1990 SURVEY OF FRONT SEAT OCCUPANT RESTRAINT USE IN EIGHTEEN TEXAS CITIES

by

Katie N. Womack

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Maintenance and Operations Division
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Tonna Polk, Project Manager

National Highway Traffic Safety Administration
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The Texas Transportation Institute
The Texas A&M University System
College Station, Texas

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Background

In 1984 the Texas Transportation Institute (TTI) conducted an observational survey of occupant restraint use in a sample of Texas cities for the Texas State Department of Highways and Public Transportation. 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 base-line study, as well as a review of other relevant studies, were presented in a 1985 report (Hatfield, et al., 1985).

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.

In order to assess changes in occupant restraint use after passage of the law, TTI collected follow-up data between January and June of 1986 in selected cities (Bunch, et al., 1986). TTI has

continued to collect occupant restraint data at two intervals (in January and in June) annually. This report presents the results of the 1990 surveys, and compares these findings with the results of previous surveys.

Study Methodology

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 SDHPT, 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 cities currently used as observation sites.

The dates on which the 1990 observational data were collected are provided below:

Observation Cities	Survey Dates
Abilene	Jan. 2-5, June 5-7
Amarillo	Jan. 8-11, June 6-7
Austin	Jan. 2-4, May 30,31, June 1,4
Beaumont	Jan. 2-4, May 29-31
Brownsville	Jan. 2-5, May 29-31
Bryan/College Station	Jan. 3-5,8, June 3,4,8,11
Corpus Christi	Jan. 2-5, June 6-8
Dallas	Jan. 2-3, May 29-30
El Paso	Jan. 2-4, May 29-31
Ft. Worth	Jan. 2-4, June 4-6
Houston	Jan. 2-4, May 29-31
Laredo	Jan. 9-12, May 29-31, June 1
Lubbock	Jan. 9-11, June 4-6
Midland	Jan. 2-5, May 29-31, June 1
San Antonio	Jan. 2-4, May 29-31, June 1
Tyler	Jan. 2-4, May 30-31, June 1
Waco	Jan. 2-5, June 7-8
Wichita Falls	Jan. 2-5, June 4-7

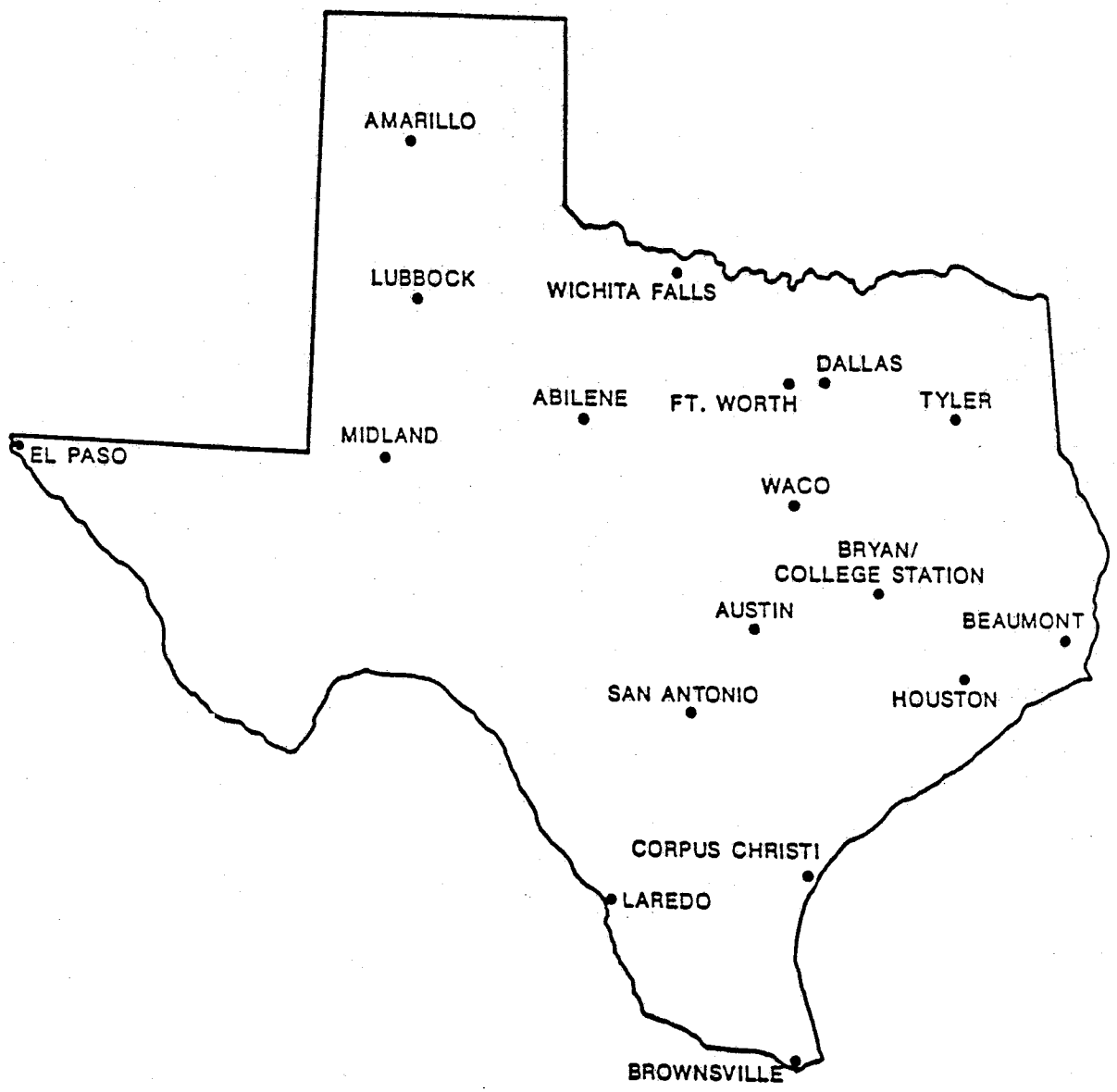


Figure 1. Study Cities in the Safety Belt Observational Survey

In each study city, occupant restraint use was observed in a geographic cross-section of 12 sites. Because the survey was intended to assess changes in safety belt use over time, an attempt was made to control for 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 and on weekdays, and a comparable number of observations was made during rush hour and non-rush hour periods.

Observations were limited to drivers and right front seat (outboard) passengers, with restraint use determined by the use of a shoulder harness. Eligible vehicles included privately owned passenger cars and pick-up trucks registered in the State of Texas. At each observation site, data on approximately 250 vehicles were recorded.

The following information was collected for each eligible vehicle:

- Driver restraint use (yes or no)
- Driver sex (male or female)
- Estimated driver age (15-19, 20-60, 61+)
- Front outboard passenger restraint use (yes or no)
- Front outboard passenger sex (male or female)
- 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 surveys utilized 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 to assure accurate observation was made.

Results of the 1990 Survey

In the combined 18-city sample, data were collected for a total of 54,362 drivers in January and 54,386 drivers in June. In January, 63.4 percent of the drivers observed were restrained, and 67.6 percent of the drivers observed in the June survey were restrained. Data for 24,858 passengers were also collected. Passengers were restrained 52.8 and 55.0 percent of the time in the January and June surveys, respectively. Among both drivers and front seat passengers, females evidenced higher wearing rates than did their male counterparts during the two survey periods, as shown in Table 1.

TABLE 1. 1990 OCCUPANT RESTRAINT USE BY SEX

	DRIVERS		PASSENGERS	
	Male	Female	Male	Female
% Restrained (January)	59.4	68.4	47.6	56.0
(June)	64.2	71.8	52.1	57.1
% Unrestrained (January)	40.6	31.6	52.4	44.0
(June)	35.8	28.2	47.9	42.9
Total Occupants (N): Jan.	30,363	23,999	4,992	7,893
June	30,226	24,160	4,972	7,001

When the data were examined by age of the driver, older drivers (over 60 years of age) were found to buckle up 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 quite similar. Again, those in the oldest age group had the highest safety belt wearing rates (Table 3). Restraint use for passengers under age 15 averaged 56.6 percent. Restraint use for passengers over age 15 averaged 53.4 percent. The age group with the lowest passenger restraint use was teens (averaging 49.3 percent usage across the two survey waves), followed closely by children under five (averaging 50.1 percent usage across the two survey waves).

TABLE 2. 1990 DRIVER RESTRAINT USE BY AGE

	DRIVER AGE		
	15 - 19	20 - 60	Over 60
% Restrained (January)	52.0	63.5	67.1
(June)	57.9	67.8	70.2
% Unrestrained (January)	48.0	36.5	32.9
(June)	42.1	32.2	29.8
Total Drivers (N): Jan.	1546	49,545	3,271
June	1796	49,561	3,029

TABLE 3. 1990 PASSENGER RESTRAINT USE BY AGE

	PASSENGER AGE				
	0 - 4*	5 - 14	15 - 19	20 - 60	61+
% Restrained (January)	51.9	58.6	47.6	51.4	63.4
(June)	47.9	58.0	51.1	54.3	66.1
% Unrestrained (January)	48.1	41.4	52.4	48.6	36.6
(June)	52.1	42.0	48.9	45.6	33.9
Total Passengers (Jan.)	428	1,507	1,593	8,324	1,033
(June)	361	1,404	1,454	7,937	817

*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 between 20 and 60 years of age had the highest belt usage rates in January (71.9 percent) and females over 60 had the highest belt usage rates in June (74.2 percent). Male drivers under 20 years of age had the lowest usage rates (45.9 percent in January and 54.9 percent in June).

TABLE 4. 1990 PERCENTAGE OF RESTRAINED DRIVERS BY AGE AND SEX

		DRIVER SEX	
Driver Age		Male	Female
15 - 19	January	45.9	61.9
	June	54.9	63.4
20 - 60	January	59.4	68.5
	June	64.3	71.9
Over 60	January	65.0	70.5
	June	67.6	74.2

Passenger restraint use was also analyzed by the passenger's sex and age. The highest restraint use was evidenced by females in the over 60 age group, and the lowest use was evidenced by males in the teen years and in the 20 to 60 age group (See Table 5).

TABLE 5. 1990 PERCENTAGE OF RESTRAINED PASSENGERS BY AGE AND SEX

		PASSENGER SEX	
Passenger Age		Male	Female
0-4	January	52.3	51.4
	June	46.3	49.7
5-14	January	57.2	60.0
	June	56.9	59.7
15-19	January	43.0	51.3
	June	51.7	50.5
20-60	January	45.2	55.1
	June	50.5	56.7
Over 60	January	55.3	65.8
	June	61.8	67.0

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 6. 1990 OCCUPANT RESTRAINT USE BY VEHICLE TYPE

	DRIVER		PASSENGER	
	Car	Pick-up	Car	Pick-up
% Restrained (January)	65.1	56.1	54.4	43.8
(June)	69.6	59.3	56.5	48.0
% Unrestrained (January)	34.9	43.9	45.6	56.2
(June)	30.3	40.7	43.5	52.0
Total Occupants (Jan.)	43,938	10,424	10,918	1,967
(June)	43,466	10,920	9,816	2,157

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 both survey waves, at least 22 percent of all vehicles observed had a passenger in the front outboard seating position. In this sample of 24,858 vehicles, if the driver was unrestrained, it was unlikely that the passenger was restrained. Restrained passengers were riding with unrestrained drivers in 15 percent of the observations (Table 7). However, if the driver was restrained, the passenger was also restrained approximately 78 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

	Passenger Restraint		
Driver Restraint	Unrestrained	Restrained	Total
Unrestrained (January)	4,315 (85.9%)	706 (14.1)	5,021
(June)	3,808 (84.2)	716 (15.8)	4,524
Restrained (January)	1,771 (22.5)	6,093 (77.5)	7,864
(June)	1,580 (21.2)	5,869 (78.8)	7,449

The data were analyzed separately for each of the 18 cities included in the study for each survey wave. Driver restraint use ranged from lows of 48 percent in Amarillo in January and 50 percent in San Antonio in June to highs of 80 and 81 percent in Austin and Tyler in January and June, respectively (Table 8). As mentioned previously, front seat passenger restraint was consistent with driver rates. The highest wearing rates were observed in Tyler in the January survey wave (79 percent) and in the June survey wave (70 percent). The lowest rates observed for passengers were in Brownsville (31.2 percent) in January and San Antonio (34.2 percent) in June. In Wichita Falls in the January survey, there was a greater percentage of passengers restrained (63.5 percent) than drivers (61.5 percent). In all other cities, the percentage of drivers restrained was greater than the observed percentage of passengers restrained, with an average difference of 10.6 percent in January and 12.6 in June.

Within each of the 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

TABLE 8. 1990 PERCENTAGE OCCUPANT RESTRAINT USE IN THE 18 STUDY CITIES

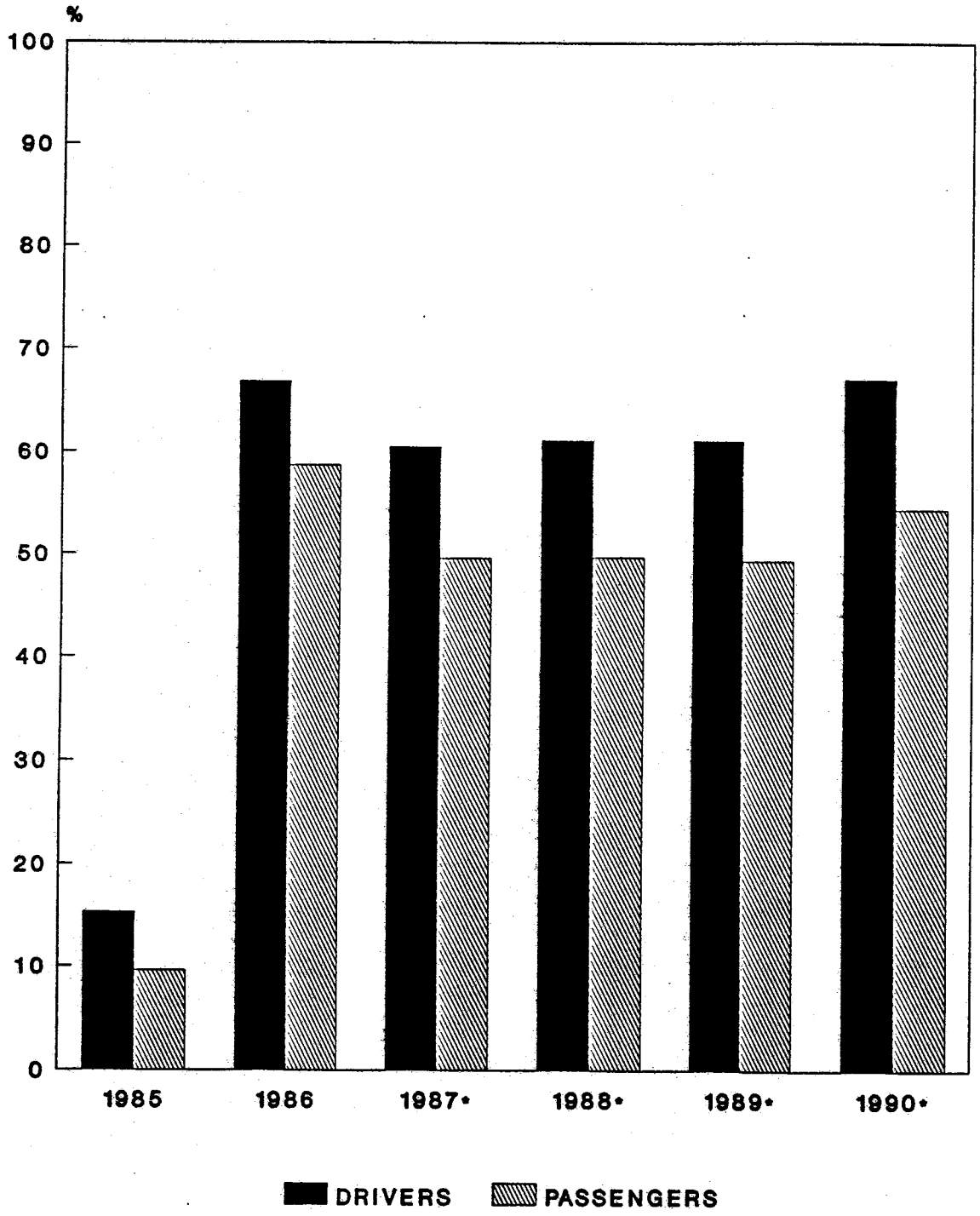
	DRIVER		PASSENGER	
	Jan.	June	Jan.	June
Abilene	56.3	63.7	48.3	61.6
Amarillo	48.3	61.4	31.2	51.2
Austin	80.4	76.8	75.2	65.4
Beaumont	67.7	72.0	66.0	62.0
Brownsville	55.8	63.5	40.9	43.3
Bryan/College Station	63.5	63.7	51.8	53.8
Corpus Christi	75.9	77.5	60.7	67.3
Dallas	67.0	67.1	57.5	55.3
El Paso	66.2	72.9	52.0	60.1
Ft. Worth	65.9	60.7	59.3	50.2
Houston	55.7	65.4	41.9	49.7
Laredo	68.8	73.0	50.9	55.8
Lubbock	57.8	72.0	47.3	57.5
Midland	66.2	67.9	56.6	65.1
San Antonio	50.1	50.2	38.5	34.2
Tyler	79.3	80.8	78.7	69.7
Waco	54.1	53.8	46.0	47.1
Wichita Falls	61.5	73.6	63.5	67.0
18-City Average	63.4	67.6	52.8	55.0

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 cities in which comparison data are available. Figure 2 illustrates the changes over time for the 12 cities in which data are available throughout the survey period. Driver restraint use in the 12 cities increased significantly from 15.2 percent in 1985 (the "before" period) to 66.8 percent in 1986 (the first "after" period). A significant drop in use was observed from 1986 to 1987 (from 66.8 percent in 1987 to approximately 60 percent in both survey waves of 1987, $p<.01$). Restraint use continued to decrease in the January, 1988 survey wave. However, the trend reversed in June of 1988 with the increase to a level slightly higher (61.1 percent) than that of June 1987 (60.5 percent). This average rate for the 12 cities remained stable at 61 percent in 1989. In 1990 a significant increase in belt use was observed in the 12 control cities. The increase in January to 62.8 percent use was significantly higher ($p<.01$) than the previous June (61.1 percent). Further, the combined average of the 12 cities in the June survey of 67.1 percent represents the highest belt use observed since observation began in 1985.

Passenger data in Figure 2 are limited to those individuals at least 15 years of age in the 12 cities, in order to insure comparability between waves of the survey. Restraint use among front seat passengers followed the same trend as use among drivers. "Before" usage was 9.6 percent. Immediately following MUL enactment, usage rose to 58.7 percent, a year later declined to 49.9 percent (a significant decrease of 9 percent, $p<.01$), and six



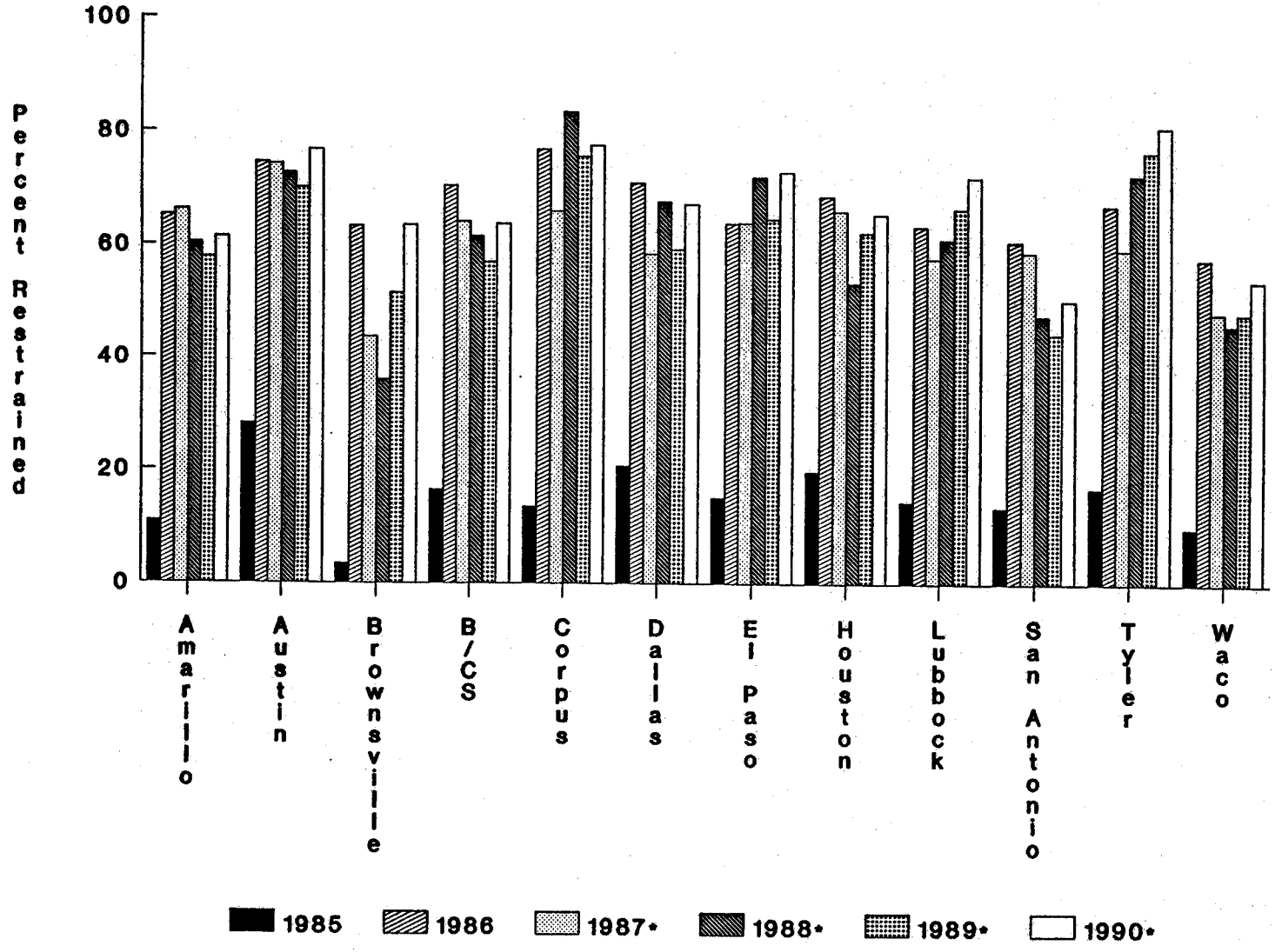
June Survey

Figure 2. Driver and Passenger Use By Year

months later was at 49.6 percent. Passenger restraint use showed no statistically significant changes from 1987 through 1989 for the June survey wave. However, most recently, the June 1990 survey wave showed a significant increase of five percentage points from the previous June ($p<.01$).

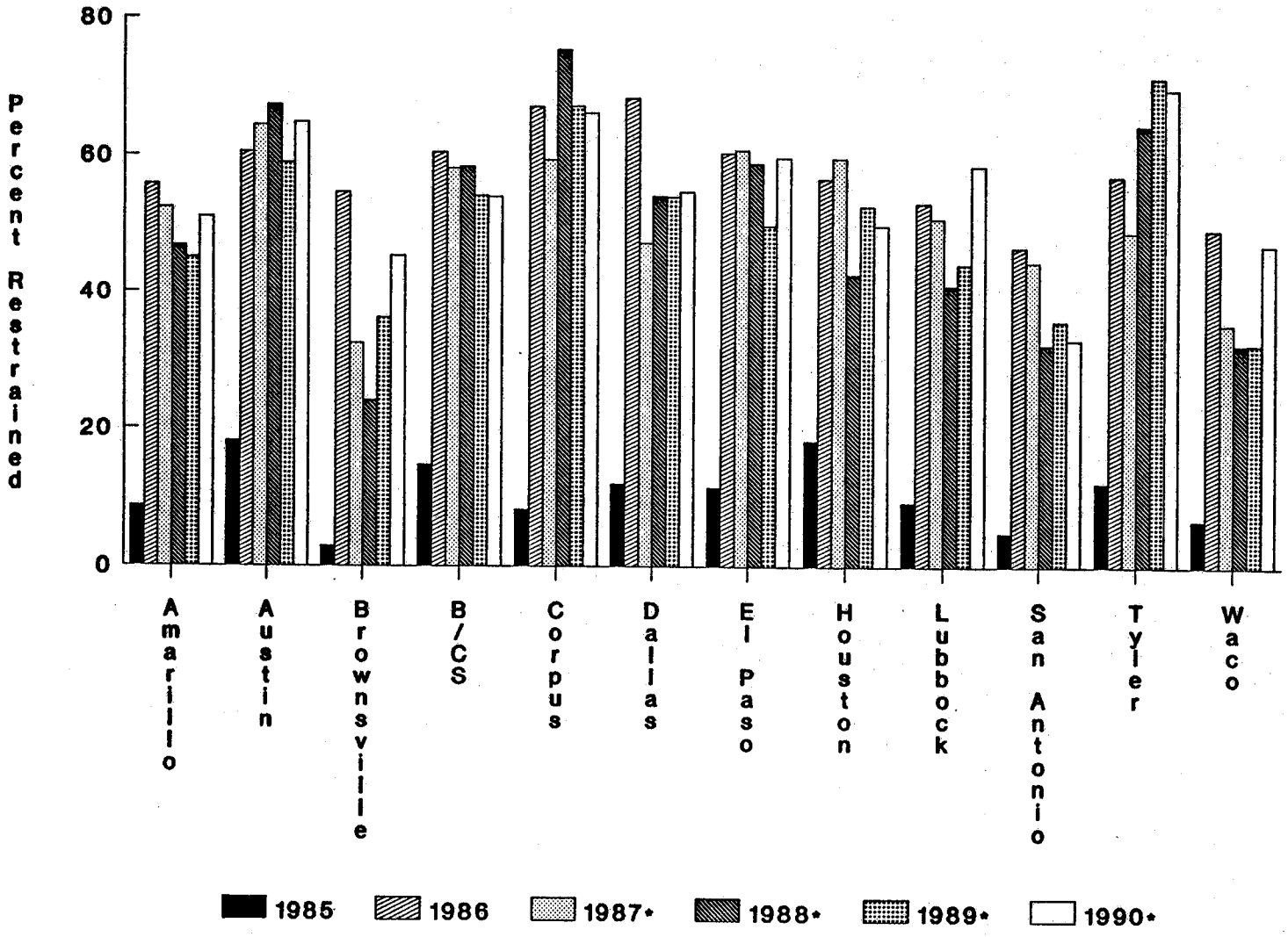
Figures 3 and 4 illustrate the changes over the five-year period for the 12 cities in which data has been collected each year. These graphs highlight the fact that, although changes in the composite average for all cities may be gradual at times, there is a much greater degree of fluctuation in most of the individual cities. In 11 of the 12 cities, driver restraint use **increased** by a significant amount ($p<.01$) from June, 1989 to June, 1990. Corpus Christi was the only city that showed no change from June, 1989 to June, 1990.

The percentages of driver restraint use for each of the 18 cities included in the surveys over time are provided in Table 9. Several shifts in restraint use in the six cities added to the survey sample subsequent to 1985 are evidenced. Abilene experienced steady usage rates in 1988, but showed significant increases from January to June in 1989 and 1990. Beaumont showed a small but significant ($p<.05$) increase in the January (1990) survey from the previous June, and an even larger increase during the following six months. Similarly, Wichita Falls has shown steady increases since 1989, and a dramatic 12.1 percentage point gain in the most recent survey wave. A steadily increasing trend in usage has been observed in Laredo. Statistically significant decreases in usage were observed for Fort Worth (January to June,



* June Survey

Figure 3. Driver Restraint Use By City and Year



* June Survey

Figure 4. Passenger Restraint Use By City and Year

TABLE 9. PERCENT OF DRIVERS RESTRAINED BY CITY OVER TIME

CITY	(Pre-Law) 1985	1986	Jan. 1987	June 1987	Jan. 1988	June 1988	Jan. 1989	June 1989	Jan. 1990	June 1990
Abilene	NA	NA	NA	NA	52.9	52.8	52.2	57.3	56.3	63.7
Amarillo	10.8	65.2	63.2	66.2	58.1	60.4	51.5	57.8	48.3	61.4
Austin	28.1	74.6	74.2	74.3	64.8	72.7	72.0	70.1	80.4	76.8
Beaumont	NA	60.0	53.3	52.0	46.6	59.3	57.2	65.2	67.7	72.0
Brownsville	3.4	63.3	40.8	43.6	39.3	35.9	40.9	51.5	55.8	63.5
Bryan/College Stn.	16.4	70.4	61.1	64.1	58.5	61.5	57.8	56.9	63.5	63.7
Corpus Christi	13.4	76.8	75.6	65.9	77.9	83.3	79.0	75.6	75.9	77.5
Dallas	20.6	70.9	57.9	58.4	58.1	67.6	67.1	59.2	67.0	67.1
El Paso	15.0	63.8	60.9	63.9	55.2	72.0	62.0	64.6	66.2	72.9
Fort Worth	NA	63.3	53.3	61.2	55.3	55.0	55.7	57.8	65.9	60.7
Houston	19.7	68.6	54.9	66.0	46.8	53.3	59.7	62.1	55.7	65.4
Laredo	NA	NA	NA	NA	32.4	50.1	71.7	61.8	68.8	73.0
Lubbock	14.3	63.3	56.3	57.6	62.5	61.0	55.8	66.4	57.8	72.0
Midland	NA	NA	NA	NA	53.1	55.2	68.3	69.7	66.2	67.9
San Antonio	13.3	60.6	65.0	58.7	50.8	47.4	47.7	44.2	50.1	50.2
Tyler	16.7	67.0	57.8	59.2	58.2	72.4	83.0	76.5	79.3	80.8
Waco	9.7	57.5	46.5	48.0	48.0	45.9	51.8	47.9	54.1	53.8
Wichita Falls	NA	NA	NA	NA	56.7	59.9	55.4	56.3	61.5	73.6
Average	**15.2**	**66.8**	**59.5**	**60.5**	**54.2**	**59.2**	**60.5**	**61.2**	**63.4**	**67.6**

1990) and for Midland (June, 1989 to January, 1990).

Passenger restraint use in seven of the 12 cities examined before and after the mandatory use law (Austin, Bryan/College Station, Corpus Christi, Dallas, Houston, San Antonio and Tyler) did not significantly change from 1989 to 1990 (Figure 4). Significant increases in passenger restraint use were observed in the remaining five cities, Amarillo, Brownsville, El Paso, Lubbock, and Waco, in 1990. Additionally, increases in passenger restraint use from January to June of 1990 were observed in Amarillo, Corpus Christi, El Paso, Houston, Lubbock, and Waco. Significant decreases during the six-month interval were observed in Tyler and Austin. As shown in Table 10, significant increases in passenger restraint use were observed in 1990 for five of the cities added to the sample in 1986 and 1988 (Abilene, Beaumont, Laredo, and Midland and Wichita Falls).

Table 11 gives changes over time in driver restraint use by males and females (for all cities included in the observations). These data indicate that in the three year period prior to 1989 male driver restraint use declined, and in 1989 male driver restraint use increased to above the 1987 level. In 1990, male driver restraint use again increased to a level only slightly lower than the peak rate of 1986. 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 percent of the 1986 post-enactment rate. By 1990, female driver restraint use was observed to be at an all time high of 71.8 percent. Table 12 shows a similar trend for passengers. Again, male passengers were

TABLE 10. PERCENT OF PASSENGERS RESTRAINED BY CITY OVER TIME

CITY	(Pre-Law) 1985	1986	Jan. 1987	June 1987	Jan. 1988	June 1988	Jan. 1989	June 1989	Jan. 1990	June 1990
Abilene	NA	NA	NA	NA	38.7	39.2	33.7	52.6	48.3	61.6
Amarillo	8.7	55.8	53.4	52.4	40.1	46.8	42.8	41.8	31.2	51.2
Austin	18.1	60.5	61.6	64.4	53.3	67.3	55.0	60.3	75.2	65.4
Beaumont	NA	47.2	50.6	45.5	39.2	50.9	45.9	54.3	66.0	62.0
Brownsville	2.9	54.6	28.7	32.5	24.8	24.1	28.5	35.1	40.9	43.3
Bryan/College Stn.	14.7	60.4	55.9	58.1	57.7	58.3	55.2	56.5	51.8	53.8
Corpus Christi	8.2	67.0	67.0	59.3	68.3	75.2	67.9	67.4	60.7	67.3
Dallas	11.9	68.3	57.0	47.2	55.9	54.0	55.8	55.7	57.5	55.3
El Paso	11.4	60.3	57.4	60.7	53.7	58.8	50.1	49.6	52.0	60.1
Fort Worth	NA	54.0	45.0	53.2	44.9	45.9	52.6	48.1	59.3	50.2
Houston	18.2	56.6	42.0	59.6	36.9	42.6	42.5	52.9	41.9	49.7
Laredo	NA	NA	NA	NA	37.8	42.7	42.5	52.9	50.9	55.8
Lubbock	9.3	53.0	38.7	50.8	41.2	40.9	49.1	44.1	47.3	57.5
Midland	NA	NA	NA	NA	40.0	40.2	53.8	56.5	56.6	65.1
San Antonio	4.9	46.6	51.6	44.4	29.8	32.2	37.8	35.6	38.5	34.2
Tyler	12.1	56.9	46.4	48.8	44.8	64.3	82.7	72.8	78.7	69.7
Waco	6.7	49.2	32.1	35.3	35.4	32.3	46.5	36.4	46.0	47.1
Wichita Falls	NA	NA	NA	NA	49.5	46.2	44.9	48.1	63.5	67.0
Average	9.6	58.7	49.3	51.1	43.5	48.2	50.4	50.7	52.8	55.0

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.

TABLE 11. DRIVER RESTRAINT USE BY SEX AND YEAR

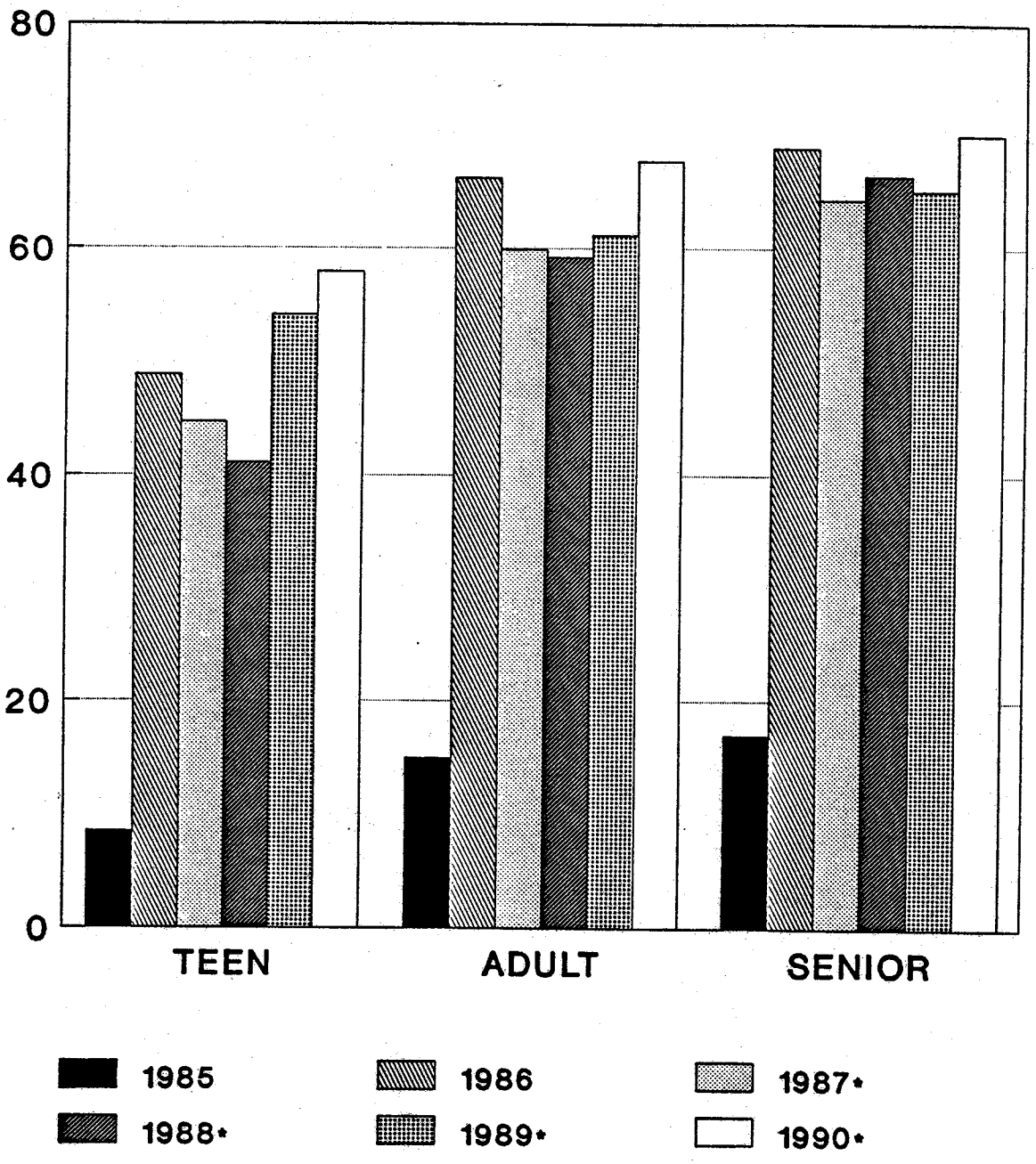
	PERCENT RESTRAINED	
	MALE	FEMALE
1985	13.8	16.9
1986	64.8	67.8
1987 (June)	57.0	63.8
1988 (June)	54.9	64.7
1989 (June)	57.2	66.3
1990 (June)	64.2	71.8

TABLE 12. PASSENGER RESTRAINT USE BY SEX AND YEAR

	PERCENT RESTRAINED	
	MALE	FEMALE
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

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 percent) and the lowest decrease in belt use during the second year (4 percent) compared to the other two age groups (Figure 5). Although teen restraint use steadily decreased since 1986, a dramatic increase occurred in 1989 and continued in 1990 for teen belt use. Adult and senior use both increased significantly in 1990 (adults by 6.5 percentage points and seniors by 5.0 percentage points).

When sex and age were analyzed together (Table 13) the most notable finding was that females at every age level reached usage rates that were higher than ever observed previously. Similarly. restraint use by teenage males rose to an all time high of 55 percent. The gap between males and females at the teen level is larger than for any other age group, and teenage males retained the position as lowest percentage of users.



* June Survey

Figure 5. Driver Restraint Use By Age and Year

TABLE 13. 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

Monthly Observations in Austin, Texas

In the statewide survey of safety belt use, data were collected twice a year in each of the study cities. While these measurements provide a general indication of usage rates for two points in time, they do not offer a longitudinal analysis of safety belt wearing rates. The variation that has occurred in the January and June survey waves suggests some seasonality. Therefore, an attempt was made to identify trends and/or random fluctuations in safety belt use by collecting monthly data in the city of Austin. These monthly observations were made at the same study sites as those used in the 18-city survey to insure comparability. While the pattern observed in Austin may not typify what was happening in

other Texas cities, these data do provide a more detailed description of safety belt use over an extended period of time.

As shown in Table 14 and Figure 6, the baseline wearing rates for drivers and front seat passengers were 28 percent and 18 percent, respectively. These rates were recorded in January of 1985 as part of TTI's pre-law safety belt survey. Despite increased attention on the seat belt issue due to pending legislation, driver restraint use had only increased to 34 percent by August of 1985, while passenger restraint use increased to 22 percent.

When the mandatory belt use law first went into effect without sanctions (September 1, 1985), seat belt wearing rates for both drivers and passengers increased dramatically, as expected. Over the three-month warning period when no fines could be imposed on violators (September 1 - November 30, 1985), driver safety belt use dropped only slightly from the peak coincident with the implementation of the law. Passenger restraint use dropped somewhat more than drivers, but the rate was still higher than that recorded in the baseline period.

With the imposition of $25 - $50 fines which began on December 1, 1985, another sharp rise in usage rates was noted. This rate for the succeeding 52 months of observation has been maintained fairly consistently, and has in fact increased somewhat from the December 1985 enactment date. The 12-month average restraint rate for drivers for 1986 was 70.5 percent. In 1987, driver compliance averaged 72.9 percent. Driver restraint usage averaged 72.1 percent in 1988 and in 1989.

Although the average driver restraint use during the 52-month post-enactment period has been approximately 72 percent, some notable fluctuations have occurred. Percentages in the high 60's were observed in the Spring of 1986 and in the Fall of 1987. The highest rate following MUL sanctions was observed in October of 1989.

As expected, passenger restraint use was generally lower than that observed for drivers (by approximately 7 percent). However, the trend of use has fluctuated more for passengers than for drivers over the duration of the observation period. The highest passenger use rate following MUL sanctions was observed in August of 1987, while the lowest rate was observed in January of 1988. Overall, passenger usage rates in Austin have not shown a statistically significant increase or decrease since the initial rise following MUL implementation.

TABLE 14. MONTHLY SEAT BELT USE IN AUSTIN, TEXAS

Month	Driver	Passenger
Baseline: January 1985	28.1	18.1
1985		
August	34.4	22.4
September	59.5	48.1
October	54.2	42.5
November	51.3	33.2
December	68.1	69.2
1986		
January	74.6	60.5
February	70.4	68.7
March	69.0	64.3
April	69.6	66.4
May	66.4	58.8
June	69.6	66.6
July	72.2	73.5
August	71.0	68.7

September	70.8	65.0
October	70.7	58.2
November	71.0	58.9
December	70.7	57.2
1987		
January	74.2	62.0
February	75.2	68.2
March	75.6	72.6
April	73.0	64.9
May	74.0	67.6
June	74.3	66.9
July	74.6	75.9
August	72.9	80.7
September	67.7	56.9
October	69.7	53.1
November	68.8	59.0
December	74.4	64.2
1988		
January	64.8	51.2
February	64.8	54.9
March	71.3	63.0
April	70.2	58.5
May	79.7	61.8
June	72.8	67.6
July	76.6	72.5
August	78.6	77.5
September	71.3	58.0
October	71.0	55.6
November	72.6	53.4
December	71.1	74.3
1989		
January	72.0	55.0
February	69.4	54.7
March	73.2	64.8
April	71.7	59.8
May	75.6	59.3
June	70.1	60.3
July	65.0	55.0
August	65.9	68.0
September	74.6	73.6
October	82.6	74.1
November	73.9	57.8
December	71.8	68.0
1990		
January	80.4	75.2
February	74.8	66.8
March	76.2	67.8
April	78.0	67.8

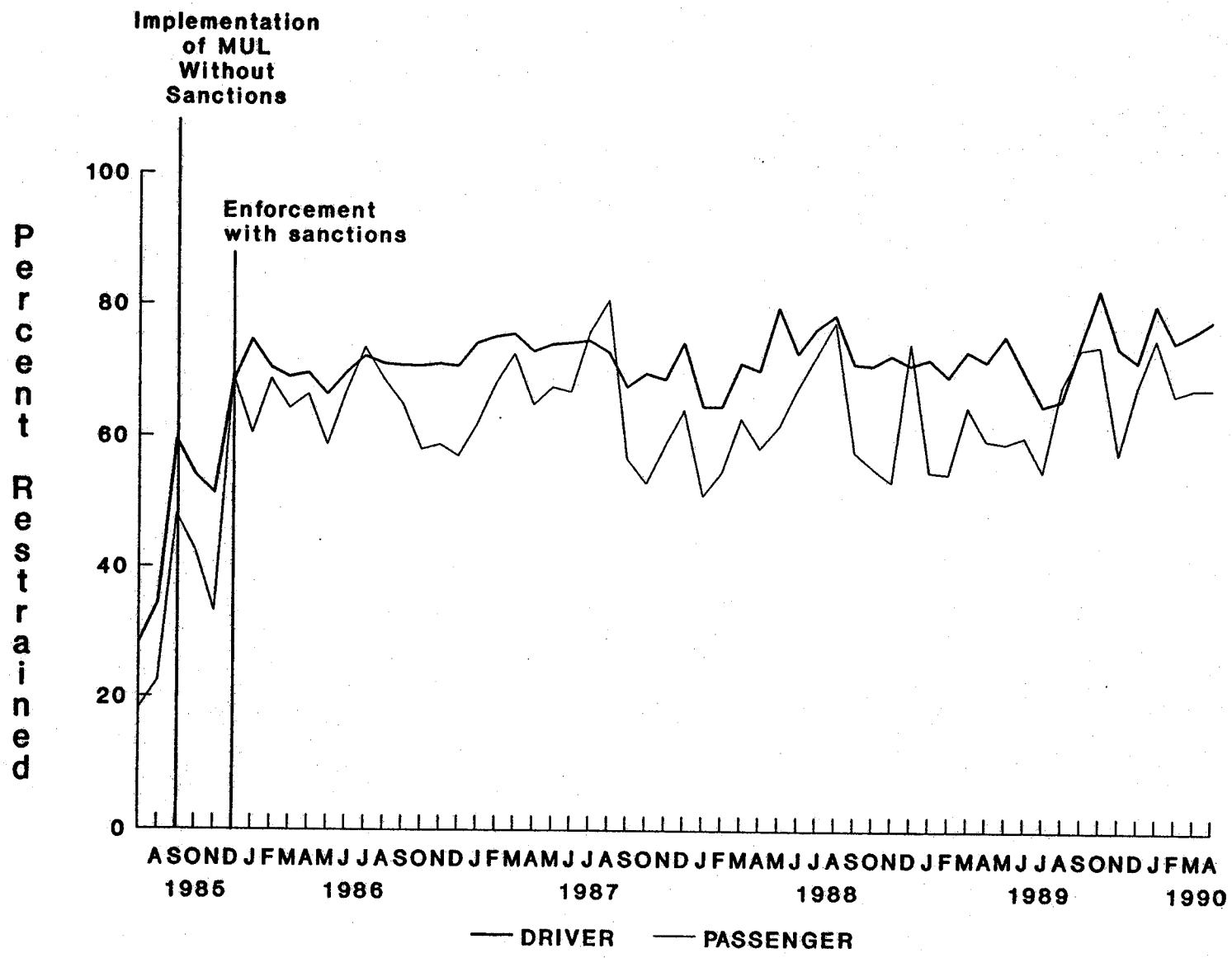


Figure 6. Observed Monthly Occupant Restraint Use in Austin, Texas

Summary and Conclusions

The initial survey of 1985 showed driver restraint use in 12 Texas cities ranging from three percent to 28 percent and averaging 15.2 percent across all 12. Passenger restraint use was approximately 10 percent for the 12 cities. Not surprisingly, a dramatic increase in belt use was observed during the first year of the post-law period. Driver restraint use rates ranged from a low of 57 percent to a high of 77 percent in the 1986 survey, and passenger restraint use was 59 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 drivers decreased by approximately six percent to a 60 percent usage rate for all cities combined. Front seat passenger restraint use also decreased in the second year period from 57 percent to 50 percent overall. 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 54.1 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 for drivers rose to an average of 59.2 percent

for the eighteen cities surveyed in June of 1988, while passenger usage rates rose to 48.2 percent. As with the downward shift from June of 1987 to June of 1988, this upward change may be due in part to natural fluctuation in the data.

The 1989 survey indicated a levelling off for the average driver usage rate across the 18 study cities of 61 percent, and a passenger usage rate of 51 percent. Three survey waves (January 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 drivers 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.

Analysis of safety belt use for males and females and for the three age groups revealed comparable patterns in the 1990 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. Females of all ages were more likely to buckle up in greater numbers. Teenage males were still least likely to buckle up. However, a greater percentage of teenage males were observed riding restrained than ever before. 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 widened in the June, 1990 survey wave to more than 12 percent.

In summary, 1990 observation of occupant restraint use revealed combined average usage rates for the 18 cities surveyed at levels higher than previous years. Sixteen of the 18 cities surveyed experienced significant increases in belt use from the previous year. It is notable that eight of the 18 cities surpassed 70 percent in the June survey wave, which has been established as a national target usage rate.

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