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Evaluation of Motorcycle Safety Helmet Usage Law

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Evaluation of Motorcycle Safety Helmet Usage Law

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Foreword

One of the serious problems in traffic safety faced by the State of Texas is that of the fatalities and incapacitating injuries of the motorcyclists, particularly following the enactment of S.B. 198 which minimized the motorcycle helmet usage law to a permissive status. Cyclists have become quite vocal about governmental interference with a freedom of choice concerning helmet usage and strongly supported this position in spite of repeated research findings favoring helmet usage. For this reason it became necessary to research the matter and present the facts.

The Driver Performance Program of the Human Factors Division of the Texas Transportation Institute, Texas A&M University, in cooperation with the Texas Office of Traffic Safety, has developed and conducted an extensive and intensive research on evaluating the impact of the change in the motorcycle helmet usage law. The study was concerned with the trends in motorcycle accidents, research underway in other states, a pre-/post-law change analysis of Texas data, and an indepth study in urban areas. The multiple-source data collection assured the most complete and accurate data amassed to date on motorcycle helmet usage in the State of Texas.

EXECUTIVE SUMMARY

This project was an evaluation of the impact that Texas S.B. 198 (modified motorcycle helmet use law) had on motorcycle accidents, injury severities, and fatalities in Texas. The three data sources--motorcycle accident records, medical data on motorcycle accident victims, and rider questionnaires from accident victims--were analyzed.

Motorcycle Accident Records

All accidents records from August 29, 1976 through August 28, 1977 (pre-law change) and from August 29, 1977 through August 28, 1978 (post-law change) were evaluated. There were 10,116 motorcycle accidents during the pre period and 10,651 accidents during the post period — a 5.3% increase. Males represented over 95% of all victims and the preponderance of them were from 18 to 25 years of age. As helmet usage decreased, severe injuries and fatalities increased. During the pre period 5.2% of the injury/fatality victims were unhelmeted, while in the post period 51.9% of the victims were unhelmeted. Roughly 62% of motorcycle accidents occurred in urban areas for both periods.

The analyses (Chi Square and Ridit Analysis) indicated that post-law change accident injuries had a 52% probability of being more severe than the pre-law injuries. Similar analyses indicated that the unhelmeted cyclist had a 55% probability of suffering more severe injuries than the helmeted cyclist. Using Chi Square, Odds Ratio and Relative Difference Tests to determine difference in fatality experiences, the following statements can be made:

- The unhelmeted rider was 2.5 times more likely to die than the helmeted rider
- The unhelmeted cyclist was 1.41 times more likely to sustain an incapacitating injury or die than the helmeted one

- The unhelmeted rider was 1.83 times more likely to sustain a head injury that was fatal than the helmeted rider
- The unhelmeted cyclist was 2.67 times more likely to sustain a head injury that was either incapacitating or fatal than the helmeted one.

Medical Data on Motorcycle Accident Victims

From hospital/coroner data, the head and neck injuries were the most severe for all cases--pre and post as well as in both locations, Dallas and Houston. The number of cases who were "treated and released" was lower for the post period which suggests more severe injuries were sustained. Also the number of "dead on arrival" for the post period were more than doubled that of the pre period. Cost of accident figures increased by 63% for Parkland Hospital cases and 44% for Memorial Hospital cases.

Rider Questionnaire Data on Motorcycle Accident Victims

From rider questionnaires, it was determined that the exposure factor consisted of local and cross country riding which accounted for the vast majority of riding and that the number of riders during the post period increased substantially. Further, nearly half of the cyclist were riding 6+ days per week with most of it occurring in urban areas during daylight hours in all types of weather. The "before and after accident" helmet usage decreased during the pre period, but increased 75.3% during the post period. Even though only 1 of 5 questionnaire respondents recommended helmet usage for everyone, nearly 3 of 5 favored a required helmet usage law.

The results of this study demonstrate the increased risk motorcycle riders face when they choose to ride without protective helmets.

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CHAPTER 1. OVERVIEW

Motorcycling has become one of the more popular modes of transportation in the United States today. The National Safety Council (1)* indicated an increase of over 900% in motorcycle registrations in this country from 1961 to 1975. The Motorcycle Industry Council, Inc. (2) estimates that today there are 8 million motorcycles in use by 20 million people in this country. Cycles have an attractive appeal as a recreation vehicle as well as an economical mode of transportation. This increased popularity of motorcycles is most likely attributable to their low initial cost, their attraction as a pleasure vehicle, and for some models the high gasoline mileage.

The enactment of the Federal Highway Safety Act of 1966 resulted in 13 highway safety standards being issued in June, 1967 (3); one of these standards provided that motorcycle operators and passengers wear approved safety helmets. To assure enforcement of the standard, the Department of Transportation was authorized to withhold federal highway safety funds if states did not enforce the standard (3). As a result, the cycle fatality rate dropped from 11.7 deaths per 10 thousand registered cycles in 1966 to 6.4 deaths per 10 thousand registered cycles in 1974 — a reduction of 55% in eight years (5). However, in 1975 Rep. Stewart McKinney (Rep., Conn.) introduced federal legislation to remove the penalty clause on highway safety funds, thus allowing repeal of the state laws requiring motorcycle helmet usage (4). By 1978, 22 states had repealed their mandatory helmet use laws (6). According to the National Highway Traffic Safety Administration (6),

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*Numbers in parentheses designate references at the end of the chapter.

4,082 cyclists were killed in traffic accidents in 1977. This represents an increase of 770 over the number of motorcycle fatalities in 1976, an increase of 23% in one year.

The United Services Automobile Association (5) indicated that the ratio of motorcycle-to-automobile registrations increased from 1-to-130 in 1960 to 1-to-28 in 1978 — a startling increase of 464%. Meanwhile the cycle-to-auto fatality rate changed from 1-to-40 in 1960 to 1-to-12 today — an increase of 333%. The absolute death rate increased, but the relative rate decreased due to the eight years of mandatory motorcycle helmet usage laws.

The National Highway Traffic Safety Administration (7) estimated annual motorcycle accident injuries at over 350,000 with many of these resulting in permanent disabilities. Death and injury rates are attributable to increased number of cyclists and increased mileage traveled since National registration rose a mere 1% from 1976 to 1977 (7). However, the most significant factor contributing to death and injury rates is the repeal of mandatory helmet use laws (8, 9, 10, 11, 12, 13, 14). For example, considering a like number of cyclists in Illinois and Michigan, motorcycle fatality or serious head injuries in Illinois (no helmet usage required) is three times greater than in Michigan where helmet usage is required (7).

The Motorcycle Industry Council (2) indicated that there were 7,925,600 motorcycles in use in the United States in 1977. Of this number, 44.4% were on-highway models, 22.1% were off-highway models, and 33.5% were dual usage models. Comparing these figures with the 1976 percentages, the dual purpose percentage decreased while both off- and on-highway model percentages increased. Another important trend is the increase in engine displacement, i.e., on-highway models (750cc and over) have increased 3.4%

the past year and off-highway models (125 to 350cc) have increased 2.4% over the last year (2).

The motorcycle population for the United States was 3.7 cycles per 100 persons in 1977. Texas' cycle population is identical to the National average even though the number of motorcycle registrations in Texas in 1977 was exceeded by only one state, California (2).

Even though the Motorcycle Industry Council (2) estimates that 58% of all motorcycles used on the street in 1977 were at some time used to commute to work or school, nearly all motorcycles used on the street were used for purposes other than commuting. However, trips tend to be relatively short — 61% were used for trips under two miles, 56% for trips from two to ten miles, and 38% for trips over ten miles (2). Motorcycles used on the street were regularly ridden an average of eight months a year on a nationwide basis; however, in the West and the South, motorcycles were used year around.

REFERENCES

1. _____. Accident Facts, 1976 Edition. Chicago, Illinois: National Safety Council, 1976.

2. _____. 1978 Motorcycle Statistical Annual. Newport Beach, California: Motorcycle Industry Council, Inc., 1978.

3. _____. Highway Safety Act of 1966 (P. L. 89-564), Washington, D. C.: U. S. Congress, 1966.

4. _____. Highway Safety Act of 1976 (P. L. 94-280), Washington, D. C.: U. S. Congress, 1976.

5. _____. "The Odds Grow Shorter," Aide. San Antonio, Texas: United Services Automobile Association Insurance, Summer, 1978.

6. _____. Office of Public Affairs. News Release for June 29, 1978. Washington, D. C.: U. S. Department of Transportation, National Highway Traffic Safety Administration, June 1978.

7. _____. Fact Sheet. Washington, D. C.: Department of Transportation, Office of Public Affairs, Undated.

8. Carraro, Barbara. "A Look at Motorcycle Accidents in 1976," Traffic Safety. Chicago, Illinois: National Safety Council, January, 1978.

9. _____. "Minnesota DPS Urges Reinstatement of Motorcycle Helmet Use Law," Traffic Safety. Chicago, Illinois: National Safety Council, April, 1978.

10. Armstrong, Ed, et el. "The Pro and Con of Motorcycle Helmet Laws," Traffic Safety. Chicago, Illinois: National Safety Council, April, 1976.

11. Hames, Lee N. and Elaine A. Petrucelli. "AMA Report Tells ... What the Experts Think About Motorcycle Helmets," Traffic Safety. Chicago, Illinois: National Safety Council, September, 1977.

12. Lummis, Michael, et el. Impact of Motorcycle Helmet Law Repeal. Kansas City, Kansas: University of Kansas Medical Center, Undated.

13. _____. A Preliminary Estimate of the Impact of Revision of the South Dakota Motorcycle Helmet Law (SDGL 32-20-4) on Cyclist Helmet Use and Accident Caused Personal Injury. Vermillion, South Dakota: Human Factors Laboratory, University of South Dakota, November, 1977.

14. Koehler, Myron. "An Evaluation of the Motorcycle Law Changes in Texas," Texas Transportation Researcher. College Station, Texas: Texas Transportation Institute, Texas A&M University. July. 1978.

CHAPTER 2. DESCRIPTION OF RESEARCH PROCEDURES

The Office of Traffic Safety contracted with the Texas Transportation Institute to conduct a 13-month, 2-phase study of motorcycle accidents consisting of eleven tasks in Phase I and four tasks in Phase II. Since the effective date of S. B. 198 was August 29, 1977, Phase I of the study pertained to the evaluation of the mandatory helmet usage period (August 29, 1976 through August 28, 1977) which will be the pre-law change period. Phase II dealt with the evaluation of the post-law change period (August 29, 1977 through August 28, 1978).

This study employed a multi-data collection approach, i.e., 1) all motorcycle-involved accident data for the pre and post periods as maintained by the Texas Department of Public Safety; 2) winter and summer traffic mix data from Houston, Dallas, San Antonio, and Bryan/College Station as compiled by the research staff from traffic counts; 3) pre and post injury and fatality data as collected by the research staff at hospitals and coroner offices in Dallas and Harris counties; and 4) motorcycle rider questionnaire data for the pre and post periods from accident victims in Dallas and Harris counties. Additional data concerning vehicle registration, licensed operators, accident occurrences, injuries, and fatalities were ascertained from the Texas Department of Public Safety and the State Department of Highways and Public Transportation to establish trends and comparisons.

Because analyses involved the pre and post periods, it became necessary to determine compatibility of the two groups so that inferences could be made between groups as well as within groups. Number of registered vehicles was used in preference to licensed operators inasmuch as each vehicle has a unique registration while a licensed operator has but one driver license

number regardless of the various types of licenses for which the person qualifies or the endorsements on that license. Also, it was determined that age group comparisons could be made on pooled data since the number of females in the study were too small for statistical comparisons. Additionally, trends were established on the rate of accident involvement, injury rate, and fatality rate for both motor vehicles and motorcycles. Further explanations will be provided in the discussion of the analyses.

The study addressed various aspects that can be employed in a motorcycle safety effort. For example from an enforcement point of view, high accident locations and seasonal as well as time of week and day occurrences have been identified; thus, corrective or preventive countermeasures may be implemented. From an educational point of view, various factual material may be incorporated into educational programs both for motorcyclists and motor vehicle operators.

Task Descriptions.

For Task 1, it was necessary to obtain from the Department of Public Safety a computerized tape of all the motorcycle-involved accidents in Texas

for the period of August 29, 1976 through August 28, 1977 (pre-law change period). This accident data was formatted in three separate forms, each with a specific purpose. The first part of the format contained data for those accidents which occurred either in cities that participated in urban projects or in rural areas or cities that did not participate in urban projects. The second part of the format provided information on all the people and vehicles involved in the accident. While the third part of the format supplied data on the casualties and occupants of the vehicles that were involved in the accident.

Since the computerized accident data was maintained without name and mailing address, it was necessary to obtain face copies of the motorcycle-involved accidents which occurred in Dallas and Harris counties during the pre-law change period in order to ascertain names and addresses for mailing rider questionnaires and to provide the hospital/coroner office with proper identification of injured and fatality cases. Once the face copies of accident reports were received, postal zip codes had to be found and data was then entered into the computer for mailing labels, questionnaire identification labels, and hospital/coroner office lists.

Task 2 dealt with traffic counts in Dallas, Houston, San Antonio, and Bryan/College Station to ascertain traffic mix and helmet usage in various size towns and different geographic areas. Traffic counts were conducted during the winter season and the late spring to allow for seasonal effect on motorcycle riding. Data collected consisted of the total traffic flow, number of motorcycles in the flow, number of helmeted and unhelmeted motorcycle operators. Various traffic locations were selected to provide information relative to user patterns. Data collected included such information as: location, day of week, time of day, duration

of collection period, traffic volume, weather and roadway conditions.

Task 3 provided a third source of information which came from other researchers involved in motorcycle studies in Kansas, South Dakota, Colorado, and Oklahoma. Primary concern was in the methodology employed, type of data collected, and statistical analyses used to analyze the data. Areas of concern were the effect of helmet law repeal on helmet usage, severity of injuries sustained, cause of fatalities, and economic impact of these accidents. Assistance was also sought in direction, research methodology, and statistical analyses.

Task 4 dealt with the development of a plan to analyze the data. Many data sources were considered in formulation of an analysis plan. Data were established for compatibility tests as well as frequencies on accidents by age group, helmeted versus unhelmeted, injury severity, fatalities, color of garments, etc.

Task 5 was to write a computer program to accomplish the plans from Task 4. A sample of the data was used to debug the computer program and to review the output. Frequency tabulations were prepared to permit a decision on the analyses to be employed.

Task 6 involved the analyses of data for the pre-law change period. Data analyses developed trends for the past several years and permitted the staff to project anticipated data on registration of motorcycles and motor vehicles, number of accidents, number of injuries, and number of fatalities for both types of vehicles. Also, information was isolated for

the purpose of determining compatability of the pre- and post-law change periods. The traffic mix data were merged with other data to provide a more realistic situation. The analyses will be discussed in full detail in the next chapter.

For Task 7 lists of people involved in motorcycle accidents in Dallas and Harris counties during the pre-law change period were prepared for the hospitals and coroner's offices to help in the positive identification of subjects' medical records. Research staff members, along with personnel from the respective hospitals and coroner's offices, reviewed the medical records which permitted the collection of more specific information on injuries and severity of injuries. In fatality cases, the medical examiner's records were perused to obtain causal data. Injury data collected pertained to the body region and aspect of the injury, the lesion and body organ or system affected by the injury, and the abbreviated injury scale for the particular injury. Data were collected on as many as five injuries to one person involved in the accident. Additional data consisted of the age and sex, total number of injuries sustained, the overall abbreviated injury scale, the injury severity (computed), hospital disposition, duration of hospitalization, and total cost of injuries.

For Task 8 the rider questionnaire and letter (see Appendix, pp. A1-A3 for copies) was mailed to all motorcycle-involved subjects in Dallas and Harris counties for whom mailing addresses were obtainable. Data collected in this indepth case study effort provided information on motorcycle experience, exposure, type of riding, conditions of riding, size of cycle, protective gear as well as specific information on the accident, injuries, costs, etc., and rider opinion on causation and helmet usage.

In Task 9 an attempt was made to prepare cost data and assess the economic aspects of motorcycle-involved accidents. The National Highway Traffic Safety Administration's 1975 Societal Costs of Motor Vehicle Accidents (NHTSA, December 1976) was used to extrapolate costs and economic aspects of motorcycle accidents.

Societal costs considered by NHTSA include production losses, medical care costs, funeral expenses for fatalities, legal and court costs, insurance administration expenses, accident investigation costs, property and vehicle damages, traffic delay expenses, losses to others, and non-quantifiable costs (suffering, pain, etc.). Economic aspects and/or impacts will include such items as: insurance rates, death rates, injury loss, and property damage.

Additional cost data was collected from the responses on the rider questionnaires.

Task 10 pertained to the preparation of data displays for meaningful information dissemination. Research findings had to be presented in such a manner to lend to accurate interpretation and maximum usage as well as being quickly and easily comprehended. Tabular data is included in the appendix on such aspects as: accident occurrences, severity of injury, age groups, helmeted versus unhelmeted, etc.

Task 11 was to draft and submit an interim report for Phase I; however, this task was deleted with a contract change notice and Phase II was expanded to eight tasks including a report to the legislature. Tasks in Phase II paralleled Tasks 1, 5, 6, 7, 8, 9, 10, and 11 of Phase I. The change was made so more complete data was collected in Phase II and that better comparisons were possible with Phase I data.

CHAPTER 3. DATA COLLECTION AND ANALYSIS

Data collection for this research study was approached from multiple sources to ascertain the most complete and correct data base currently available for motorcycle-involved accidents. The primary objective of the study was to evaluate the impact of the permissive motorcycle helmet use law (S.B. 198), thus pre and post comparisons of helmeted versus unhelmeted cyclists who were involved in motorcycle accidents in Texas during the periods of August 29, 1976 through August 28, 1977 (pre-law change) and August 29, 1977 through August 28, 1978 (post-law change).

Phase I.

The initial effort for the pre-law change period was to obtain a computer tape from the Texas Department of Public Safety. This tape contained accident data on all motorcyclists in Texas who were involved in some type motorcycle accident during August 29, 1976 and August 28, 1977. Inasmuch as the computerized accident data maintained by the Department of Public Safety does not contain the name and mailing address of the person involved, it became necessary to procure copies of the original accident reports on all accidents which occurred in Dallas and Harris counties. The latter information was used for the indepth portion of the study.

While the computer tape was producing various frequency tabulation data, the research staff had to look up postal zip codes for the subjects of the indepth study. The names, addresses, and zip codes were input into the computer to make lists to be used at the respective hospitals and coroner's offices for positive identification of subjects. Also, the computer printed mailing labels and identification labels for the rider questionnaires.

After the hospital and coroner's office personnel had an opportunity to identify pertinent records, the research staff visited each location to encode the medical data (see Appendix, pp. A4-A14 for coding sheet and instructions). Of the 1,150 accidents which occurred in Dallas county during the pre-law change period, 88 (8%) were established at Parkland Hospital for the study and 19 (95%) of the 20 fatalities were identified at the Medical Examiner's Office. In Harris county there were 1,175 accidents during the pre-law change period and 67 (6%) were identified in the three Memorial Hospital System facilities and 15 (71%) of the 21 fatalities were located at the Coroner's office. Initial plans were to use Ben Taub Hospital in Houston to provide greater compatibility (both Parkland and Ben Taub are county owned hospitals). However, at the last moment the requirements for data collection at Ben Taub became so encumbered that it diminished the possibility of adequate returns; therefore, an alternative course was to use Memorial Hospital Systems in Houston.

Once the hospital lists were printed the research staff prepared the rider questionnaires for mailing. There were 1,150 questionnaires mailed for the Dallas county accidents and 1,175 for the Harris county accidents. Of these, 3 were returned from Dallas county and 4 from Harris county for some type addressing problem or unclaimed mail. From the remaining 1,147 questionnaires in Dallas county, 169 (15%) completed questionnaires were returned. The remaining 1,171 questionnaires from Harris county netted 171 (15%) completed returns.

Another source of information which provided direction to the study was the advice and materials provided by Dr. Vern Ellingstad of Vermillion, South Dakota; Mr. Michael Lummis of Kansas City, Kansas; Mr. Ray Bays of Oklahoma City, Oklahoma; and Mr. Larry Karsten of Denver, Colorado. These

people were involved in similar motorcycle helmet usage studies in the respective States for the National Highway Traffic Safety Administration.

The final data source was the traffic counts conducted in Dallas, Houston, San Antonio, and Bryan/College Station. The traffic counts provided data on traffic mix, volume, helmeted and unhelmeted cyclists, as well as time, conditions, and location of the counts. The research staff conducted the counts in Bryan/College Station, while the data in other locations was collected by other teams within the Texas Transportation Institute who were conducting traffic counts for other studies. The results of this data collection did not produce the most compatable conditions for comparison purposes; however, it did achieve the objective of ascertaining traffic mix and helmet usage. Another approach to traffic mix was to compare the total number of registered motorcycles in the State with the total number of other registered vehicles.

Supplemental data on vehicle and motorcycle registrations, accidents, injuries, fatalities, and licensed operators were obtained from the Texas State Department of Highways and Public Transportation and the Texas Department of Public Safety. These data permitted trends to be established and projections to be made for ensuing years.

Traffic Count Data.

From the traffic counts (see Appendix, pp. A15-A28) a consolidation was prepared and is presented on the next page. During winter, motorcycles accounted for a mere 0.23% of the total volume; however, 80.5% wore helmets. As the season became warmer, motorcycle mix increased by 2.6 times the winter mix, but helmet usage dropped to 64.4%. Comparing these statistics

Table 1. Traffic Count Data by Location and Season

Town	Fall/Winter			Spring/Summer		
	Total Vehicles	Motorcycles	Helmeted	Total Vehicles	Motorcycles	Helmeted
Bryan/College Station	104,693	359(0.34)+	303(84.4)+	107,874	855(0.79)+	562(65.7)+
Dallas	-	-	-	2,337	7(0.30)+	33(42.9)+
Houston	173,033	263(0.15)+	192(73.0)+	52,160	121(0.23)+	67(55.4)+
San Antonio	11,626	45(3.87)+	42(93.3)+	2,047	6(0.29)+	5(83.3)+
Total	289,352	667(0.23)+	537(80.5)+	164,418	989(0.60)+	637(64.4)+

+ (percentage)

with the statewide motorcycle-to-vehicle registrations, motorcycles represent 2.9% of the mix.

Phase II.

A computerized motorcycle-involved accident data tape for the post-law change period (August 29, 1977 through August 28, 1978) was obtained from the Department of Public Safety along with copies of the original accident reports for Dallas and Harris counties. While the computer was compiling frequency tabulation tables, the research staff began looking up postal zip codes for subjects included in the indepth study. The names, addresses, and zip codes were input into the computer to make lists to be used by personnel of the respective hospitals and medical examiner's offices for positive identification of subjects. The computer also printed mailing labels and identification labels for the rider questionnaires.

Hospital and coroner's office personnel identified pertinent records prior to the research staff visit to expedite data reduction. Of the 1,227 Dallas county motorcycle accidents during the post-law change period, 126(10%) were located at Parkland Hospital and coded for the study and 31(91%) of the 34 fatalities were identified at the coroner's office. In Harris county there were 1,323 motorcycle-involved accidents during the post-law change period. The Memorial Hospital System personnel located 63(5%) cases for the study and the medical examiner's office identified 28(56%) of the 50 fatality cases. Because many records were being processed and were not ready for the permanent file, a severe loss of cases was experienced.

Rider questionnaires were mailed to 1,227 subjects in Dallas County with two returns for unclaimed mail and to 1,323 subjects in Harris County with five returned letters. From the remaining 1,225 questionnaires in Dallas County, 205 (17%) completed returns were received and coded. Of the 1,318 remaining questionnaires in Harris County, 188 (14%) completed questionnaires were returned for coding.

Statewide Frequency Tabulation

From the accident frequency tables (see Appendix pp. A29-A32), it became apparent that the motorcycle riding season for the State began in late February and went through October; however, the indepth data revealed that peak accident involvement began approximately a month later and decreased a month earlier in the northern part of the State than it did in the southern part. On a statewide basis, accident occurrence was highest on weekends (Friday through Sunday) while the indepth areas had less variation. Finally, statewide occurrences peaked just before noon and remained high until 10 p.m. on the average. The indepth study areas held relatively close to this pattern.

Reviewing the influence of sex and age on motorcycle accidents, it was obvious that males were credited with the preponderance of accidents (over 97%) and that the age group of 18 to 25 experienced nearly half of all motorcycle accidents. The percentages were relatively consistent for vehicle #1 and vehicle #2. Vehicle #1 was the one considered responsible by the investigating officer or being a greater contributor to the accident, while vehicle #2 was the one considered less responsible by the

investigating officer or being a lesser contributor to the accident. These statistics are consistent with motor vehicle statistics.

Comparing injury severity when helmeted or unhelmeted, the percentage of fatalities and incapacitating injuries for the unhelmeted cyclists consistently exceeded that of the helmeted cyclists. This fact was similar for both vehicle #1 and vehicle #2. The fatality rate, using pooled data, was 1.9 times greater for the unhelmeted cyclists of vehicle #1 and 1.6 times greater for the unhelmeted cyclists of vehicle #2.

Considering color of clothing of motorcyclists involved in accidents and comparing these data with data from A Pilot Study of the Effects of Color of Clothing Upon Pedestrian-Vehicle Accident Probabilities (Corder-Bolz, 1978), it appeared as though cyclists wearing white, yellow, or red clothing decreased their chances of becoming motorcycle accident fatalities (p. A-41). Blue was not considered for two reasons: 1) the effect of light blue was negated by dark blue and 2) blue jeans and denim shirts provide good protective clothing for cyclists thus high percentage of usage as reflected in Tables 8-11 in the Appendix, pp. A37-A40.

Another comparison was helmet usage in urban and rural environments for the pre and post periods (pp. A42-A43). During the pre-law change period, helmet usage among accident victims was higher in the urban areas than rural areas and higher for vehicle #1 cyclists than for vehicle #2. During the post-law change period, helmet usage was higher in urban than rural but cyclists of vehicle #2 had a higher usage rate than those of vehicle #1. Operators of vehicle #2 had a higher helmeted rate than the unhelmeted in the post-law change period while the reverse was true for vehicle #1. Another observation was that accident investigators recorded unknown helmet

usage less frequently in both urban and rural areas during the post-law change period than they did for the pre-law change period.

Hospital/Coroner Data.

The indepth portion of the study analyzed injury and fatality data from Dallas and Harris counties for the pre-law change and post-law change periods. The total number of motorcycle-involved accidents in Dallas County for the pre-law change period was 1,150 of which 90 cases (8%) treated at Parkland Hospital were made available for the study, Harris county had 1,175 of which 82 cases (7%) treated at the Memorial Hospitals were located for the study. Post-law change comparisons for Dallas County were 1,227 total and 156(13%) available, while Harris County had 1,323 total and 90(7%) available (see Appendix, pp. A44-A45). Other information included age group, total number of injuries per accident, injury severity index, hospital disposition, duration of hospitalization (pp. A48-A49), and cost of accident.

The first comparisons were the location of the most severe injury by the number of injuries sustained per accident. From these comparisons, it became obvious that head and neck injuries had the highest weighted mean in all cases for pre and post periods in both locations (pp. A46-A47). These comparisons did not consider whether the victims were wearing helmets or not wearing them, that will be treated later.

The next comparisons were hospital disposition. During the pre-law period, Parkland Hospital "treated and released" 42% of its referrals while Memorial Hospitals "treated and released" 72%. For the post-law period, Parkland "treated and released" 44% while Memorial Hospitals "treated and released" 40%. The "dead on arrival" cases for the

pre-law change period for Dallas were 6% and for Houston they were 16%; however, during the post-law change period, Dallas' "dead on arrival" increased to 13% while Houston's "dead on arrival" jumped to 33%. These figures tend to suggest that post-law fatalities and injuries were more extensive than the pre-law fatalities and injuries.

A comparison of injury severity by age of motorcyclist (pp. A50-A51) indicated that during the pre period, 46% of the Parkland cases and 44% of the Memorial cases were in the 18< 25 age group. For the post period, the percentages were 60% and 44%, respectively. This accounts for 50% of the hospital referrals.

The cost by injury severity per accident for Parkland's pre period was $6,451 while the post period jumped to $10,250 (63% increase). For Memorial's pre period referrals the average cost per accident was $3,719 and the post period increased to $8,416 (44% greater).

The final group of tables relating to hospital injuries (pp. A54-A65) dealt with the five severity categories coded and the body region, aspect, lesion, and organ or system. One finding which became apparent was that head injuries increased for the post period and lower extremity injuries decreased for the post period. Even though these tables did not separate helmeted and unhelmeted (that fact was established in Tables 6 and 7, pp. A35-A36), the evidence suggests that the unprotected head became more vulnerable to injury thus shifting injury location from lower extremities to head.

Motorcycle Rider Questionnaire

During the pre-law change period, 2,318 questionnaires were mailed and 340(14.7%) completed returns were received. For the post-law change period, 2,543 questionnaries were mailed and 393(15.5%) completed returns were received. The females represented a mere 2.6% of the total (too small

for statistical purposes); therefore, sex of subjects was disregarded. The "18 to 25 years" age group represented 40.7% of the total respondents, while the "less than 18" age group accounted for 21.6% and the "25 to 35 years" age group represented another 23.3%.

Another point of interest was that roughly 46% of the respondents were riding 750cc and larger engine displacement motorcycles. This bears out the trend of cycle ownership moving towards larger cycles as indicated by the Motorcycle Industry Council.

It is also interesting to note that the preponderance of riders surveyed indicated they wore helmets, eye protection, and boots, in that order. This was consistent for both urban areas in the pre and post responses under normal riding conditions as well as after their accident. The number of respondents who indicated they wore a helmet before the law changed was extremely high; however, they apparently did not wear the helmet consistently, since the pre-law change usage was 88.4% compared to 75.9% for the post-law period. Further, the usage was far less for cyclists 18 years of age or older, i.e., 61.9% for pre and 50.9% for post (a drop of at least 25% in each case).

Another important aspect of this survey was rider opinion of primary and secondary causes of the accident, i.e., primary causes were failure to yield right of way, rider error, and not seen by other driver, while secondary causes were not seen by other driver, failure to yield right of way, failure to maintain control, and rider error.

The number of riders who admitted to injury was 84.6% for the pre period as opposed to 91.9% for the post period, given a 36% increase in the number of riders in the post period. The cyclists receiving first aid at the scene increased by 61.5% in the post-law change period, while those who received first aid at the hospital increased by 41.2% in the post period. The number hospitalized during the post period was 26% greater than that for the pre

period. These statistics were reinforced by average cost of accident — the pre period average was $3,880 while the post period increased to $4,112 (6% increase).

The before and after accident helmet usage decreased during the pre-law change but increased during the post-law change. What was even more impressive was the 75.3% increase post over pre in helmet usage after the accident. This might suggest that "doubting Thomases" about helmet usage were even more convinced of helmet benefit after they experienced an accident.

Then what did riders say about wearing helmets? During the pre period 71.2% favored helmet usage as opposed to 72.8% during the post — a very slight increase. The opposition was a bit more decisive — 7.4% pre and 10.5% post. The difference came in those who were indifferent — pre 21.4% as opposed to 16.7% post (a 22% decrease). Yet when asked if they recommended helmet usage for everyone, only 19.6% agreed with 20.7% agreeing during the pre and 18.7% agreeing during the post. However, the most significant item was that riders favored a required helmet law, i.e., 59.5% favored the required helmet law during the pre-law change period and 56.7% favored the required helmet law during the post-law change period (pp. A66-A68).

Data Analysis

Through the use of mean differences for number of registered vehicles, accidents, injuries, and fatalities, the respective items were projected for 1978 for both motor vehicles and motorcycles. Due to a sizable surge in motorcycle data during 1977 over previous years, the 1977 motorcycle figures reflect higher than or equal to the 1978 projected rates for motorcycles; however, motor vehicle rates remained relatively consistent with prior years (see Appendix, p. A69).

The computer tapes from the Department of Public Safety provided motorcycle-involved accident data for the pre- and post-law change periods. Each accident was treated as an observation and only two logical records, A and B, were utilized for data purposes. From these two working data sets, the data were formatted into a form amenable to tabular or graphical display and statistical analysis.

The data from the pre-law change period were not significantly different from the post-law change period when sex and age group parameters were compared. The distributions for these parameters were relatively similar for statewide data compared to the two urban areas used for the indepth study (see Appendix, pp. A33-A34); thus comparisons between and within data sets were possible.

The analysis evaluated the impact of the motorcycle helmet use law change by addressing the following questions (data included all motorcycle-involved accidents in Texas during the pre- and post-law change periods):

1. Did motorcycle-involved accident victims suffer more severe injuries during the pre- or post-law change period?
2. Did the unhelmeted cyclist suffer more severe injuries than the helmeted cyclist?
3. Did the chance of fatality differ for the helmeted and unhelmeted cyclists?
4. Did the chance of fatality or incapacitating injury differ for the helmeted and unhelmeted motorcyclists?
5. Did head injury fatalities differ for the helmeted and unhelmeted motorcyclists?

6. Did fatalities and incapacitating injuries from head inflicted wounds differ for the helmeted and unhelmeted motorcyclists?

Specific statistical analysis techniques used to help answer the above questions were Chi Square (χ^2), Odds Ratio, Relative Difference, and Ridit Analysis.

To answer question 1 -- Did motorcycle-involved accident victims suffer more severe injuries during the pre- and post-law change period? -- a Chi Square (χ^2) analysis was made comparing pre- and post-law change data. The χ^2 test statistic was 16.84 as compared to a table value of 16.27 at the $\alpha < .001$ level, thus indicating that there was a significant difference between injury severity sustained by motorcycle-involved accident victims from the pre- and post-law change periods. To determine the difference in level of injury severity sustained, a Ridit Analysis was conducted. The result indicated that the post-law change victims had a 52% greater chance sustaining a more severe injury than one from the pre period.

The helmeted and unhelmeted cases for the pre and post periods were pooled to answer question 2 -- Did the unhelmeted cyclist suffer more severe injuries than the helmeted cyclist? -- a Chi Square (χ^2) analysis was made comparing helmeted and unhelmeted data. The χ^2 test statistic was 108.0 as compared to a table value of 16.27 at the $\alpha < .001$ level thus indicating that there was a significant difference in level of injury severity sustained by the helmeted and unhelmeted motorcycle accident victims. To determine this difference, a Ridit Analysis was conducted. The result indicated that the unhelmeted cyclist had a 55% greater chance of sustaining a more severe injury than the helmeted cyclist.

To address the third question -- Did the chance of fatality differ for the helmeted and unhelmeted cyclists? -- the number of fatalities for unhelmeted cyclists were compared with those for helmeted cyclists (pooled data was used as stated previously). A χ^2 analysis was done comparing fatalities of helmeted and unhelmeted cyclists. The χ^2 test statistic was 39 as opposed to a table value of 10.83 at the $\alpha < .001$ level, thus indicating a significant difference in chance of fatalities between the helmeted and unhelmeted motorcycle accident victims. The Odds Ratic for this data indicated that the probability of a fatal accident for the unhelmeted cyclist was 2.5 times as great as for the helmeted cyclist. A Relative Difference, a measure of the proportion of unhelmeted cyclists who would not have become fatalities had they been wearing helmets, was computed. The result was .250 which indicated that out of every 1000 motorcyclists who would have survived an accident had they been wearing a helmet, 250 will become fatalities simply because they were unhelmeted.

To answer question 4 -- Did the chance of fatality or incapacitating injury differ for the helmeted and unhelmeted motorcyclists? -- a χ^2 analysis was performed. The χ^2 test statistic was 82 as compared to a table value of 10.83 at the $\alpha < .001$ level, thus indicating that there was a significant difference in chance of fatality or incapacitating injury between helmeted and unhelmeted accident victims. The Odds Ratio indicated that the probability of a fatality or incapacitating injury for the unhelmeted cyclist was 1.41 times as great as for the unhelmeted cyclist. A Relative Difference was also computed and the result was .110 which indicated that out of every 1,000 motorcyclists who would have survived or suf-

fered less than incapacitating injury from an accident had they been wearing helmets, 110 will become fatalities or suffer incapacitating injuries because they were unhelmeted.

In response to the fifth question -- Did head injury fatalities differ for the helmeted and unhelmeted motorcyclists? -- a Chi Square (χ^2) analysis was performed comparing head injury fatalities between the helmeted and unhelmeted cyclists. The χ^2 test statistic was 7.12 as opposed to a table value of 6.64 at the $\alpha < .01$ level, thus indicating that there was a significant difference in head injury fatalities between helmeted and unhelmeted cyclists. The Odds Ratio for this data indicated that the probability of a fatality from a head injury for the unhelmeted cyclist was 1.83 times as great as for the helmeted cyclist. The Relative Difference computed was .138 which indicated that out of every 1,000 motorcyclists who would have survived an accident had they been wearing helmets, 138 will become fatalities because they were not helmeted.

Answering question 6 -- Did fatalities and incapacitating injuries from head inflicted wounds differ for the helmeted and unhelmeted motorcycles? -- a χ^2 analysis was done comparing fatalities and incapacitating injuries from head inflicted wounds between the helmeted and unhelmeted cyclists. The χ^2 test statistic was 83.72 as compared to a table value of 10.83 at the $\alpha < .001$ level, thus indicating that there was a significant difference in fatalities and incapacitating injuries from head inflicted wounds between helmeted and unhelmeted cyclists. The Odds Ratio for these data indicated that the probability for this occurrence for the unhelmeted cyclist was 2.67 times as great as for the helmeted cyclist.

The Relative Difference was calculated and the result was .90 which indicated that out of every 1000 motorcyclists who would have survived or sustained less than incapacitating injuries had they been wearing helmets, 90 will become fatalities or sustain incapacitating injuries because they were not helmeted.

Analysis of the data revealed that the level of injury sustained by a motorcycle accident victim was greater for the post-law change period than for the pre-law change period by a factor of .48. Also, the probability of sustaining an injury of a specified degree was greater for the unhelmeted rider than for the helmeted one by a factor as large as 2.5 for fatalities. Finally, fatality due to head injury was 1.8 times as great for unhelmeted cyclists as for the helmeted cyclists.

CHAPTER 4. CONCLUSIONS AND RECOMMENDATIONS

Three overall conclusions can be drawn from the findings in this research.

1. Unhelmeted motorcycle accident victims sustain more severe injuries and experience a higher fatality rate than the helmeted victims.
2. In motorcycle accidents unhelmeted cyclists sustain a greater number of and more severe head injuries than those suffered by the helmeted cyclists.
3. When motorcyclists are given the freedom of choice regarding helmet usage, a majority will choose not to wear the helmet.

Based upon the foregoing conclusions, these recommendations are suggested:

1. In view of the first three conclusions, it is recommended that the appropriate state agencies restudy motorcycle safety helmet usage.
2. It is recommended that motorcycle rider training programs incorporate a more intensified effort to develop greater vehicle operator awareness by stressing protective gear, visibility, accident causation, and vulnerability should an accident become imminent.
3. Inasmuch as helmet information on accident reports is recorded only in the event of a fatality or injury (otherwise it is left blank), it is recommended that the accident report be completed in its entirety to provide more complete data for evaluation purposes.

A P P E N D I X

TEXAS A&M UNIVERSITY
TEXAS TRANSPORTATION INSTITUTE
COLLEGE STATION TEXAS 77843

HUMAN FACTORS DIVISION

Dear Motorcycle Rider:

We at the Texas Transportation Institute of Texas A&M University need your assistance in collecting information about motorcycling. We are conducting research for the Office of Traffic Safety for the purposes of accident prevention and safety education.

The number of motorcyclists in Texas has increased by leaps and bounds in the past few years. To date, we have not put forth an effort to learn about this rider population so that safety considerations for this group can be based upon facts. Your name has been selected as a licensed motorcycle operator to help provide the requested information. Would you please take a few moments to complete the enclosed questionnaire, seal it in the postage paid envelope, and drop it into the nearest mailbox?

We will treat all information in confidence and in no way can your responses have an effect on your driving record or your riding privilege. We are interested in facts only. We respect your rights as an individual; therefore, we are collecting our data without your individual identification.

May I take this opportunity to thank you for your candid responses and your cooperation in this very worthy research. May you have many enjoyable hours riding your motorcycle.

Sincerely,

Myron Koehler, Ed. D.
Principal Investigator

MK/jp
Enclosures

MOTORCYCLE RIDER QUESTIONNAIRE

The purpose of this questionnaire is to gather research information about motorcycle riding in Texas; therefore, we ask you to take a few moments to help us by answering each item as accurately as possible. Remember that this information is for research purposes and will not affect your motorcycle operator's license or your driver record in any way. Thank you for your assistance and cooperation. Happy motorcycling.

We are not requesting your name but would you please indicate two items of personal information? _____ *age* _____ *sex*

1. How long have you been riding a motorcycle? ____ *years* _____ *months*
2. What size motorcycle do you ride? _____ *under 150cc*
   _____ *150cc to 250cc* _____ *250cc to 400cc*
   _____ *400cc to 750cc* _____ *750cc or more*
3. Check the type of riding you do and estimate the annual number of miles for each type that you ride.
   _____ *trail/dirt/off street* _____ *miles*
   _____ *local on street/in town* _____ *miles*
   _____ *cross country/highway* _____ *miles*
   _____ *other type (specify)* _____ *miles*
4. How frequently do you ride per week?
   _____ *6 or 7 days* _____ *4 or 5 days*
   _____ *2 or 3 days* _____ *less than 2 days*
5. How much of your riding is done in each of the following categories? (Each column should account for 100%.)
   _____% *daylight riding* _____% *urban/in town riding*
   _____% *night time riding* _____% *rural/out of town riding*
6. Check weather conditions under which you ride.

	Day/Night	*Day only*
All types of weather		
Light rains and cold winds		
Clear and dry weather		

7. What type of protective gear do you wear when riding?
   ____ *boots* ____ *jacket* ____ *heavy pants*
   ____ *gloves* ____ *helmet* ____ *eye protection*
8. If you rode a motorcycle before August 29, 1977, did you wear a helmet? ____ *yes* ____ *no* If yes, how frequently did you wear it?
   ____ *always* ____ *most of the time*
   ____ *some of the time* ____ *rarely wore one*
9. If you are 18 years of age or older now and wear a helmet, how often do you use it?
   ____ *always* ____ *most of the time*
   ____ *some of the time* ____ *rarely wear one*
10. Were you ever involved in a motorcycle accident? ____ *yes* ____ *no* (If not, go to item 15 on the back.) If you had an accident, indicate the date and what you think was the cause of the accident.

_____

_____

_____

_____

_____

_____

_____

_____

(over, please)

11. Were you injured? ____ *yes* ____ *no* If so, please indicate the extent of your injury.
    ____ *received first aid on the scene*
    ____ *received medical care at emergency room and released*
    ____ *was hospitalized for* _____ *days*
    ____ *other (specify)* _____

    _____

    _____

12. What protective gear were you wearing when the accident occurred?

    _____ *boots.* _____ *jacket* _____ *heavy pants*

    _____ *gloves* _____ *helmet* _____ *eye protection*

13. Estimate the total cost of the accident (whether you, your insurance company, or some other means paid for the cost of restoration.)

____ *less than $500*	____ *$5,500 to $6,000*
____ *$500 to $1,000*	____ *$6,000 to $7,000*
____ *$1,000 to $1,500*	____ *$7,000 to $8,000*
____ *$1,500 to $2,000*	____ *$8,000 to $9,000*
____ *$2,000 to $2,500*	____ *$9,000 to $10,000*
____ *$2,500 to $3,000*	____ *$10,000 to $12,000*
____ *$3,000 to $3,500*	____ *$12,000 to $15,000*
____ *$3,500 to $4,000*	____ *$15,000 to $20,000*
____ *$4,000 to $4,500*	____ *$20,000 to $30,000*
____ *$4,500 to $5,000*	____ *$30,000 to $50,000*
____ *$5,000 to $5,500*	____ *$50,000 or more*

14. Indicate the "before and after" effect that the accident had on your attitude about wearing a helmet while riding a motorcycle.

Before the Accident	*After the Accident*
_____ *never wore a helmet*	_____ *never wear a helmet now*
_____ *wore a helmet on rare occasions*	_____ *wear a helmet on rare occasions*
_____ *wore a helmet some of the time*	_____ *wear a helmet some of the time*
_____ *wore a helmet most of the time*	_____ *wear a helmet most of the time*
_____ *wore a helmet whenever I rode*	_____ *wear a helmet whenever I ride*

15. What is your opinion about wearing a helmet when you ride a motorcycle?

    _____

    _____

    _____

    _____

    _____

16. Would you recommend that everyone should wear a helmet? ___ *yes* ___ *no*

17. Should motorcyclists be required, by law, to wear a helmet? ___*yes* ___*no*

DEFINITIONS OF INJURY

Abrasion - Any wearing, grinding, or rubbing away of an area of the skin or mucous membrane.

Amputation - Any medically required severing of body parts to save the victim's life.

Asphyxia - Any damage to the respiratory system resulting from a lack of oxygen or excess of carbon dioxide in the body that is usually caused by interruption of breathing and/or causes unconsciousness.

Avulsion - Any tissue injury which resulted from forcibly tearing or separating the tissue from the body.

Burn - Any injury or damage resulting from exposure to fire, heat, caustics, electricity or certain radiations.

Concussion - Any hard blow or collision to the head causing injury to the brain resulting in disturbance of cerebral function.

Contusion/Bruise - Any injury involving rupture of small blood vessels and discoloration without a break in the overlying skin.

Crushing - Any deformed or destroyed body structure caused by squeezing or forcing through pressure.

Dislocation - Any injury to the capsule and ligaments of a joint that results in displacement of a bone end at that joint.

Edema - Any abnormal excess accumulation of serous fluid in connective tissue or in a serous cavity.

Fracture/Rupture - Any breaking of hard and soft tissue.

Head Trauma - Any disordered psychic or behavioral state resulting from mental or emotional stress or physical injury to living tissue caused by an extrinsic agent.

Hemorrhage - Any excessive or uncontrollable bleeding.

Laceration - Any jagged, irregular, or blunt breaking or tearing of the soft tissue.

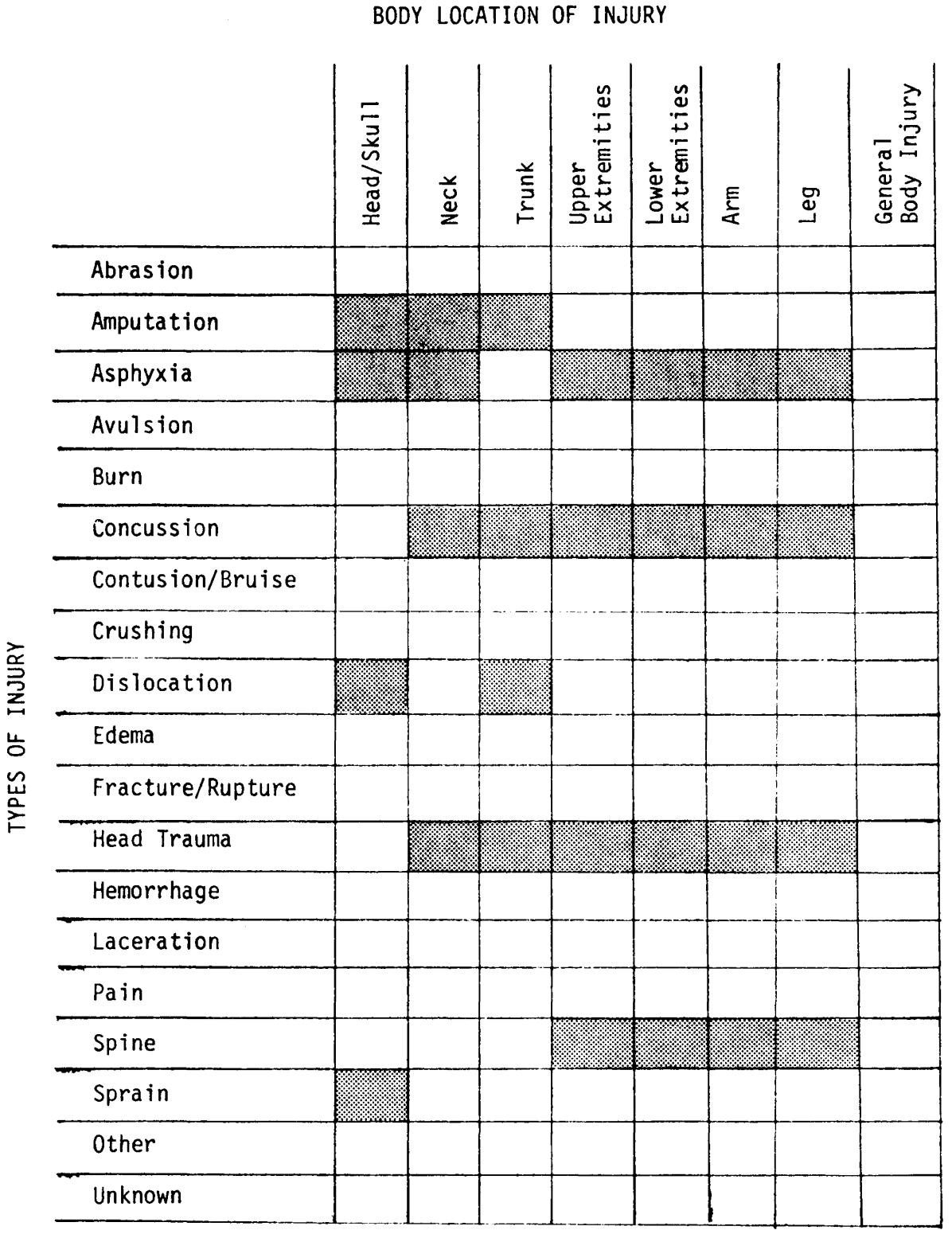
Pain - Any localized physical suffering associated with bodily disorder.

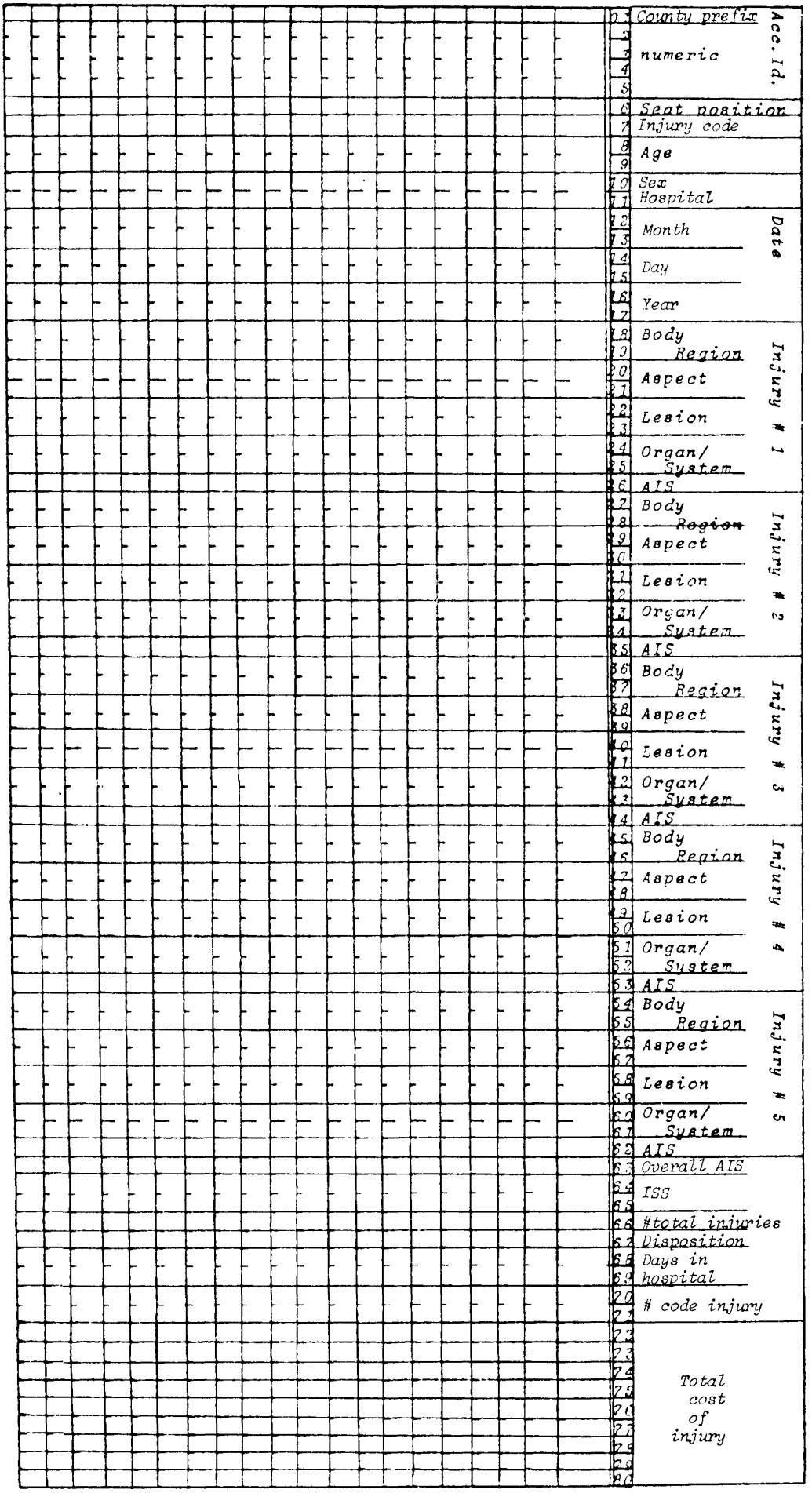
Spine - Any injury to the spinal cord, or spine.

Sprain - Any sudden or violent twist or wrench of a joint which stretches or tears ligaments.

Other - Any injury not previously described.

Unknown - Self explanatory


BODY LOCATION OF INJURY
TYPES OF INJURY
Head/Skull
Neck
Trunk
Upper Extremities
Lower Extremities
Arm
Leg
General Body Injury
Abrasion
Amputation
Asphyxia
Avulsion
Burn
Concussion
Contusion/Bruise
Crushing
Dislocation
Edema
Fracture/Rupture
Head Trauma
Hemorrhage
Laceration
Pain
Spine
Sprain
Other
Unknown



MEDICAL INFORMATION CODING FORM

TEXAS MOTORCYCLE ACCIDENT STUDY

CODING INSTRUCTIONS: MEDICAL INFORMATION

1. Card Layout

Columns	Description	Remarks
1	County Prefix	D - Dallas H - Harris
2 - 5	Register Number for Accident	0001 Numbered Consecutively
6	Seat Position	1 = Rider (R) (See Attachment A) 2 = Passenger (P) 3 = Rider & Passenger (R&P)
7	Injury Code	(See Attachment A)
8 - 9	Rider Age	Computer Derived
10	Sex	1 = Male Rider 2 = Female Rider 3 = Rider and Passenger - Male 4 = Rider and Passenger - Female 5 = R - Male P - Female 6 = R - Female P - Male 0 = Unknown
11	Hospital Code	(See Attachment A)
12 - 13	Accident Month	(See Attachment B)
14 - 15	Accident Day	(See Attachment B)
16 - 17	Accident Year	(See Attachment B)
18 - 19	Body Region of Injury # 1	(Most Severe)
20 - 21	Aspect of Injury # 1	(See Attachment C)
22 - 23	Lesion Type of Injury # 1	(See Attachment C)
24 - 25	Organ/Syetem of Injury # 1	(See Attachment C)
26	Abbreviated Injury Scale of Injury # 1	(See Attachment C)
27 - 28	Body Region of Injury # 2	(More Severe)
29 - 30	Aspect of Injury # 2	(See Attachment C)
31 - 32	Lesion Type of Injury # 2	(See Attachment C)
33 - 34	Organ/System of Injury # 2	(See Attachment C)
35	Abbreviated Injury Scale of Injury # 2	(See Attachment C)
36 - 37	Body Region of Injury # 3	(Severe)
38 - 39	Aspect of Injury # 3	(See Attachment C)
40 - 41	Lesion Type of Injury # 3	(See Attachment C)
42 - 43	Organ/System of Injury #3	(See Attachment C)
44	Abbreviated Injury Scale of Injury # 3	(See Attachment C)
45 - 46	Body Region of Injury # 4	(Less Severe)
47 - 48	Aspect of Injury # 4	(See Attachment C)
49 - 50	Lesion Type of Injury # 4	(See Attachment C)
51 - 52	Organ/System of Injury # 4	(See Attachment C)
53	Abbreviated Injury Scale of Injury # 4	(See Attachment C)

1. Card Layout (continued)

54 - 55	Body Region of Injury # 5	(Least Severe)
56 - 57	Aspect of Injury # 5	(See Attachment C)
58 - 59	Lesion Type of Injury # 5	(See Attachment C)
60 - 61	Organ/System of Injury # 5	(See Attachment C)
62	Abbreviated Injury Scale of Injury # 5	(See Attachment C)
63	Overall Abbreviated Injury Scale	(Total effect of all injuries on Body)
64 - 65	Injury Severity Scale	(See Attachment B)
66	Total Number of Injuries Reported on Medical Records	Self explanatory
67	Disposition of This Victim	1 = Treated and Released 2 = Admitted to Hospital 3 = Dead on Arrival 4 = Died Within 30 Days
68 - 69	Days Hospitalized	Self explanatory
70	Number of Coded Injuries	(Maximum = 5)
71	Data Availability	0 = Data on card present and usable 1 = No medical treatment reported 2 = Medical records not obtained
72 - 80	Total Cost of Injury	

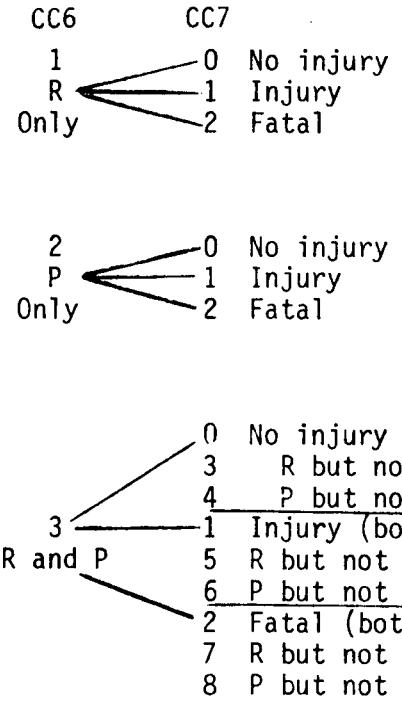
Recapitulation of Injury Codes

Card Code	Description	Remarks
18 - 19 27 - 28 36 - 37 45 - 46 54 - 55	Body Region of Injuries 1, 2, 3, 4, and 5	Section II Specific Codes
20 - 21 29 - 30 38 - 39 47 - 48 56 - 57	Aspect of Injuries 1, 2, 3, 4, and 5	Section II Specific Codes
22 - 23 31 - 32 40 - 41 49 - 50 58 - 59	Lesion of Injuries 1, 2, 3, 4, and 5	Section II Specific Codes
24 - 25 33 - 34 42 - 43 51 - 52 60 - 61	Organ/System of Injuries 1, 2, 3, 4, and 5	Section II Specific Codes
26 35 44 53 62	Abbreviated Injury 1, 2, 3, 4, and 5	Section II Specific Codes

ATTACHMENT A

CODING FOR INJURIES

Accident number



LEGEND

1 = Rider (R)

2 = Passenger (P)

3 = Rider and Passenger (R&P)

HOSPITAL CODING

Harris County

1. Ben Taub Hospital
2.
3.
4.
0. Any Other Harris County Hospital

Dallas County

1. Parkland Hospital
2.
3.
4.
0. Any Other Dallas County Hospital

ATTACHMENT B

ACCIDENT MONTH

01	January	07	July
02	February	08	August
03	March	09	September
04	April	10	October
05	May	11	November
06	June	12	December

ACCIDENT DAY OF WEEK

1	Sunday	5	Thursday
2	Monday	6	Friday
3	Tuesday	7	Saturday
4	Wednesday		

YEAR OF ACCIDENT

76	If left digit of accident number is 6.
77	If left digit of accident number is 7.
78	If left digit of accident number is 8.

INJURY SEVERITY SCALE

Severity will be measured in terms of dollar damage to vehicle and property as well as injury cost estimates. A weighted formula will be employed to derive a quantitative index of accident severity. The formula is:

$$S = \frac{TPD}{N_v} + \frac{6\ (N_i)}{N_p} + 25\ (N_f)$$

Where:

S is severity of accident
TPD is total property damage
N_v is number of vehicles involved
N_i is total injuries
N_p is number of persons involved
N_f is number of fatalities

ATTACHMENT C

Body Region

01	Head, Skull
02	Face, Eye, Ear, Jaw
03*	Head/Face
04	Neck, Throat, Cervical Spine
05	Shoulder, Clavicle
06	Chest, Thoracic Organs, Thoracic Spine
07	Abdominal/Pelvic Organs, Lumbar Spine
08	Pelvic Girdle, Hip
09*	Upper Extremities
10	Upper Arm
11	Elbow
12	Forearm
13	Wrist/Hand
14*	Lower Extremities
15	Thigh
16	Knee
17	Lower Leg, Calf
18	Ankle, Foot, Toes
19*	Upper One-Half of Body
20*	Upper Extremities and Trunk
21*	Lower Extremities and Trunk
22*	Trunk (incl. Chest/Back, Shoulder, Pelvic Area)
23*	Upper and Lower Extremities
24*	Upper and Lower Extremities and Trunk
25*	Head and Lower Extremities
26*	Face and Upper and Lower Extremities
27*	Whole Body
00	Unknown

Region marked with an * are applicable to general external injuries only.

Aspect

01	Proximal
02	Distal
03	Right
04	Left
05	Bilateral
06	Central (Medial)
07	Anterior (Ventral)
08	Posterior (Dorsal)
09	Superior (Upper)
10	Inferior (Lower)
11	Whole Region
12	Not Applicable (for Major Organs)
13	Unknown

Attachment C (continued)

Lesion

01	Abrasion	11	Fracture/Rupture
02	Amputation	12	Head Trauma
03	Asphyxia	13	Hemorrhage
04	Avulsion	14	Laceration
05	Burn	15	Pain
06	Concussion	16	Spine
07	Contusion/Bruise	17	Sprain
08	Crushing	18	Other
09	Dislocation	19	Unknown
10	Edema		

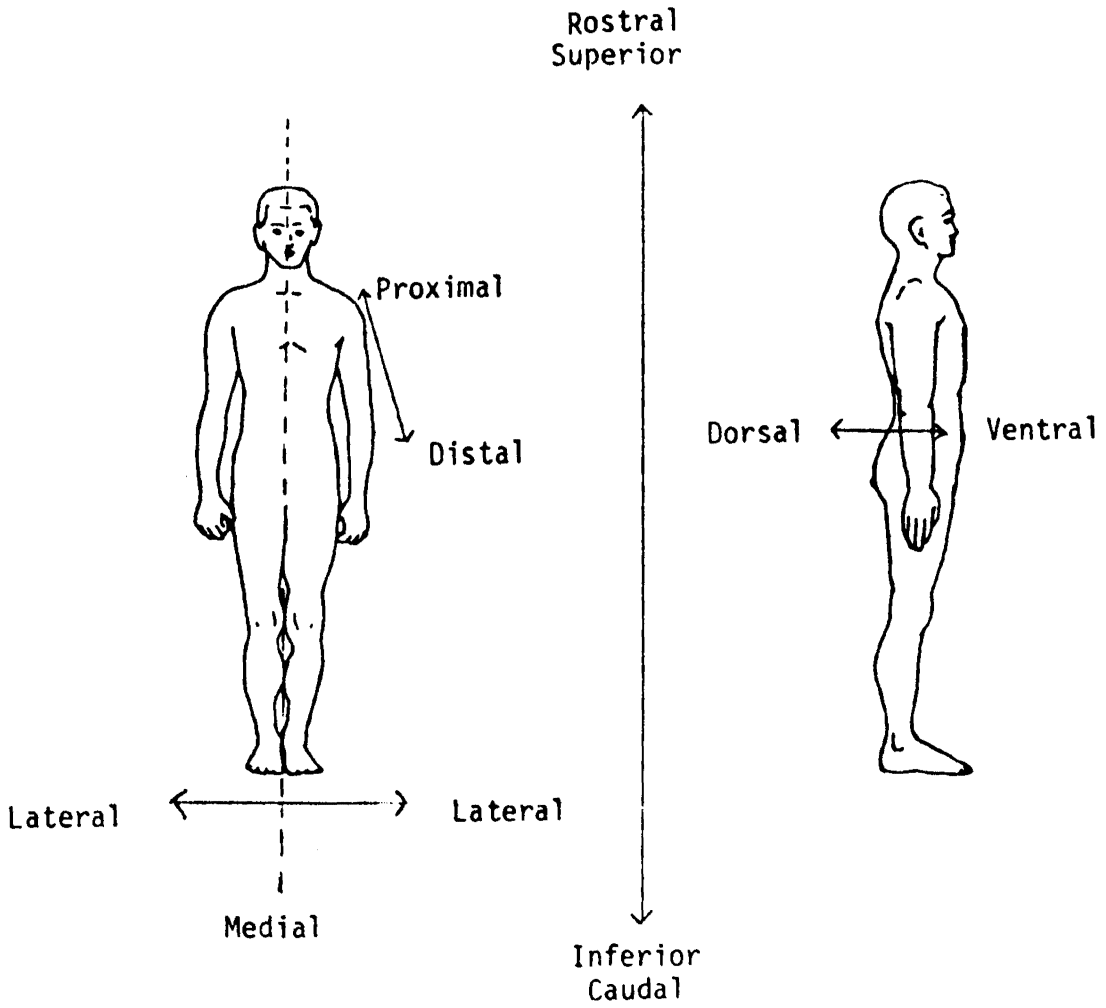
System/Organ

01	All Systems in Region	11	Liver
02	Arteries	12	Muscles
03	Brain	13	Nervous System
04	Digestive	14	Pulmonary, Lungs
05	Eyes, Ears (Organs and Innervation to)	15	Respiratory
		16	Skeletal
06	General External Body Surface	17	Spinal Cord
07	Heart	18	Spleen
08	Integumentary	19	Urogenital
09	Joints	20	Vertebrae
10	Kidneys	21	Unknown

Abbreviated Injury Scale (AIS)

0	No Injury
1	Minor Injury
2	Moderate Injury
3	Severe (not life-threatening)
4	Serious (life-threatening, survival probable)
5	Critical (survival uncertain)
6	Maximum (currently Untreatable)
9	Unknown

ANATOMICAL DIRECTIONS



TRAFFIC COUNT FOR FEBRUARY 6 - 10, 1978 AT TEXAS AVENUE

AND JERSEY STREET IN COLLEGE STATION, TEXAS

AM TIMES		WEATHER CONDITIONS	TOTAL # VEHICLES	TOTAL # M/C	DRIVER		PASSENGER	
					TOTAL W/HELMETS	TOTAL # W/O HELMETS	TOTAL W/HELMETS	TOTAL # W/O HELMETS
7:30	Mon.	Dry Clear Cold	2,233	9	9	0	0	0
	Tues.	Wet Cloudy Cold	2,158	2	1	1	0	0
Till	Wed.	Wet Cloudy Cold	2,106	5	4	1	0	0
	Thurs.	Wet Cloudy Cold	2,162	3	3	0	0	0
8:30	Fri.	Dry Cloudy Cold	2,097	3	2	1	0	0
Daily Total:			10,756	22	19	3	0	0
Average/week			2,151.2	4.4	3.8	0.6	0.0	0.0

AM-PM

11:30	Mon.	Dry Clear Cool	4,914	43	39	4	2	1
	Tues.	Wet Cloudy Cold	4,357	4	4	0	0	0
Till	Wed.	Dry Cloudy Cold	4,550	17	15	2	0	1
	Thurs.	Wet Cloudy Cold	4,527	6	6	0	0	0
1:30	Fri.	Dry Cloudy Cool	5,620	37	31	6	0	1
Daily Total:			23,968	107	95	12	2	3
Average/week:			4,793.6	21.4	19.0	2.4	0.4	0.6

PM

4:30	Mon.	Dry Clear Cool	3,150	34	29	5	0	1
	Tues.	Wet Cloudy Cold	2,884	1	1	0	0	1
Till	Wed.	Wet Cloudy Cold	3,358	10	10	0	0	0
	Thurs.	Dry Cloudy Cold	3,154	8	8	0	0	0
5:30	Fri.	Dry Cloudy Cold	3,468	12	8	4	2	1
Daily Total:			16,014	65	56	9	2	3
Average/week:			3,202.8	13.0	11.2	1.8	0.4	0.6

Grand Totals for the Week:	50,738	194	170	24	4	6	

TRAFFIC COUNT FOR FEBRUARY 13 - 17, 1978 AT TEXAS AVENUE

AND VILLA MARIA IN BRYAN, TEXAS

AM TIMES		WEATHER CONDITIONS	TOTAL # VEHICLES	TOTAL # M/C	DRIVER		PASSENGER	
					TOTAL W/HELMETS	TOTAL # W/O HELMETS	TOTAL W/HELMETS	TOTAL # W/O HELMETS
7:30	Mon.	Dry Clear Cool	1,956	7	7	0	0	0
	Tues.	Dry Clear Cool	2,122	3	3	0	0	0
Till	Wed.	Dry Cloudy Cool	2,102	7	6	1	0	0
	Thurs.	Dry Clear Cool	2,080	4	4	0	0	0
8:30	Fri.	Wet Cloudy Cool	2,080	4	4	0	0	0
Daily Total:			10,340	25	24	1	0	0
Average/week			2,068	5.0	4.8	0.2	0.0	0.0

AM-PM

11:30	Mon.	Dry Clear Cool	6,173	35	21	14	2	3
	Tues.	Dry Clear Cool	5,886	22	19	3	0	0
Till	Wed.	Wet Cloudy Cold	4,773	0	0	0	0	0
	Thurs.	Dry Clear Warm	5,265	15	14	1	0	2
1:30	Fri.	Wet Cloudy Cool	5,199	5	4	1	0	0
Daily Total:			27,296	77	58	19	2	5
Average/week:			5,459.2	15.4	11.6	3.8	0.4	1.0

PM

4:30	Mon.	Dry Clear Cool	3,308	18	12	6	1	0
	Tues.	Dry Clear Cool	3,330	15	15	0	0	0
Till	Wed.	Dry Cloudy Cold	2,946	5	3	2	0	2
	Thurs.	Dry Clear Warm	3,266	19	15	4	1	1
5:30	Fri.	Dry Clear Cold	3,469	6	6	0	0	1
Daily Total:			16,319	63	51	12	2	4
Average/week:			3,263.8	12.6	10.2	2.4	0.4	0.8

Grand Totals for the Week:		53,955	165	133	32	4	9

TRAFFIC COUNT FOR APRIL 17 - 21, 1978 AT TEXAS AVENUE

AND JERSEY STREET IN COLLEGE STATION, TEXAS

AM TIMES		WEATHER CONDITIONS	TOTAL # VEHICLES	TOTAL # M/C	DRIVER		PASSENGER	
					TOTAL W/HELMETS	TOTAL # W/O HELMETS	TOTAL W/HELMETS	TOTAL # W/O HELMETS
7:30	Mon.	Wet Cloudy Warm	2,066	6	5	1	1	0
	Tues.	Dry Sunny Warm	2,181	24	16	8	0	0
Till	Wed.	Dry Sunny Cool	2,221	12	9	3	1	1
	Thurs.	Dry Sunny Cool	2,169	19	14	5	0	0
8:30	Fri.	Dry Sunny Cool	2,027	9	6	3	0	1
Daily Total:			10,664	70	50	20	2	2
Average/week			2,132.8	14.0	10.0	4.0	0.4	0.4

AM-PM

11:30	Mon.	Wet Cloudy Warm	5,155	30	21	9	0	0
	Tues.	Dry Sunny Hot	4,705	72	37	35	4	11
Till	Wed.	Dry Sunny Warm	4,877	73	44	29	2	7
	Thurs.	Dry Sunny Cool	5,206	50	41	9	2	1
1:30	Fri.	Dry Sunny Hot	6,382	66	38	28	2	8
Daily Total:			26,325	291	181	110	10	27
Average/week:			5,265.0	58.2	36.2	22.0	2.0	5.4

PM

4:30	Mon.	Wet Cloudy Warm	3,048	19	17	2	2	0
	Tues.	Dry Sunny Hot	3,054	47	32	15	1	8
Till	Wed.	Dry Sunny Warm	3,273	32	21	11	2	3
	Thurs.	Dry Sunny Cool	3,243	42	27	15	0	2
5:30	Fri.	Dry Sunny Hot	3,571	53	37	16	0	6
Daily Total:			16,189	193	134	59	5	19
Average/week:			3,237.8	38.6	26.8	11.8	1.0	3.8

Grand Totals for the Week:	53,178	554	365	189	17	48
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TRAFFIC COUNT FOR MAY 1 - 5, 1978 AT TEXAS AVENUE

AND VILLA MARIA IN BRYAN, TEXAS

AM TIMES		WEATHER CONDITIONS	TOTAL # VEHICLES	TOTAL # M/C	DRIVER		PASSENGER	
					TOTAL W/HELMETS	TOTAL # W/O HELMETS	TOTAL W/HELMETS	TOTAL # W/O HELMETS
7:30	Mon.	Dry Cloudy Warm	1,949	10	8	2	0	0
	Tues.	Dry Cloudy Cool	2,072	4	4	0	0	0
Till	Wed.	Wet Cloudy Cool	1,760	2	2	0	0	0
	Thurs.	Dry Sunny Cool	1,953	12	11	1	0	0
8:30	Fri.	Dry Cloudy Cool	1,966	11	8	3	0	0
Daily Total:			9,700	39	33	6	0	0
Average/week			1,940.0	7.8	6.6	1.2	0.0	0.0

AM-PM

11:30	Mon.	Dry Cloudy Warm	5,628	31	12	19	1	1
	Tues.	Dry Cloudy Cool	5,746	34	20	14	1	1
Till	Wed.	Dry Cloudy Cool	5,836	18	10	8	1	1
	Thurs.	Dry Sunny Cool	5,882	36	27	9	1	3
1:30	Fri.	Dry Sunny Warm	6,345	37	25	12	3	2
Daily Total:			29,437	156	94	62	7	8
Average/week:			5,887.4	31.2	18.8	12.4	1.4	1.6

PM

4:30	Mon.	Dry Cloudy Warm	2,261	24	11	13	1	1
	Tues.	Dry Cloudy Cool	3,177	17	14	3	2	3
Till	Wed.	Dry Sunny Cool	3,167	15	11	4	0	1
	Thurs.	Dry Sunny Cool	3,289	17	14	3	0	1
5:30	Fri.	Dry Sunny Warm	3,665	33	20	13	3	2
Daily Total:			15,559	106	70	36	6	8
Average/week:			3,111.8	21.2	14.0	7.2	1.2	1.6

Grand Totals for the Week:	54,696	301	197	104	13	16

TRAFFIC COUNT FOR SEPTEMBER 16 AND 23 AND NOVEMBER 15, 1977 at

I - 35 NORTHBOUND AND THEO AVENUE IN SAN ANTONIO, TEXAS

TIMES		WEATHER CONDITIONS	TOTAL # VEHICLES	TOTAL # M/C	DRIVER		PASSENGER	
					TOTAL # W/HELMETS	TOTAL # W/O HELMETS	TOTAL # W/HELMETS	TOTAL # W/O HELMETS
AM								
9-16-78	7:50-8:15	Cloudy, Dry	1,550	2	2	0	0	0
PM								
9-23-78	2:05-2:30	Cloudy, Dry	641	5	4	1	0	0
AM								
11/15/78	7:20-7:55	Clear, Sunny, Dry	2,118	11	10	1	0	0
11/15/78	7:55-8:10	Clear, Sunny, Dry	800	1	1	0	0	0
11/15/78	9:20-9:50	Clear, Dry	1,159	4	4	0	0	0
TOTAL			4,077	16	15	1	0	0

TRAFFIC COUNT FOR NOVEMBER 17, 1977 AT

I - 10 EASTBOUND AND I - 37 IN SAN ANTONIO, TEXAS

AM								
11-17-77	7:40-8:00	Clear, Dry	1,281	6	6	0	0	0

TRAFFIC COUNT FOR FEBRUARY 16, 1978 AT CALHOUN,

WHEELER, AND M. L. KING BLVD. IN HOUSTON, TEXAS

TIMES		WEATHER CONDITIONS	TOTAL # VEHICLES	TOTAL # M/C	DRIVER		PASSENGER	
					TOTAL # W/HELMETS	TOTAL # W/O HELMETS	TOTAL # W/HELMETS	TOTAL # W/O HELMETS
Thurs-day 2/16/78 AM	7:00-8:00	Cloudy, Dry	3,226	2	2	0	0	0
	8:00-9:00	Cloudy, Dry	2,522	1	1	0	0	0
PM	1:00-2:00	Sunny	2,099	4	4	0	0	0
	2:00-3:00	Sunny	2,421	8	8	0	0	0
	3:30-4:30	Sunny	2,876	7	3	4	2	1
	4:30-5:30	Sunny	3,635	3	2	1	0	0
Total			16,779	25	20	5	2	1

TRAFFIC COUNT FOR FEBRUARY 17, 23, AND 24, 1978 AT CALHOUN,

WHEELER, AND M. L. KING BLVD. IN HOUSTON TEXAS

TIMES AM		WEATHER CONDITIONS	TOTAL # VEHICLES	TOTAL # M/C	DRIVER		PASSENGER	
					TOTAL # W/HELMETS	TOTAL # W/O HELMETS	TOTAL # W/HELMETS	TOTAL # W/O
Fri.	7:00-8:00	Cloudy, Dry	3,325	2	2	0	0	0
2/17/78	8:00-9:00	Cloudy, Dry	2,549	2	2	0	0	0
Total			5,874	4	4	0	0	0

PM

Thurs.	3:30-4:30	Sunny, Dry	2,937	2	2	0	0	0
2/23/78	4:30-5:30	Sunny, Dry	3,598	12	9	3	0	0
Total			6,535	14	11	3	0	0

PM

Fri.	1:00-2:00	Partly Cloudy, Dry	2,576	7	4	3	0	1
2/24/78	2:00-3:00	Partly Cloudy, Dry	2,692	4	4	0	1	0
Total			5,268	11	8	3	1	1

TRAFFIC COUNT FOR MARCH 1, 1978

AT I - 610 AND 18th STREET, HOUSTON, TEXAS

TIMES PM		WEATHER CONDITIONS	TOTAL # VEHICLES	TOTAL # M/C	DRIVER		PASSENGER	
					TOTAL # W/HELMETS	TOTAL # W/O HELMETS	TOTAL W/HELMETS	TOTAL # W/O HELMETS
Wednes. 3/1/78	1:00-2:00	Cloudy, Dry	8,210	4	3	1	0	0
	2:00-3:00	Cloudy, Dry	8,880	15	10	5	1	4
	3:00-4:00	Cloudy, Dry	10,250	15	11	4	0	1
Total:			27,340	34	24	10	1	5

TRAFFIC COUNT FOR MARCH 13 - 16, 1978 AT US 59

AND WESLAYAN IN HOUSTON, TEXAS

INBOUND

TIMES AM		WEATHER CONDITIONS	TOTAL # VEHICLES	TOTAL # M/C	DRIVER		PASSENGER	
					TOTAL W/HELMETS	TOTAL # W/O HELMETS	TOTAL W/HELMETS	TOTAL # W/O HELMETS
Monday	6:30-7:00	Clear, Dry	3,158	5	4	1	0	0
	7:00-7:30	Clear, Dry	3,927	3	0	3	1	0
	7:30-8:00	Clear, Dry	4,205	5	5	0	0	0
3/13/78	8:00-8:30	Clear, Dry	3,568	1	1	0	0	0
	8:30-9:00	Clear, Dry	4,040	6	5	1	0	0
Total			18,898	20	15	5	1	0

OUTBOUND PM

Monday	3:30-4:00	Clear, Dry	2,662	6	4	2	0	0
	4:00-4:30	Clear, Dry	3,947	5	5	0	1	0
	4:30-5:00	Clear, Dry	3,505	5	5	0	0	0
3/13/78	5:00-5:30	Clear, Dry	3,190	1	1	0	0	0
	5:30-6:00	Clear, Dry	3,138	4	2	2	0	0
Total:			16,442	21	17	4	1	0

OUTBOUND PM

Tuesday	3:30-4:00	Clear, Dry	4,175	6	2	4	0	2
	4:00-4:30	Clear, Dry	3,979	6	3	3	1	0
	4:30-5:00	Clear, Dry	3,461	9	7	2	0	0
3/14/78	5:00-5:30	Clear, Dry	3,152	6	3	3	1	1
	5:30-6:00	Clear, Dry	3,333	6	1	5	1	0
Total:			18,100	33	16	17	3	3

TRAFFIC COUNT FOR MARCH 13 - 16, 1978 AT US 59

AND WESLAYAN IN HOUSTON, TEXAS

INBOUND

TIMES AM		WEATHER CONDITIONS	TOTAL # VEHICLES	TOTAL # M/C	DRIVER		PASSENGER	
					TOTAL W/HELMETS	TOTAL # W/O HELMETS	TOTAL W/HELMETS	TOTAL # W/O HELMETS
Wednes-	6:30-7:00	Clear, Dry	4,207	11	9	2	0	0
	7:00-7:30	Clear, Dry	4,229	11	7	4	1	0
day	7:30-8:00	Clear, Dry	4,379	5	4	1	0	0
	8:00-8:30	Clear, Dry	4,578	5	4	1	0	0
3/15/78	8:30-9:00	Clear, Dry	4,328	7	5	2	1	0
Total:			21,721	39	29	10	2	0

INBOUND AM

Thurs-	6:30-7:00	Clear, Dry	3,689	17	15	2	0	0
	7:00-7:30	Clear, Dry	4,057	7	5	2	0	0
day	7:30-8:00	Clear, Dry	4,297	6	4	2	0	0
	8:00-8:30	Clear, Dry	4,393	3	3	0	0	0
3/16/78	8:30-9:00	Clear, Dry	4,269	6	6	0	0	0
Total:			20,705	39	33	6	0	0

OUTBOUND PM

Thurs-	3:30-4:00	Clear, Dry	3,865	8	6	2	0	0
	4:00-4:30	Clear, Dry	3,218	5	2	3	0	0
day	4:30-5:00	Clear, Dry	3,100	3	1	2	0	0
	5:00-5:30	Clear, Dry	2,534	5	4	1	0	1
3/16/78	5:30-6:00	Clear, Dry	2,654	2	2	0	0	0
Total:			15,371	23	15	8	0	1

TRAFFIC COUNT FOR MARCH 27, 1978 AT I - 610 EAST BOUND

AND WEST BOUND AT WEST T. C. JESTER IN HOUSTON, TEXAS

TIMES PM		WEATHER CONDITIONS	TOTAL # VEHICLES	TOTAL # M/C	DRIVER		PASSENGER	
					TOTAL # W/HELMETS	TOTAL # W/O HELMETS	TOTAL W/HELMETS	TOTAL # W/O HELMETS
Mon. 3/27/78	1:30-2:00	Clear, Dry	4,100	9	7	2	1	0
	2:00-3:00	Clear, Dry	8,860	30	20	10	2	3
	3:00-4:00	Clear, Dry	10,230	28	15	13	2	4
	4:00-4:15	Clear, Dry	2,650	8	4	4	1	1
Total:			25,840	75	46	29	6	8

TRAFFIC COUNT FOR MARCH 29 - 30, 1978 AT I - 610

SOUTHBOUND AT SHIPCHANNEL IN HOUSTON, TEXAS

TIMES		WEATHER CONDITIONS	TOTAL # VEHICLES	TOTAL # M/C	DRIVER		PASSENGER	
					TOTAL # W/HELMETS	TOTAL # W/O HELMETS	TOTAL W/HELMETS	TOTAL # W/O HELMETS
AM	6:30-8:15	Clear, Dry	6,440	5	2	3	NA	NA
AM	10:00-12:00	Clear, Dry	4,600	13	6	7	NA	NA
PM	1:15-3:00	Clear, Dry	4,720	18	10	8	NA	NA
PM	4:15-6:00	Clear, Dry	10,560	10	3	7	NA	NA
Total:			26,320	46	21	25	NA	NA

TRAFFIC COUNT FOR MAY 23, 1978 AT I - 10 WESTBOUND

NEAR I - 410 INTERCHANGE IN SAN ANTONIO, TEXAS

TIMES AM		WEATHER CONDITIONS	TOTAL # VEHICLES	TOTAL # M/C	DRIVER		PASSENGER	
					TOTAL # W/HELMETS	TOTAL # W/O HELMETS	TOTAL W/HELMETS	TOTAL # W/O HELMETS
May 23, 1978	9:23-9:43	Dry, Clear	513	0	0	0	0	0
	9:48-9:58	Dry, Clear	492	3	3	0	0	0
	10:29-11:00	Dry, Clear	1,042	3	2	1	0	0
TOTALS			2,047	6	5	1	0	0

TRAFFIC COUNT FOR JUNE 6, 1978 AT I - 30

EASTBOUND IN DALLAS, TEXAS

TIMES		WEATHER CONDITIONS	TOTAL # VEHICLES	TOTAL # M/C	DRIVER		PASSENGER	
					TOTAL # W/HELMETS	TOTAL # W/O HELMETS	TOTAL # W/HELMETS	TOTAL # W/O HELMETS
AM 6/6/78	11:30-11:45	Dry, Cloudy	161	1	1	0	0	0
PM	1:42-1:52	Dry, Clear	100	0	0	0	0	0
TOTAL:			261	1	1	0	0	0

TRAFFIC COUNT FOR JUNE 7, 1978 AT I - 35E

NORTHBOUND IN DALLAS, TEXAS

	AM							
6-7-78	10:47-10:47	Dry, Clear	1,199	6	2	4	0	0
TOTAL:			1,199	6	2	4	0	0

TRAFFIC COUNT FOR JUNE 8, 1978 at U. S. 75 SOUTHBOUND - NORTH

CENTRAL EXPRESSWAY NEAR CAMBELL ROAD IN DALLAS, TEXAS

	AM							
6-8-78	10:13-10:45	Dry, Cloudy	877	0	0	0	0	0
TOTAL:			877	0	0	0	0	0

MOTORCYCLE INVOLVED ACCIDENT DATA
FOR THE STATE OF TEXAS, HARRIS AND DALLAS COUNTIES

Table 1 Accident Frequency and Percentage by Months for 8/29/76 - 8/28/77

Month	Statewide		Dallas County		Harris County	
	Frequency	% age	Frequency	% age	Frequency	% age
January	375	3.7	34	2.8	59	4.0*
February	602	5.9	65	5.5	85	5.8
March	736	7.3	72	6.0	119	8.2*
April	928	9.2	120	10.1*	103	7.1
May	1,218	12.0	169	14.2*	171	11.7
June	1,194	11.8	171	14.4*	162	11.1
July	1,222	12.1	130	10.9	171	11.7
August	1,157	11.4	125	10.5	159	10.9
September	978	9.7	115	9.7	151	10.3*
October	745	7.4	77	6.5	128	8.8*
November	513	5.1	63	5.3*	76	5.2*
December	448	4.4	49	4.1	76	5.2*
Totals	10,116	100.0	1,190	100.0	1,460	100.0

* indicates that figure exceeds state average.

Table 1a Accident Frequency and Percentage by Months for 8/29/77 - 8/28/78

Month	Statewide		Dallas County		Harris County	
	Frequency	% age	Frequency	% age	Frequency	% age
January	283	2.6	23	1.8	42	2.8*
February	399	3.7	29	2.3	61	4.1*
March	771	7.2	92	7.3*	119	8.1*
April	1,054	9.9	148	11.7*	110	7.5
May	1,138	10.7	136	10.7	146	9.9
June	1,141	10.7	158	12.5*	151	10.3
July	1,043	9.8	148	11.7*	140	9.5
August	1,114	10.5	146	11.5*	160	10.9*
September	1,192	11.2	134	10.6	161	10.9
October	1,062	10.0	113	8.9	177	12.0*
November	766	7.2	76	6.0	110	7.5*
December	688	6.5	63	5.0	95	6.5
Totals	10,651	100.0	1,266	100.0	1,472	100.0

* indicates that figure exceeds state average.

Table 2 Accident Frequency and Percentage by Day of Week for 8/29/76 - 8/28/77

Day of Week	Statewide		Dallas County		Harris County	
	Frequency	% age	Frequency	% age	Frequency	% age
Sunday	1,594	15.8	169	14.2	225	15.4
Monday	1,278	12.6	146	12.3	187	12.8*
Tuesday	1,347	13.3	178	15.0*	201	13.8*
Wednesday	1,343	13.3	175	14.7*	180	12.3
Thursday	1,318	13.0	148	12.4	187	12.8
Friday	1,548	15.3	179	15.0	258	17.7*
Saturday	1,688	16.7	195	16.4	222	15.2
Totals	10,116	100.0	1,190	100.0	1,460	100.0

* indicates that figure exceeds state average.

Table 2a Accident Frequency and Percentage by Day of Week for 8/29/77-8/28/78

Day of Week	Statewide		Dallas County		Harris County	
	Frequency	% age	Frequency	% age	Frequency	% age
Sunday	1,677	15.8	164	12.9	217	14.7
Monday	1,336	12.5	161	12.7*	185	12.6*
Tuesday	1,208	11.3	149	11.8*	157	10.7
Wednesday	1,295	12.2	170	13.4*	181	12.3*
Thursday	1,449	13.6	191	15.1*	211	14.3*
Friday	1,746	16.4	210	16.6*	248	16.8*
Saturday	1,940	18.3	221	17.5	273	18.6*
Totals	10,651	100.0	1,266	100.0	1,472	100.0

* indicates that figure exceeds state average.

Table 3 Accident Frequency and Percentage by Time of Day for 8/29/76 - 8/28/77

Time of Day	Statewide		Dallas County		Harris County	
	Frequency	% age	Frequency	% age	Frequency	% age
M to 1 am	256	2.5	27	2.3	31	2.1
1 am to 2 am	221	2.2	28	2.4*	30	2.1
2 am to 3 am	199	2.0	24	2.0	28	1.9
3 am to 4 am	59	0.6	4	0.3	3	0.2
4 am to 5 am	26	0.3	2	0.2	6	0.4*
5 am to 6 am	29	0.3	2	0.2	4	0.3
6 am to 7 am	93	0.9	14	1.2*	27	1.9*
7 am to 8 am	277	2.7	36	3.0*	54	3.7*
8 am to 9 am	222	2.2	24	2.0	32	2.2
9 am to 10 am	194	1.9	29	2.4*	18	1.2
10 am to 11 am	257	2.5	21	1.8	40	2.7*
11 am to N	425	4.2	42	3.5	66	4.5*
N to 1 pm	583	5.8	71	6.0*	67	4.6
1 pm to 2 pm	561	5.6	68	5.7*	61	4.2
2 pm to 3 pm	627	6.2	73	6.1	82	5.6
3 pm to 4 pm	839	8.3	122	10.3*	113	7.7
4 pm to 5 pm	960	9.5	113	9.5	141	9.7*
5 pm to 6 pm	1,097	10.8	142	11.9*	179	12.3*
6 pm to 7 pm	835	8.2	89	7.5	135	9.2*
7 pm to 8 pm	701	6.9	82	6.9	97	6.6
8 pm to 9 pm	572	5.6	67	5.6	73	5.0
9 pm to 10 pm	432	4.3	41	3.4	68	4.7*
10 pm to 11 pm	341	3.4	41	3.4	55	3.8*
11 pm to M	310	3.1	28	2.4	50	3.4*
Totals	10,116	100.0	1,190	100.0	1,460	100.0

* indicates that figure exceeds state average.

Table 3a Accident Frequency and Percentage by Time of Day for 8/29/77 - 8/28/78

Time of Day	Statewide		Dallas County		Harris County	
	Frequency	% age	Frequency	% age	Frequency	% age
M to 1 am	328	3.1	33	2.6	50	3.4*
1 am to 2 am	228	2.1	28	2.2*	28	1.9
2 am to 3 am	253	2.4	24	1.9	34	2.3
3 am to 4 am	73	0.7	9	0.7	13	0.9*
4 am to 5 am	43	0.4	5	0.4	6	0.4
5 am to 6 am	30	0.3	2	0.2	2	0.1
6 am to 7 am	116	1.1	12	0.9	31	2.1*
7 am to 8 am	306	2.9	47	3.7*	66	4.5*
8 am to 9 am	242	2.3	31	2.5*	33	2.3
9 am to 10 am	184	1.7	25	2.0*	24	1.6
10 am to 11 am	275	2.6	26	2.1	41	2.8*
11 am to N	398	3.7	55	4.3*	50	3.4
N to 1 pm	564	5.3	64	5.1	68	4.6
1 pm to 2 pm	548	5.1	58	4.6	78	5.3*
2 pm to 3 pm	560	5.2	52	4.1	81	5.5*
3 pm to 4 pm	797	7.5	94	7.4	115	7.8*
4 pm to 5 pm	946	8.9	117	9.2*	136	9.2*
5 pm to 6 pm	1,118	10.5	141	11.1*	156	10.6*
6 pm to 7 pm	935	8.8	116	9.2*	119	8.1
7 pm to 8 pm	762	7.1	79	6.2	104	7.1
8 pm to 9 pm	574	5.4	66	5.2	72	4.9
9 pm to 10 pm	511	4.8	62	4.9*	56	3.8
10 pm to 11 pm	422	4.0	69	5.5*	50	3.4
11 pm to M	438	4.1	51	4.0	59	4.0
Totals	10,651	100.0	1,266	100.0	1,472	100.0

* indicates that figure exceeds state average.

Table 4 Age and Sex of Driver (Vehicle #1) for period 8/29/76 - 8/28/77

Age	Statewide		Dallas County		Harris County	
	Male	Female	Male	Female	Male	Female
< 18	1,295 (17.8)	35 (18.1)	168 (19.9)*	2 (12.5)	172 (16.4)	4 (17.4)
18-25	3,622 (49.7)	81 (42.0)	371 (44.1)	10 (62.5)*	497 (47.2)	8 (34.8)
25-35	1,760 (24.2)	54 (28.0)	244 (29.0)*	2 (12.5)	297 (28.2)*	8 (34.8)*
35-50	482 (6.6)	17 (8.8)	47 (5.6)	1 (6.3)	73 (6.9)*	2 (8.7)
≥ 50	126 (1.7)	6 (3.1)	12 (1.4)	1 (6.2)*	14 (1.3)	1 (4.3)*
Total	7,285(100.0)	193(100.0)	842(100.0)	16(100.0)	1,053(100.0)	23(100.0)

* percentage exceeds statewide average.

Table 4a Age and Sex of Driver (Vehicle #1) for period 8/29/77 - 8/28/78

Age	Statewide		Dallas County		Harris County	
	Male	Female	Male	Female	Male	Female
< 18	1,765 (22.2)	51 (22.9)	221 (22.9)*	5 (23.8)*	218 (20.0)	8 (32.3)*
18-25	3,794 (47.7)	102 (45.7)	427 (44.3)	8 (38.1)	513 (47.0)	9 (37.5)
25-35	1,824 (23.0)	51 (22.9)	244 (25.3)*	6 (28.6)*	281 (25.7)*	3 (12.5)
35-50	465 (5.9)	19 (8.5)	65 (6.8)*	2 (9.5)*	65 (6.0)*	4 (16.7)*
≥ 50	99 (1.2)	0 (0.0)	7 (0.7)	0 (0.0)	14 (1.3)*	0 (0.0)
Total	7,947(100.0)	223(100.0)	964(100.0)	21(100.0)	1,091(100.0)	24(100.0)

* percentage exceeds statewide average.

Table 5 Age and Sex of Driver (Vehicle #2) for period 8/29/76 - 8/28/77

Age	Statewide		Dallas County		Harris County	
	Male	Female	Male	Female	Male	Female
< 18	545 (24.8)	31 (40.8)	66 (23.3)	2 (28.6)	52 (20.5)	2 (22.2)
18-25	956 (43.5)	25 (32.9)	101 (35.7)	3 (42.9)*	114 (45.1)*	6 (66.7)*
25-35	494 (22.5)	17 (22.4)	85 (30.0)*	2 (28.5)*	66 (26.1)*	1 (11.1)
35-50	154 (7.0)	2 (2.6)	26 (9.2)*	0 (0.0)	20 (7.9)*	0 (0.0)
≥ 50	47 (2.2)	1 (1.3)	5 (1.8)	0 (0.0)	1 (0.4)	0 (0.0)
Total	2,196(100.0)	76(100.0)	283(100.0)	7(100.0)	253(100.0)	9(100.0)

* percentage exceeds statewide average.

Table 5a Age and Sex of Driver (Vehicle #2) for period 8/29/77 - 8/28/78

Age	Statewide		Dallas County		Harris County	
	Male	Female	Male	Female	Male	Female
< 18	646 (30.7)	18 (30.5)	61 (25.4)	1 (10.0)	59 (23.7)	2 (28.6)
18-25	894 (42.5)	24 (40.7)	102 (42.5)	4 (40.0)	102 (41.0)	3 (42.8)*
25-35	403 (19.2)	15 (25.4)	54 (22.5)*	4 (40.0)*	62 (24.9)*	2 (28.6)*
35-50	136 (6.5)	1 (1.7)	20 (8.3)*	0 (0.0)	23 (9.2)*	0 (0.0)
≥ 50	24 (1.1)	1 (1.7)	3 (1.3)*	1 (10.0)*	3 (1.2)*	0 (0.0)
Total	2,103(100.0)	59(100.0)	240(100.0)	10(100.0)	249(100.0)	7(100.0)

* percentage exceeds statewide average.

Table 6 Injury Severity when Helmeted or Unhelmeted (Vehicle #1) for 8/29/76 - 8/28/77

Injury	Statewide		Dallas County		Harris County	
	Helmeted	Unhelmeted	Helmeted	Unhelmeted	Helmeted	Unhelmeted
Fatal	117 (2.3)	14 (5.5)	13 (2.1)	0 (0.0)	14 (2.0)	1 (0.0)
Incap.	1,376 (27.0)	80 (31.5)	160 (25.1)	5 (31.3)	213 (31.3)*	10 (30.3)
NIncap.	2,892 (56.7)	137 (53.9)	383 (60.1)*	9 (56.2)*	354 (52.0)	18 (54.6)*
Pos. Inj.	717 (14.0)	23 (9.1)	81 (12.7)	2 (12.5)*	100 (14.7)*	4 (12.1)*
Total	5,102(100.0)	254(100.0)	637(100.0)	16(100.0)	681(100.0)	33(100.0)

* percentage exceeds statewide average.

Table 6a Injury Severity when Helmeted or Unhelmeted (Vehicle #1) for 8/29/77 - 8/28/78

Injury	Statewide		Dallas County		Harris County	
	Helmeted	Unhelmeted	Helmeted	Unhelmeted	Helmeted	Unhelmeted
Fatal	64 (2.1)	140 (4.1)	8 (2.1)	19 (4.2)*	9 (2.4)*	30 (6.4)*
Incap.	776 (25.9)	1,109 (32.2)	80 (20.8)	112 (24.9)	122 (32.2)*	177 (37.8)*
NIncap.	1,714 (57.1)	1,811 (52.5)	242 (63.0)*	279 (62.0)*	196 (51.7)	199 (42.5)
Pos. Inj.	448 (14.9)	388 (11.2)	54 (14.1)	40 (8.9)	52 (13.7)	62 (13.3)*
Total	3,002(100.0)	3,448(100.0)	384(100.0)	450(100.0)	379(100.0)	468(100.0)

* percentage exceeds statewide average.

Table 7 Injury Severity when Helmeted or Unhelmeted (Vehicle #2) for 8/29/76 - 8/28/77

Injury	Statewide		Dallas County		Harris County	
	Helmeted	Unhelmeted	Helmeted	Unhelmeted	Helmeted	Unhelmeted
Fatal	45 (3.2)	5 (4.8)	3 (1.4)	0 (0.0)	2 (1.3)	0 (0.0)
Incap.	365 (26.3)	41 (39.4)	32 (15.3)	5 (41.7)*	41 (26.3)	2 (40.0)*
NIncap.	743 (53.4)	40 (38.5)	134 (64.1)*	6 (50.0)*	83 (53.2)	3 (60.0)*
Pos. Inj.	238 (17.1)	18 (17.3)	40 (19.2)*	1 (8.3)	30 (19.2)*	0 (0.0)
Total	1,391(100.0)	104(100.0)	209(100.0)	12(100.0)	156(100.0)	5(100.0)

* percentage exceeds statewide average.

Table 7a Injury Severity when Helmeted or Unhelmeted (Vehicle #2) for 8/29/77 - 8/28/78

Injury	Statewide		Dallas County		Harris County	
	Helmeted	Unhelmeted	Helmeted	Unhelmeted	Helmeted	Unhelmeted
Fatal	24 (2.8)	37 (5.1)	1 (1.0)	3 (3.7)	2 (1.9)	3 (4.1)
Incap.	248 (28.8)	232 (32.1)	21 (21.4)	17 (20.7)	33 (31.1)*	26 (35.1)*
NIncap.	428 (49.8)	350 (48.5)	53 (54.1)*	48 (58.5)*	51 (48.1)	34 (45.9)
Pos. Inj.	160 (18.6)	103 (14.3)	23 (23.5)*	14 (17.1)*	20 (18.9)*	11 (14.9)*
Total	860(100.0)	722(100.0)	98(100.0)	82(100.0)	106(100.0)	74(100.0)

* percentage exceeds statewide average.

Table 8 Color of Upper Garment by Light Condition (Vehicle #1) for 8/29/76 - 8/28/77

Color of Up. Gar.	Statewide		Dallas County		Harris County	
	Daylight	Darkness	Daylight	Darkness	Daylight	Darkness
White	612 (18.9)	196 (14.7)	87 (20.3)*	37 (24.3)*	76 (18.0)	22 (12.2)
Yellow	140 (4.3)	48 (3.6)	18 (4.2)	3 (2.0)	20 (4.7)*	6 (3.3)
Blue	1,034 (31.9)	461 (34.6)	158 (36.9)*	61 (40.1)*	141 (33.4)*	64 (35.4)*
Brown	242 (7.5)	114 (8.5)	26 (6.1)	7 (4.6)	39 (9.2)*	20 (11.0)*
Black	141 (4.3)	94 (7.0)	23 (5.4)*	12 (7.9)*	21 (5.0)*	15 (8.3)*
Green	247 (7.6)	109 (8.2)	27 (6.3)	4 (2.6)	24 (5.7)	10 (5.5)
Red	171 (5.3)	49 (3.7)	18 (4.2)	6 (4.0)*	18 (4.3)	10 (5.5)*
Other	656 (20.2)	262 (19.7)	71 (16.6)	22 (14.5)	83 (19.7)	34 (18.8)
Total	3,243(100.0)	1,333(100.0)	428(100.0)	152(100.0)	422(100.0)	181(100.0)

* percentage exceeds statewide average.

Table 8a Color of Upper Garment by Light Condition (Vehicle #1) for 8/29/77 - 8/28/78

Color of Up. Gar.	Statewide		Dallas County		Harris County	
	Daylight	Darkness	Daylight	Darkness	Daylight	Darkness
White	669 (18.8)	265 (14.6)	98 (20.7)*	34 (13.9)	93 (19.6)*	38 (17.0)*
Yellow	137 (3.8)	65 (3.6)	19 (4.0)*	10 (4.1)*	17 (3.6)	4 (1.8)
Blue	1,150 (32.2)	610 (33.7)	148 (31.2)	89 (36.3)*	158 (33.3)*	73 (32.6)
Brown	290 (8.1)	186 (10.3)	35 (7.4)	32 (13.1)*	37 (7.8)	30 (13.4)*
Black	204 (5.7)	125 (6.9)	29 (6.1)*	18 (7.3)*	41 (8.6)*	15 (6.7)
Green	226 (6.4)	134 (7.4)	24 (5.1)	12 (4.9)	23 (4.8)	11 (4.9)
Red	168 (4.7)	79 (4.4)	19 (4.0)	9 (3.7)	21 (4.4)	11 (4.9)*
Other	724 (20.3)	345 (19.1)	102 (21.5)*	41 (16.7)	85 (17.9)	42 (18.7)
Total	3,568(100.0)	1,809(100.0)	474(100.0)	245(100.0)	475(100.0)	224(100.0)

* percentage exceeds statewide average.

Table 9 Color of Lower Garment by Light Condition (Vehicle #1) for 8/29/76 - 8/28/77

Color of Low. Gar.	Statewide		Dallas County		Harris County	
	Daylight	Darkness	Daylight	Darkness	Daylight	Darkness
White	43 (1.3)	12 (0.8)	3 (0.7)	3 (1.9)*	6 (1.3)	1 (0.5)
Yellow	8 (0.2)	2 (0.1)	2 (0.5)*	0 (0.0)	2 (0.5)*	0 (0.0)
Blue	2,871 (83.1)	1,203 (84.7)	382 (84.3)*	142 (88.7)*	359 (80.5)	159 (82.4)
Brown	179 (5.2)	78 (5.5)	21 (4.6)	7 (4.4)	33 (7.4)*	15 (7.8)*
Black	36 (1.1)	30 (2.1)	9 (2.0)*	3 (1.9)	6 (1.3)*	4 (2.1)
Green	115 (3.3)	41 (2.9)	15 (3.3)	2 (1.2)	11 (2.5)	5 (2.5)
Red	22 (0.6)	3 (0.2)	0 (0.0)	0 (0.0)	2 (0.4)	0 (0.0)
Other	181 (5.2)	52 (3.7)	21 (4.6)	3 (1.9)	27 (6.1)*	9 (4.7)*
Total	3,455(100.0)	1,421(100.0)	453(100.0)	160(100.0)	446(100.0)	193(100.0)

* percentage exceeds statewide average.

Table 9a Color of Lower Garment by Light Condition (Vehicle #1) for 8/29/77 - 8/28/78

Color of Low. Gar.	Statewide		Dallas County		Harris County	
	Daylight	Darkness	Daylight	Darkness	Daylight	Darkness
White	61 (1.6)	17 (0.8)	12 (2.3)*	3 (1.1)*	12 (2.3)*	2 (0.8)
Yellow	9 (0.2)	5 (0.3)	2 (0.4)*	1 (0.4)*	2 (0.4)*	0 (0.0)
Blue	3,282 (84.2)	1,718 (86.2)	431 (84.0)	229 (85.1)	415 (81.5)	203 (83.2)
Brown	188 (4.8)	89 (4.5)	21 (4.1)	15 (5.6)*	36 (7.1)*	16 (6.5)*
Black	52 (1.3)	35 (1.8)	9 (1.8)*	6 (2.2)*	6 (1.2)	6 (2.5)*
Green	104 (2.7)	54 (2.7)	11 (2.1)	3 (1.1)	9 (1.8)	7 (2.9)*
Red	19 (0.5)	4 (0.2)	4 (0.8)*	0 (0.0)	1 (0.2)	0 (0.0)
Other	184 (4.7)	70 (3.5)	23 (4.5)	12 (4.5)*	28 (5.5)*	10 (4.1)*
Total	3,899(100.0)	1,992(100.0)	513(100.0)	269(100.0)	509(100.0)	244(100.0)

* percentage exceeds statewide average.

Table 10 Color of Upper Garment by Light Condition (Vehicle #2) for 8/29/76 - 8/28/77

Color of Up. Gar.	Statewide		Dallas County		Harris County	
	Daylight	Darkness	Daylight	Darkness	Daylight	Darkness
White	194 (19.1)	48 (16.5)	32 (19.9)*	5 (15.1)	24 (23.8)*	6 (15.8)
Yellow	38 (3.8)	15 (5.2)	4 (2.5)	2 (6.1)*	5 (4.9)*	4 (10.5)*
Blue	330 (32.5)	104 (35.9)	53 (32.9)*	17 (51.5)*	33 (32.7)*	9 (23.7)
Brown	70 (6.9)	28 (9.6)	11 (6.8)	3 (9.1)	8 (7.9)*	3 (7.9)
Black	34 (3.4)	17 (5.9)	5 (3.1)	1 (3.0)	3 (3.0)	4 (10.5)*
Green	64 (6.3)	24 (8.3)	12 (7.5)*	3 (9.1)*	3 (3.0)	1 (2.6)
Red	54 (5.3)	7 (2.4)	7 (4.3)	0 (0.0)	5 (4.9)	1 (2.6)*
Other	230 (22.7)	47 (16.2)	37 (23.0)*	2 (6.1)	20 (19.8)	10 (26.4)*
Total	1,014(100.0)	290(100.0)	161(100.0)	33(100.0)	101(100.0)	38(100.0)

* percentage exceeds statewide average.

Table 10a Color of Upper Garment by Light Condition (Vehicle #2) for 8/29/77 - 8/28/78

Color of Up. Gar.	Statewide		Dallas County		Harris County	
	Daylight	Darkness	Daylight	Darkness	Daylight	Darkness
White	175 (17.2)	57 (16.6)	22 (20.2)*	5 (12.5)	23 (20.5)*	7 (14.6)
Yellow	48 (4.7)	17 (5.0)	3 (2.8)	1 (2.5)	6 (5.4)*	3 (6.2)*
Blue	333 (32.8)	117 (34.1)	43 (39.4)*	13 (32.5)	38 (33.9)*	13 (27.1)
Brown	97 (9.6)	38 (11.1)	9 (8.3)	6 (15.0)*	8 (7.1)	5 (10.4)
Black	49 (4.8)	25 (7.3)	8 (7.3)*	5 (12.5)*	6 (5.4)*	3 (6.2)
Green	64 (6.3)	23 (6.7)	4 (3.7)	2 (5.0)	6 (5.4)	2 (4.2)
Red	36 (3.5)	12 (3.5)	2 (1.8)	1 (2.5)	1 (0.9)	6 (12.5)*
Other	214 (21.1)	54 (15.7)	18 (16.5)	7 (17.5)*	24 (21.4)*	9 (18.8)*
Total	1,016(100.0)	343(100.0)	109(100.0)	40(100.0)	112(100.0)	48(100.0)

* percentage exceeds statewide average.

Table 11 Color of Lower Garment by Light Condition (Vehicle #2) for 8/29/76 - 8/28/77

Color of Low. Gar.	Statewide		Dallas County		Harris County	
	Daylight	Darkness	Daylight	Darkness	Daylight	Darkness
White	9 (0.8)	1 (0.3)	4 (2.3)*	0 (0.0)	1 (0.9)*	0 (0.0)
Yellow	4 (0.4)	0 (0.0)	1 (0.6)*	0 (0.0)	1 (0.9)*	0 (0.0)
Blue	876 (81.9)	274 (88.1)	153 (87.9)*	31 (88.7)*	89 (81.7)	37 (92.5)*
Brown	66 (6.2)	10 (3.2)	7 (4.0)	1 (2.8)	10 (9.2)*	0 (0.0)
Black	9 (0.8)	4 (1.3)	0 (0.0)	0 (0.0)	1 (0.9)*	1 (2.5)*
Green	33 (3.1)	8 (2.6)	3 (1.7)	2 (5.7)*	2 (1.8)	1 (2.5)
Red	6 (0.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Other	66 (6.2)	14 (4.5)	6 (3.5)	1 (2.8)	5 (4.6)	1 (2.5)
Total	1,069(100.0)	311(100.0)	174(100.0)	35(100.0)	109(100.0)	40(100.0)

* percentage exceeds statewide average.

Table 11a Color of Lower Garment by Light Condition (Vehicle #2) for 8/29/77 - 8/28/78

Color of Low. Gar.	Statewide		Dallas County		Harris County	
	Daylight	Darkness	Daylight	Darkness	Daylight	Darkness
White	16 (1.5)	3 (0.8)	3 (2.5)*	0 (0.0)	5 (4.3)*	1 (2.0)*
Yellow	1 (0.1)	1 (0.3)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Blue	912 (83.2)	316 (85.0)	104 (85.2)*	42 (91.3)*	91 (77.8)	41 (83.7)
Brown	56 (5.1)	20 (5.4)	2 (1.6)	1 (2.2)	9 (7.7)*	5 (10.2)*
Black	9 (0.8)	6 (1.6)	1 (0.8)	0 (0.0)	1 (0.9)*	0 (0.0)
Green	27 (2.5)	9 (2.4)	1 (0.8)	2 (4.3)*	1 (0.8)	0 (0.0)
Red	5 (0.4)	2 (0.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Other	70 (6.4)	15 (4.0)	11 (9.0)*	1 (2.2)	10 (8.5)*	2 (4.1)*
Total	1,096(100.0)	372(100.0)	122(100.0)	46(100.0)	117(100.0)	49(100.0)

* percentage exceeds statewide average.

Table 12*

Comparison of 1976 Dusk and Dark Survey of Pedestrian by Color of Clothing with 1976-1977 Motorcycle Involved Accidents by Color of Clothing of the Riders

Color	Number observed	Percent-age	Number vehicle #1	Percent-age	Fatality chances	Number vehicle #2	Percent-age	Fatality chances
White	798	45.0	29	7.8	-83%	4	6.2	-86%
Yellow	273	15.4	7	1.9	-88%	1	1.6	-90%
Brown	177	10.0	167	45.1	+351%	30	46.9	+369%
Black	153	8.6	65	17.6	+105%	10	15.6	+81%
Green	205	11.6	95	25.7	+122%	17	26.6	+129%
Red	166	9.4	7	1.9	-80%	2	3.1	-67%

*Corder-Bolz, C. R. and G. Potter. A Pilot Study of the Effects of Color of Clothing Upon Pedestrian - Vehicle Accident Probabilities. Austin, Texas: Southwest Educational Development Laboratory, May, 1978.

Table 13

Statewide Helmet Usage for Motorcycle Involved Accidents Occurring in Urban Areas from August 29, 1976 through August 28, 1977

Helmet Usage	Vehicle 1		Vehicle 2	
	# Accident	Percentage	# Accident	Percentage
Helmeted	3,262	67.8	934	61.3
Unhelmeted	104	2.2	39	2.6
Unknown	1,441	30.0	550	36.1
Total	4,807	100.0	1,523	100.0

Table 13a

Statewide Helmet Usage for Motorcycle Involved Accidents Occurring in Urban Areas from August 29, 1977 through August 28, 1978

Helmet Usage	Vehicle 1		Vehicle 2	
	# Accident	Percentage	# Accident	Percentage
Helmeted	1,890	36.3	538	38.7
Unhelmeted	2,130	40.9	430	30.9
Unknown	1,190	22.8	423	30.4
Total	5,210	100.0	1,391	100.0

Table 14

Statewide Helmet Usage for Motorcycle Involved Accidents Occurring in Rural Areas from August 29, 1976 through August 28, 1977

Helmet Usage	Vehicle 1		Vehicle 2	
	# Accident	Percentage	# Accident	Percentage
Helmeted	1,840	63.4	457	53.1
Unhelmeted	150	5.2	65	7.6
Unknown	910	31.4	338	39.3
Total	2,900	100.0	860	100.0

Table 14a

Statewide Helmet Usage for Motorcycle Involved Accidents Occurring in Rural Areas from August 29, 1977 through August 28, 1978

Helmet Usage	Vehicle 1		Vehicle 2	
	# Accident	Percentage	# Accident	Percentage
Helmeted	1,112	34.9	322	37.4
Unhelmeted	1,318	41.4	292	33.9
Unknown	757	23.7	247	28.7
Total	3,187	100.0	861	100.0

Table 15

HOSPITAL DATA FOR MOTORCYCLE ACCIDENTS WHICH OCCURRED DURING 8/28/76 through 8/28/78

Item Descriptor	Dallas County*		Harris County**	
	Pre	Post	Pre	Post
1. Total number accidents in county	1,150	1,227	1,175	1,323
2. Total number cases available	110	156	82	90
3. Seat position: Rider	90	126	67	59
Passenger	20	30	15	31
4. Age group: less than 18	15	22	21	20
18 to 25	51	92	36	40
25 to 35	35	34	18	23
35 to 50	8	8	5	7
50 or over	1	0	2	0
5. Total number of injuries per accident:				
1 injury	16	46	25	19
2 injuries	34	47	27	28
3 injuries	28	32	16	22
4 injuries	16	6	5	10
5 injuries	2	11	3	5
6 injuries	5	4	3	3
7 injuries	3	4	1	1
8 injuries	0	5	0	2
9 injuries	3	1	2	0
Undeterminable	3	10	0	0
6. Injury severity index:				
less than 10	56	85	37	56
10 to < 20	30	40	25	4
20 to < 30	4	1	5	5
30 to < 40	7	7	7	14
40 to < 50	8	16	0	11
50 to < 60	0	5	3	0
60 to < 70	4	2	4	0
70 to < 80	0	0	1	0
80 to < 90	1	0	0	0

*Parkland Hospital - county owned

**Memorial Hospital System - 3 non county owned

Table 15 continued

HOSPITAL DATA FOR MOTORCYCLE ACCIDENTS WHICH OCCURRED DURING 8/28/76 through 8/28/78

Item Descriptor	Dallas County		Harris County	
	Pre	Post	Pre	Post
7a. Hospital disposition:				
Received treatment and released	46	68	59	36
Hospitalized	45	57	8	24
Dead on arrival	7	20	13	30
Dead within 30 days	9	10	2	0
Unaccounted	3	1	0	0
7b. Duration of hospitalization:				
less than 5 days	79	118	76	77
5 days but < 10 days	12	13	2	6
10 days but <15 days	2	10	2	2
15 days but < 20 days	5	6	0	1
20 days but < 25 days	2	2	0	1
25 days but < 30 days	3	2	0	1
30 days or more	7	5	2	2
8. Cost of accident*				
$ 520	1	0	0	0
$ 2,190	32	39	33	21
$ 4,350	28	50	25	25
$ 8,055	25	28	8	9
$ 86,955	2	4	0	3
$192,240	0	2	0	0
Undeterminable	22	33	16	32

* costs were taken from Table 1. Societal Costs, Summary, 1975(Dollars), National Highway Traffic Safety Administration, 1975 Societal Costs of Motor Vehicle Accidents, December, 1976.

Table 16 Location of the Body Which Sustained the Most Severe Injury from Motorcycle Accidents during August 29, 1976 through August 28, 1977 (Parkland Hospital Data, Dallas County, Texas)

Location of Most Severe Injury	Number of Injuries Sustained per Accident*										Weighted Mean
	1	2	3	4	5	6	7	8	9	Total	
Head	-	2	8	3	2	2	1	-	3	21	4.57
Neck	-	-	-	2	-	-	-	-	-	2	4.00
Chest	3	5	7	4	-	2	1	-	-	22	3.14
Abdomen	4	6	1	4	-	-	-	-	-	15	2.33
Lower extremities	6	10	7	2	-	1	1	-	-	27	2.52
General body	3	11	5	1	-	-	-	-	-	20	2.20
Total	16	34	28	16	2	5	3	-	3	107	2.99

* no determination was possible for three cases.

Table 16a Location of the Body Which Sustained the Most Severe Injury from Motorcycle Accidents during August 29, 1977 through August 28, 1978 (Parkland Hospital Data, Dallas County, Texas)

Location of Most Severe Injury	Number of Injuries Sustained per Accident										Weighted Mean
	1	2	3	4	5	6	7	8	9	Total	
Head	3	12	9	2	5	1	2	3	-	37	3.54
Neck	-	-	1	-	2	1	1	1	-	6	5.67
Chest	11	11	6	3	2	1	1	1	-	36	2.61
Abdomen	4	3	2	1	1	-	-	-	1	12	2.83
Lower extremities	10	10	9	-	1	-	-	-	-	30	2.07
General body	18	11	5	-	-	1	-	-	-	35	1.74
Total	46	47	32	6	11	4	4	5	1	156	2.67

Table 17 Location of the Body Which Sustained the Most Severe Injury from Motorcycle Accidents during August 29, 1976 through August 28, 1977 (Memorial Hospital System Data, Harris County, Texas)

Location of Most Severe Injury	Number of Injuries Sustained per Accident										Weighted Mean
	1	2	3	4	5	6	7	8	9	Total	
Head	2	4	4	2	3	1	-	-	-	16	3.19
Neck	-	-	1	-	-	1	-	-	-	2	4.50
Chest	4	5	4	1	-	1	1	-	1	17	3.06
Abdomen	5	3	1	-	-	-	-	-	-	9	1.56
Lower extremities	8	12	4	2	-	-	-	-	-	26	2.00
General body	6	3	2	-	-	-	-	-	1	12	2.25
Total	25	27	16	5	3	3	1	-	2	82	2.50

Table 17a Location of the Body Which Sustained the Most Severe Injury from Motorcycle Accidents during August 29, 1977 through August 28, 1978 (Memorial Hospital System Data, Harris County, Texas)

Location of Most Severe Injury	Number of Injuries Sustained per Accident										Weighted Mean
	1	2	3	4	5	6	7	8	9	Total	
Head	4	6	5	4	3	2	1	-	-	25	3.24
Neck	-	1	3	-	-	-	-	-	-	4	2.75
Chest	5	6	6	5	2	1	-	1	-	26	3.04
Abdomen	-	1	-	-	-	-	-	-	-	1	2.00
Lower extremities	2	8	6	-	-	-	-	-	-	16	2.25
General body	8	6	2	1	-	-	-	1	-	18	2.11
Total	19	28	22	10	5	3	1	2	-	90	2.74

Table 18

Duration of Hospitalization for Motorcycle Accident Injury Referrals
during August 29, 1976 through August 28, 1977
(Parkland Hospital Data, Dallas County, Texas)

46 were treated and released - 7 were dead on arrival

Hospital Disposition	Duration of Hospitalization (in days)*						
	< 5	5 to < 10	10 to < 15	15 to < 20	20 to < 25	25 to < 30	30 or more
Hospitalized	19 (82.6)+	9 (75.0)+	2(100.0)+	5(100.0)+	2(100.0)+	2 (66.7)+	6 (85.7)+
Hospitalized and Died	4 (17.4)+	3 (25.0)+	-	-	-	1 (33.3)+	1 (14.3)+
Total	23(100.0)+	12(100.0)+	2(100.0)+	5(100.0)+	2(100.0)+	3(100.0)+	7(100.0)+

* no determination was possible for three cases.
+ (percentage)

Table 18a

Duration of Hospitalization for Motorcycle Accident Injury Referrals
during August 29, 1977 through August 28, 1978
(Parkland Hospital Data, Dallas County, Texas)

68 were treated and released - 20 were dead on arrival

Hospital Disposition	Duration of Hospitalization (in days)*						
	< 5	5 to < 10	10 to < 15	15 to < 20	20 to < 25	25 to < 30	30 or more
Hospitalized	26 (83.9)+	10 (83.3)+	8 (88.9)+	5 (83.3)+	2(100.0)+	2(100.0)+	4 (80.0)+
Hospitalized and Died	5 (16.1)+	2 (16.7)+	1 (11.1)+	1 (16.7)+	-	-	1 (20.0)+
Total	31(100.0)+	12(100.0)+	9(100.0)+	6(100.0)+	2(100.0)+	2(100.0)+	5(100.0)+

* no determination was possible for one case.
+ (percentage)

Table 19

Duration of Hospitalization for Motorcycle Accident Injury Referrals
during August 29, 1976 through August 28, 1977
(Memorial Hospital System Data, Harris County, Texas)

59 were treated and released - 13 were dead on arrival

Hospital Disposition	Duration of Hospitalization (in days)						
	< 5	5 to < 10	10 to < 15	15 to < 20	20 to < 25	25 to < 30	30 or more
Hospitalized	4 (80.0)+	1 (50.0)+	2(100.0)+	-	-	-	1(100.0)+
Hospitalized and Died	1 (20.0)+	1 (50.0)+	-	-	-	-	-
Total	5(100.0)+	2(100.0)+	2(100.0)+	-	-	-	1(100.0)+

+ (percentage)

Table 19a

Duration of Hospitalization for Motorcycle Accident Injury Referrals
during August 29, 1977 through August 28, 1978
(Memorial Hospital System Data, Harris County, Texas)

36 were treated and released - 30 were dead on arrival

Hospital Disposition	Duration of Hospitalization (in days)						
	< 5	5 to < 10	10 to < 15	15 to < 20	20 to < 25	25 to < 30	30 or more
Hospitalized	12(100.0)+	6(100.0)+	2(100.0)+	1(100.0)+	1(100.0)+	1(100.0)+	1(100.0)+
Hospitalized and Died	-	-	-	-	-	-	-
Total	12(100.0)+	6(100.0)+	2(100.0)+	1(100.0)+	1(100.0)+	1(100.0)+	1(100.0)+

+ (percentage)

Table 20

Injury Severity by Age of Motorcyclist for Accidents Occurring during August 29, 1976 through August 28, 1977 (Parkland Hospital Data, Dallas County, Texas)

Injury Severity	Age of Motorcyclist				
	< 18	18 < 25	25 < 35	35 < 50	50 or more
< 10	10 (66.7)+	23 (45.1)+	23 (65.7)+	-	-
10 < 20	3 (20.0)+	14 (27.4)+	8 (22.8)+	5 (62.5)+	-
20 < 30	1 (6.6)+	2 (3.9)+	1 (2.9)+	-	-
30 < 40	-	5 (9.8)+	1 (2.9)+	1 (12.5)+	-
40 < 50	1 (6.7)+	3 (5.9)+	1 (2.9)+	2 (25.0)+	1(100.0)+
50 < 60	-	-	-	-	-
60 < 70	-	3 (5.9)+	1 (2.8)+	-	-
70 < 80	-	-	-	-	-
80 < 90	-	1 (2.0)+	-	-	-
Total	15(100.0)+	51(100.0)+	35(100.0)+	8(100.0)+	1(100.0)+

+ (percentage)

Table 20a

Injury Severity by Age of Motorcyclist for Accidents Occurring during August 29, 1977 through August 28, 1978 (Parkland Hospital Data, Dallas County, Texas)

Injury Severity	Age of Motorcyclist				
	< 18	18 < 25	25 < 35	35 < 50	50 or more
< 10	14 (63.7)+	53 (57.6)+	15 (44.1)+	3 (37.5)+	-
10 < 20	1 (4.5)+	25 (27.2)+	11 (32.4)+	3 (37.5)+	-
20 < 30	1 (4.5)+	-	-	-	-
30 < 40	2 (9.1)+	4 (4.3)+	1 (2.9)+	-	-
40 < 50	2 (9.1)+	8 (8.7)+	4 (11.8)+	2 (25.0)+	-
50 < 60	2 (9.1)+	2 (2.2)+	1 (2.9)+	-	-
60 < 70	-	-	2 (5.9)+	-	-
70 < 80	-	-	-	-	-
80 < 90	-	-	-	-	-
Total	22(100.0)+	92(100.0)+	34(100.0)+	8(100.0)+	-

+ (percentage)

Table 21

Injury Severity by Age of Motorcyclist for Accidents Occurring during August 29, 1976 through August 28, 1977 (Memorial Hospital System Data, Harris County, Texas)

Injury Severity	Age of Motorcyclist				
	< 18	18 < 25	25 < 35	35 < 50	50 or more
< 10	9 (42.8)+	17 (47.2)+	9 (50.0)+	1 (20.0)+	1 (50.0)+
10 < 20	7 (33.3)+	9 (25.0)+	6 (33.3)+	2 (40.0)+	1 (50.0)+
20 < 30	2 (9.5)+	2 (5.6)+	1 (5.6)+	-	-
30 < 40	1 (4.8)+	4 (11.1)+	1 (5.6)+	1 (20.0)+	-
40 < 50	-	-	-	-	-
50 < 60	1 (4.8)+	1 (2.8)+	1 (5.5)+	-	-
60 < 70	1 (4.8)+	3 (8.3)+	-	-	-
70 < 80	-	-	-	1 (20.0)+	-
80 < 90	-	-	-	-	-
Total	21(100.0)+	36(100.0)+	18(100.0)+	5(100.0)+	2(100.0)+

+ (percentage)

Table 21a

Injury Severity by Age of Motorcyclist for Accidents Occurring during August 29, 1977 through August 28, 1978 (Memorial Hospital System Data, Harris County, Texas)

Injury Severity	Age of Motorcyclist				
	< 18	18 < 25	25 < 35	35 < 50	50 or more
< 10	15 (75.0)+	24 (60.0)+	15 (65.2)+	2 (28.6)+	-
10 < 20	1 (5.0)+	2 (5.0)+	-	1 (14.3)+	-
20 < 30	-	4 (10.0)+	1 (4.4)+	-	-
30 < 40	2 (10.0)+	4 (10.0)+	7 (30.4)+	1 (14.3)+	-
40 < 50	2 (10.0)+	6 (15.0)+	-	3 (42.8)+	-
50 < 60	-	-	-	-	-
60 < 70	-	-	-	-	-
70 < 80	-	-	-	-	-
80 < 90	-	-	-	-	-
Total	20(100.0)+	40(100.0)+	23(100.0)+	7(100.0)+	-

+ (percentage)

Table 22

Extrapolated Cost by Injury Severity Sustained in Motorcycle Accident during August 29, 1976 through August 28, 1977 (Parkland Hospital Data, Dallas County, Texas)

Injury Severity	Extrapolated Cost Categories*						
	$520	$2,190	$4,350	$8,055	$86,955	$192,240	Unk.
< 10	-	26 (81.3)+	11 (39.3)+	15 (60.0)+	1 (50.0)+	-	3 (13.6)+
10 < 20	1(100.0)+	6 (18.7)+	15 (53.5)+	7 (28.0)+	-	-	1 (4.6)+
20 < 30	-	-	1 (3.6)+	1 (4.0)+	1 (50.0)+	-	1 (4.6)+
30 < 40	-	-	1 (3.6)+	1 (4.0)+	-	-	5 (22.7)+
40 < 50	-	-	-	1 (4.0)+	-	-	7 (31.8)+
50 < 60	-	-	-	-	-	-	-
60 < 70	-	-	-	-	-	-	4 (18.2)+
70 < 80	-	-	-	-	-	-	-
80 < 90	-	-	-	-	-	-	1 (4.5)+
Total	1(100.0)+	32(100.0)+	28(100.0)+	25(100.0)+	2(100.0)+	-	22(100.0)+

* average cost per accident was $6,451.
+ (percentage)

Table 22a

Extrapolated Cost by Injury Severity Sustained in Motorcycle Accident during August 29, 1977 through August 28, 1978 (Parkland Hospital Data, Dallas County, Texas)

Injury Severity	Extrapolated Cost Categories*						
	$520	$2,190	$4,350	$8,055	$86,955	$192,240	Unk.
< 10	-	31 (79.5)+	31 (62.0)+	17 (60.7)+	1 (25.0)+	1 (50.0)+	4 (12.1)+
10 < 20	-	8 (20.5)+	19 (38.0)+	10 (35.7)+	3 (75.0)+	-	-
20 < 30	-	-	-	-	-	1 (50.0)+	-
30 < 40	-	-	-	-	-	-	7 (21.2)+
40 < 50	-	-	-	1 (3.6)+	-	-	15 (45.5)+
50 < 60	-	-	-	-	-	-	5 (15.1)+
60 < 70	-	-	-	-	-	-	2 (6.1)+
70 < 80	-	-	-	-	-	-	-
80 < 90	-	-	-	-	-	-	-
Total	-	39(100.0)+	50(100.0)+	28(100.0)+	4(100.0)+	2(100.0)+	33(100.0)+

* average cost per accident was $10,250.
+ (percentage)

Table 23

Extrapolated Cost by Injury Severity Sustained in Motorcycle Accidents during August 29, 1976 through August 28, 1977 (Memorial Hospital System Data, Harris County, Texas)

Injury Severity	Extrapolated Cost Categories*						
	$520	$2,190	$4,350	$8,055	$86,955	$192,240	Unk.
< 10	-	23 (69.7)+	11 (44.0)+	2 (25.0)+	-	-	1 (6.3)+
10 < 20	-	9 (27.3)+	12 (48.0)+	4 (50.0)+	-	-	-
20 < 30	-	1 (3.0)+	2 (8.0)+	2 (25.0)+	-	-	-
30 < 40	-	-	-	-	-	-	7 (43.7)+
40 < 50	-	-	-	-	-	-	-
50 < 60	-	-	-	-	-	-	3 (18.7)+
60 < 70	-	-	-	-	-	-	4 (25.0)+
70 < 80	-	-	-	-	-	-	1 (6.3)+
80 < 90	-	-	-	-	-	-	-
Total	-	33(100.0)+	25(100.0)+	8(100.0)+	-	-	16(100.0)+

* average cost per accident was $3,719.
+ (percentage)

Table 23a

Extrapolated Cost by Injury Severity Sustained in Motorcycle Accident during August 29, 1977 through August 28, 1978 (Memorial Hospital System Data, Harris County, Texas)

Injury Severity	Extrapolated Cost Categories*						
	$520	$2,190	$4,350	$8,055	$86,955	$192,240	Unk.
< 10	-	20 (95.2)+	23 (92.0)+	9(100.0)+	2 (66.7)+	-	2 (6.2)+
10 < 20	-	1 (4.8)+	2 (8.0)+	-	1 (33.3)+	-	-
20 < 30	-	-	-	-	-	-	5 (15.6)+
30 < 40	-	-	-	-	-	-	14 (43.8)+
40 < 50	-	-	-	-	-	-	11 (34.4)+
50 < 60	-	-	-	-	-	-	-
60 < 70	-	-	-	-	-	-	-
70 < 80	-	-	-	-	-	-	-
80 < 90	-	-	-	-	-	-	-
Total	-	21(100.0)+	25(100.0)+	9(100.0)+	3(100.0)+	-	32(100.0)+

*average cost per accident was $8,416.

Table 24

Frequency of Injuries by Body Region for Motorcycle Accidents
Occurring August 29, 1976 through August 28, 1977
(Parkland Hospital Data, Dallas County, Texas)

Body Region	Frequency of Injuries by Severity Categories				
	Most Severe	More Severe	Severe	Less Severe	Least Severe
Head	21 (19.1)+	5 (5.4)+	3 (5.4)+	1 (3.5)+	1 (7.7)+
Neck	2 (1.8)+	5 (5.4)+	1 (1.8)+	2 (6.9)+	-
Chest	23 (20.9)+	21 (22.9)+	21 (37.5)+	3 (10.3)+	5 (38.4)+
Abdomen	16 (14.6)+	5 (5.4)+	4 (7.1)+	4 (13.8)+	1 (7.7)+
Lower extremities	27 (24.5)+	26 (28.3)+	7 (12.5)+	4 (13.8)+	3 (23.1)+
General body	21 (19.1)+	30 (32.6)+	20 (35.7)+	15 (51.7)+	3 (23.1)+
Total	110(100.0)+	92(100.0)+	56(100.0)+	29(100.0)+	13(100.0)+

+ (percentage)

Table 24a

Frequency of Injuries by Body Region for Motorcycle Accidents
Occurring August 29, 1977 through August 28, 1978
(Parkland Hospital Data, Dallas County, Texas)

Body Region	Frequency of Injuries by Severity Categories				
	Most Severe	More Severe	Severe	Less Severe	Least Severe
Head	37 (23.7)+	7 (6.4)+	6 (9.5)+	2 (6.5)+	2 (8.3)+
Neck	6 (3.9)+	5 (4.6)+	2 (3.2)+	2 (6.5)+	1 (4.2)+
Chest	36 (23.1)+	28 (25.7)+	15 (23.8)+	14 (45.1)+	5 (20.8)+
Abdomen	12 (7.7)+	19 (17.4)+	11 (17.5)+	2 (6.5)+	3 (12.5)+
Lower extremities	30 (19.2)+	19 (17.4)+	12 (19.0)+	1 (3.2)+	1 (4.2)+
General body	35 (22.4)+	31 (28.5)+	17 (27.0)+	10 (32.2)+	12 (50.0)+
Total	156(100.0)+	109(100.0)+	63(100.0)+	31(100.0)+	24(100.0)+

+ (percentage)

Table 25

Frequency of Injuries by Body Region for Motorcycle Accidents
Occurring August 29, 1976 through August 28, 1977
(Memorial Hospital System Data, Harris County, Texas)

Body Region	Frequency of Injuries by Severity Categories				
	Most Severe	More Severe	Severe	Less Severe	Least Severe
Head	16 (19.5)+	8 (14.0)+	5 (16.7)+	1 (7.1)+	1 (11.1)+
Neck	2 (2.5)+	3 (5.3)+	-	-	-
Chest	17 (20.7)+	20 (35.1)+	6 (20.0)+	4 (28.6)+	1 (11.1)+
Abdomen	9 (11.0)+	5 (8.8)+	3 (10.0)+	2 (14.3)+	-
Lower extremities	26 (31.7)+	11 (19.3)+	10 (33.3)+	3 (21.4)+	5 (55.6)+
General body	12 (14.6)+	10 (17.5)+	6 (20.0)+	4 (28.6)+	2 (22.2)+
Total	82(100.0)+	57(100.0)+	30(100.0)+	14(100.0)+	9(100.0)+

+ (percentage)

Table 25a

Frequency of Injuries by Body Region for Motorcycle Accidents
Occurring August 29, 1977 through August 28, 1978
(Memorial Hospital System Data, Harris County, Texas)

Body Region	Frequency of Injuries by Severity Categories				
	Most Severe	More Severe	Severe	Less Severe	Least Severe
Head	25 (27.8)+	17 (23.9)+	7 (16.3)+	4 (19.0)+	-
Neck	4 (4.4)+	1 (1.4)+	3 (7.0)+	-	-
Chest	26 (28.9)+	13 (18.3)+	8 (18.6)+	2 (9.5)+	5 (45.4)+
Abdomen	1 (1.1)+	9 (12.7)+	4 (9.3)+	2 (9.5)+	3 (27.3)+
Lower extremities	16 (17.8)+	17 (24.0)+	11 (25.6)+	4 (19.1)+	-
General body	18 (70.0)+	14 (19.7)+	10 (23.2)+	9 (42.9)+	3 (27.3)+
Total	90(100.0)+	71(100.0)+	43(100.0)+	21(100.0)+	11(100.0)+

+ (percentage)

Table 26

Frequency of Injury by Body Aspect for Motorcycle Accidents
during August 29, 1976 through August 28, 1977
(Parkland Hospital Data, Dallas County, Texas)

Body Aspect	Frequency of Injuries by Severity Categories				
	Most Severe	More Severe	Severe	Less Severe	Least Severe
Proximal	-	-	-	-	-
Distal	-	-	..	-	-
Right side	27 (24.6)+	30 (32.6)+	11 (19.6)+	4 (13.8)+	4 (30.8)+
Left side	33 (30.0)+	22 (23.9)+	19 (33.9)+	9 (31.0)+	4 (30.8)+
Bilateral	2 (1.8)+	1 (1.1)+	1 (1.8)+	1 (3.5)+	-
Central	3 (2.7)+	-	2 (3.6)+	2 (6.9)+	-
Anterior	1 (0.9)+	4 (4.4)+	3 (5.3)+	-	-
Posterior	1 (0.9)+	1 (1.1)+	3 (5.4)+	-	-
Superior	5 (4.6)+	4 (4.3)+	2 (3.6)+	-	-
Inferior	4 (3.6)+	2 (2.2)+	-	1 (3.4)+	-
Whole body	33 (30.0)+	28 (30.4)+	15 (26.8)+	12 (41.4)+	5 (38.4)+
Not applicable	1 (0.9)+	-	-	-	-
Unknown	-	-	-	-	-
Total	110(100.0)+	92(100.0)+	56(100.0)+	29(100.0)+	13(100.0)+

+(percentage)

Table 26a

Frequency of Injury by Body Aspect for Motorcycle Accidents
Occurring August 29, 1977 through August 28, 1978
(Parkland Hospital Data, Dallas County, Texas)

Body Aspect	Frequency of Injuries by Severity Categories				
	Most Severe	More Severe	Severe	Less Severe	Least Severe
Proximal	1 (0.6)+	-	-	-	-
Distal	1 (0.6)+	-	1 (1.6)+	-	-
Right side	51 (32.7)+	25 (22.9)+	16 (25.4)+	5 (16.1)+	6 (25.0)+
Left side	36 (23.1)+	37 (33.9)+	21 (33.3)+	4 (12.9)+	4 (16.7)+
Bilateral	10 (6.4)+	9 (8.3)+	5 (7.9)+	3 (9.7)+	3 (12.5)+
Central	3 (2.0)+	1 (0.9)+	1 (1.6)+	-	-
Anterior	7 (4.5)+	7 (6.4)+	-	3 (9.7)+	1 (4.2)+
Posterior	8 (5.1)+	4 (3.7)+	3 (4.8)+	2 (6.5)+	-
Superior	1 (0.6)+	-	-	-	-
Inferior	1 (0.6)+	-	-	-	-
Whole body	23 (14.8)+	11 (10.1)+	7 (11.1)+	5 (16.1)+	6 (25.0)+
Not applicable	8 (5.1)+	11 (10.1)+	8 (12.7)+	7 (22.6)+	2 (8.3)+
Unknown	6 (3.9)+	4 (3.7)+	1 (1.6)+	2 (6.4)+	2 (8.3)+
Total	156(100.0)+	109(100.0)+	63(100.0)+	31(100.0)+	24(100.0)+

+ (percentage)

Table 27

Frequency of Injuries by Body Aspect for Motorcycle Accidents
Occurring August 29, 1976 through August 28, 1977
(Memorial Hospital System Data, Harris County, Texas)

Body Aspect	Frequency of Injuries by Severity Categories				
	Most Severe	More Severe	Severe	Less Severe	Least Severe
Proximal	-	-	-	-	-
Distal	-	-	-	-	-
Right side	15 (18.3)+	14 (24.6)+	6 (20.0)+	5 (35.7)+	3 (33.3)+
Left side	26 (31.7)+	16 (28.1)+	7 (23.3)+	2 (14.3)+	3 (33.3)+
Bilateral	7 (8.6)+	5 (8.8)+	1 (3.3)+	1 (7.1)+	-
Central	2 (2.4)+	3 (5.3)+	-	-	-
Anterior	-	2 (3.5)+	2 (6.7)+	2 (14.3)+	-
Posterior	-	2 (3.5)+	3 (10.0)+	-	-
Superior	4 (4.9)+	1 (1.7)+	1 (3.3)+	-	-
Inferior	2 (2.4)+	1 (1.7)+	1 (3.3)+	-	-
Whole body	26 (31.7)+	13 (22.8)+	9 (30.1)+	4 (28.6)+	3 (33.4)+
Not applicable	-	-	-	-	-
Unknown	-	-	-	-	-
Total	82(100.0)+	57(100.0)+	30(100.0)+	14(100.0)+	9(100.0)+

+ (percentage)

Table 27a

Frequency of Injuries by Body Aspect for Motorcycle Accidents
Occurring August 29, 1977 through August 28, 1978
(Memorial Hospital System Data, Harris County, Texas)

Body Aspect	Frequency of Injuries by Severity Categories				
	Most Severe	More Severe	Severe	Less Severe	Least Severe
Proximal	-	-	-	-	-
Distal	-	-	-	-	-
Right side	21 (23.3)+	18 (25.4)+	12 (27.9)+	4 (19.1)+	3 (27.3)+
Left side	23 (25.6)+	21 (29.6)+	10 (23.3)+	2 (9.5)+	2 (18.2)+
Bilateral	5 (5.6)+	5 (7.0)+	4 (9.3)+	3 (14.3)+	3 (27.3)+
Central	-	-	-	-	-
Anterior	3 (3.3)+	2 (2.8)+	-	-	-
Posterior	2 (2.2)+	1 (1.4)+	3 (7.0)+	-	-
Superior	1 (1.1)+	-	-	-	-
Inferior	-	1 (1.4)+	-	-	-
Whole body	30 (33.3)+	17 (23.9)+	13 (30.2)+	10 (47.6)+	2 (18.2)+
Not applicable	-	-	-	-	-
Unknown	5 (5.6)+	6 (8.5)+	1 (2.3)+	2 (9.5)+	1 (9.0)+
Total	90(100.0)+	71(100.0)+	43(100.0)+	21(100.0)+	11(100.0)+

+ (percentage)

Table 28

Frequency of Injuries by Body Lesion for Motorcycle Accidents
Occurring August 29, 1976 through August 28, 1977
(Parkland Hospital Data, Dallas County, Texas)

Lesion	Frequency of Injuries by Severity Categories				
	Most Severe	More Severe	Severe	Less Severe	Least Severe
Abrasion	17 (15.5)+	20 (21.7)+	18 (32.1)+	11 (37.9)+	4 (30.8)+
Amputation	2 (1.8)+	1 (1.1)+	-	-	-
Asphyxia	-	-	-	-	-
Avulsion	3 (2.7)+	4 (4.3)+	2 (3.6)+	-	1 (7.7)+
Burn	1 (0.9)+	1 (1.1)+	2 (3.6)+	-	-
Concusion	-	-	-	-	-
Contusion/bruise	8 (7.3)+	11 (11.9)+	4 (7.1)+	2 (6.9)+	1 (7.7)+
Crushing	5 (4.5)+	3 (3.3)+	-	-	-
Dislocation	2 (1.8)+	4 (4.3)+	2 (3.6)+	1 (3.5)+	-
Edema	-	3 (3.3)+	-	-	-
Fracture/rupture	49 (44.6)+	24 (26.1)+	10 (17.9)+	9 (31.0)+	4 (30.7)+
Head trauma	8 (7.3)+	1 (1.1)+	1 (1.8)+	-	1 (7.7)+
Hemorrhage	3 (2.7)+	1 (1.1)+	2 (3.6)+	-	-
Laceration	6 (5.5)+	13 (14.1)+	9 (16.0)+	5 (17.2)+	2 (15.4)+
Pain	1 (0.9)+	3 (3.3)+	2 (3.6)+	1 (3.5)+	-
Spine	1 (0.9)+	1 (1.1)+	-	-	-
Sprain	1 (0.9)+	2 (2.2)+	1 (1.8)+	-	-
Other	2 (1.8)+	-	3 (5.3)+	-	-
Unknown	1 (0.9)+	-	-	-	-
Total	110(100.0)+	92(100.0)+	56(100.0)+	29(100.0)+	13(100.0)+

+ (percentage)

Table 28a

Frequency of Injuries by Body Lesion for Motorcycle Accidents
Occurring August 29, 1977 through August 28, 1978
(Parkland Hospital Data, Dallas County, Texas)

Lesion	Frequency of Injuries by Severity Categories				
	Most Severe	More Severe	Severe	Less Severe	Least Severe
Abrasion	25 (16.0)+	29 (26.6)+	15 (23.8)+	8 (25.8)+	6 (25.0)+
Amputation	-	-	2 (3.2)+	-	-
Asphyxia	-	-	-	-	-
Avulsion	2 (1.3)+	1 (0.9)+	-	-	-
Burn	-	-	-	1 (3.2)+	-
Concussion	-	-	-	-	-
Contusion/bruise	5 (3.2)+	11 (10.1)+	5 (7.9)+	1 (3.2)+	2 (8.3)+
Crushing	-	-	-	-	-
Dislocation	1 (0.6)+	1 (0.9)+	1 (1.6)+	-	-
Edema	-	2 (1.8)+	2 (3.2)+	1 (3.2)+	-
Fracture/rupture	77 (49.4)+	34 (31.2)+	15 (23.8)+	8 (25.8)+	8 (33.3)+
Head trauma	16 (10.3)+	1 (0.9)+	-	-	1 (4.2)+
Hemorrhage	2 (1.3)+	-	-	1 (3.2)+	1 (4.2)+
Laceration	18 (11.5)+	22 (20.2)+	20 (31.7)+	10 (32.3)+	4 (16.7)+
Pain	2 (1.3)+	1 (0.9)+	-	-	-
Spine	5 (3.2)+	3 (2.8)+	2 (3.2)+	1 (3.3)+	2 (8.3)+
Sprain	2 (1.3)+	1 (0.9)+	-	-	-
Other	-	-	-	-	-
Unknown	1 (0.6)+	3 (2.8)+	1 (1.6)+	-	-
Total	156(100.0)+	109(100.0)+	63(100.0)+	31(100.0)+	24(100.0)+

+ (percentage)

Table 29

Frequency of Injuries by Body Lesion for Motorcycle Accidents
Occurring August 29, 1976 through August 28, 1977
(Memorial Hospital System Data, Harris County, Texas)

Lesion	Frequency of Injuries by Severity Categories				
	Most Severe	More Severe	Severe	Less Severe	Least Severe
Abrasion	9 (11.0)+	14 (24.6)+	9 (30.0)+	3 (21.4)+	2 (22.2)+
Amputation	-	-	-	-	-
Asphyxia	1 (1.2)+	-	-	-	-
Avulsion	1 (1.2)+	-	-	-	-
Burn	1 (1.2)+	1 (1.7)+	-	-	-
Concussion	2 (2.4)+	1 (1.7)+	-	-	-
Contusion/bruise	14 (17.1)+	8 (14.1)+	3 (10.0)+	-	-
Crushing	4 (4.9)+	3 (5.3)+	2 (6.7)+	-	-
Dislocation	-	-	-	-	-
Edema	1 (1.2)+	1 (1.7)+	-	1 (7.1)+	-
Fracture/rupture	24 (29.3)+	13 (22.8)+	8 (26.7)+	4 (28.6)+	6 (66.7)+
Head trauma	2 (2.4)+	-	1 (3.3)+	-	-
Hemorrhage	1 (1.2)+	5 (8.8)+	1 (3.3)+	2 (14.3)+	-
Laceration	8 (9.8)+	7 (12.3)+	3 (10.0)+	3 (21.5)+	1 (11.1)+
Pain	4 (4.9)+	3 (5.3)+	2 (6.7)+	-	-
Spine	-	-	-	-	-
Sprain	8 (9.8)+	1 (1.7)+	1 (3.3)+	1 (7.1)+	-
Other	2 (2.4)+	-	-	-	-
Unknown	-	-	-	-	-
Total	82(100.0)+	57(100.0)+	30(100.0)+	14(100.0)+	9(100.0)+

+ (percentage)

Table 29a

Frequency of Injuries by Body Lesion for Motorcycle Accidents
Occurring August 29, 1977 through August 28, 1978
(Memorial Hospital System Data, Harris County, Texas)

Lesion	Frequency of Injuries by Severity Categories				
	Most Severe	More Severe	Severe	Less Severe	Least Severe
Abrasion	12 (13.4)+	18 (25.4)+	7 (16.3)+	6 (28.5)+	-
Amputation	-	-	-	-	-
Asphyxia	-	-	-	-	-
Avulsion	-	-	1 (2.3)+	-	-
Burn	1 (1.1)+	1 (1.4)+	1 (2.3)+	-	-
Concussion	3 (3.3)+	2 (2.8)+	1 (2.3)+	-	-
Contusion/bruise	10 (11.1)+	15 (21.1)+	10 (23.3)+	2 (9.5)+	3 (27.2)+
Crushing	15 (16.7)+	5 (7.1)+	1 (2.3)+	-	-
Dislocation	3 (3.3)+	3 (4.2)+	-	-	-
Edema	1 (1.1)+	1 (1.4)+	1 (2.3)+	-	-
Fracture/rupture	29 (32.2)+	13 (18.3)+	9 (20.9)+	8 (38.1)+	4 (36.4)+
Head trauma	8 (8.9)+	1 (1.4)+	-	-	-
Hemorrhage	-	1 (1.4)+	3 (7.0)+	2 (9.5)+	-
Laceration	6 (6.7)+	9 (12.7)+	6 (14.0)+	2 (9.5)+	4 (36.4)+
Pain	-	-	-	-	-
Spine	2 (2.2)+	-	2 (4.7)+	-	-
Sprain	-	2 (2.8)+	1 (2.3)+	-	-
Other	-	-	-	-	-
Unknown	-	-	-	1 (4.8)+	-
Total	90(100.0)+	71(100.0)+	43(100.0)+	21(100.0)+	11(100.0)+

+ (percentage)

Table 30

Frequency of Injuries by Body Organ or System for Motorcycle Accident Occurring August 29, 1976 through August 28, 1977 (Parkland Hospital Data, Dallas County, Texas)

Body Organ or System	Frequency of Injuries by Severity Categories				
	Most Severe	More Severe	Severe	Less Severe	Least Severe
Arteries	1 (0.9)+	-	-	-	-
Brain	11 (10.0)+	2 (2.2)+	2 (3.6)+	-	1 (7.7)+
Digestive	-	-	-	1 (3.5)+	-
Eyes/Ears	-	-	-	-	-
Heart	1 (0.9)+	1 (1.1)+	1 (1.8)+	-	1 (7.7)+
Integumentary	17 (15.5)+	23 (25.0)+	19 (33.9)+	9 (31.0)+	4 (30.8)+
Joints	-	-	-	-	-
Kidneys	2 (1.8)+	-	1 (1.8)+	-	2 (15.4)+
Liver	-	-	-	-	-
Muscles	3 (2.7)+	7 (7.6)+	2 (3.6)+	3 (10.3)+	-
Nervous system	-	-	-	-	-
Pulminary/lungs	2 (1.8)+	2 (2.2)+	5 (8.9)+	-	-
Respiratory	-	-	2 (3.6)+	-	-
Skeletonal	50 (45.5)+	29 (31.5)+	12 (21.4)+	9 (31.0)+	4 (30.7)+
Spinal cord	1 (0.9)+	2 (2.2)+	-	-	-
Spleen	-	1 (1.1)+	-	1 (3.5)+	-
Urogenital	5 (4.6)+	-	-	1 (3.5)+	-
Vertebrae	2 (1.8)+	-	-	-	-
General external body surface	9 (8.2)+	24 (26.0)+	11 (19.6)+	5 (17.2)+	1 (7.7)+
All systems in region	5 (4.5)+	1 (1.1)+	1 (1.8)+	-	-
Unknown	1 (0.9)+	-	-	-	-
Total	110(100.0)+	92(100.0)+	56(100.0)+	29(100.0)+	13(100.0)+

+ (percentage)

Table 30a

Frequency of Injuries by Body Organ or System for Motorcycle Accident Occurring August 29, 1977 through August 28, 1978 (Parkland Hospital Data, Dallas County, Texas)

Body Organ or System	Frequency of Injuries by Severity Categories				
	Most Severe	More Severe	Severe	Less Severe	Least Severe
Arteries	-	-	-	-	-
Brain	1 (0.6)+	-	-	-	-
Digestive	-	3 (2.8)+	1 (1.6)+	-	2 (8.3)+
Eyes/Ears	-	-	1 (1.6)+	-	-
Heart	3 (2.0)+	4 (3.7)+	3 (4.8)+	2 (6.5)+	-
Integumentary	9 (5.8)+	6 (5.5)+	6 (9.5)+	2 (6.5)+	1 (4.2)+
Joints	-	-	-	-	-
Kidneys	2 (1.3)+	5 (4.6)+	1 (1.6)+	-	-
Liver	2 (1.3)+	4 (3.2)+	3 (4.8)+	-	-
Muscles	4 (2.6)+	6 (5.5)+	4 (6.3)+	-	2 (8.3)+
Nervous system	27 (17.3)+	3 (2.8)+	2 (3.2)+	1 (3.2)+	2 (8.3)+
Pulminary/lungs	-	1 (0.9)+	-	-	-
Respiratory	1 (0.6)+	1 (0.9)+	1 (1.6)+	4 (12.9)+	2 (8.3)+
Skeletonal	71 (45.5)+	36 (33.0)+	17 (26.9)+	7 (22.6)+	8 (33.4)+
Spinal cord	-	-	-	-	-
Spleen	-	1 (0.9)+	3 (4.8)+	2 (6.4)+	-
Urogenital	-	2 (1.8)+	2 (3.2)+	-	-
Vertebrae	-	-	-	-	-
General external body surface	35 (22.4)+	36 (33.0)+	19 (30.1)+	13 (41.9)+	7 (29.2)+
All systems in region	1 (0.6)+	-	-	-	-
Unknown	-	1 (0.9)+	-	-	-
Total	156(100.0)+	109(100.0)+	63(100.0)+	31(100.0)+	24(100.0)+

+ (percentage)

Table 31

Frequency of Injuries by Body Organ or System for Motorcycle Accident Occurring August 29, 1976 through August 28, 1977
(Memorial Hospital System Data, Harris County, Texas)

Body Organ or System	Frequency of Injuries by Severity Categories				
	Most Severe	More Severe	Severe	Less Severe	Least Severe
Arteries	-	-	-	-	-
Brain	2 (2.4)+	3 (5.3)+	1 (3.3)+	1 (7.1)+	-
Digestive	-	-	-	-	-
Eyes/ears	-	-	-	-	-
Heart	-	1 (1.7)+	-	-	-
Integumentary	9 (11.0)+	6 (10.5)+	7 (23.4)+	3 (21.5)+	2 (22.2)+
Joints	-	-	-	-	-
Kidneys	1 (1.2)+	-	-	-	-
Liver	-	1 (1.7)+	-	-	-
Muscles	5 (6.1)+	3 (5.3)+	1 (3.3)+	-	-
Nervous system	-	-	-	-	-
Pulminary/Lungs	4 (4.9)+	3 (5.3)+	1 (3.3)+	1 (7.1)+	-
Respiratory	-	-	-	-	-
Skeletonal	27 (33.9)+	10 (17.5)+	9 (30.1)+	4 (28.6)+	6 (66.7)+
Spinal cord	-	2 (3.5)+	1 (3.3)+	-	-
Spleen	-	-	-	1 (7.1)+	-
Urogenital	2 (2.4)+	-	-	-	-
Vertebrae	1 (1.2)+	-	-	-	-
General external body surface	20 (24.4)+	23 (40.4)+	7 (23.3)+	2 (14.3)+	1 (11.1)+
All systems in region	11 (13.4)+	5 (8.8)+	3 (10.0)+	2 (14.3)+	-
Unknown	-	-	-	-	-
Total	82(100.0)+	57(100.0)+	30(100.0)+	14(100.0)+	9(100.0)+

+ (percentage)

Table 31a

Frequency of Injuries by Body Organ or System for Motorcycle Accident Occurring August 29, 1977 through August 28, 1978 (Memorial Hospital System Data, Harris County, Texas)

Body Organ or System	Frequency of Injuries by Severity Categories				
	Most Severe	More Severe	Severe	Less Severe	Least Severe
Arteries	-	-	-	-	-
Brain	8 (8.9)+	3 (4.2)+	1 (2.3)+	1 (4.8)+	-
Digestive	-	2 (2.8)+	2 (4.7)+	-	-
Eyes/ears	1 (1.1)+	-	-	-	-
Heart	-	-	-	1 (4.8)+	1 (9.1)+
Integumentary	6 (6.7)+	8 (11.3)+	3 (7.0)+	1 (4.8)+	3 (27.3)+
Joints	-	-	-	-	-
Kidneys	-	-	1 (2.3)+	1 (4.8)+	-
Liver	2 (2.2)+	3 (4.2)+	4 (9.3)+	3 (14.3)+	1 (9.1)+
Muscles	1 (1.1)+	3 (4.2)+	1 (2.3)+	-	-
Nervous system	8 (8.9)+	2 (2.8)+	3 (7.0)+	-	-
Pulminary/Lungs	9 (10.0)+	3 (4.2)+	1 (2.3)+	-	2 (18.2)+
Respiratory	1 (1.1)+	1 (1.4)+	-	-	-
Skeletonal	29 (32.2)+	14 (19.8)+	10 (23.3)+	8 (38.0)+	4 (36.3)+
Spinal cord	2 (2.2)+	2 (2.8)+	2 (4.7)+	-	-
Spleen	-	-	-	-	-
Urogenital	-	-	-	-	-
Vertebrae	-	-	-	-	-
General external body surface	22 (24.5)+	25 (35.3)+	13 (30.2)+	6 (28.5)+	-
All systems in region	1 (1.1)+	2 (2.8)+	1 (2.3)+	-	-
Unknown	-	3 (4.2)+	1 (2.3)+	-	-
Total	90(100.0)+	71(100.0)+	43(100.0)+	21(100.0)+	11(100.0)+

+ (percentage)

Table 32

MOTORCYCLE RIDER QUESTIONNAIRE DATA

Question Item Descriptor	Dallas County Pre	Dallas County Post	Harris County Pre	Harris County Post
1. Average years of riding experience.	7.60	6.96	8.39	6.83
Number of riders	*146*	*171*	*145*	*155*
2. Percentage riding cycles of 750^{+}cc.	43.1%	42.0%	56.3%	43.4%
Number of riders	*167*	*200*	*167*	*182*
3a. Average miles riden on trails.	2,451	2,138	1,863	2,534
Number of riders	*51*	*58*	*51*	*58*
3b. Average miles riden locally.	5,140	4,647	7,318	5,164
Number of riders	*143*	*184*	*151*	*165*
3c. Average miles riden cross country.	4,432	4,620	7,844	4,418
Number of riders	*74*	*100*	*90*	*98*
3d. Average miles riden other types.	800	4,800	3,300	6,167
Number of riders	*5*	*5*	*10*	*6*
4. Percentage riding 6^{+} days per week.	39.9%	49.7%	50.6%	46.7%
Number of riders	*163*	*195*	*168*	*182*
5a. Percentage riding 50-75% during day.	54.7%	53.8%	53.7%	60.3%
Number of riders	*162*	*195*	*159*	*179*
5b. Percentage riding 25-50% during night.	60.8%	59.3%	55.5%	65.5%
Number of riders	*143*	*177*	*155*	*165*
5c. Percentage riding 50-100% urban	68.9%	71.1%	71.4%	66.3%
Number of riders	*148*	*180*	*154*	*160*
5d. Percentage riding 1-50% rural	66.7%	87.7%	73.1%	80.6%
Number of riders	*126*	*146*	*130*	*134*
6a. Percentage riding anytime in all weather.	77.5%	76.4%	85.7%	80.0%
Number of riders	*89*	*110*	*105*	*105*
6b. Percentage riding anytime in mild weather.	42.6%	66.3%	68.5%	42.4%
Number of riders	*54*	*86*	*54*	*66*
6c. Percentage riding anytime in clear weather.	90.7%	90.0%	89.6%	91.2%
Number of riders	*107*	*150*	*96*	*114*
7. Number of riders wearing protective gear under normal riding conditions.				
Boots	103	115	126	117
Gloves	71	104	74	89
Jacket	55	117	69	105

Table 32 continued

Question	Item Descriptor	Dallas County Pre	Dallas County Post	Harris County Pre	Harris County Post
	Helmet	139	153	150	154
	Heavy pants	82	96	96	84
	Eye protection	129	143	123	138
8a.	Percentage wore helmet before August 29, 1977.	100%	95.8%	97.6%	96.6%
8b.	Percentage who always wore helmets.	87.3%	77.3%	89.5%	74.4%
	Number of riders	*145*	*185*	*145*	*172*
9.	Percentage, 18 or older, who always wear helmets.	58.5%	44.7%	64.7%	57.7%
	Number of riders	*83*	*170*	*99*	*156*
10a.	Percentage who admit accident involvement.	94.0%	96.9%	98.8%	95.6%
	Number of riders	*156*	*194*	*164*	*182*
10b.	Rider's opinion of primary cause:				
	Failure to yield right of way	63	84	72	74
	Rider error	37	40	38	40
	Not seen by other driver	26	23	20	26
	Collision from rear	7	2	6	5
	Poor road condition	6	17	4	9
	Illegal turn	5	6	5	4
	Vehicle failure	4	9	5	4
	Illegal pass	2	0	1	2
	Failure to maintain control	0	4	1	1
	Other cause	4	1	8	3
10c.	Rider's opinion of secondary cause:				
	Not seen by other driver	37	17	31	14
	Failure to yield right of way	7	19	12	13
	Failure to maintain control	7	34	10	11
	Rider error	6	4	10	5
	Poor road condition	5	3	2	3
	Illegal turn	3	2	2	3
	Collision from rear	2	2	1	1
	Illegal pass	1	0	0	0
	Vehicle failure	0	1	1	0
	Other cause	1	0	4	0
11a.	Percentage who admit being injured.	85.5%	90.2%	83.7%	93.7%
	Number of riders	*130*	*194*	*139*	*174*
11b.	Number who received first aid on scene.	31	73	65	82
	Number who received first aid at hospital.	56	93	63	75
11c.	Number who were hospitalized.	46	60	54	66
	Average number days in hospital.	35	18	19	17
	Average number days of convalescing.	82	68	84	105
	Number of riders	*30*	*32*	*19*	*29*

Question	Item Descriptor	Dallas County Pre	Dallas County Post	Harris County Pre	Harris County Post
12.	Number of riders wearing protective gear at the time of the accident				
	Boots	83	90	114	100
	Gloves	32	55	42	53
	Jacket	48	73	57	75
	Helmet	152	118	155	132
	Heavy pants	78	85	92	77
	Eye protection	99	108	99	108
13.	Average cost of accident.	$3,622	$3,796	$4,127	$4,475
	Number of riders	*152*	*194*	*159*	*169*
14a.	Helmet wearing experience before accident.				
	Percentage who always wore helmet.	81.8%	48.1%	87.1%	59.2%
	Number of riders	*154*	*189*	*163*	*169*
14b.	Helmet wearing experience after accident.				
	Percentage who always wear helmet.	60.0%	54.1%	67.5%	66.9%
	Number of riders	*90*	*181*	*108*	*166*
15.	Rider opinion about wearing helmet:				
	Percentage for	66.1%	70.2%	76.3%	75.5%
	Percentage against	6.5%	11.1%	8.3%	9.8%
	Percentage indifferent	27.4%	18.7%	15.4%	14.7%
	Number of riders	*168*	*198*	*169*	*184*
16.	Recommend helmet usage for everyone.	23.4%	19.3%	17.9%	18.1%
	Against helmet usage for everyone.	76.6%	80.7%	82.1%	81.9%
	Number of riders	*167*	*197*	*162*	*182*
17.	Percentage favoring required helmet law.	59.6%	57.5%	59.4%	55.9%
	Percentage against required helmet law.	40.4%	42.5%	40.6%	44.1%
	Number of riders	*166*	*200*	*165*	*179*
Age of riders	less than 18	34	43	35	46
	18 to 25 years	64	87	71	76
	25 to 35 years	42	51	38	40
	35 to 50 years	19	21	20	17
	50 or over	4	2	7	6
	Unknown	6	1	0	3
Total number of questionnaires		169	205	171	188
	Males	154	198	168	181
	Females	7	5	3	4
	Not indicated	8	2	0	3

Table 33

TEXAS MOTORCYCLE DATA FOR THE PERIOD 1968-1978

Year	# Registered M/C	# M/C Involved Accident	Rate	# M/C Injuries	Rate	# M/C Fatalities	Rate
1968	94,153	———	——	———	——	80	.00085
1969	111,967	———	——	———	——	74	.00066
1970	145,766	———	——	———	——	116	.00080
1971	185,216	8,124	.044	10,268	.055	158	.00085
1972	215,333	9,232	.043	7,588	.035	174	.00081
1973	247,852	9,906	.040	8,181	.033	179	.00072
1974	267,655	10,478	.039	8,734	.033	206	.00077
1975	272,803	10,197	.037	8,562	.031	211	.00077
1976	267,419	9,676	.036	8,543	.032	192	.00072
1977	283,000	11,143	.039	10,133	.036	274	.00097
1978	303,983+	11,646+	.038	10,642+	.035	296+	.00097

TEXAS MOTOR VEHICLE DATA FOR THE PERIOD 1968-1978

Year	# Registered MV*	# MV Accidents	Rate	# MV Injuries	Rate	# MV Fatalities	Rate
1968	5,952,836	364,982	.061	108,194	.018	3,481	.00058
1969	6,219,989	384,952	.062	110,147	.018	3,551	.00057
1970	6,409,231	396,861	.062	111,621	.017	3,560	.00056
1971	6,744,653	394,166	.058	121,082	.018	3,594	.00053
1972	7,100,669	432,998	.061	128,158	.018	3,688	.00052
1973	7,480,373	464,226	.062	132,635	.018	3,692	.00049
1974	7,742,718	434,194	.056	123,611	.016	3,046	.00039
1975	8,149,748	468,596	.057	138,962	.017	3,429	.00042
1976	8,654,254	479,203	.055	145,282	.017	3,230	.00037
1977	9,143,000	504,001	.055	161,635	.018	3,698	.00040
1978	9,497,463+	519,448+	.055	167,573+	.018	3,722+	.00039

* Includes Passenger, Commercial, and Exempt

+ Estimated figures