

1993 SURVEY OF FRONT SEAT OCCUPANT RESTRAINT USE IN  
EIGHTEEN TEXAS CITIES

by  
Katie N. Womack

December 1993

This report was prepared in cooperation with the

Traffic Operations Division  
Texas Department of Transportation  
Jeanne Swanson, Project Manager

National Highway Traffic Safety Administration  
U.S. Department of Transportation

**1993 SURVEY OF FRONT SEAT OCCUPANT RESTRAINT USE  
IN EIGHTEEN TEXAS CITIES**

**Background**

A mandatory belt use law (MUL) was passed in the 1985 general session of the Texas Legislature and went into effect without sanctions September 1, 1985; enforcement with the imposition of fines began on December 1, 1985. The Texas law requires drivers and front seat passengers to use safety belts. Drivers are responsible for passengers under 15 years of age. Safety belt usage applies to passenger cars and light pick-up trucks weighing up to 3/4 tons. It exempts persons for medical reasons (requiring a written statement from a licensed physician) and exempts postal employees in box-to-box delivery of mail. Use or non-use of safety belts is not admissible evidence in a civil trial.

The Texas Transportation Institute (TTI) began collecting occupant restraint use data in a sample of Texas cities for the Texas Department of Transportation (TxDOT) in 1984. At that time occupant restraint legislation was not under consideration in Texas. It was agreed, however, that collecting baseline data on occupant restraint use would prove beneficial for information purposes in response to legislative initiative. The background, methodology and results of the baseline study, as well as a review

of other relevant studies, were presented in a 1985 report (Hatfield, et al., 1985).

In order to assess changes in occupant restraint use after passage of the law and to provide current usage rates, TTI has continued to conduct observational surveys each year since the MUL has been in effect. From 1986 through 1990, data was collected at two intervals (in January and in June) annually. The survey was conducted at one interval during the summer in 1991, 1992, and 1993. The 1993 survey was conducted May 22 through June 10. This report presents the results of the 1993 survey, and compares these findings with the results of previous surveys.

### Study Method

In the 1985 pre-law observational survey, 12 Texas cities were selected to cover the major population centers in the East, Central, and Gulf Coast regions of the State, as well as the less populated areas of West Texas, the Panhandle, and the Rio Grande Valley. At the request of TxDOT, two additional cities were included in the 1986 post-law survey and four additional cities were included in the 1988 post-law survey. Figure 1 shows the sample of 18 cities currently used as observation sites.

Observations were limited to drivers and right front seat (outboard) passengers, with restraint use determined by the use of

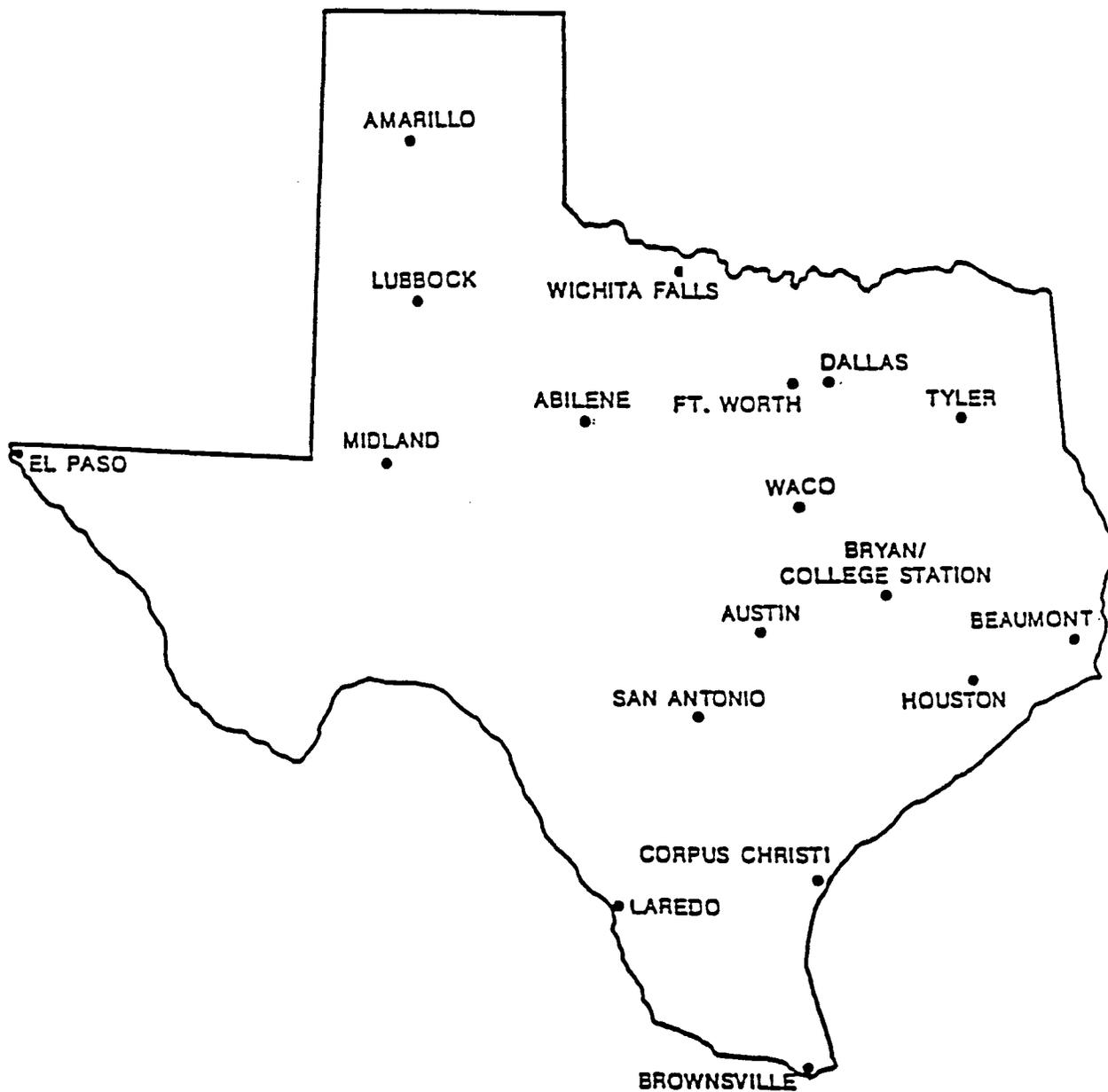


Figure 1. Study Cities in the Safety Belt Observational Survey

a shoulder harness. Eligible vehicles included passenger cars and pick-up trucks. At each observation site, data was collected for one hour.

Two methods of collecting data were used. In one method, used at a minimum of four sites in each city, the following information was collected for each eligible vehicle:

- Driver and front seat outboard passenger restraint use (yes or no)
- Front seat occupant gender
- Estimated driver age (15-19, 20-60, 61+)
- Estimated front outboard passenger age (0-4, 5-14, 15-19, 20-60, 61+)\*
- Pick-up truck (yes or no)

\* No information on passengers under 15 was recorded in the 1985 baseline study.

The second method, used at a minimum of two sites in each city, involved using a hand held, four button counter to record front seat shoulder harness use. Two buttons were designated "yes" buttons to be used for each occupant observed wearing a shoulder harness in a passenger car or a light truck. Two buttons were designated "no" buttons to be used for each occupant not restrained in a passenger car or light truck.

In each study city, occupant restraint use was observed in a geographic cross-section of 12 sites during the survey years of 1985 through 1991. In 1992 and 1993, the survey method was altered

somewhat to encompass a statewide observational survey. Data was collected in each of the 18 study cities of previous years. However, data that included detailed variables were collected at four sites in cities that had at least six total sites selected for the statewide survey, and at six sites in cities where the six sites constituted the total number for the city. The sites were randomly selected by census tract in cities that were selected for the statewide survey sample. In cities that were not selected for the statewide survey sample, six randomly selected sites from previous survey years were chosen to represent the city.

Because the survey was intended to assess changes in safety belt use over time, an attempt was made to control as many external variables as possible. Specifically, all observation sites were located in urban areas, at street intersections controlled by either stop signs or stop lights, and on roadways with traffic volume sufficient to allow for adequate sample sizes. In addition, all observations were recorded during daylight hours.

The surveys utilized TTI staff and Texas A&M University students as observers. Each observer was provided individual instruction and training by the TTI study staff prior to the survey. During the survey period observers were monitored and a quality check was conducted to assure accurate observation was made.

Results of the 1993 Survey

In the combined 18-city sample, data regarding 44,793 front seat occupants were collected at a total of 169 intersections. The percentage of front seat occupants restrained was 68.8.

Analysis of the sites in each city where detailed data were collected revealed a higher usage rate for females than males. As shown in Table 1, female drivers were restrained 10.6 percentage points more often than male drivers (80.7 percent compared to 70.1 percent), while female passengers were restrained 6.6 percentage points more often than their male counterparts (67.1 percent compared to 60.5 percent).

TABLE 1. 1993 OCCUPANT RESTRAINT USE BY SEX

	DRIVERS		PASSENGERS	
	<u>Male</u>	<u>Female</u>	<u>Male</u>	<u>Female</u>
% Restrained	70.1	80.7	60.5	67.1
% Unrestrained	29.9	19.3	39.5	32.9
Total Occupants (N):	7,576	5,250	1,676	2,076

Older drivers were restrained proportionately more often than younger drivers, particularly those drivers under 20 years of age (Table 2). For passengers, the relationship between age and restraint use was similar. Again, those in the oldest age group had the highest safety belt wearing rates (Table 3). The age group with the lowest passenger restraint use was infants and children under five (55.2 percent).

TABLE 2. 1993 DRIVER RESTRAINT USE BY AGE

	DRIVER AGE		
	<u>15 - 19</u>	<u>20 - 60</u>	<u>Over 60</u>
% Restrained	67.1	74.2	79.1
% Unrestrained	32.9	25.8	20.9
Total Drivers (N):	359	11,199	1,268

TABLE 3. 1993 PASSENGER RESTRAINT USE BY AGE

	PASSENGER AGE				
	<u>0 - 4*</u>	<u>5 - 14</u>	<u>15 - 19</u>	<u>20 - 60</u>	<u>61+</u>
% Restrained	55.2	62.2	59.6	64.5	71.9
% Unrestrained	44.8	37.8	40.4	35.5	28.1
Total Passengers (N):	143	489	418	2,264	438

\*Restraint use was considered either safety belt or child safety seat.

Cross-classification of the data by age and sex (Table 4) revealed that female drivers over 60 years of age had the highest belt usage rates in 1993 (84.0 percent). Male drivers under 20 years of age had the lowest usage rates (64.5 percent).

**TABLE 4. 1993 PERCENTAGE OF RESTRAINED DRIVERS BY AGE AND SEX**

<u>Driver Age</u>	<u>DRIVER SEX</u>	
	<u>Male</u>	<u>Female</u>
15 - 19	64.5	71.0
20 - 60	69.7	80.7
Over 60	75.7	84.0

Passenger restraint use was also analyzed by the passenger's sex and age (Table 5). The highest restraint use was evidenced by females in the over 60 age group (73.0 percent), and the lowest use was evidenced by female infants and children under five years (49.2 percent).

For both drivers and passengers, restraint use was found to be higher for occupants of passenger cars than for pick-up trucks (Table 6). This finding is consistent with behavior observed in previous surveys.

TABLE 5. 1993 PERCENTAGE OF RESTRAINED PASSENGERS BY AGE AND SEX

<u>Passenger Age</u>	<u>PASSENGER SEX</u>			
	<u>Male</u>	(n)	<u>Female</u>	(n)
0-4	60.0	80	49.2	63
5-14	61.1	298	63.9	191
15-19	60.8	209	58.4	209
20-60	59.3	1973	68.4	1291
Over 60	69.0	116	73.0	322

TABLE 6. 1993 OCCUPANT RESTRAINT USE BY VEHICLE TYPE

	<u>DRIVER</u>		<u>PASSENGER</u>	
	<u>Car</u>	<u>Pick-up</u>	<u>Car</u>	<u>Pick-up</u>
% Restrained	77.8	62.1	67.1	49.7
% Unrestrained	22.2	37.9	32.9	50.3
Total Occupants	10,114	2,712	3,118	634

As was true in previous surveys, there was a strong association between driver and passenger restraint use--often referred to as the audience effect. In the 1993 survey, at least 29 percent of all vehicles observed had a passenger in the front outboard seating position. In this sample of 3,752 vehicles, if the driver was unrestrained, it was unlikely that the passenger was restrained. Restrained passengers were riding with unrestrained

drivers in only 21.8 percent of the observations (Table 7). However, if the driver was restrained, the passenger was also restrained approximately 79 percent of the time. These data indicate that front seat occupants are very likely to behave in the same manner in terms of restraint use.

**TABLE 7. ASSOCIATION BETWEEN DRIVER AND PASSENGER RESTRAINT USE**

<u>Driver Restraint</u>	<u>Passenger Restraint</u>		<u>Total</u>
	<u>Unrestrained</u>	<u>Restrained</u>	
Unrestrained	749 (78.2%)	209 (21.8)	958
Restrained	596 (21.3)	2,198 (78.7)	2,794

Table 8 shows the observed restraint usage rate for each of the 18 cities using data from all sites to represent citywide data. This citywide estimate represents the usage rate for all front seat occupants observed in each city and does not differentiate among drivers and passengers. Citywide occupant restraint use ranged from a low of 61.0 percent in Houston to a high of 82.6 percent in Midland.

The data that provided information regarding driver and passenger were analyzed separately for each of the 18 cities. Using only the sites for which these detailed data was collected in each city (i.e., not representing the city as a whole, but taking data from four sites), driver restraint use ranged from a low of

55.2 percent in Dallas to a high of 85.8 percent in Midland (Table 9). Passenger restraint use ranged from 49.2 percent in Dallas to 82.1 percent in Waco. The total average percentage of drivers restrained was greater than the observed percentage of passengers restrained, with an average difference of 9.1 percent.

**TABLE 8. 1993 PERCENTAGE OCCUPANT RESTRAINT USE  
IN THE 18 STUDY CITIES**

CITY	Number Observed	Percent Restrained
Abilene	1,226	71.1
Amarillo	1,558	71.2
Austin	1,171	79.3
Beaumont	370	70.5
Brownsville	1,422	62.6
Bryan/College Station	1,481	80.8
Corpus Christi	1,019	73.8
Dallas	5,723	70.6
El Paso	1,034	68.0
Ft. Worth	1,075	67.0
Houston	13,660	61.0
Laredo	1,579	69.2
Lubbock	2,103	78.5
Midland	1,294	82.6
San Antonio	6,059	69.9
Tyler	2,038	74.0
Waco	655	76.5
Wichita Falls	1,325	71.8

**TABLE 9. 1993 PERCENTAGE DRIVER AND PASSENGER RESTRAINT USE  
IN THE 18 STUDY CITIES**

CITY	Drivers	Passengers
Abilene	73.8	62.1
Amarillo	72.4	67.0
Austin	81.2	76.8
Beaumont	75.4	67.4
Brownsville	67.7	56.2
Bryan/College Station	83.9	76.5
Corpus Christi	76.8	62.7
Dallas	55.2	49.2
El Paso	68.9	56.4
Ft. Worth	68.6	56.8
Houston	70.3	62.9
Laredo	72.8	61.3
Lubbock	78.8	71.8
Midland	85.8	67.4
San Antonio	68.8	59.2
Tyler	76.6	62.9
Waco	74.4	82.1
Wichita Falls	72.8	61.5

Within the 18 study cities driver and passenger restraint use was analyzed by sex and age to determine if significant differences were evident. Because the patterns within cities generally followed those observed in the combined sample, a detailed

description of the results of the city-specific analyses are not included in this report. However, the results may be obtained from the author upon request.

### Trend Analysis

This section of the analysis compares restraint use over time for the survey cities. Figure 2 illustrates the changes over time for the cities in each survey period. Note that the survey in 1985 included 12 cities, the surveys in 1986 and 1987 included 14 cities, and each wave since 1988 included 18 cities.

Restraint use increased significantly (Z-test of significance,  $p < .01$ ) from 14.2 percent in 1985 (the "before" period) to 64.9 percent in 1986 (the first "after" period). A significant drop in use was observed from 1986 to 1987 (from 64.9 percent in 1986 to 56.9 and 58.6 percent in the two survey waves of 1987, Z-test of significance,  $p < .01$ ). Restraint use continued to decrease in the January, 1988 survey wave. However, the trend reversed in June of 1988 with an increase to a level equivalent to January of 1987 (56.9 percent). The usage rate continued to gradually increase through 1989. In 1990 a significant increase in belt use was observed. The increase in June to 65.3 percent use was significantly higher (Z-test of significance,  $p < .01$ ) than the previous June (59.2 percent). Further, the combined average in the June, 1990, survey of 65.3 percent represented the highest belt use

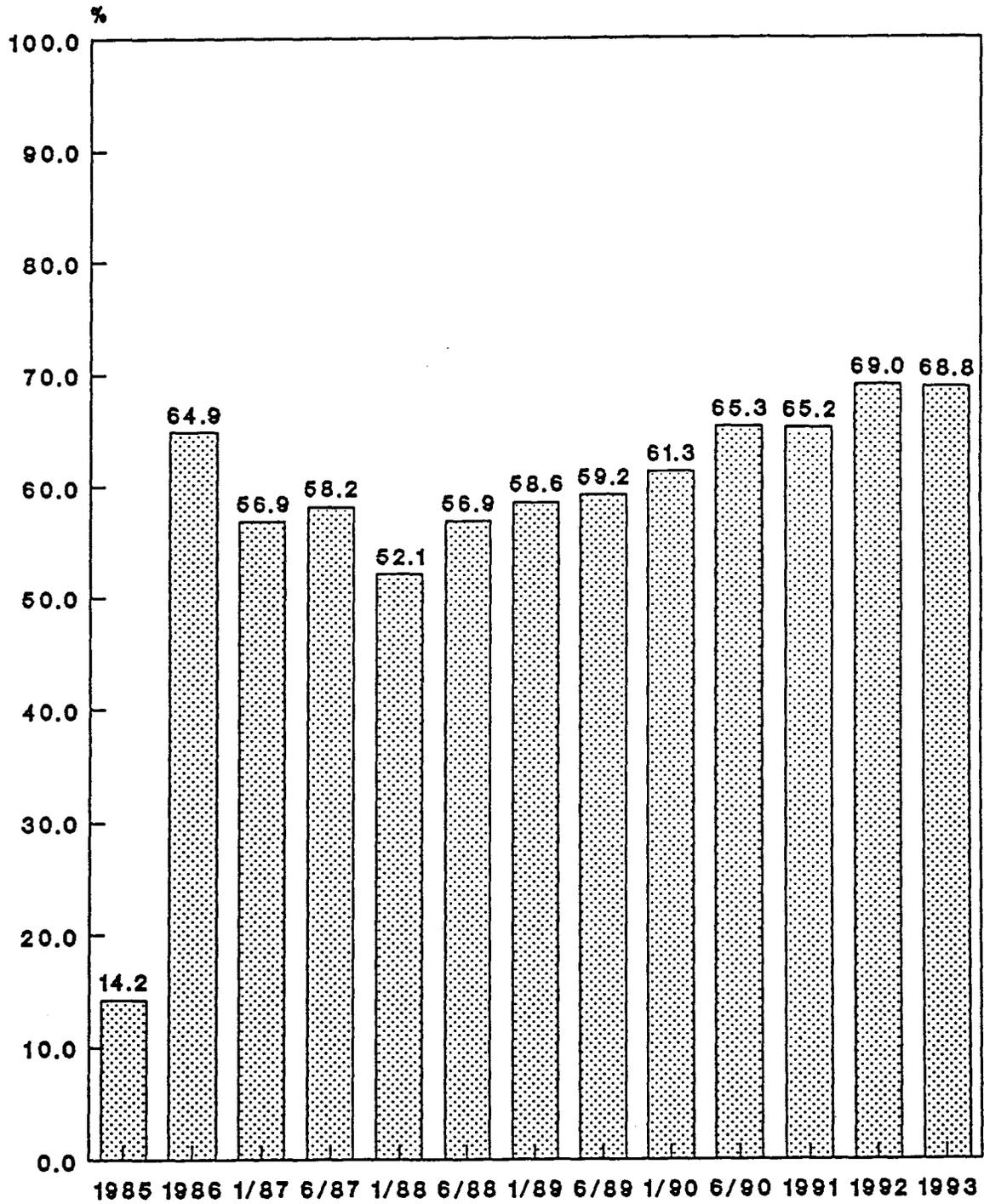


Figure 2. Front Seat Occupant Restraint Use By Year

observed since observation began in 1985. The usage rate remained stable at 65.2 percent in 1991. A significant increase (Z-test of significance,  $p < .01$ ) was again observed in 1992 when usage rose to 69 percent, which represented the highest belt use observed since observation began in 1985. The usage rate for the 18 cities combined did not change significantly in 1993.

The percentages of driver restraint use for each of the 18 cities included in the surveys over time are provided in Table 10. Data collected in 1993 provide directly comparable observations to the 1992 data at the city level because comparable sites during these two years were used. City level data collected from 1985 through 1991 are comparable. While each year's data provides an estimate of front seat occupant restraint use for each city, the alteration of site selection in 12 of the 18 cities in 1992 means 1993 observations are most directly comparable to 1992 observations.

No statistically significant change in driver restraint use was observed in 12 of the 18 cities. (Comparable data was not available for Brownsville in 1992.) One city, Beaumont, showed a significant (Z-test of significance,  $p < .05$ ) increase in driver restraint use. Four cities showed significant (Z-test of significance,  $p < .05$ ) decreases in driver restraint use--Corpus Christi, Dallas, Fort Worth, and San Antonio. Dallas experienced the largest decrease in use (21.8 percentage points).

**TABLE 10. PERCENT OF DRIVERS RESTRAINED BY CITY  
OVER TIME**

CITY	1985	1986	Jan. 1987	June 1987	Jan. 1988	June 1988	Jan. 1989	June 1989	Jan. 1990	June 1990	1991	1992	1993
Abilene	NA	NA	NA	NA	52.9	52.8	52.2	57.3	56.3	63.7	69.3	75.6	73.8
Amarillo	10.8	65.2	63.2	66.2	58.1	60.4	51.5	57.8	48.3	61.4	61.7	71.2	72.4
Austin	28.1	74.6	74.2	74.3	64.8	72.7	72.0	70.1	80.4	76.8	79.1	81.2	81.2
Beaumont	NA	60.0	53.3	52.0	46.6	59.3	57.2	65.2	67.7	72.0	73.5	66.8	75.4
Brownsville	3.4	63.3	40.8	43.6	39.3	35.9	40.9	51.5	55.8	63.5	68.9	NA	67.7
Bryan/CS	16.4	70.4	61.1	64.1	58.5	61.5	57.8	56.9	63.5	63.7	67.8	87.2	83.9
Corpus Christi	13.4	76.8	75.6	65.9	77.9	83.3	79.0	75.6	75.9	77.5	71.4	81.0	76.8
Dallas	20.6	70.9	57.9	58.4	58.1	67.6	67.1	59.2	67.0	67.1	66.0	77.0	55.2
El Paso	15.0	63.8	60.9	63.9	55.2	72.0	62.0	64.6	66.2	72.9	68.2	62.6	68.9
Ft. Worth	NA	63.3	53.3	61.2	55.3	55.0	55.7	57.8	65.9	60.7	62.1	62.2	68.6
Houston	19.7	68.6	54.9	66.0	46.8	53.3	59.7	62.1	55.7	65.4	58.3	76.5	70.3
Laredo	NA	NA	NA	NA	32.4	50.1	71.7	61.8	68.8	73.0	78.4	71.0	72.8
Lubbock	14.3	63.3	56.3	57.6	62.5	61.0	55.8	66.4	57.8	72.0	60.5	82.4	78.8
Midland	NA	NA	NA	NA	53.1	55.2	68.3	69.7	66.2	67.9	73.3	86.6	85.8
San Antonio	13.3	60.6	65.0	58.7	50.8	47.4	47.7	44.2	50.1	50.2	56.3	78.6	68.8
Tyler	16.7	67.0	57.8	59.2	58.2	72.4	83.0	76.5	79.3	80.8	81.1	77.6	76.6
Waco	9.7	57.5	46.5	48.0	48.0	45.9	51.8	47.9	54.1	53.8	55.8	73.3	74.4
Wichita Falls	NA	NA	NA	NA	56.7	59.9	55.4	56.3	61.5	73.6	64.2	71.6	72.8
<b>Average</b>	<b>15.2</b>	<b>66.8</b>	<b>59.5</b>	<b>60.5</b>	<b>54.2</b>	<b>59.2</b>	<b>60.5</b>	<b>61.2</b>	<b>63.4</b>	<b>67.6</b>	<b>67.5</b>	<b>75.4</b>	<b>73.6</b>

Passenger restraint use in 12 of the 17 cities did not significantly (Z-test of significance,  $p < .01$ ) change from 1992 to 1993 (Table 11). Significant increases in passenger restraint use were observed in Fort Worth (22.0 percentage points) and Waco (16.8 percentage points). Significant decreases during the one-year interval were observed in Corpus Christi (9.0 percentage points), Houston and Midland (13.2 percentage points).

Table 12 gives changes over time in driver restraint use by males and females for all cities included in the observational survey. These data indicate that in the two year period prior to 1989 male driver restraint use declined, and in 1989 male driver restraint use increased to the 1987 level. In 1990 and 1991, male driver restraint use increased to a level only slightly lower than the peak rate of 1986. The 1991 decrease in belt use by males was not significantly different from 1990. However, belt use among males increased dramatically (10 percentage points) in 1992. The male usage rate of 70.1 percent evidenced in 1993 is a significant decrease (Z-test of significance,  $p < .01$ ) from the 1992 usage rate of 73.5 percent.

Female driver restraint use evidenced a smaller decline than male restraint use from 1986 to 1987, began to increase in 1988, and increased in 1989 to within 1.5 percentage points of the 1986 post-enactment rate. In 1990, female driver restraint use increased to above the previous peak rate observed in 1986. This

**TABLE 11. PERCENT OF PASSENGERS RESTRAINED BY CITY OVER TIME**

CITY	1985	1986	Jan. 1987	June 1987	Jan. 1988	June 1988	Jan. 1989	June 1989	Jan. 1990	June 1990	1991	1992	1993
Abilene	NA	NA	NA	NA	38.7	39.2	33.7	52.6	48.3	61.6	67.2	69.0	62.1
Amarillo	8.7	55.8	53.4	52.4	40.1	46.8	42.8	41.8	31.2	51.2	53.3	67.0	67.0
Austin	18.1	60.5	61.6	64.4	53.3	67.3	55.0	60.3	75.2	65.4	73.4	69.7	76.8
Beaumont	NA	47.2	50.6	45.5	39.2	50.9	45.9	54.3	66.0	62.0	66.0	61.5	67.4
Brownsville	2.9	54.6	28.7	32.5	24.8	24.1	28.5	35.1	40.9	43.3	50.1	NA	56.2
Bryan/CS	14.7	60.4	55.9	58.1	57.7	58.3	55.2	56.5	51.8	53.8	58.3	78.0	76.5
Corpus Christi	8.2	67.0	67.0	59.3	68.3	75.2	67.9	67.4	60.7	67.3	62.1	71.7	62.7
Dallas	11.9	68.3	57.0	47.2	55.9	54.0	55.8	55.7	57.5	55.3	58.1	54.8	49.2
El Paso	11.4	60.3	57.4	60.7	53.7	58.8	50.1	49.6	52.0	60.1	54.6	53.2	56.4
Ft. Worth	NA	54.0	45.0	53.2	44.9	45.9	52.6	48.1	59.3	50.2	46.4	34.8	56.8
Houston	18.2	56.6	42.0	59.6	36.9	42.6	42.5	52.9	41.9	49.7	42.9	76.1	62.9
Laredo	NA	NA	NA	NA	37.8	42.7	42.5	52.9	50.9	55.8	67.4	59.0	61.3
Lubbock	9.3	53.0	38.7	50.8	41.2	40.9	49.1	44.1	47.3	57.5	51.7	72.8	71.8
Midland	NA	NA	NA	NA	40.0	40.2	53.8	56.5	56.6	65.1	56.9	80.6	67.4
San Antonio	4.9	46.6	51.6	44.4	29.8	32.2	37.8	35.6	38.5	34.2	41.6	67.7	59.2
Tyler	12.1	56.9	46.4	48.8	44.8	64.3	82.7	72.8	78.7	69.7	76.4	65.8	62.9
Waco	6.7	49.2	32.1	35.3	35.4	32.3	46.5	36.4	46.0	47.1	41.1	65.3	82.1
Wichita Falls	NA	NA	NA	NA	49.5	46.2	44.9	48.1	63.5	67.0	56.5	53.5	61.5
<b>Average</b>	<b>15.2</b>	<b>66.8</b>	<b>59.5</b>	<b>60.5</b>	<b>54.2</b>	<b>59.2</b>	<b>60.5</b>	<b>61.2</b>	<b>63.4</b>	<b>67.6</b>	<b>67.5</b>	<b>64.7</b>	<b>64.5</b>

rate increased in 1991 (although not statistically significantly from 1990) to an all time high of 72.3 percent. As with males, the female usage rate increased dramatically in 1992 to 82.7 percent, an increase of 10 percentage points and the highest rate observed for females. Following the same trend as males in 1993, the female usage rate of 80.7 percent evidenced in 1993 is a significant decrease (Z-test of significance,  $p < .01$ ) from the 1992 usage rate of 82.7 percent.

TABLE 12. DRIVER RESTRAINT USE BY SEX AND YEAR

	PERCENT RESTRAINED	
	<u>MALE</u>	<u>FEMALE</u>
1985	13.8	16.9
1986	64.8	67.8
1987 (June)	57.0	63.8
1988 (June)	54.9	64.7
1989 (June)	57.2	66.3
1990 (June)	64.2	71.8
1991 (June)	63.9	72.3
1992	73.5	82.7
1993	70.1	80.7

Table 13 shows a similar trend for passengers. Again, male passengers were less likely to be belted prior to safety belt legislation (7.5 percent male passengers restrained and 10.8 percent female passengers restrained in 1985). Male passenger

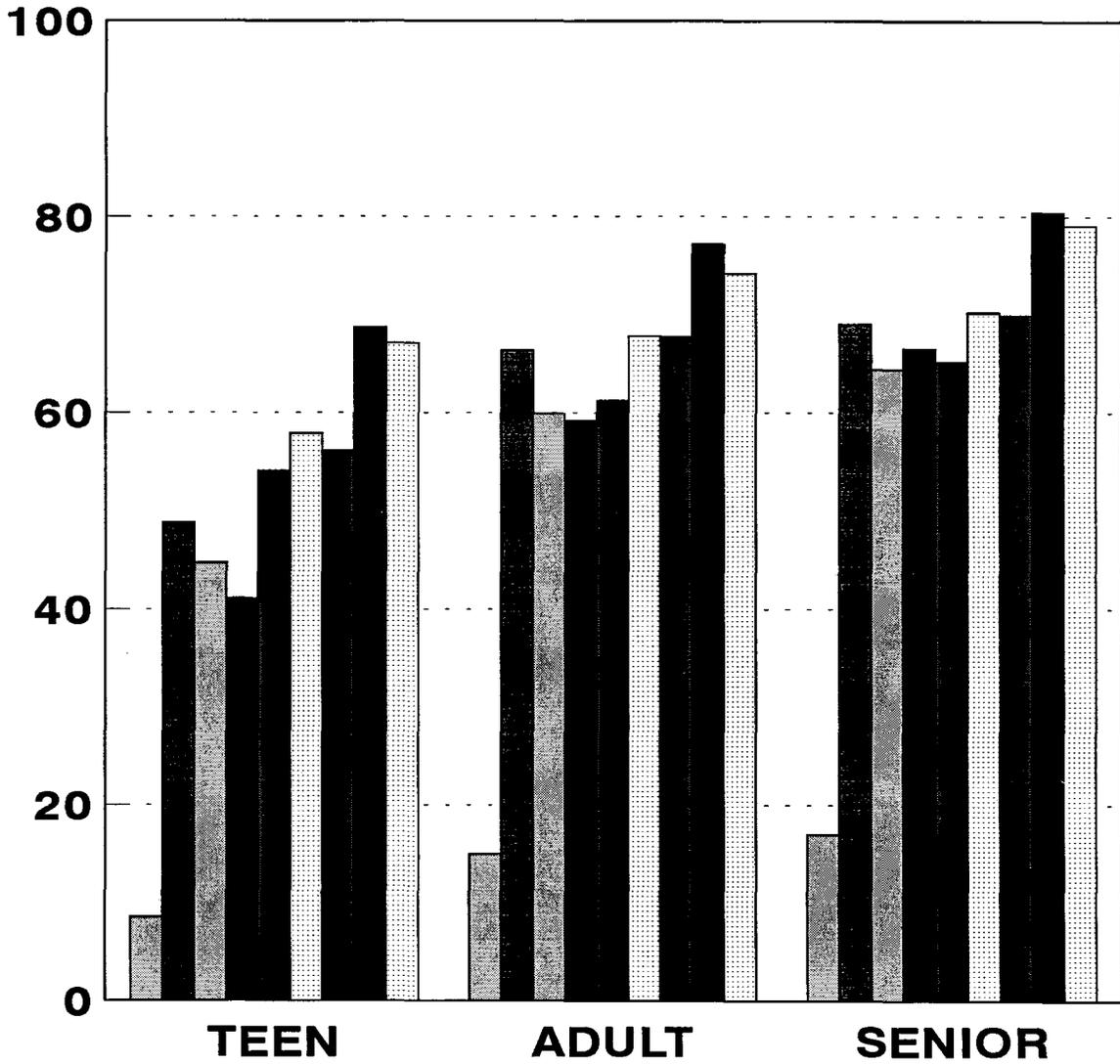
usage dropped to a greater degree after the first year of the enactment period (from 55.1 percent in 1986 to 44.7 percent in 1987, compared to 58.0 and 53.4 percent for female passengers). The decrease in passenger restraint use from June of 1987 to June of 1988 was significantly smaller for both males and females. The slow downward trend was reversed for both male and female passengers in 1989. Increased passenger restraint use for both males and females continued in 1990 and was sustained in 1991. Passenger restraint use increased in 1992 among males by 8.4 percentage points, and among females by 13.5 percentage points. No significant change in passenger restraint among males was observed in 1993. However, a significant decrease (Z-test of significance,  $p < .01$ ) was observed for restrained female passengers.

**TABLE 13. PASSENGER RESTRAINT USE BY SEX AND YEAR**

	PERCENT RESTRAINED	
	<u>MALE</u>	<u>FEMALE</u>
1985	7.5	10.8
1986	55.1	58.0
1987 (June)	44.7	53.4
1988 (June)	42.2	50.0
1989 (June)	45.4	54.8
1990 (June)	52.1	57.1
1991 (June)	51.6	59.1
1992	60.0	72.6
1993	60.5	67.1

Changes in restraint use over time by the three age groups were also analyzed. The results revealed that the oldest group of drivers (over 60 years) showed the highest increase in belt use for the first year after the law went into effect (52 percentage points) and the lowest decrease in belt use during the second year (4 percentage points) compared to the other two age groups (Figure 3). Although teen restraint use steadily decreased since 1986, a dramatic increase occurred in 1989 and continued in 1990 and 1991 for teen belt use. The shift from 57.9 percent in 1990 to 56.1 percent in 1991 was not statistically significant. Adult and senior use both increased significantly in 1990 (adults by 6.5 percentage points and seniors by 5.0 percentage points) and did not significantly change in 1991. In 1992, all three age groups experienced significant increases. However, in 1993, teen and older driver restraint use remained constant, while the adult age 20 to 60 group significantly increased restraint use (Z-test of significance,  $p < .01$ ).

When sex and age were analyzed together (Table 14), the results showed that, whereas the gap between males and females at the teen level was larger than for any other age group in previous years, the teenage gap between males and females narrowed in 1991, and continued to be lower than the gap between adult males and females in 1992 and 1993. Adult female drivers age 20 to 60 were much more likely than males to wear safety belts. The difference between females and males at the lower and upper age levels was not



1985   
  1986   
  1987\*   
  1988\*   
  1989\*  
 1990\*   
 1991\*   
 1992   
 1993

\*June survey

Figure 3. Driver Restraint Use By Age And Year

as large. Teenage males retained the position as the lowest percentage of users at 64.5 percent.

**TABLE 14. DRIVER RESTRAINT USE OVER TIME  
BY AGE AND SEX**

		PERCENT RESTRAINED		
		DRIVER AGE		
		15-19	20-60	Over 60
1985	Male	6.5	13.8	15.9
	Female	12.0	16.9	18.3
1986	Male	46.9	64.9	68.8
	Female	51.9	68.0	69.3
1987 (June)	Male	45.1	56.9	61.8
	Female	44.0	63.7	69.3
1988 (June)	Male	38.9	54.8	63.0
	Female	46.9	59.7	72.6
1989 (June)	Male	51.0	57.0	63.6
	Female	61.9	66.3	69.5
1990 (June)	Male	54.9	64.3	67.6
	Female	63.4	71.9	74.2
1991 (June)	Male	53.1	64.0	67.0
	Female	60.7	72.4	74.6
1992	Male	65.5	73.3	77.4
	Female	73.9	82.6	85.5
1993	Male	64.5	69.7	75.7
	Female	71.0	80.7	84.0

## Summary and Conclusions

The initial survey of 1985 showed front seat occupant restraint use in 12 Texas cities averaging 14.2 percent for all front seat occupants observed. Not surprisingly, a dramatic increase in belt use was observed during the first year of the post-MUL period. Restraint use rates in the 1986 survey were 64.9 percent overall. At that time, compliance was considerably higher than reported usage rates in other MUL States.

In the second year of the post-law period (1987), observed usage rates for front seat occupants decreased by approximately seven percent to a 57 percent usage rate for all cities combined. During this second year of MUL experience, decreases in use were attributed to those segments of the population that were least likely to be restrained prior to seat belt legislation. Specifically, males, teens, and pick-up occupants showed the largest decreases in use.

The January survey of 1988 seemed to support further evidence of the post-law decline. The average belt use rate of 52 percent for 18 cities surveyed in January of 1988 was six percentage points lower than June of 1987. One factor contributing to the decrease was the inclusion of the four additional cities for this survey wave. Without the new cities the 14-city average was 55.7 percent.

Observed usage rates rose to an average of 56.9 percent for the eighteen cities surveyed in June of 1988. As with the downward shift from June of 1987 to June of 1988, this upward change may have been due in part to natural fluctuations in the data.

The 1989 survey indicated a levelling off for the average restraint usage rate across the 18 study cities of 59 percent. Three survey waves (June 1988 through June 1989) reflected a consistency in the overall restraint use average that was not, however, reflected uniformly at the city level.

The 1990 survey revealed a significant increase in seat belt use. The average percentage of front seat occupants restrained across all 18 cities was the highest ever observed in the June survey wave. Every city in the sample experienced an increase in driver restraint use from June of 1989 to June of 1990, with the exception of Midland (which experienced a statistically non-significant decrease in use). Eight of the eighteen cities reached the targeted 70 percent by 1990.

No significant changes in the combined 18-city seat belt use rate were revealed in the 1991 survey from June of 1990. At the city level, six cities showed increases and five cities showed decreases in belt use. Six of the 18 cities surveyed sustained a usage rate above 70 percent.

The 1992 survey revealed a significant increase in front seat restraint use in 11 cities. Five of these cities showed increases in driver restraint use by over 15 percentage points. Eight of the 18 cities surveyed in 1992 sustained a usage rate above 70 percent, and of those, three had over 80 percent restraint use by front seat occupants.

A statistically significant change in the combined 18-city seat belt use rate was not observed in 1993 from the overall rate observed in 1992. At the city level, only one city increased in driver usage in 1993, whereas four cities had statistically significant decreases. In 1993, 12 of the 18 cities had occupant restraint usage rates above 70 percent, and two cities had usage rates above 80 percent.

Analysis of safety belt use for males and females and for the three age groups revealed comparable patterns in the 1993 survey to previous observed usage patterns. Females evidenced higher usage rates than males, and individuals in the oldest age group (i.e., those over 60 years of age) used safety belts more often than those in the younger age categories. Teenage males were still least likely to buckle up. As in earlier years, the audience effect was found to be quite strong. In other words, two front seat occupants were shown to behave in a very similar manner in terms of restraint use--either both individuals used the available restraint system, or both rode unrestrained. The gap between driver restraint use

and passenger restraint use (9.1 percent) was also consistent with the range observed in previous surveys.

In summary, 1993 observation of occupant restraint use revealed an average usage rate across the 18 cities of 68.8 percent. Two-thirds (12) of the Texas cities surveyed had greater than 70 percent usage rates, which has been established as a national target usage rate. Furthermore, two cities surveyed had greater than 80 percent restraint usage for front seat occupants.

The collection of data specific to the occupants observed revealed that female drivers used seat belts more often than male drivers, and female passengers, overall, were belted more often than male passengers. However, female passengers under four years old were least likely to be buckled. Older drivers and passengers (over 60 years) wore belts more often than younger occupants. Additionally, restraint use in cars was higher than restraint use in pick-up trucks. The most notable change in these patterns of restraint use was that the difference in usage among teenage males and females was less than the difference in usage over the previous six years (6.5 percentage point difference in 1993), and the difference between usage among males and females in the 20 to 60 year age group was the largest ever observed (11.0 percentage point difference in 1993).

## REFERENCES

Hatfield, N.G., W.M. Hinshaw, N.G. Bunch, and R. Bremer, Observed Pre-Law Safety Belt Use by Adult Front Seat Occupants in Twelve Texas Cities, Texas Transportation Institute, Texas A&M University System, December, 1985.