1996 SURVEY OF FRONT SEAT OCCUPANT RESTRAINT USE IN EIGHTEEN TEXAS CITIES

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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, and may be issued a citation for a front seat minor passenger's failure to use a safety belt. 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).

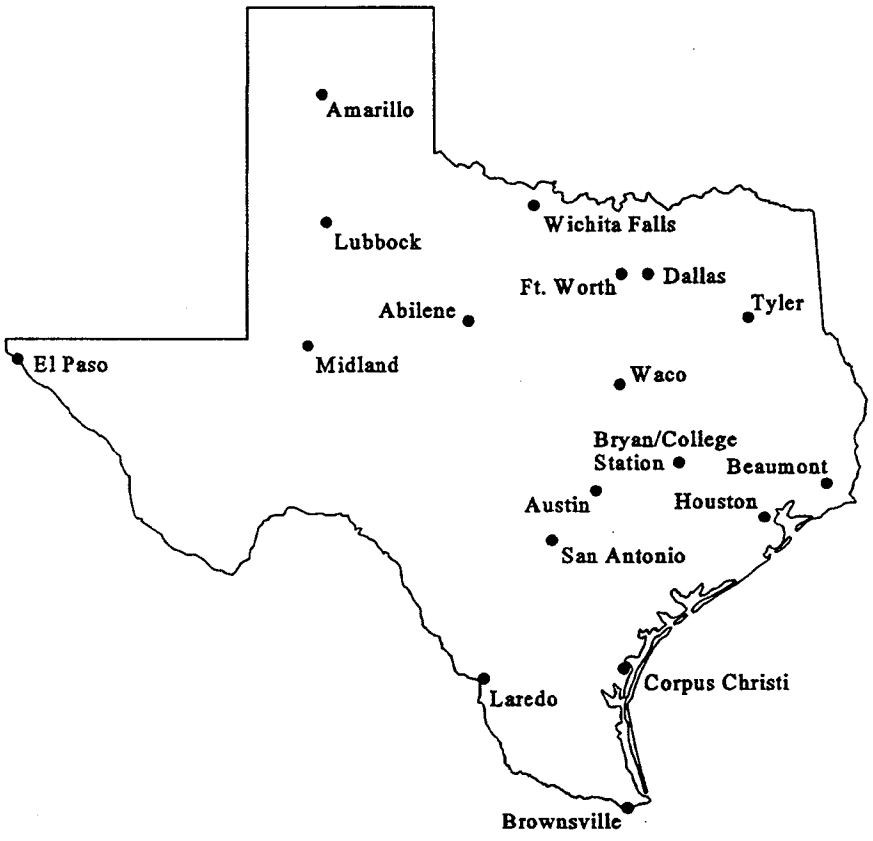
In order to assess changes in occupant restraint use after passage of the law and to provide current usage rates, TTI has continued to conduct observational surveys each year since the MUL has been in effect. From 1987 through 1990, data was collected at two intervals annually (January and June). From 1991 through 1996, the survey was conducted at one interval during the summer. The 1996 survey was conducted May 18 through July 12. This report presents the results of the 1996 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 a shoulder harness. Eligible vehicles included passenger cars and pick-up trucks. At each observation site, data was collected for one hour.

FIGURE 1
STUDY CITIES IN THE SAFETY BELT OBSERVATIONAL SURVEY



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)
- Driver and front seat outboard occupant gender (male or female)
- 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. Beginning in 1992, the survey method was altered somewhat to encompass a statewide observational survey. Data were collected in all of the original 18 study cities. 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 1996 Survey

In the combined 18-city sample, data regarding 58,148 front seat occupants were collected at a total of 169 intersections. The percentage of front seat occupants restrained was 73.95.

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 percentage points more often than male drivers (83.8 percent compared to 73.8 percent), while female passengers were restrained 6.7 percentage points more often than their male counterparts (73.7 percent compared to 67.1 percent).

TABLE 1. 1996 OCCUPANT RESTRAINT USE BY SEX

	DRIVERS		PASSENGERS	
	Male	Female	Male	Female
% Restrained	73.8	83.8	67.1	73.7
% Unrestrained	26.2	16.2	32.9	26.3
Total Occupants (N):	9,168	6,627	1,904	2,681

The driver restraint usage rate increased as age increased. The restraint usage rate for drivers over age 60 was 82.7 percent compared to 75.1 percent for teenage drivers (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 usage rates (Table 3). The age group with the lowest passenger restraint use was children in the 5 to 14 year age group (60.7 percent), well below the usage for other passenger age groups.

TABLE 2. 1996 DRIVER RESTRAINT USE BY AGE

	DRIVER AGE		
	15 - 19	20 - 60	Over 60
% Restrained	75.1	77.8	82.7
% Unrestrained	24.9	22.2	17.3
Total Drivers (N):	309	14,416	1,070

TABLE 3. 1996 PASSENGER RESTRAINT USE BY AGE

	PASSENGER AGE				
	0 - 4*	5 - 14	15 - 19	20 - 60	61+
% Restrained	59.1	58.3	71.4	71.3	74.5
% Unrestrained	40.9	41.7	28.6	28.7	25.5
Total Passengers (N):	176	444	353	2,806	381

*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 are more likely than male drivers to wear safety belts. The difference in usage rates by males and females was similar at each of the three age levels.

TABLE 4. 1996 PERCENTAGE OF RESTRAINED DRIVERS BY AGE AND SEX

	DRIVER SEX	
Driver Age	Male	Female
15 - 19	72.0	81.4
20 - 60	73.4	83.6
Over 60	79.5	87.9

Passenger restraint use was also analyzed by the passenger's sex and age (Table 5). The highest restraint use was evidenced by females and males in the over 60 age group (approximately 80 percent), and the lowest use was evidenced by male and female children ages 5 to 14 years (60.7 percent).

For both drivers and passengers, restraint use was found to be higher for occupants of passenger cars than for pick-up trucks, as seen in Table 6 for sites that included driver and passenger data. The difference was 14.7 percentage points across all sites.

TABLE 5. 1996 PERCENTAGE OF RESTRAINED PASSENGERS BY AGE AND SEX

	PASSENGER SEX			
Passenger Age	Male	(n)	Female	(n)
0-4	69.9	73	72.2	54
5-14	60.7	318	60.7	280
15-19	68.2	192	68.1	235
20-60	67.4	1223	75.5	1827
Over 60	79.6	98	80.0	285

TABLE 6. 1996 OCCUPANT RESTRAINT USE BY VEHICLE TYPE

	DRIVER		PASSENGER	
	Car	Pick-up	Car	Pick-up
% Restrained	80.9	68.0	73.5	59.9
% Unrestrained	19.1	32.0	26.5	40.1
Total Occupants	12,263	3,532	3,739	846

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 1996 survey, 29 percent of all vehicles observed had a passenger in the front outboard seating position. In this sample of 4,585 vehicles, if the driver was unrestrained, it was unlikely that the passenger was restrained. Restrained passengers were riding with unrestrained drivers in only 24.4 percent of the observations (Table 7). However, if the driver was restrained, the passenger was also restrained 83 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	75.6 (710)	24.4 (229)	100 (939)
Restrained	17.0 (621)	83.0 (3025)	100 (3646)

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 65.8 percent in Brownsville to a high of 86.1 percent in Austin.

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 were 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 64.8 percent in Beaumont to a high of 86.8 percent in Bryan/College Station (Table 9). Passenger restraint use ranged from 55.6 percent in El Paso to 90.8 percent in Austin. The total average percentage of drivers restrained was greater than the observed percentage of passengers restrained, with an average difference of 5.8 percent.

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.

TABLE 8. 1996 PERCENTAGE OCCUPANT RESTRAINT USE IN THE 18 STUDY CITIES

CITY	Number Observed	Percent Restrained
Abilene	2,136	77.7
Amarillo	2,223	69.8
Austin	1,698	86.1
Beaumont	679	65.8
Brownsville	2,205	76.1
Bryan/College Station	2,237	86.0
Corpus Christi	1,149	78.4
Dallas	7,276	73.4
El Paso	2,216	67.9
Ft. Worth	888	76.8
Houston	19,463	71.3
Laredo	1,963	71.9
Lubbock	2,253	73.6
Midland	1,806	81.2
San Antonio	6,507	74.1
Tyler	1,254	76.1
Waco	821	78.1
Wichita Falls	1,374	74.1

TABLE 9. 1996 PERCENTAGE DRIVER AND PASSENGER RESTRAINT USE IN THE 18 STUDY CITIES

CITY	Drivers	Passengers
Abilene	78.4	74.6
Amarillo	70.4	67.2
Austin	86.1	90.8
Beaumont	64.8	60.9
Brownsville	81.3	70.0
Bryan/College Station	86.8	84.7
Corpus Christi	80.7	70.1
Dallas	80.6	63.4
El Paso	68.0	55.6
Ft. Worth	80.5	89.4
Houston	79.2	68.2
Laredo	76.7	62.4
Lubbock	76.0	73.4
Midland	84.2	68.5
San Antonio	76.1	69.1
Tyler	77.4	71.4
Waco	75.3	84.5
Wichita Falls	76.3	70.7

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 survey since 1988 included 18 cities. The statistical test used to determine significant changes was a two-tailed z-test of significance. Maximum alpha levels of .05 were accepted. Explanation of the statistical method and rationale for its use can be found in Downie and Heath (Chapter 12, 1965).

Restraint use increased significantly from 14.2 percent in 1985 (the "before law" period) to 64.9 percent in 1986 (the first "after law" period). A significant drop in use was observed from 1986 to 1987 (from 64.9 percent in 1987 to 56.9 and 58.6 percent in the two survey waves of 1987). 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 of 1990 to 65.3 percent use was significantly higher than the previous June (59.2 percent in 1989). Further, the combined average in the June, 1990, survey of 65.3 percent represented the highest belt use observed since observation began in 1985. The usage rate remained stable at 65.2 percent in 1991. A significant increase 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

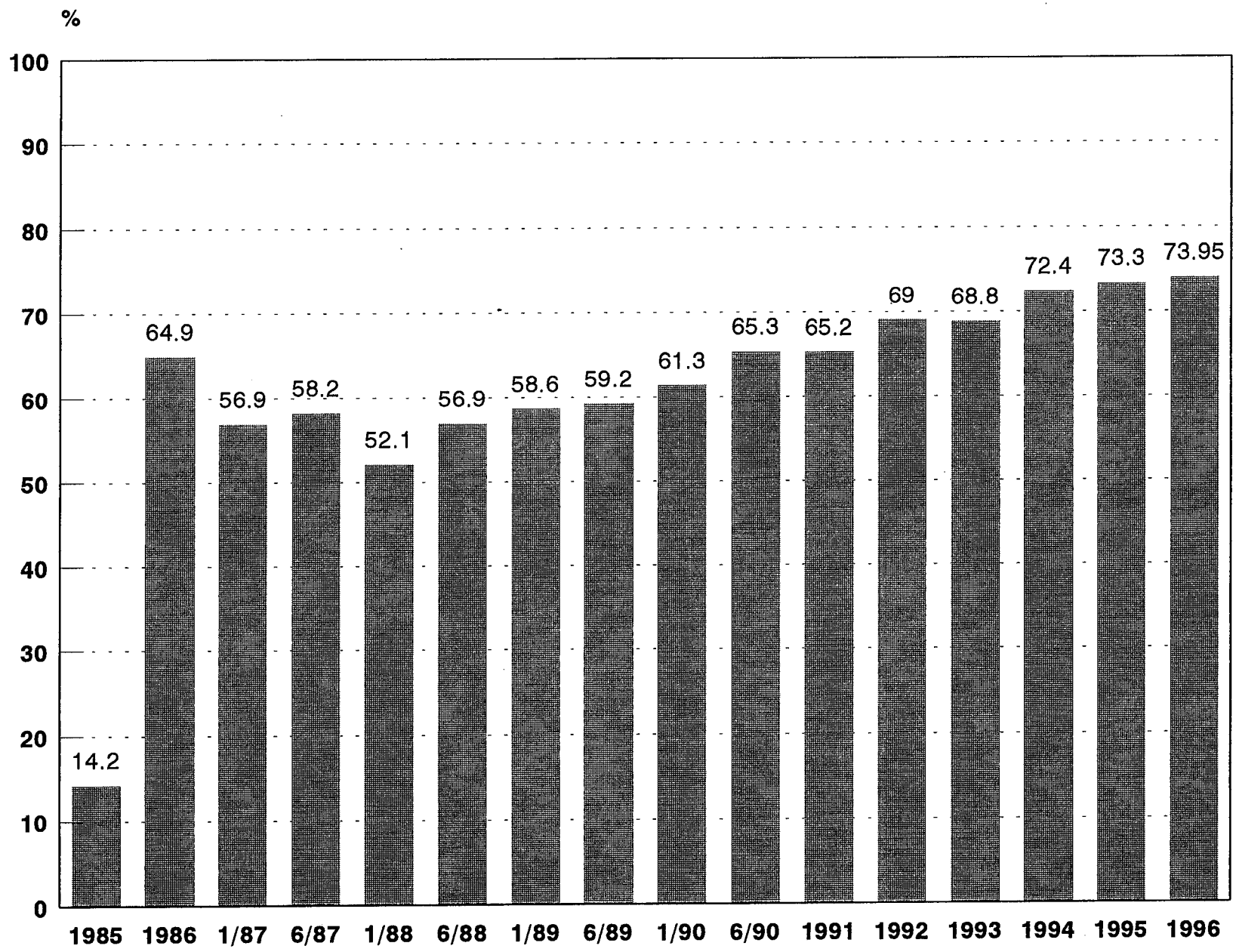


Figure 2. Front Seat Occupant Restraint Use By Year

the 18 cities combined did not change significantly in 1993. A statistically significant increase in safety belt use was observed from 1993 to 1994 as the rate changed from 68.8 percent to 72.4 percent and again in 1995 as the rate changed from 72.4 percent to 73.3 percent. The estimated usage rate of 73.95 for front seat occupants observed in 1996 represents a significant increase over the 1995 usage rate.

Data collected at the city level in 1996 provide directly comparable observations to the 1992 - 1995 data because comparable sites during these four 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 the 1992-1996 data are not comparable to earlier years' data. Table 10 provides city level data for each of the 18 cities surveyed for 1992 through 1996. From 1995 to 1996, five of the 18 cities experienced significant increases in front seat occupant restraint use, ten cities showed no statistically significant change, and three cities (Laredo, Midland, and Tyler) experienced decreases in restraint use. The largest increase in belt use was observed in Fort Worth, which increased by 13 percentage points over 1995. The largest decrease in belt use was observed in Tyler, which was 7.0 percentage points below 1995).

TABLE 10. FRONT SEAT OCCUPANT RESTRAINT USE BY CITY--1992-1996

CITY	1992	1993	1994	1995	1996
Abilene	74.2	71.1	70.2	75.1	77.7
Amarillo	70.3	71.2	74.2	68.1	69.8
Austin	80.4	79.3	84.0	85.8	86.1
Beaumont	64.1	70.5	71.0	64.1	65.8
Brownsville	60.9	62.6	67.0	75.0	76.1
Bryan/College Station	63.7	80.8	83.0	85.9	86.0
Corpus Christi	79.1	73.8	80.4	79.0	78.4
Dallas	67.2	70.6	73.1	71.7	73.4
El Paso	64.9	68.0	64.2	61.8	67.9
Ft. Worth	56.0	67.0	69.7	60.7	76.8
Houston	56.3	61.0	69.2	69.3	71.3
Laredo	68.0	69.2	67.2	75.3	71.9
Lubbock	83.2	78.5	76.6	74.2	73.6
Midland	85.5	82.6	85.2	85.1	81.2
San Antonio	69.7	69.9	73.4	69.9	74.1
Tyler	71.6	74.0	75.3	83.1	76.1
Waco	71.4	76.5	73.1	79.4	78.1
Wichita Falls	68.3	71.8	72.4	69.8	74.1

Tables 11 and 12 provide driver and passenger restraint use rates across each of the study years. (Comparable data for drivers was not available for Brownsville in 1992.) This subset of data indicates significant increases in driver restraint use for the selected sites representing two cities in 1996--Fort Worth and Houston. A significant decrease in driver restraint use was detected in Tyler.

Passenger restraint use at selected sites in 12 of the 18 cities did not significantly change from 1995 to 1996 (Table 12). Significant increases in passenger restraint use were observed in Amarillo, Fort Worth, and Wichita Falls. Significant decreases during the one-year interval were observed in El Paso, Midland, and Tyler.

Table 13 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. Belt use among males in 1992 was approximately 10 percentage points higher than 1991. Again, the sites included in the 1992 survey were a subset of earlier surveys and therefore do not represent a replication of earlier surveys. A significant decrease from the 1992 usage rate was observed in 1993 for males. In 1994, however, the male driver restraint usage rate returned to approximate the 1992 rate. A small, but statistically significant increase

TABLE 11. 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	1994	1995	1996
Abilene	NA	NA	NA	NA	52.9	52.8	52.2	57.3	56.3	63.7	69.3	75.6	73.8	71.9	75.5	78.4
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	75.9	70.0	70.4
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	85.0	88.7	86.1
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	71.0	63.7	64.8
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	79.3	80.1	81.3
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	87.7	88.3	86.8
Corpus	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	83.3	81.8	80.7
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	72.2	76.4	80.6
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	65.4	74.0	68.0
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	70.0	67.4	80.5
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	76.1	73.9	79.2
Laredo	NA	NA	NA	NA	32.4	50.1	71.7	61.8	68.8	73.0	78.4	71.0	72.8	71.9	78.0	76.7
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	85.7	77.8	76.0
Midland	NA	NA	NA	NA	53.1	55.2	68.3	69.7	66.2	67.9	73.3	86.6	85.8	86.7	86.5	84.2
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	72.4	71.8	76.1
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	76.9	83.9	77.4
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	73.0	79.9	75.3
Wichita Falls	NA	NA	NA	NA	56.7	59.9	55.4	56.3	61.5	73.6	64.2	71.6	72.8	74.8	75.9	76.3
Average	**15.2**	**66.8**	**59.5**	**60.5**	**54.2**	**59.2**	**60.5**	**61.2**	**63.4**	**67.6**	**67.5**	**77.3**	**74.5**	**77.2**	**78.7**	**78.0**

TABLE 12. 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	1994	1995	1996
Abilene	NA	NA	NA	NA	38.7	39.2	33.7	52.6	48.3	61.6	67.2	69.0	62.1	63.9	73.2	74.6
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	68.0	60.1	67.2
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	77.7	84.2	90.8
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	74.2	49.3	60.9
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	63.3	69.6	70.0
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	75.8	79.8	84.7
Corpus	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	70.0	69.6	70.1
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	68.7	66.0	63.4
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	56.7	68.2	55.6
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	75.8	61.8	89.4
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	66.7	69.8	68.2
Laredo	NA	NA	NA	NA	37.8	42.7	42.5	52.9	50.9	55.8	67.4	59.0	61.3	55.2	63.7	62.4
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	72.1	69.9	73.4
Midland	NA	NA	NA	NA	40.0	40.2	53.8	56.5	56.6	65.1	56.9	80.6	67.4	79.3	78.2	68.5
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	71.4	59.8	69.1
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	68.7	79.8	71.4
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	73.3	76.8	84.5
Wichita Falls	NA	NA	NA	NA	49.5	46.2	44.9	48.1	63.5	67.0	56.5	53.5	61.5	59.7	54.8	70.7
Average	**9.6**	**58.7**	**49.3**	**51.1**	**43.5**	**48.2**	**50.4**	**50.7**	**52.8**	**55.0**	**56.1**	**67.4**	**64.2**	**68.3**	**69.7**	**71.0**

in belt use for male drivers was observed in 1995. The slight decrease observed in 1996 is not statistically significantly less than 1995 safety belt usage for males.

Restraint use for female drivers showed 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-law rate for females. In 1990, female driver restraint use increased to above

TABLE 13. 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
1991 (June)	63.9	72.3
1992	73.5	82.7
1993	70.1	80.7
1994	73.2	83.0
1995	74.9	84.1
1996	73.8	83.8

the previous peak rate observed in 1986. This 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 decreased significantly in 1993 and increased in 1994 to approximate the 1992 rate. The slight increase observed in 1995 and in 1996 for belted female drivers is not statistically significant.

Table 14 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

TABLE 14. 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
1991 (June)	51.6	59.1
1992	60.0	72.6
1993	60.5	67.1
1994	62.4	72.6
1995	63.0	74.5
1996	67.1	73.7

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 was observed for restrained female passengers. Male passenger restraint use significantly increased in 1994. Female passenger restraint use significantly increased to the 1992 level of use. No statistically significant change in passenger belt use for males or females was observed from 1994 to 1995. In 1996, male passenger restraint use increased to an all time high of 67.1 percent. Female passenger restraint use stayed statistically the same.

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 (four 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

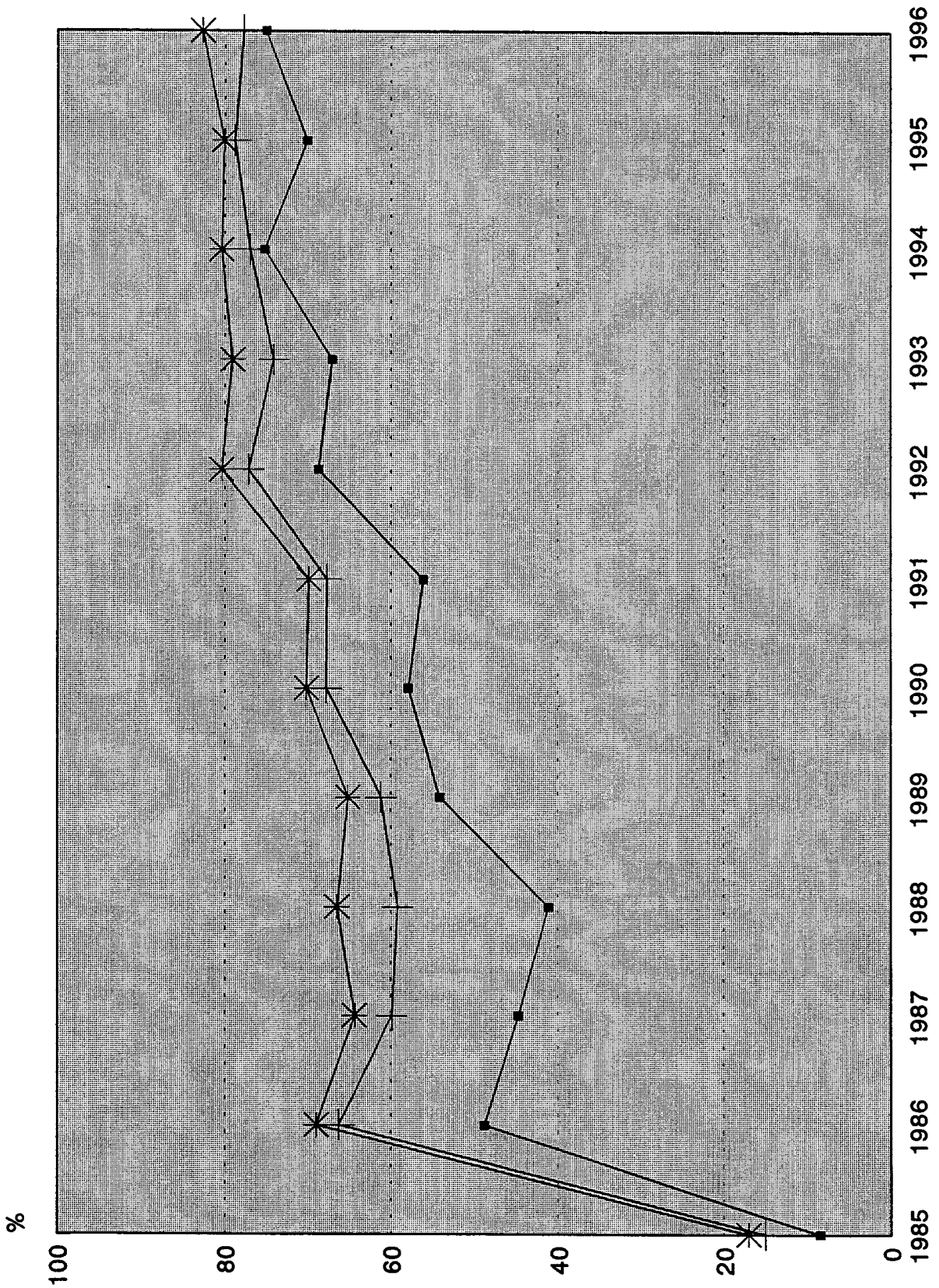


Figure 3. Driver Restraint Use By Age and Year

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. Both teens and adults showed increases in restraint use in 1994, while no change was observed in senior belt use. In 1995 a significant increase in adult belt use was observed, while teenage and senior belt use stayed statistically the same. Adult belt use returned to the 1994 level in 1996. While both teens and seniors evidenced percentage increases in belt use in 1996 over 1995, neither increase was statistically significant.

When sex and age were analyzed together (Table 15), the results have shown in previous years that the gap between males and females at the teen level was larger than for any other age group. However, the teenage gap between males and females narrowed in 1991, and has continued to be lower than the gap between adult males and females. In fact, in 1995 the usage rate for males and females in the teenage group was statistically the same, and has remained the same in 1996. Adult and senior female drivers were much more likely than males to wear safety belts. The 7.5 percentage point difference between the lowest group of restrained male drivers (teens) and the highest group of restrained male drivers (seniors) is a statistically significant difference. Senior females wore safety belts significantly more often than teen females, but not significantly more often than 20 - 60 year old females.

TABLE 15. 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
1994	Male	72.6	72.7	78.3
	Female	79.4	83.0	84.4
1995	Male	70.4	74.8	76.8
	Female	69.2	84.3	84.5
1996	Male	72.0	73.4	79.5
	Female	81.4	83.6	87.9

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 18 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 normal 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, incidentally, was not reflected uniformly at the city level.

The 1990 survey revealed a significant increase in safety 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 18 cities reached the national (NHTSA) and state (TxDOT) target goal of 70 percent by 1990.

No significant changes in the combined 18-city safety 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 significant increases 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 safety 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.

A statistically significant increase in the combined 18-city safety belt use rate was observed in 1994. Additionally, significant increases were observed in seven of the 18 cities, and only one city showed an overall decrease in use.

A statistically significant increase was again observed in the combined 18-city restraint use rate for 1995. As in 1994, significant increases were observed in seven of the 18 cities.

The combined 18-city safety belt use rate for front seat occupants in 1996 was estimated at 73.95 percent, which represents a statistically significant increase over the 1995 rate of 73.3 percent. Increases in belt use were observed in five cities, while decreases were observed in three. The largest increase was observed in Fort Worth (16.1 percentage point increase).

Analysis of safety belt use for males and females and for the three age groups revealed somewhat comparable patterns in the 1996 survey to previous observed usage patterns. Females evidenced higher usage rates than males, both as drivers and as passengers. Teenage drivers were less likely than older drivers to buckle up. Children in the 5 - 14 year old age group were the least likely passengers to be restrained. Male and female passengers over 60 years of age used safety belts 80 percent of the time.

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 (7.1 percent) was slightly less than the range observed in previous surveys. However, the gap between car and pick-up occupant restraint use remains significantly large (14.7 percentage points less for pick-up occupants than car occupants across all sites.).

SUMMARY

In summary, 1996 observation of occupant restraint use revealed an average usage rate across the 18 cities of 73.95 percent. The number of cities that had greater than 70 percent usage rates, (established as a national target usage rate for 1992) has grown to 15 of the 18. Additionally, three cities surveyed had greater than 80 percent restraint usage for front seat occupants, which was established as a national target usage rate for 1994.

The collection of data specific to the occupants observed revealed that female drivers used seat belts more often than male drivers, and female passengers were belted more often than male passengers. Child passengers 5 - 14 years old were least likely to be buckled. Older drivers were more likely than those under 60 years old to wear safety belts. 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 usage among passengers increased to an all time high of 67.1 percent, and the gap between driver and passenger restraint use narrowed to 6.6 percentage points.

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