an arm rest. The use of an arm rest does not provide any additional protection to the child, and does not replace the use of the harness.

### No Harness/Shield (Code 4)

Use this code if the toddler is in an approved toddler safety seat, but is not restrained by the harness or shield.

### Other/Unsafe (Code 5)

Use this code if an unsafe use of a toddler safety seat is observed (with exception of the auto safety belt). This predominately pertains to the tether strap not being used for a seat requiring a tether strap (i.e., Child Love Seat).

### Unsure (Code 6)

If you can not make a positive verification on the use of the harness system or shield, use Code 6.

### Unused Seat (Code 7)

If there is a toddler in the vehicle not using a safety seat and the car also contains an unused toddler seat, use a Code 7.

### Booster Seat

This column should only be used when a booster seat is being used (Code 5 for Passenger Restraint) or an unused booster seat is observed.

#### Harness/Lap Belt (Code 1)

If a toddler/subteen is observed in a booster seat and the seat is secured by the auto lap belt and the child is using a two-strap harness, fastened by a tether strap, then use this code.

#### Shouder/Lap Belt (Code 2)

If a toddler/subteen is observed in a booster seat and the seat and child is secured by a combination lap and shoulder harness, use Code 2. If the shoulder harness on an one piece safety belt system is placed behind the child and only the lap belt restrains the seat use Code 3:

#### Lap Belt Only (Code 3)

Use this code if the child is in an approved booster seat that is secured by the auto safety belt, but is not restrained by a shoulder belt or a harness/tether device.

#### No Harness/Car Belt (Code 4)

Use this code if the child is in an approved booster seat, but the seat is not restrained by a lap belt and is not restrained by a shoulder harness or a harness/tether device.

#### Other/Unsafe (Code 5)

Use this code if an other unsafe use of a booster seat is observed. Please indicate what the unsafe usage was.

#### Unsure (Code 6)

If you can not make a positive verification on the use of the safety device, use Code 6.

#### Unused Seat (Code 7)

If there is a toddler or subteen (up to age 8) in the vehicle not in a safety seat, and the car also contains an unused booster seat, use this code.

### Comments

You are encouraged to briefly describe any unsafe safety seat usage or explain difficulty in viewing the usage of the safety seat. This is particularly important if a code 5 or 6 is used to describe the use of a child safety seat. This information will not be coded but will be used to verify coding of unusual or confusing observations.

## Special Study Data Form

Printed data forms entitled "Special Study - Child Safety Seats - Form A" will be used in this study (Figure C.3). Fifty observations can be recorded on the front and back of the form. Use as many forms as necessary during each hour of observation. Send all completed forms to Goodell- Grivas, Inc. using the addressed envelopes provided at the end of each week.

### General Information

The top portion of the form provides a description of observer, location, date, and environmental conditions. The general information is identical to the Passenger Restraint Observation Form except that Number 8, "Exit To", has been deleted since you will be observing parked cars in the lot. Begin a new sheet for each Special Study period. Use more than one sheet if necessary.

### Observation Data

Complete one line on the form for each infant, toddler or booster safety seat observed. If a vehicle has two child safety seats in it, two lines of data will be coded for the observation.

1. Seat: Write in the vehicle seat code number 1 for front seat, 2 for back seat, and 3 for the rear of station wagons or hatchbacks, for the location of each child safety seat.
2. Position: Write in the position code number 1 if the safety seat is located on the driver side, 2 for center, or 3 for out-board position. If a seat is located in the rear of a station wagon or a hatchback, do not code in the position.
3. Tether: (Code for Toddler Seats Only), write in the code describing the tether requirement and its use. The codes are as follows:

**SPECIAL STUDY - CHILD SAFETY SEATS: FORM A**

1. Observer: \_\_\_\_\_ 2. City: \_\_\_\_\_  
 3. Day: Su M Tu W Th F Sa 4. Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_  
 5. Area Type: City Suburb 6. Location No.: \_\_\_\_\_  
 7. Shopping Center: \_\_\_\_\_  
 8. Road Conditions: Dry Wet Snow/Ice  
 9. Start Time: \_\_\_\_\_ AM PM 10. End Time: \_\_\_\_\_ AM PM

No.	Seat	Position	Tether	Belting Attached to Seat	Shield Required	Infant or Toddler Seat Model/Comments
	1 Front 2 Back 3 Rear	1 Driver side 2 Center 3 Outboard	1 Tether required properly used 2 Tether required improperly used 3 Tether required not used 4 Tether not required	1 Proper 2 Improper 3 No 4 Not required	1 Yes 2 No	
1.						
2.						
3.						
4.						
5.						
6.						
7.						
8.						
9.						
10.						
11.						
12.						
13.						
14.						
15.						
16.						
17.						
18.						
19.						
20.						

Figure C.3. Child safety seat study data form.

#### Tether Required, Properly Used (Code 1)

This means that the toddler seat has been positively identified as one that requires the use of a tether and that the tether is properly secured. Proper use of a tether is as follows; if the toddler seat is in the front seat the tether strap must be attached to the back seat lap belt; if the toddler seat is in the back seat the tether must be bolted to the rear deck lid or bolted to the rear of a station wagon or hatchback at a proper angle (approximately 45 degrees or greater).

#### Tether Required, (and used but) Improperly Used (Code 2)

This means that a positive identification has been made as to the need for a tether but that there is something improper about the use of the tether (this code implies that the tether is secured in some way but that the securing is improper). Please explain the improper use whenever the Code 2 is used.

#### Tether Required But Not Used (Code 3)

This means that a toddler seat has been positively identified as requiring a tether but that the tether is not used at all. For example the Child Love Seat requires a tether. If this seat model was observed without the tether strap used it would receive a Code 3.

#### Not Required (Code 4)

This means that a toddler seat has been positively identified as a seat that does not require a tether strap.

4. Belting Attached to Seat: Write in the code describing the belting of the toddler seat to the vehicle seat. The codes are as follows:

### Proper (Code 1)

This indicates that the toddler seat has been positively identified as one in which the vehicle's belt (lap or lap/shoulder combination) should be wrapped around the undercarriage of the toddler seat in order to hold the seat in-place. This is in contrast to seats that use the vehicle's belt system (that goes around the toddler) to hold the child and the seat in place. The coding for this type of seat will be explained later in the section.

### Improper (Code 2)

This means that a toddler seat has been positively identified as one that requires the vehicle's belt system to be attached to the undercarriage of the toddler seat to hold it in place, but there is something improper about the usage of the vehicle belt system. The most common misuse will probably be misplacement of the vehicle belt. Use the illustrations in the manual to note where and how the belt-system should be attached.

### No (Code 3)

This means that a toddler seat has been positively identified as one that requires the vehicle's belt system to be attached to the undercarriage but that the belting is not used, i.e., the toddler seat is not restrained and is simply setting on the vehicle seat or is laying in the rear of a station wagon or hatchback. This observation would receive a Code 3.

### Not Required (Code 4)

This code deals with child safety seats in which the child must first be placed in the seat and then the safety seat is belted around the child (or sometimes the child and shield) and attached to the vehicle seat. Examples of this type of safety seat are: Bobby Mac Two-In-One, Bobby Mac Deluxe, and the Century (GM) Child Love Seat.

5. Shield Required: (Code for Toddler Seats Only) Write in the code to describe whether or not a shield is required for proper use of the toddler seat. Code a 1 for yes or a 2 for no. Refer to the manual for illustrations of the toddler seats that require a shield. The Ford Tot Guard is an example of a seat which has a shield which is permanently attached to the seat and would always receive a Code 1. The Bobby-Mac Deluxe toddler seat requires a shield and would be coded as a 1. Note: The shield may or may not be in the car so be certain about the type of safety seat. Don't assume that the safety seat is not a shield-type seat just because you do not see a shield.

6. Model: Write in the brand name and model of the observed toddler or infant seat. The model names can be found in your manual along with the illustrations of the infant/toddler seats. You may be able to read the name directly off the seat. Be sure to indicate if the seat is a toddler or infant seat. If a convertible seat is being used as an infant seat, code it as an infant seat.

When identifying a seat, please try to be as specific as possible. For example when you identify a Bobby Mac Deluxe seat, do not simply write down "Bobby Mac", but also include the model description (Deluxe) or model code number (i.e., Strollee 599). This information will assist us in checking if the seat requires a tether or shield.



MOTORCYCLE - MOPED OBSERVATION: FORM #3

1. Observer: \_\_\_\_\_ 2. City: \_\_\_\_\_  
 3. Day: Su M Tu W Th F Sa 4. Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_

No.	Driver 1 - Helmet On 2 - Helmet Off	Passenger 1 - Helmet On 2 - Helmet Off  (If no Passenger, Leave Blank)	Type of Cycle 1 - Moped or Motorbike  (If Motorcycle Leave Blank)
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
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16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			

Figure C.4. Helmet study data form.

APPENDIX D - SUMMARY OF QUARTERLY OBSERVATIONS

PERCENT OF TODDLERS OBSERVED IN CHILD SAFETY SEATS

January - March, 1984

	<u>Total</u>	<u>Number Observed in Safety Seat</u>	<u>Percent</u>
Total (19 Cities)	5,328	2,232	41.9
Boston	300	145	48.3
*Providence	225	128	56.9
*New York	188	92	48.9
Baltimore	313	123	39.3
*Pittsburgh	126	91	72.2
Chicago	234	109	46.6
*Minneapolis/St. Paul	319	158	49.5
*Fargo/Moorhead	200	85	42.5
Miami	226	169	74.8
*Atlanta	186	131	70.4
Birmingham	198	111	55.6
New Orleans	325	65	20.0
Seattle	260	183	70.4
*San Francisco	448	183	40.8
San Diego	355	201	56.6
*Los Angeles	253	39	15.4
Phoenix	324	71	21.9
Houston	420	76	18.1
*Dallas	428	74	17.3
Avg. Percent Per City			45.6

\*Reported in March, 1984

PERCENT OF INFANTS OBSERVED IN CHILD SAFETY SEATS

January - March, 1984

	<u>Total</u>	<u>Number Observed in Safety Seat</u>	<u>Percent</u>
Total (19 Cities)	454	265	58.4
Boston	32	21	65.6
*Providence	15	10	66.7
*New York	29	13	44.8
Baltimore	39	29	74.4
*Pittsburgh	7	7	100.0
Chicago	21	18	85.7
*Minneapolis/St. Paul	31	16	51.6
*Fargo/Moorhead	7	5	71.4
Miami	15	9	60.0
*Atlanta	32	12	37.5
Birmingham	19	7	36.8
New Orleans	40	12	30.0
Seattle	30	17	56.7
*San Francisco	43	30	69.8
San Diego	33	31	93.9
*Los Angeles	12	3	25.0
Phoenix	11	5	45.5
Houston	18	9	50.0
*Dallas	20	11	55.0
Avg. Percent Per City			59.0

\*Reported in March, 1984

PERCENT OBSERVED SAFETY BELT USE BY PASSENGERS

January - March, 1984

	<u>Toddler</u>		<u>Sub-Teen</u>		<u>Teen</u>		<u>Adult</u>	
	<u>Base</u>	<u>Percent</u>	<u>Base</u>	<u>Percent</u>	<u>Base</u>	<u>Percent</u>	<u>Base</u>	<u>Percent</u>
Total (19 Cities)	5,328	6.9	4,055	11.7	3,358	7.4	18,542	13.8
Boston	300	5.7	290	15.2	229	6.1	1,155	11.9
*Providence	225	1.3	103	5.8	132	3.8	790	6.7
*New York	188	4.3	379	6.1	190	1.6	1,263	7.7
Baltimore	313	8.6	251	17.9	155	0.6	1,353	6.7
*Pittsburgh	126	0.8	127	9.4	129	3.9	675	8.7
Chicago	234	9.8	96	25.0	37	13.5	344	19.5
*Minneapolis/St. Paul	319	9.4	460	13.9	697	13.9	1,097	21.8
*Fargo/Moorhead	200	2.0	96	6.2	108	0.9	521	4.0
Miami	226	0.4	187	6.4	190	4.7	1,077	8.1
*Atlanta	186	1.1	244	6.9	160	8.8	1,197	10.2
Birmingham	198	0.5	265	4.2	182	6.6	796	8.0
New Orleans	325	5.8	167	9.6	34	5.9	509	12.6
Seattle	260	7.7	273	28.2	210	13.3	1,692	26.4
*San Francisco	448	9.2	223	11.7	47	2.1	729	19.3
San Diego	355	14.6	173	34.7	55	23.6	675	36.9
*Los Angeles	253	10.7	128	2.3	119	3.4	697	11.9
Phoenix	324	8.6	161	5.0	169	3.0	1,340	15.3
Houston	420	7.4	190	4.2	259	8.1	1,283	12.4
*Dallas	428	7.0	242	5.8	256	3.9	1,349	12.8
Avg. Percent Per City		6.0		11.5		6.7		13.7

\*Reported in March, 1984

PERCENT OF INFANTS OBSERVED IN CHILD SAFETY SEATS

April - June, 1984

	<u>Total</u>	<u>Number Observed in Safety Seat</u>	<u>Percent</u>
Total (19 Cities)	513	350	68.2
*Boston	25	20	80.0
*Providence	22	20	90.9
New York	7	5	71.4
Baltimore	18	17	94.4
Pittsburgh	33	19	57.6
Chicago	16	13	81.2
Minneapolis/St. Paul	46	29	63.0
*Fargo/Moorhead	19	13	68.4
*Miami	33	20	60.6
*Atlanta	43	26	60.5
Birmingham	34	21	61.8
New Orleans	55	24	43.6
Seattle	41	34	82.9
*San Francisco	42	29	69.0
*San Diego	43	38	88.4
Los Angeles	7	4	57.1
Phoenix	10	6	60.0
*Houston	11	8	72.7
Dallas	8	4	50.0
Avg. Percent Per City			69.1

\*Reported in June, 1984

PERCENT OF TODDLERS OBSERVED IN CHILD SAFETY SEATS

April - June, 1984

	<u>Total</u>	<u>Number Observed in Safety Seat</u>	<u>Percent</u>
Total (19 Cities)	6,052	2,633	43.5
*Boston	428	196	45.8
*Providence	426	168	39.4
New York	316	130	41.1
Baltimore	301	183	60.8
Pittsburgh	323	130	40.2
Chicago	192	96	50.0
Minneapolis/St. Paul	349	182	52.1
*Fargo/Moorhead	269	92	34.2
*Miami	230	172	74.8
*Atlanta	237	173	73.0
Birmingham	196	128	65.3
New Orleans	285	145	50.9
Seattle	271	159	58.7
*San Francisco	488	220	45.1
*San Diego	322	209	64.9
Los Angeles	404	76	18.8
Phoenix	418	68	16.3
*Houston	301	53	17.6
Dallas	296	53	17.9
Avg. Percent Per City			45.6

\*Reported in June, 1984

PERCENT OBSERVED SAFETY BELT USE BY PASSENGERS

April - June, 1984

	<u>Toddler</u>		<u>Sub-Teen</u>		<u>Teen</u>		<u>Adult</u>	
	<u>Base</u>	<u>Percent</u>	<u>Base</u>	<u>Percent</u>	<u>Base</u>	<u>Percent</u>	<u>Base</u>	<u>Percent</u>
Total (19 Cities)	6,052	7.3	4,723	13.0	5,032	7.1	22,017	12.0
*Boston	428	3.3	182	11.5	179	3.9	1,617	6.8
*Providence	426	6.1	153	9.8	234	3.8	1,586	5.3
New York	316	6.0	153	10.5	127	1.6	1,248	4.9
Baltimore	301	2.7	89	12.4	70	2.9	679	7.8
Pittsburgh	323	10.8	371	16.2	630	8.3	1,381	15.1
Chicago	192	11.5	196	20.4	226	9.3	603	15.9
Minneapolis/St. Paul	349	9.7	382	17.3	705	11.9	1,192	18.2
*Fargo/Moorhead	269	8.6	309	8.1	540	5.9	1,147	11.6
*Miami	230	0.9	315	16.5	356	5.1	1,449	7.7
*Atlanta	237	4.2	479	15.4	460	7.6	1,726	10.2
Birmingham	196	1.0	330	11.2	255	7.1	1,144	7.7
New Orleans	285	1.4	422	5.0	284	4.6	1,619	4.7
Seattle	271	15.9	117	27.4	58	25.9	653	35.7
*San Francisco	488	7.2	292	14.4	48	6.3	619	13.7
*San Diego	322	9.9	175	30.3	68	26.5	854	33.3
Los Angeles	404	11.4	207	8.7	240	5.0	1,213	13.1
Phoenix	418	9.1	207	4.3	192	1.6	1,283	18.6
*Houston	301	9.3	231	7.4	201	4.5	1,061	11.8
Dallas	296	6.8	113	6.2	159	2.5	943	10.4
Avg. Percent Per City		7.1		13.3		7.6		13.3

\*Reported in June, 1984

PERCENT OF TODDLERS OBSERVED IN CHILD SAFETY SEATS

July - December, 1984

	<u>Total</u>	<u>Number Observed in Safety Seat</u>	<u>Percent</u>
Total (19 Cities)	5,493	2,604	47.4
Boston	195	89	45.6
Providence	167	93	55.7
New York	212	104	49.1
Baltimore	330	129	39.1
Pittsburgh	369	121	32.8
Chicago	238	214	89.9
*Minneapolis/St. Paul	264	190	72.0
Fargo/Moorhead	277	70	25.3
*Miami	187	138	73.8
Atlanta	276	173	62.7
Birmingham	235	138	58.7
New Orleans	382	86	22.5
Seattle	382	217	56.8
San Francisco	504	198	39.3
San Diego	384	298	77.6
Los Angeles	390	132	33.8
Phoenix	225	68	30.2
Houston	221	78	35.3
Dallas	255	67	26.3
Avg. Percent Per City			48.8

\*Reported in December, 1984

PERCENT OF INFANTS OBSERVED IN CHILD SAFETY SEATS

July - December, 1984

	<u>Total</u>	<u>Number Observed in Safety Seat</u>	<u>Percent</u>
Total (19 Cities)	526	364	69.2
Boston	15	11	73.3
Providence	8	6	75.0
New York	13	10	76.9
Baltimore	22	16	72.7
Pittsburgh	27	13	48.1
Chicago	34	27	79.4
*Minneapolis/St. Paul	29	21	72.4
Fargo/Moorhead	18	12	66.7
*Miami	19	13	68.4
Atlanta	37	32	86.5
Birmingham	53	36	67.9
New Orleans	42	17	40.5
Seattle	41	33	80.5
San Francisco	44	34	77.3
San Diego	58	47	81.0
Los Angeles	29	15	51.7
Phoenix	7	4	57.1
Houston	16	10	62.5
Dallas	14	7	50.0
Avg. Percent Per City			67.8

\*Reported in December, 1984

PERCENT OBSERVED SAFETY BELT USE BY PASSENGERS

July - December, 1984

	<u>Toddler</u>		<u>Sub-Teen</u>		<u>Teen</u>		<u>Adult</u>	
	<u>Base</u>	<u>Percent</u>	<u>Base</u>	<u>Percent</u>	<u>Base</u>	<u>Percent</u>	<u>Base</u>	<u>Percent</u>
Total (19 Cities)	5,493	8.1	5,568	15.2	5,186	7.2	21,230	13.4
Boston	195	0.5	214	10.3	192	7.8	1,144	7.7
Providence	167	3.6	142	17.6	369	4.1	1,203	6.7
New York	212	1.4	228	11.4	219	5.5	1,153	8.6
Baltimore	330	3.0	284	9.9	199	4.0	1,154	7.7
Pittsburgh	369	20.1	300	20.0	607	7.9	1,166	14.0
Chicago	238	3.8	518	20.3	321	8.4	1,332	14.0
*Minneapolis/St. Paul	264	6.4	277	19.5	248	8.9	1,328	15.1
Fargo/Moorhead	277	15.2	260	14.6	473	6.3	908	11.9
*Miami	187	1.1	165	14.5	167	7.8	1,119	11.4
Atlanta	276	5.4	469	15.8	341	7.0	1,562	12.4
Birmingham	235	4.3	559	12.0	350	8.6	1,158	8.2
New Orleans	382	9.9	301	9.0	471	5.1	1,004	9.4
Seattle	382	17.3	139	41.0	53	34.0	511	36.6
San Francisco	504	9.1	197	14.2	38	13.2	583	17.8
San Diego	384	6.0	370	23.8	354	10.7	1,725	23.7
Los Angeles	390	7.2	237	11.4	97	11.3	668	13.6
Phoenix	225	8.0	381	10.8	281	5.3	1,107	17.2
Houston	221	9.0	228	11.0	176	4.5	1,258	10.5
Dallas	255	6.7	299	10.0	230	4.3	1,147	17.8
Avg. Percent Per City		7.3		15.6		8.7		13.9

\*Reported in December, 1984