

EXECUTIVE SUMMARY

AN ANALYSIS OF FACTORS ASSOCIATED WITH
BELT USE FOLLOWING LEGISLATION

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BACKGROUND

On September 1, 1985 the Texas mandatory safety belt use law (MUL) was implemented without sanctions. Three months later, \$25-50 fines for safety belt violations took effect. Based on the experience of other states with MULs, safety belt usage rates in Texas greatly exceeded expectations. Compliance was extremely high immediately following the implementation of the MUL and, perhaps more importantly, safety belt usage rates have remained fairly stable over time.

Texas Transportation Institute (TTI) contracted with the State Department of Highways and Public Transportation (SDHPT) to examine the factors thought to be related to restraint usage rates following passage of mandatory safety belt legislation. The primary objective of the study was to identify variables that could explain differences in safety belt use across Texas cities. In addition, this analysis was intended to help identify and document the components of a successful mandatory safety belt use law.

¹Mounce, N.H., AN ANALYSIS OF FACTORS ASSOCIATED WITH BELT USE FOLLOWING LEGISLATION, Texas Transportation Institute, 1988.

METHODOLOGY

The examination of factors thought to be related to post-MUL safety belt use required data from a variety of sources. Five general categories of information were incorporated in the analysis, each of which is described briefly in the paragraphs to follow.

Observed Safety Belt Usage Rates

Observational surveys of safety belt use by drivers and front seat passengers have been conducted by TTI since 1985. (For a complete description of the survey methodology and results, the reader is referred to Womack, 1988.) For purposes of this analysis, only driver restraint use was considered.

Local Occupant Restraint Enforcement Data

Occupant restraint citation data for the study cities were provided by the Texas Safety Association (Lucas, 1987). Driver, passenger, and child restraint violations were not distinguished in all cities. Consequently, total restraint citations were used throughout the analysis. Two measures of citation activity levels were considered: per capita citations (restraint citations issued per 100,000 population) and restraint citations as a ratio to hazardous moving violations.

Public Attitudes and Opinions Regarding the MUL

A telephone survey of 1,000 randomly selected Texas households was conducted to assess public knowledge, attitudes, and opinions regarding the Texas mandatory safety belt use law. In addition, oversampling was done to provide a minimum of 100 respondents in each of the study cities. These city-specific samples provided the data used in this analysis. (Results of the statewide survey are reported in Womack and Schifflett, 1988.)

Community Occupant Protection Program Activities

Community Occupant Protection Programs (COPPs) sponsored by the Texas State Department of Highways and Public Transportation (SDHPT) from 1983-1988 were reviewed to document contract objectives and expenditures. While contract objectives provide a subjective assessment of the activities conducted under a given contract, this information could not be meaningfully quantified for purposes of analysis. There, contract expenditures were used to approximate public information and education (PI&E) activity levels. In order to control for differences in city size, the expenditure figures were calculated on a per capita basis.

Demographic Data

For each study city, the following information was recorded from the 1980 U.S. Census: population, ethnic proportions, percent of population over 25 years of age with four or more years of college, percent of families below poverty level, median family income, median age, median number of persons per household, and

crime rate. While absolute values of these variables have changed considerably since 1980, the relative socio-economic conditions across the study cities are not believed to be significantly different at this time. Therefore, these census data are potentially useful for explaining relative differences in safety belt wearing rates across cities in the sample.

Statistical Analysis

Due to the limited availability of observational and enforcement data, the study sample was restricted to the following 12 cities: Amarillo, Austin, Beaumont, Brownsville, Bryan/College Station, Corpus Christi, Dallas, El Paso, Fort Worth, Houston, Lubbock, and San Antonio.

Correlational analyses were used to identify the relationship between safety belt use and other factors, such as enforcement, public information and education activities, and public attitudes. The association between safety belt use and the factors described above was measured in each case using Pearson's product moment correlation coefficient, with a five percent probability of a Type I error used to determine statistical significance. While this type of analysis provides insight into relationships between variables, it is not intended to imply cause and effect. This is an important point to remember in terms of interpreting results of this study.

The data available for this study imposed several limitations on the analyses conducted and the interpretation of results. First, the sample size of 12 cities is small for most types of

analyses, and particularly for correlational analysis. Furthermore, local occupant restraint citation data were not available for both 1986 and 1987 in each study city. As a result, the sample size for some analyses was reduced to nine cities.

RESULTS AND CONCLUSIONS

The safety belt usage rates exhibited in Texas following the implementation of mandatory restraint legislation were uncharacteristically high. Furthermore, average belt wearing rates have experienced only modest declines in subsequent years. Despite the relatively high averages that have been maintained, the disparity in belt use across cities in the state appears to be increasing. The purpose of this study was to identify factors that are associated with safety belt use in order to (1) explain the differences in belt wearing behaviors across cities, and (2) document the components of a successful MUL.

Previous studies have found a strong positive correlation between safety belt use and occupant restraint enforcement activities. This relationship was particularly evident in states that allowed for primary enforcement tactics (Campbell, 1987). Because the Texas MUL includes primary enforcement provisions, enforcement was believed to be a key factor in achieving the high post-law usage rates noted across the state. Results of the analyses provide at least partial support for this hypothesis.

Occupant restraint enforcement efforts in the first year following MUL implementation appeared to be very strongly related to subsequent safety belt use in the study cities. Moreover, the

effect seemed to be long term in that 1986 enforcement levels were significantly correlated to 1988 observed safety belt use. Enforcement activities conducted in 1987, however, were **not** found to be related to restraint usage rates in either 1987 or 1988. It was also noted that increased enforcement activity levels were not consistently accompanied by increases in safety belt use. Thus, it would seem that initial MUL enforcement was, perhaps, a more important determinant of safety belt use than enforcement activities conducted later in the post-law period.

The principle of "novel stimulus effect" would suggest that a diminishing benefit will be derived from enforcement as time progresses. The trend of safety belt use can be expected to continue in a generally downward direction until such time that those individuals who wear safety belts because of the threat of enforcement stop using them. The remaining level of safety belt use will represent the voluntary usage rate. It is estimated that this rate can be increased only slightly (less than 10-15 percent) by enforcement applied in a concentrated manner.

Public perception of enforcement was presumed to be equally as important as actual enforcement in terms of explaining differences in safety belt use across cities. Awareness of the primary enforcement provision was positively associated with safety belt use in all three years of the analysis. Other measures of perceived enforcement, however, were not found to be related to restraint use. Contrary to expectations, public perception of enforcement provided very little insight into the variation in safety belt use among cities in the sample.

The attitudes and opinions of individuals in the study areas were not strongly related to safety belt use, either. Whereas belt wearing rates in 1987 and 1988 varied a great deal across cities, the vast majority of respondents in the sample expressed favorable opinions of the MUL, and virtually all perceived the MUL to be at least somewhat effective at reducing injuries and saving lives. The uniformity of responses precluded any meaningful correlations between public attitudes and safety belt use across cities in the sample.

Despite the assumption that self-reported safety belt wearing behaviors are typically overreported, a statistically significant correlation was found between observed usage rates and the proportion of respondents who reported "Always" wearing safety belts. This apparent relationship should be kept in mind when reviewing survey responses for purposes of estimating belt use in a given community.

Comparisons between community occupant protection program expenditures and safety belt use produced rather counterintuitive results. Safety belt use was not found to be related to per capita expenditures in any given year of the study period. No evidence was found to suggest that the level of 402 funding spent on occupant protection programs was positively related to safety belt use in these particular cities.

Finally, an examination of demographic variables revealed that only education and income appeared to be related to safety belt use, and the relationship was evident in the pre-law period only. The ethnic composition of the study areas was not found to be

associated with restraint use in either the before or after period of the analysis. Once mandatory safety belt legislation was in place, the demographic composition of the study cities no longer explained relative differences in restraint use.

Of all the variables examined in this study, it appears that actual enforcement activity was the most strongly related to safety belt use. This statement is based on the finding that cities in which initial citation activity levels were highest have sustained relatively high safety belt wearing rates over time. When interpreting these results, however, several points must be remembered. First, while the sample appeared to be representative both in terms of observed safety belt usage rates and enforcement activity levels, the small number of cities in the study sample limited the statistical power to detect relationships. Furthermore, extreme scores in any of the cities would have skewed the results to a great extent. The inability to detect a relationship between COPP expenditures and safety belt use may have been largely the result of this situation.

To imply that enforcement was the key to the high post-MUL usage rates observed in Texas is an oversimplification. While statistically significant relationships were not found between belt use and the other factors in the analysis (i.e., public attitudes and opinions, community occupant protection program activities, perceived enforcement, and demographic variables), these factors undoubtedly played a part in increasing safety belt use in Texas. However, it is often difficult, if not impossible, to quantify variables of this type for analytical purposes.

With these study limitations in mind, it seems reasonable to suggest that no single factor, including enforcement, should be credited with having produced the high post-MUL usage rates throughout the state. While initial enforcement efforts appeared to be most strongly associated with long term increases in safety belt use, the role played by local enforcement agencies should not be considered finished. The fact that the Texas MUL includes primary enforcement provisions often led to the assumption that all law enforcement agencies in the state were using such an approach. During 1986 and 1987, **none** of the local police departments represented in this analysis had used primary enforcement tactics. As more police agencies adopt primary enforcement methods, the effect of citation activity levels and public perception of enforcement on safety belt use in given communities may become more apparent. Further analysis of this relationship appears warranted, particularly if data from other cities becomes available to increase the size of the study sample.

For states not yet covered by mandatory safety belt legislation, results of this study suggest that initial enforcement efforts following the implementation of an MUL have the greatest potential for affecting subsequent safety belt use. However, there was some evidence to suggest that the cumulative effect of enforcement over time is also related to increased belt use. It is recommended, therefore, that in states already covered by an MUL, law enforcement agencies strengthen their occupant restraint citation activities in order to help sustain the level of safety belt use achieved after legislation took effect.

REFERENCES

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