# AN EVALUATION OF THE UTILIZATION OF PSYCHOLOGICAL KNOWLEDGE CONCERNING POTENTIAL ROADSIDE DISTRACTORS

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# AN EVALUATION OF THE UTILIZATION OF PSYCHOLOGICAL KNOWLEDGE CONCERNING POTENTIAL ROADSIDE DISTRACTORS

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For

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16. Abstract

This report presents the findings of a project designed: (1) to evaluate the effect of nighttime distractors on accidents at signalized intersections, and (2) to facilitate the implementation at the local level of traffic safety standards. The findings of Part I, based on a study of nighttime accidents occurring at 30 metropolitan intersections, offer tentative data that both the color and the proximity of lights may be important in determining their distractibility with respect to the traffic signal. Part II describes the procedures followed by the project team to disseminate psychological knowledge concerning environmental distractors in the traffic environment to appropriate local agencies and includes an evaluation of the utilization of this information by these agencies.

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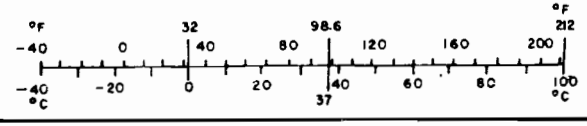
# METRIC CONVERSION FACTORS

## Approximate Conversions to Metric Measures

| Symbol | When You Know | Multiply by | To Find | Symbol |
|---|---|---|---|---|
| | **LENGTH** | | | |
| in | inches | *2.5 | centimeters | cm |
| ft | feet | 30 | centimeters | cm |
| yd | yards | 0.9 | meters | m |
| mi | miles | 1.6 | kilometers | km |
| | **AREA** | | | |
| $in^2$ | square inches | 6.5 | square centimeters | $cm^2$ |
| $ft^2$ | square feet | 0.09 | square meters | $m^2$ |
| $yd^2$ | square yards | 0.8 | square meters | $m^2$ |
| $mi^2$ | square miles | 2.6 | square kilometers | $km^2$ |
| | acres | 0.4 | hectares | ha |
| | **MASS (weight)** | | | |
| oz | ounces | 28 | grams | g |
| lb | pounds | 0.45 | kilograms | kg |
| | short tons (2000 lb) | 0.9 | tonnes | t |
| | **VOLUME** | | | |
| tsp | teaspoons | 5 | milliliters | ml |
| Tbsp | tablespoons | 15 | milliliters | ml |
| fl oz | fluid ounces | 30 | milliliters | ml |
| c | cups | 0.24 | liters | l |
| pt | pints | 0.47 | liters | l |
| qt | quarts | 0.95 | liters | l |
| gal | gallons | 3.8 | liters | l |
| $ft^3$ | cubic feet | 0.03 | cubic meters | $m^3$ |
| $yd^3$ | cubic yards | 0.76 | cubic meters | $m^3$ |
| | **TEMPERATURE (exact)** | | | |
| °F | Fahrenheit temperature | 5/9 (after subtracting 32) | Celsius temperature | °C |


## Approximate Conversions from Metric Measures

| Symbol | When You Know | Multiply by | To Find | Symbol |
|---|---|---|---|---|
| | **LENGTH** | | | |
| mm | millimeters | 0.04 | inches | in |
| cm | centimeters | 0.4 | inches | in |
| m | meters | 3.3 | feet | ft |
| m | meters | 1.1 | yards | yd |
| km | kilometers | 0.6 | miles | mi |
| | **AREA** | | | |
| $cm^2$ | square centimeters | 0.16 | square inches | $in^2$ |
| $m^2$ | square meters | 1.2 | square yards | $yd^2$ |
| $km^2$ | square kilometers | 0.4 | square miles | $mi^2$ |
| ha | hectares (10,000 $m^2$) | 2.5 | acres | |
| | **MASS (weight)** | | | |
| g | grams | 0.035 | ounces | oz |
| kg | kilograms | 2.2 | pounds | lb |
| t | tonnes (1000 kg) | 1.1 | short tons | |
| | **VOLUME** | | | |
| ml | milliliters | 0.03 | fluid ounces | fl oz |
| l | liters | 2.1 | pints | pt |
| l | liters | 1.06 | quarts | qt |
| l | liters | 0.26 | gallons | gal |
| $m^3$ | cubic meters | 35 | cubic feet | $ft^3$ |
| $m^3$ | cubic meters | 1.3 | cubic yards | $yd^3$ |
| | **TEMPERATURE (exact)** | | | |
| °C | Celsius temperature | 9/5 (then add 32) | Fahrenheit temperature | °F |



## EXECUTIVE SUMMARY

The present project had two objectives: (1) to evaluate the effect of nighttime distractors on accidents at signalized intersections and (2) to facilitate the implementation at the local level of traffic safety standards.

PART I

The first part of the project involved the evaluation of the effect of lights in the vicinity of traffic signals. Thirty signalized intersections in the Austin Metropolitian Area were randomly selected and data were collected on the number of nighttime accidents and the type and number of lights in the area surrounding the target signal (stop light). Earlier research by Holahan, Campbell, Culler and Veselka had indicated that signs other than the stop sign may be distracting to drivers at stop sign intersections, and the current study was aimed at complementing the daytime findings with information about distraction in the nighttime environment.

The results indicate that both the color and the proximity of lights may be important in determining their distractability with respect to the traffic signal. A significant positive correlation was found between the number of near-red (yellow, orange) lights in an area near the traffic signal and nighttime accidents. The results were interpreted to indicate that lights that approach the color of the traffic signal were potentially more distracting than non-red lights and that the closer they were located to the signal, the higher the chance for distraction. While the results of this single study must be viewed as tentative, they do suggest the usefulness of further research in this area.

PART II

With the advent of our investigation of lighted environmental distractors and nighttime accidents and with the advice and encouragment of the Texas Office of Traffic Safety, an attempt to disseminate this psychological knowledge to appropriate local agencies was undertaken. The dissemination and an evaluation of the utilization of this technical information were designed to facilitate the overall purpose of this project, i.e., to

promote traffic safety at the local level by effectively dealing with potential distractors. Consulting relationships were established with both the Urban Transportation Department of the City of Austin and the Austin Police Department in order to make available and encourage the use of existing psychological knowledge concerning environmental distractors, including the results of our investigations. The working relationships with these two agencies were so productive that in addition to disseminating information, an effort was made to sensitize key personnel in each agency to the importance of distractors and the value of future collaborative relationships with researchers and other agencies. The report of this phase of the project includes important information about the local interagency system involved with potential distractors by describing a system comprised of various governmental components, their interrelationships, and their particular roles with respect to the regulation of environmental distractors. In addition, key personnel within each agency are identified for accessing needed information and for implementing policy changes based on empirical findings.

The portion of this report which describes the utilization-evaluation phase is comprised of several sections. Initially, a review of organizational characteristics known to be important in promoting the utilization of technical information is presented. An explication of the project's goals and strategies for each phase of this effort is next, followed by a report of the actual steps taken to implement them. A presentation of the analysis of the inter-organizational system conveys the information gathered about various agencies important to future researchers. The results of the evaluation of this utilization-dissemination activity are the culmination of the previous efforts. The final section is a compilation of the recommendations for future research efforts in this field generated by the project team's interaction with these agencies.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

# PART I: EVALUATION OF THE RELATIONSHIP BETWEEN LIGHTS IN THE VICINITY OF TRAFFIC SIGNALS AND NIGHTTIME ACCIDENTS

## I. INTRODUCTION

In today's traffic environment the driver is presented with a diversity of roadside signs and lights situated proximately to the roadway. It appears that the driver's task in negotiating the traffic environment grows increasingly more complex. The potential relationship between roadside signs and lights and traffic safety offers an important area for empirically based research in the traffic safety field. Legislation does, of course, exist to minimize the negative effects private signs and lights may have on the driver, but, because of the lack of conclusive evidence about the influence of these potential distractors, policy makers have often resorted to intuition to direct their efforts to regulate lights, private signs, and other potential distractors. Many of the ordinances which are passed are extremely vague[1] and in some cases are enforceable.

Although some recent studies have attempted to evaluate the impact of increasing commercial development from an essentially aesthetic perspective,[2] their results are of limited help to engineers concerned primarily with traffic safety. Of more practical value is the considerable body of research which has examined the isolated target (the traffic control device) from a perceptual viewpoint. What have been lacking, however, are research efforts which have systematically investigated perception of the target as a function of distractions in its environmental background. Traffic engineers possess considerable knowledge about the construction of adequate traffic devices isolated from their environmental context, but very little is known about how to evaluate features of the background environment which may contribute to or reduce traffic

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[1] R.T. Shoaf, "Are Advertising Signs Near Freeways Traffic Hazards?" Traffic Engineering (1955), pp. 71-76.

[2] Boston Redevelopment Authority, City Signs and Lights (Boston, 1971).

signal effectiveness. Many of the studies that do exist are both contradictory and open to methodological criticism. Some have reported positive relationships between elements of the traffic environment and traffic accidents,[3] while others have reported no relationship at all.[4]

Overall, too little has been done to evaluate the effect of potential distractors in the traffic environment. Most of the investigations that have been made have produced equivocal results and many have been poorly designed. The present project was aimed at extending earlier research on environmental distraction (primarily signs) and daytime traffic accidents. The current effort defined, operationalized, and measured visual distraction in the nighttime traffic environment and included an analysis of potential distraction due to private and public lights in the vicinity of traffic signals.

## II. REVIEW OF RELEVANT LITERATURE

Ittelson notes that environments usually provide more information than a person can process effectively (i.e., there is an overload).[5] In addition to potential overload problems, the traffic environment often presents simultaneously instances of redundant, ambiguous, and contradictory information. The driver is faced with the task of sorting through the vast array of environmental information and identifying, processing, and responding to the relevant elements (i.e., traffic signals). Failure to adequately identify and respond to traffic signals could, of course, result in traffic accidents. Those places where such failure is more likely have environments in which (1) the environmental information is high and (2) the response demands on the driver are increased. Typically, these conditions occur at urban intersections.

Box and Associates provide a good summary of the effects of intersection

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[3] Madigan-Hyland, Inc., Signs and Accidents on New York State Thruway, report prepared for the New York State Thruway Authority (February 1963); and J.A. Head, "Predicting Traffic Accidents from Elements on Urban Extensions of State Highways," Highway Research Board Bulletin 208 (1959), pp. 45-63.

[4] J.C. McMonagle, "The Effects of Roadside Features on Traffic Accidents," Traffic Quarterly 6, No. 2 (1952), pp. 228-243.

[5] W. Ittelson, "Environmental Perception and Contemporary Perceptual Theory," in Environment and Cognition (New York: Seminar Press, 1973).

geometry on traffic accidents.[6] Their results indicate that about 40 percent of all accidents in urban areas occur at intersections. Cross-type intersections of two-way streets seem to be the most dangerous, having many times more accidents than "T" or "Y" configurations with comparable flows.

Do elements in the traffic environment contribute to driver distraction to such an extent that they are related to traffic accidents? A noted optometrist and U.S. Highway Research Board consultant has stated:

> We all know it takes time to see. Estimates and measurements have shown that man can fixate an event every half of a second, which means that for every 88 feet he travels at 60 miles per hour, he can handle and assimilate two events . . . Studies have shown that when an airplane pilot is overloaded with perceptual stimuli (instruments and audio communication), he often exceeds his sensory capacities and may miss both visual and auditory messages that may subsequently lead to accidents. Likewise, too many signs, traffic control lights and flashing signals, and brake lights, plus vehicular and pedestrian traffic, overload a driver's psycho-physiological abilities.[7]

Thomas indicates that one of the strongest visual stimuli is a flashing light.[8] When seen out of the corner of the eye, the flashing light will cause the eyes to swing involuntarily to focus on it. Similarly, when an object is difficult to identify (as when a sign is in motion) the eye fixates on it longer and jumps back to view it repeatedly.[9] However, these findings come not from the field but from laboratory studies.

Forbes notes that lights surrounding a traffic marker can create visual clutter and interfere with the driver's perception, causing errors.[10]

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[6] Paul C. Box and Associates, "Intersections," Chapter 4 of Traffic Control & Roadway Elements - Their Relationship to Highway Safety/Revised (Washington, D.C.: Highway Users Federation for Safety and Mobility, 1970).

[7] P.L. Connolly, "Visual Considerations: Man, the Vehicle and the Highway," Highway Research News (Winter 1968), pp. 71-74.

[8] E.L. Thomas, "Movements of the Eye," Scientific American (August 1968), pp. 88-95.

[9] W. Ewald and D. Mandekker, Street Graphics: A Concept and a System (Washington, D.C.: The American Society of Landscape Architecture Foundation, 1971).

[10] T.W. Forbes, "Visibility and Legibility of Highway Signs," Human Factors in Highway Traffic Safety Research (New York: Wiley-Interscience, 1972), pp. 95-109.

Brown and Monk found similar results when studying an individual's ability to pick out a target from a complex array of non-targets.[11] Target perception was impaired when targets were surrounded by complex backgrounds. Isolated targets were more easily detected.

Despite the intuitive appeal of positing a distraction-related component of accidents, only a small number of studies have attempted to show a relationship between potentially distracting environmental elements and traffic accidents, and even fewer investigations have been conducted in field settings.

Two field studies which did find a correlation between the number of roadside elements and the number of accidents (i.e., that the greater the complexity of the environment, the greater the accident frequency) were carried out by Head and Versace.[12] Several recent accident investigation studies have estimated that between 10 and 25 percent of automobile accidents involve distraction as a principal factor.[13]

Two studies have provided correlational evidence that billboards are a traffic safety hazard. The Highway Planning Survey, Minnesota Department of Highways, conducted a two-year study of 420 miles of two-lane and 90 miles of three and four-lane roadways and found a high correlation between the

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[11] B. Brown and T.H. Monk, "The Effect of Local Target Surround and Whole Background Constraint on Visual Search Times," Human Factors 17, No. 1 (February 1975), pp. 81-88.

[12] Head, "Predicting Traffic Accidents;" and J. Versace, "Factor Analysis of Roadway and Accident Data," Highway Research Bulletin 246 (1960), pp. 24-32.

[13] C.R. Ruch, D.F. Stackhouse, and D.J. Albright, Jr., "Automobile Accidents Occurring in a Male College Population," American College Health Association Journal 18 (April 1970), pp. 308-312; A.B. Clayton, "Road-User Errors and Accident Causation," paper presented at the 17th International Congress of Applied Psychology, Liege, Belgium, 25-30 July 1971; and U.N. Wanderer and H.M. Weber, "First Results of Exact Accident Data Acquisition on Scene," Proceedings, 3rd International Conference on Occupant Protection, New York, 1974, pp. 80-94.

presence of advertising signs and accident rates.[14] Madigan-Hyland, Inc., found that even though advertising devices were visible to drivers on only one-eighth of New York State Thruway's 1100 miles of roadway, almost one third of the accidents "attributed to driver inattention" occurred on these stretches of roadway.[15] Many of the arguments leveled against billboards have also been directed against private signs (usually those signs which identify a commercial establishment). Whereas billboards are of standard size, these signs vary tremendously in their size and are often illuminated.

A recent laboratory study of distraction by irrelevant information supports the idea that distractors reduce driver performance under high information load conditions.[16] Kahneman, Ben-Ishai, and Lotan afford some indirect evidence of a distraction effect by using a selective-attention task situation with bus drivers as subjects.[17] They demonstrated an inverse correlation between task performance and traffic accident history of the bus drivers.

The current study is an extension of earlier work by Holahan, Culler, and Wilcox and by Holahan et al. which suggests that distraction may play an important role in traffic accident occurrence.[18] The two studies are as follows:

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[14] Minnesota Department of Highways, Minnesota Rural Trunk Highway Accident, Access Point, and Advertising Sign Study (1952).

[15] Madigan-Hyland, Inc., Signs and Accidents on New York State Thruway.

[16] A.W. Johnston and B.L. Cole, "Investigations of Distraction by Irrelevant Information," Australian Road Research 6, No. 3 (1976), pp. 3-23.

[17] D. Kahneman, R. Ben-Ishai, and M. Lotan, "Relation of a Test of Attention to Road Accidents," Journal of Applied Psychology 58, No. 1 (1973), pp. 113-115.

[18] C.J. Holahan, R.E. Culler, and B.L. Wilcox, "Effects of Visual Distraction on Reaction Time in a Simulated Traffic Environment," Human Factors 20, No. 4 (1978), pp. 409-413; and C.J. Holahan et al., "Relationship between Roadside Signs and Traffic Accidents: A Field Investigation," Transportation Research Record (National Research Council), in press.

Laboratory Study (Holahan, Culler, and Wilcox): The laboratory study suggests that public and private signs proximate to traffic control signs (such as stop signs) may produce sufficient distraction to seriously impair a driver's ability to react quickly. The laboratory-based study investigated the effects of the number, color, and location (proximity) of simulated distractor signs on the perception (measured by reaction time) of a target stimulus (simulated stop sign). A three-way analysis of variance with reaction time as the dependent variable showed statistically significant main effects and both two-way and three-way interaction effects. Of the three dimensions under study, proximity was found to have the greatest effect on reaction times. This suggests that the dominant process was the subject's inability to discriminate figure from ground.

Field Study (Holahan et al.): The field-based study systematically investigated the relationship between signs located proximally to urban traffic intersections and the number of traffic accidents at those intersections. Sixty intersections were randomly selected from a list of intersections within the city of Austin, Texas, having had at least one accident during the previous 12 months. The yearly number of accidents attributed to drivers approaching from each direction was computed for each intersection. Every sign observable at an intersection was classified along three dimensions -- type of sign (public/private), size (large/small), and dominant color. Examination of the correlation between distractor dimensions and total accidents for both traffic signal controlled and stop sign controlled intersection approaches indicated that the greater the number of potentially distracting signs at stop sign intersections, the greater the number of accidents. A particularly strong picture of the relationship between signs and traffic accidents emerged when data were examined separately for stop sign approaches showing two or more annual accidents.

## III. THE PRESENT STUDY

The present study complemented the findings of the field study of daytime accidents by examining the potential distracting effects of lights on traffic signals in the nighttime traffic environment.

It was decided to examine four variables felt to mediate the occurrence

of distraction-related nighttime accidents at selected intersections in the city of Austin. These were (1) the total number of potentially distracting lights visible at the intersection, (2) the color of the potentially distracting lights, (3) the proximity of the potentially distracting lights, and (4) the overall brightness of the lights visible at the intersection. A photographic slide was made of each legal approach to each of the 30 randomly selected signalized intersections, and each slide was divided into three zones: Zone 1 was the area immediately adjacent to the traffic signal, taking in mainly the street itself and yielding extremely low numbers of lights; Zone 2 was the middle one-half of the slide, excluding Zone 1; and Zone 3 covered the outermost portion of the slide (See Figure 2). Based on previous distraction research, the following hypotheses were made:

(1) The total number of potentially distracting lights will be significantly (and positively) related to the number of nighttime traffic accidents at the selected signalized intersections.

(2)(a) The total number of red lights will be significantly (and positively) related to the number of nighttime traffic accidents at the selected signalized intersections.

(b) The total number of near-red (i.e., yellow or orange) lights will be significantly (and positively) related to the number of nighttime traffic accidents at the selected signalized intersections (but not to the extent that the red lights will be so related).

(3) The total number of potentially distracting lights in Zone 2 will be significantly (and positively) related to the number of nighttime traffic accidents at signalized intersections.

(4) The overall brightness of the intersections will be significantly (and positively) related to the number of nighttime accidents at the selected signalized intersections.

Nine "interactive" correlations also were computed (e.g., non-red lights in Zone 3 with nighttime accidents) and reported as part of the findings.

## A. Methodology

### 1. Sample

The sample for the present study included the "approaches" to 30 intersections in the Austin Metropolitian Area. The intersections were randomly selected from a list of intersections meeting the following criteria: (1) they had to be "cross-type" intersections, i.e., two through streets intersecting at a 90 degree angle, (2) they had to be signalized intersections, i.e., having a traffic light for traffic control, (3) they had to have had a recent 24-hour traffic count of between 5,000 and 30,000 vehicles and (4) there must have been at least one accident at the intersection in the past year. The actual units of analysis were the approaches to these intersections (i.e., the directions from which a motorist could legally approach the intersection), creating a total sample of 73 intersection approaches.

### 2. Variables

The dependent variable for the study was "approach accidents." This was defined as the number of nighttime accidents occurring at the intersection during the year preceding the photographing of the intersections divided by the number of legal approaches to the intersection.

The following independent variables were collected with the aid of four "raters," who viewed slides of each intersection approach and recorded values for the independent variables. The responses from all four raters were averaged to yield values for statistical analysis.

a. Brightness - Raters were instructed to estimate, on a scale of 0 to 100, how much of the total intersection slide was "bright," i.e., contained a lot of light.

b. Total Lights - After estimating the percent of brightness of the slide, raters were asked to count each of the lights appearing in the slide (according to certain guidelines specified in the procedure). The actual total was summed from the individual totals for the light breakdown by proximity and color.

c. Proximity - Raters sorted each light according to which of the three proximity zones it was in. (See Figure 2 for diagram of the exact layout of the zones).

d. Color - Three color categories were also used in recording each approach: (1) red - the number of red lights appearing on the slide, (2) near-red - the number of near-red (yellow or orange) lights appearing on the slide, and (3) non-red - the number of non-red (blue, green, or other) lights appearing on the slide.

3. Apparatus and Instruments

The four persons rating the approach slides were given two types of forms: (1) a coding sheet on which to record the number of potentially distracting lights and the brightness estimate for each approach and (2) a diagram for describing the proximity of each light by zone. Figure 1 shows the format of the coding sheet, and Figure 2 shows the zonal delineation.

4. Procedure

a. Intersection Selection - The intersections used in the present study were randomly selected from a list of metropolitian Austin intersections meeting the criteria enumerated above. A list of intersections and their traffic counts were obtained from the City of Austin.

b. Accident Information - The number of accidents occurring during the past year was also obtained from the City of Austin. The information included a description of each accident and the time of day it occurred, allowing the exclusion of daytime accidents from the present study.

c. Photography - Using a 35mm camera and high-speed color film (ASA 400), slides were taken of each approach to each of the selected intersections. In order to maximize the total visual field available to the raters, two slides were taken of each approach, one directed left, and one directed right. Figure 3 shows the approximate field covered by one of the two slides. Raters used the traffic signal itself as a dividing line to avoid tallying the same light twice.

d. Rating the Slides - Four volunteer raters estimated slide brightness and tallied and categorized the lights visible in the slides.

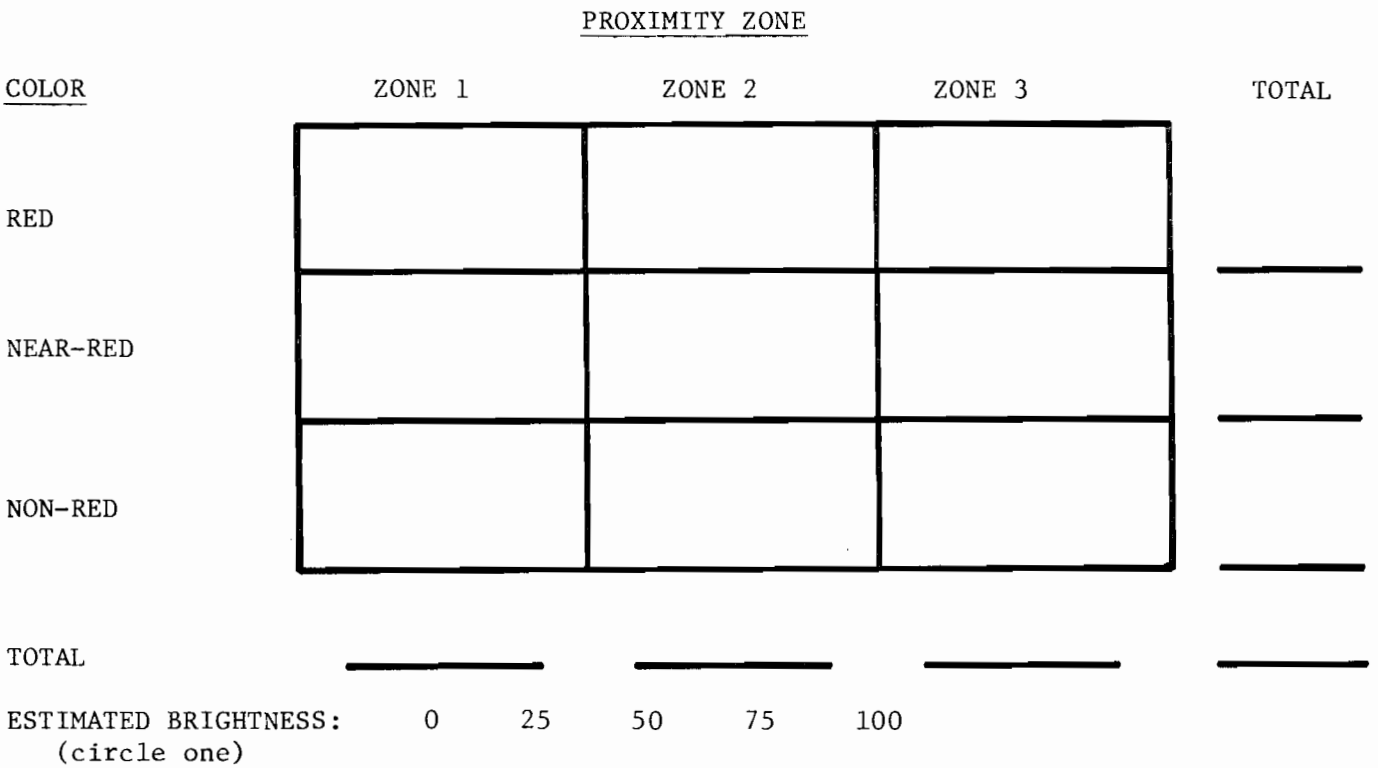


FIGURE 1 - Coding Sheet

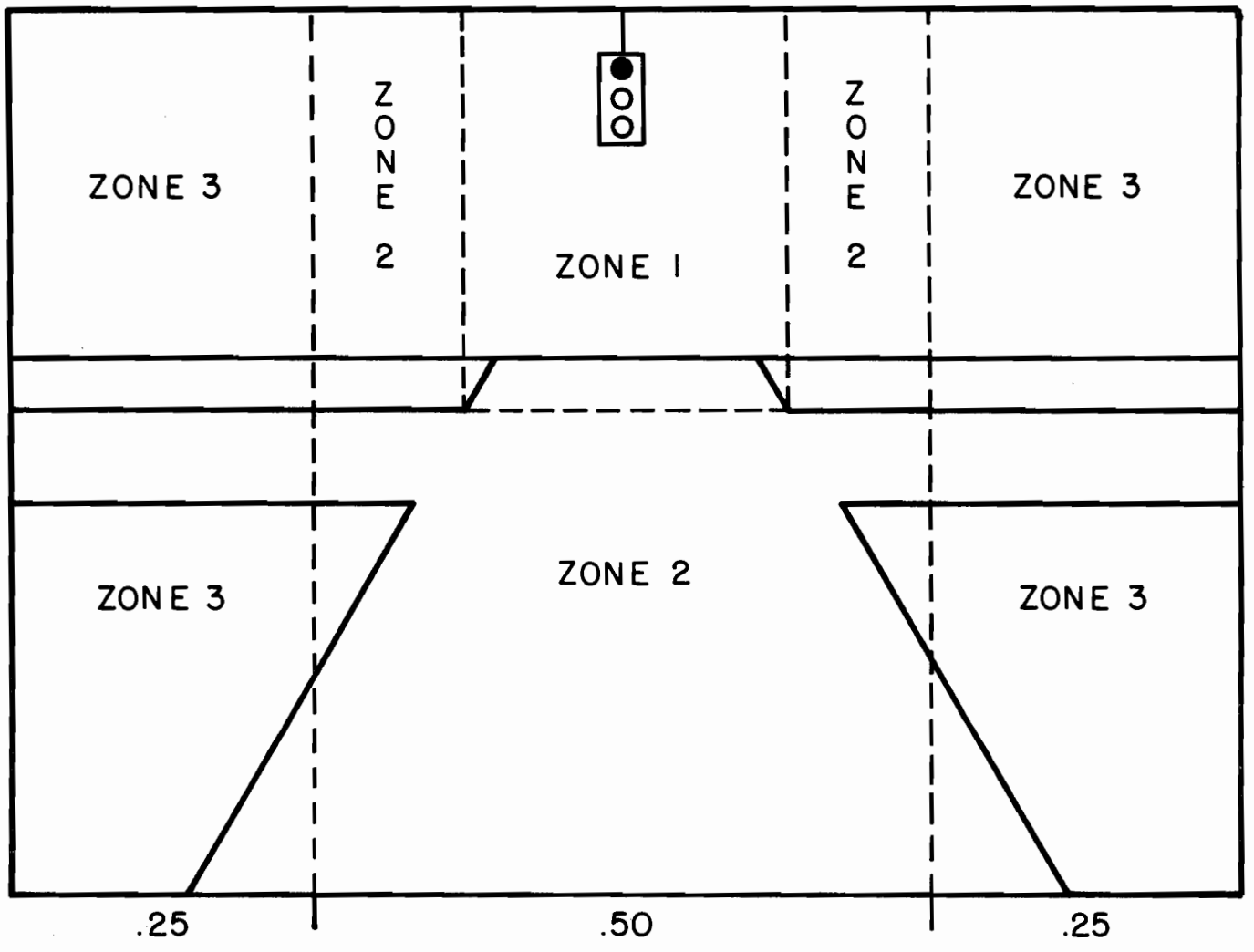


FIGURE 2 - Zonal Delineation Form

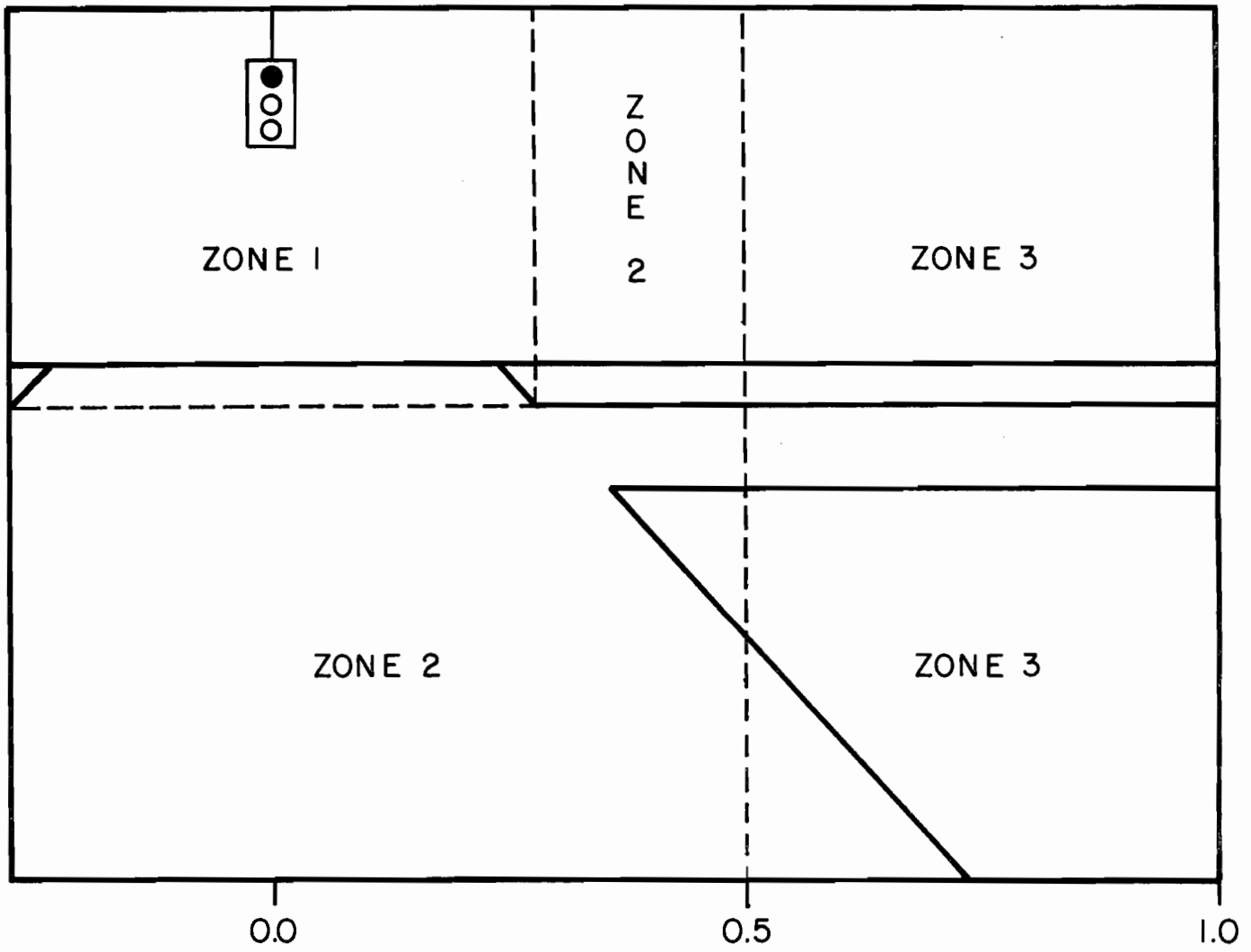


FIGURE 3 - Example of one half of slide pair (directed right) with zones delineated

Each rater viewed individually the 146 slides of the 73 intersection approaches. Slide pairs (left and right) were presented in a random order to each of the raters. Raters were instructed to record all concentrated sources of light (with respect to proximity and color) on the coding sheet with the following restrictions: (1) traffic lights and automobile signal, brake, parking, and head lights were not to be included in the tally of potentially distracting lights, (2) large block areas of light (e.g., store fronts and signs) also were not to be included, (3) long, thin streaks of light were not to be recorded. Each rater was also asked to estimate the percentage of the slide which was brightly lit. The brightness estimates for the two slides representing an intersection approach were averaged, and then those for all the raters were averaged.

After the basic rules and the proximity diagram had been explained to each rater, the rater was given four practice slides and was instructed on how to use the coding sheet. Raters were told that the two slides for each approach were to be tallied on the same approach coding sheet. Raters were urged to be careful and to avoid counting the same lights more than once.

e. Data Compilation and Analysis - After the rating was completed, the totals for each of the distractor dimensions were determined, the scores for each of the four ratings were recorded, and the average scores for all distractor dimensions were computed. Pearson Product Moment Correlation Coefficients were computed for each of the totals and subtotals (and the brightness scale), using the Statistical Package for the Social Sciences.[19]

B. Results

The results of the present study are presented in Tables 1 through 6. The total number of lights visible at each approach positively correlated with the approach accidents but not significantly so. As Table 1 shows, the

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[19] N.H. Nie et al., Statistical Package for the Social Sciences, 2nd ed. (New York: McGraw-Hill, 1975).

more general measure of total lighting, brightness, significantly (and positively) correlated with the approach accidents for the intersection sample.

Table 2 presents the results of approach accident correlations of the number of red lights in the three proximity zones, as well as the total red lights. None of these correlations was significant.

Table 3 shows the approach accident correlations with the number of near-red (yellow or orange) lights in Zones 1 through 3, as well as the total number of near-red lights. The number of near-red lights in Zone 2 was significantly ($p<.02$) (and positively) correlated with the number of approach accidents. The total near-red lights for all zones was almost significant and probably reflected the stronger correlation for Zone 2.

Table 4 presents the approach accident correlations with non-red lights (blue, green, and others) for Zones 1 through 3 and the total non-red lights. None of these correlations was significant.

Table 5 shows the approach correlations for the total number of lights in each of the three zones, and none of the correlations was significant.

Table 6 shows the mean number of lights for each of the study's categories.

C. Discussion

The present study produced two significant results. First, there was a significant correlation between nighttime approach accidents and raters' estimates of the relative brightness of intersection approaches. Second, there was a significant correlation between nighttime accidents and the number of near-red lights (yellow or orange) in Zone 2 of the three proximity zones.

The positive correlation between nighttime approach accidents and the raters' estimates of the relative brightness of the intersection approaches is somewhat confusing since many studies have shown that increased lighting is negatively correlated with accidents at intersections.[20] Of course,

[20] See F.W. Walker and S.E. Roberts, "Influence and Lighting on Accident Frequency at Highway Intersections," Transportation Research Record 562 (1976), pp. 73-78.

TABLE 1 - Pearson Product Moment Correlations of Approach Accidents with (1) Total Lights and (2) Intersection Brightness

| VARIABLE | CORRELATION | SIGNIFICANCE |
|---|---|---|
| TOTAL LIGHTS | .14 | ns |
| INTERSECTION BRIGHTNESS | .23 | .025 |

TABLE 2 - Pearson Product Moment Correlations of Approach Accidents with (1) Total Number of Red Lights in Zone 1, (2) Total Number of Red Lights in Zone 2, (3) Total Number of Red Lights in Zone 3, and (4) Total Number of Red Lights in all Zones

| VARIABLE | CORRELATION | SIGNIFICANCE |
|---|---|---|
| RED - ZONE 1 | -.14 | ns |
| RED - ZONE 2 | -.07 | ns |
| RED - ZONE 3 | .08 | ns |
| TOTAL RED | -.07 | ns |

TABLE 3 - Pearson Product Moment Correlations of Approach Accidents with (1) Total Number of Near-Red Lights in Zone 1, (2) Total Number of Near-Red Lights in Zone 2, (3) Total Number of Near-Red Lights in Zone 3, and (4) Total Number of Near-Red Lights in all Zones

| VARIABLE | CORRELATION | SIGNIFICANCE |
|---|---|---|
| NEAR-RED ZONE 1 | .00 | ns |
| NEAR-RED ZONE 2 | .26 | .014 |
| NEAR-RED ZONE 3 | -.01 | ns |
| TOTAL NEAR-RED | .19 | .058 |

TABLE 4 - Pearson Product Moment Correlations of Approach Accidents with (1) Total Number of Non-Red Lights in Zone 1, (2) Total Number of Non-Red Lights in Zone 2, (3) Total Number of Non-Red Lights in Zone 3, and (4) Total Number of Non-Red Lights in all Zones

| VARIABLE | CORRELATION | SIGNIFICANCE |
|---|---|---|
| NON-RED ZONE 1 | .14 | ns |
| NON-RED ZONE 2 | .07 | ns |
| NON-RED ZONE 3 | .13 | ns |
| TOTAL NON-RED | .14 | ns |

TABLE 5 - Pearson Product Moment Correlations of Approach Accidents with (1) Total Lights in Zone 1, (2) Total Lights in Zone 2, and (3) Total Lights in Zone 3

| VARIABLE | CORRELATION | SIGNIFICANCE |
|---|---|---|
| ZONE 1 | .12 | ns |
| ZONE 2 | .09 | ns |
| ZONE 3 | .12 | ns |

TABLE 6 - Mean Number of Lights by Proximity Zone, Color and Zone X Color

| CATEGORY | $\bar{X}$ |
|---|---|
| ZONE 1 | 4.2 |
| ZONE 2 | 11.0 |
| ZONE 3 | 4.6 |
| RED | 0.6 |
| NEAR-RED | 2.4 |
| NON-RED | 16.8 |
| ZONE 1/RED | 0.1 |
| ZONE 1/NEAR-RED | 0.3 |
| ZONE 1/NON-RED | 3.8 |
| ZONE 2/RED | 0.4 |
| ZONE 2/NEAR-RED | 1.5 |
| ZONE 2/NON-RED | 9.1 |
| ZONE 3/RED | 0.2 |
| ZONE 3/NEAR-RED | 0.6 |
| ZONE 3/NON-RED | 3.9 |
| TOTAL LIGHTS | 19.9 |

brightness and illumination are not exactly the same, and it is possible that the brightness measure in the present study may have been an indicator of the presence of large sources of light that were also sources of distraction. Store fronts and large illuminated signs, which were not counted as lights in the present study, may have contributed to driver distraction that was reflected in the significant positive correlation between accidents and brightness.

Correlations of total approach accidents with the total number of lights falling in the primary categories of (1) proximity and (2) color were not significant. It seems that neither the zonal breakdown (proximity) nor the color groups were specific enough. The zonal correlation may have been washed out by the inclusion of non-red lights (which were not distracting), while the color breakdowns include lights from Zone 3 which may have been too far from the target signal. Examination of the interactive correlations suggests that certain colors proximate to the target signal may have a distracting effect on drivers. The correlation of total near-red lights (yellow or orange) in Zone 2 with total approach accidents was significant ($r=.26$, $p < .014$). Assuming (1) that Zone 3 is too far away from the target signal to be a source of distraction (also given that the number of lights in Zone 3 was relatively small, $\bar{X} = 4.63$) and (2) that non-red lights are not sufficiently close to red to be distracting leaves questions as to why red lights were not distracting in Zone 1 and Zone 2, and why near-red lights were not distracting in Zone 1.

Although Zone 1 (see Figure 2) was the most proximate zone and included the area immediately adjacent to the target signal, it included a visual field directly above the street and there was little space which actually contained a light. The actual number of near-red and red lights in this area was very small ($\bar{X} = .34$) and was probably too small to produce a significant correlation. The number of red lights overall was very small ($\bar{X} = 0.65$) and may have been responsible for the low correlations of red lights in Zones 1 and 2 with the total intersection approach accidents. This low number of red lights in the vicinity of the traffic signal may indicate some self-regulation by commercial establishments with commercial lights in the vicinity of traffic signals.

The results of the present study suggest that both the proximity and the color of lights in the vicinity of traffic signals may play a role in determining their potential functioning as environmental distractors. While the results of this single study must be viewed as tentative, they do suggest the usefulness of further research in this area.

## PART II: UTILIZATION OF KNOWLEDGE

### I. INTRODUCTION

Data from our earlier laboratory and field studies have suggested a possible relationship between roadside signs as distractors and traffic accidents at intersections controlled by stop signs.[21] With the advent of our investigation of lighted commercial distractors and nighttime accidents, and with the advice and encouragement of the Texas Office of Traffic Safety (OTS), an attempt to disseminate this psychological knowledge to appropriate local agencies was undertaken. The dissemination and an evaluation of the utilization of this technical information were designed to facilitate the overall purpose of this project, i.e., to promote traffic safety at the local level by effectively dealing with (1) those signs and lights that may operate as potential roadside distractors and (2) the design and placement of essential traffic control devices in a manner that maximizes their discriminability.

Consulting relationships were established with both the Urban Transportation Department of the City of Austin and the Austin Police Department. The original purpose of these relationships was to make available and encourage the use of existing psychological knowledge concerning commercial distractors, including the results of our investigations. During the initial phase of this stage of the project, the working relationships with these two agencies were so productive that they permitted an expansion of our original intentions. We became concerned with not only disseminating existing information concerning the role of commercial distractors in accidents but with making an effort to sensitize key personnel in each agency to the importance of distractors and to the value of future collaborative relationships with researchers and other agencies. In this sense, the results of our studies and previous empirical investigations were used to heighten the concern of decision makers about the importance of further efforts to minimize the potential adverse effects of environmental distractors. Included in this effort was an attempt to increase local agencies'

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[21] Holahan, Culler, and Wilcox, "Effects of Visual Distraction;" and Holahan *et al.*, "Relationship Between Roadside Signs and Traffic Accidents."

willingness and readiness to work with one another to obtain additional knowledge and to determine an appropriate implementation strategy.

On the other side of the dissemination issue, the original project purpose was expanded to include enhancing the value of this final report by incorporating important information for the Office of Traffic Safety and future researchers in this field. The discussions to follow pinpoint key personnel within the appropriate agencies who may be contacted either for accessing needed information or for implementing policy changes based on empirical findings. In addition, the discussions include a description of the system as a whole, comprised of various governmental components, their interrelationships, and their particular roles with respect to the regulation of commercial distractors. Our research results were used as a catalyst to stimulate discussion by decision makers about the kinds of additional information they could best use and the form in which the information should be disseminated to them to assure usability. It is hoped that this information may facilitate the development of strategies for readily incorporating research findings into regulatory and policy changes.

## II. DETERMINANTS OF KNOWLEDGE UTILIZATION

This stage of the project was concerned with maximizing the utilization of scientific knowledge in the traffic safety field. The target was the agencies responsible for implementation of traffic safety standards at the local level. The guiding rationale for this enterprise was that the manner in which scientific knowledge is presented to policy-oriented agencies is as important as the initial generation of the knowledge.

In today's rapidly changing world, the need for more effective ways to meet new and continuing problems calls for the translation and rapid dissemination of the fruits of research. This is especially true with respect to traffic safety, given the burgeoning use of both private automobiles and new forms of commercial advertising. Nevertheless, in this, as in many fields, insufficient attention has been paid to promoting the applications of new or existing knowledge.

Knowledge utilization as a separate field of study is concerned with

> (a) developing insights on the part of both knowledge producers and knowledge users into the underlying processes of knowledge development, dissemination and implementation;
> (b) identifying factors that account for delay in adaption or adoption following the development stage; and
> (c) generating strategies or measures for enhancing appropriate and timely utilization.[22]

Many principles of knowledge utilization are almost universally applicable to various subject matter fields. Several of the critical determinants of knowledge utilization relevant to the present project are reviewed here for use by future researchers interested in facilitating the implementation of their findings. These factors were reviewed for purposes of the present project prior to the establishment of the consulting relationships so that project liaison personnel could be thoroughly familiar with them.

There are several categories of determinants of knowledge utilization, including (1) the characteristics of the knowledge or information itself, (2) the characteristics of the information transfer process, (3) the characteristics of the organization in which the information is to be used, and (4) the personal characteristics of those involved in incorporating the knowledge into policy changes.[23] Davis has proposed the acronym A VICTORY as a convenient mnemonic for encompassing the eight factors he considers necessary and sufficient to account for organizational behavior related to the utilization of promising new knowledge (See Table 7).[24]

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[22]Human Interaction Research Institute, Putting Knowledge to Use: A Distillation of the Literature Regarding Knowledge Transfer and Change, National Institute of Mental Health Grant no. 5R01MH22683-03MHS (Washington, D.C.: Government Printing Office, 1976), p. 2.

[23]Ibid.

[24]H.R. Davis, "A Checklist for Change," in A Manual for Research Utilization, ed. National Institute of Mental Health (Washington, D.C.: Government Printing Office, 1971).

TABLE 7

## Factors Influencing the Likelihood of Adoption or Adaption of a Seemingly Promising Innovation by an Organization: Integrated Findings

| H. Davis (8 Factors) | E. M. Glaser (20 Factors) | G. Zaltman et al. (Condensation of 19 Factors) | R. Havelock et al. (10 Factors) |
|---|---|---|---|
| Ability to carry out the change | Capability and resources | Financial and social costs | Structuring Capacity |
| Values or self-expectancy | Compatibility | Compatibility<br>Publicness vs. Privateness<br>Impact on interpersonal relations | Homophily<br>Empathy |
| Idea or information about the qualities of the innovation | Credibility<br>Ease in understanding and installation<br>Observability<br>Trialability<br>Divisibility<br>Reversibility | Communicability<br>Divisibility<br>Reversibility<br>Complexity of concept or implementation<br>Susceptibility to successive modifications<br>Scientific status<br>Point of origin<br>Terminality | Openness |
| Circumstances which prevail at the time | Willingness to entertain challenge<br>A climate of trust<br>Structural reorganization | | Proximity |
| Timing or readiness for consideration of the idea | Sensitivity to context factors<br>Early involvement of potential users<br>Suitable timing | | Linkage<br>Synergy |
| Obligation, or felt need to deal with a particular problem | Relevance<br>Widespread felt need to correct undesirable conditions<br>Shared interest in solving recognized problems | Degree of commitment | Energy |
| Resistance or inhibiting factors | Skill in working through resistances | Risk or uncertainty of various kinds<br>Number of gatekeepers or approval channels | |
| Yield, or perceived prospect of payoff for adoption | Relative advantage<br>An incentive system | Efficiency of innovation<br>Perceived relative advantage<br>Gateway to other innovations | Reward |

FROM: Human Interaction Research Institute, Putting Knowledge to Use: A Distillation of the Literature Regarding Knowledge Transfer and Change, National Institute of Mental Health Grant no. 5R01MH22683-03MHS (Washington, D.C.: Government Printing Office, 1976), p. 9.

These factors constitute a tool for identifying an organization's readiness to adopt a given change or set of research findings. A (Ability) refers to the resources and capabilities of the organization to implement and subsequently evaluate certain policy or procedural changes which flow from the research findings. V (Values) represent the congruence between the agency's philosophy and operating style and (in our case) the orientation of the project team. I (Idea) refers to the adequacy of the agency's understanding of the concepts being presented and their ability to translate these into appropriate actions. C (Circumstances) involves those features of the organizational environment relevant to the successful adoption of the research findings. T (Timing) is concerned with the agency's readiness to consider implementing changes based on the new information. O (Obligation) represents the agency's appreciation of the need to make changes in policy or procedure. R (Resistances) refers to those organizational or individual disinclinations to change, for whatever reasons. And Y (Yield) stands for the benefits or pay-off of the implementation of the research findings as perceived by decision makers and those who will eventually be involved in carrying out that implementation. Table 7 presents three other formulations of factors influencing the likelihood that new information will be utilized.[25]

With respect to the agencies that are targets for this dissemination activity, three major types of factors are important for utilization: organizational variables, personal variables of organization members, and stages in the process of organizational change.[26] The likelihood of successful innovation depends in part on an organization's openness

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[25]E.M. Glaser, "Knowledge Transfer and Institutional Change," Professional Psychology 4 (1973), pp. 434-444; G. Zaltman, R. Duncan, and J. Holbek, Innovations and Organizations (New York: Wiley and Sons, 1973); and R.G. Havelock and D.A. Lingwood, R & D Utilization Strategies and Functions: An Analytical Comparison of Four Systems (Ann Arbor,Mich.: Institute for Social Research, University of Michigan, 1973).

[26]Human Interaction Research Institute, Putting Knowledge to Use.

to change.[27] The clarity of an organization's goals helps to reduce anxiety about change,[28] while goal diffuseness reinforces the effects of job status insecurity. Along with the official goals of an organization, the implicit assumptions it makes about its relationship to its larger social context of clients, communities, governmental controls, and public opinion are important determinants of the kinds of change it wants or can accept.[29]

The power and status distribution within an organization also affects its ability to innovate.[30] The bureaucratic structure; the degree of occupational specialization; the size, affluence, and capacity of the organization; and the organization's adaptability to the rapidly changing society all influence the extent to which innovations will be incorporated. Other contributing factors include: (1) the degree of free communication, of both a formal and informal nature, flowing up and down the hierarchical lines and horizontally among colleagues; [31] (2) the degree of administrative and colleague support and encouragement of efforts toward problem solving and change;[32] and (3) the degree of participation permitted in the identification and solution of organizational problems.[33]

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[27] L.S. Kogan, "The Utilization of Social Work Research," Social Casework 44 (1963), pp. 569-574.

[28] M.B. Miles, "Planned Change and Organizational Health: Figure and Ground," in Change Processes in the Public Schools, ed. R.O. Carlson et al. (Eugene, Oreg.: Center for the Advanced Study of Educational Administration, University of Oregon, 1965)

[29] R.O. Lippitt, J. Watson, and B. Westley, The Dynamics of Planned Change (New York: Harcourt & Brace, 1958).

[30] Ibid.

[31] R.L. Marcum, Organizational Climate and the Adoption of Educational Innovation, Research Report for Office of Education, Contract no. OEG-4-7-078119-2901 (Logan, Calif: Utah State University, March 1968).

[32] T.W. Costello and S.S. Zalkind, eds., Psychology in Administration (Englewood Cliffs, N.J.: Prentice-Hall, 1963).

[33] E.M. Glaser and H.L. Ross, Increasing the Utilization of Applied Research Results, Final Report to National Institute of Mental Health, Grant no. 5 R12 MH 09250-02 (Los Angeles, Calif: Human Interaction Research Institute, 1971).

Many studies have demonstrated that personality attributes, interests, training, and other characteristics of organizational leadership and staff play an important role in determining how quickly an agency introduces an innovation.[34] Staff morale and cohesiveness, the presence of tenure and vested interests, the amount of extra-organizational professional activity, and staff experience with previous changes and innovations have also been found to influence utilization.[35] The personal characteristics of key individuals in an agency will affect their responses to new ideas and proposed procedures. Such characteristics as the person's age, economic and social status, professional orientation, and psychological factors, such as needs for affiliation, achievement, and personal security, have also been discussed as important.[36]

Several behavioral scientists have outlined the phases of the process an organization goes through in implementing change (See Table 8). Nearly all these models begin with a concern, a problem, a conflict, or some other discrepancy that puts pressure for change on the organization. Following this initial phase, all these models describe a shift to diagnosis, analysis, or clarification of the problem and its causes; all recognize the need to gather information for creating and considering alternative courses of action; all include an implementation phase in which an innovation is tried out; and all see the need for some follow-through evaluation with subsequent modification or stabilization of the innovation.[37] Each of the agencies

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[34]Glaser, "Knowledge Transfer and Institutional Change;" and R.G. Havelock, Planning for Innovation through Dissemination and Utilization of Knowledge (Ann Arbor, Mich: Center for Research on Utilization of Scientific Knowledge, Institute for Social Research, University of Michigan, 1969).

[35]Glaser and Ross, Increasing Utilization of Applied Research; and Havelock, Planning for Innovation through Dissemination.

[36]Human Interaction Research Institute, Putting Knowledge to Use.

[37]See Lippitt, Watson, and Westley, Dynamics of Planned Change; D.H. Jenkins, "Force Field Analysis Applied to a School Situation," in The Planning of Change: Readings in the Applied Behavioral Sciences, eds. W.G. Bennis, K.D. Benne, and R. Chin (New York: Holt, Rinehart & Winston, 1962); C.C. Jung and R. Lippitt, "The Study of Change as a Concept in Research Utilization," Theory into Practice 5, No. 1 (1966), pp. 25-29; G. Watson, ed., Change in School Systems, (Washington, D.C.: Cooperative Project for Educational Development by National Training Laboratories, National Education Association, 1967); L.E. Greiner, "Patterns of Organization Change," Harvard Business Review 45 (1967), pp. 119-130; and L.J. Rubin, "Installing an Innovation," in Educational Change: the Reality and the Promise, ed., R.R. Goulet (New York: Citation Press, 1968).

TABLE 8
## Stages of Successful Organizational Change

| Author | Date | Concern: Awareness | Diagnosis: Knowledge Search | Consideration of Alternatives | Action: Implementation | Follow-through: Evaluation |
|---|---|---|---|---|---|---|
| Lippett et al. | 1958 | Need for change<br>Get consultant | Clarification of problem | Examination of alternatives | Actual change | Stabilize |
| Jenkins | 1962 | | Analyze | Determine | Make the change | Stabilize |
| Jung, Lippitt | 1966 | Identify concern | Diagnosis | Retrieve relevant knowledge<br>Formulate alternatives<br>Determine feasibility (tests) | Adopt the innovation | Diffusion |
| Watson | 1967 | Sensing problem | Diagnosing | Inventing possible solutions<br>Comparing<br>Weighing<br>Deciding | Implementing | Evaluating<br>Revising |
| Greiner | 1967 | Pressures<br>Arousal<br>Intervention<br>Reorientation | Diagnosis | Specific problems<br>Invention<br>Commitment | Experiment | Search for results<br>Reinforcement<br>Acceptance |
| Rubin | 1968 | | Diagnosis | Alternative Selection | Strategy<br>situation<br>Action<br>Initiate<br>Install | Support transition<br>link to permanent system |

FROM: Human Interaction Research Institute, Putting Knowledge to Use: A Distillation of the Literature Regarding Knowledge Transfer and Change, National Institute of Mental Health Grant no. 5R01MH22683-03MHS (Washington, D.C.: Government Printing Office, 1976), p. 31.

with which a project team becomes involved may be at a different stage in its thinking about a particular issue, e.g., the regulation of commercial distractors. It follows that the agencies may differ in the types of information which would be most valuable to them and the strategy most appropriate for facilitating change. For example, in one case, effort and information must be geared to sensitizing the agency to the very presence of a problem, while, in another case, information concerning acceptable alternative strategies may be most timely.

All of the factors discussed, when used to analyze the agencies targeted for dissemination, yield a picture of traffic safety decision makers as a total system. This systemic view then makes possible the identification of appropriate leverage points and strategies for influencing and facilitating decisions concerning traffic safety. Havelock and Markowitz have demonstrated that conceptualizing the many individuals and organizations that concern themselves with highway safety as a problem solving system may be valuable for enhancing the contributions of research.[38]

## III. PROJECT EVALUATION AND GOALS

Included in the original proposal for the dissemination activity was a formal evaluation of the project team's efforts. The evaluation strategy to be employed incorporated several components and was established prior to the initiation of the consulting relationships. The first step in any good evaluation involves a clarification of the project's goals and the proposed means of assessing the extent to which they are achieved. Formulating specific project goals prior to the formal activities also helps to make explicit the various assumptions and responsibilities each project team member may have.[39]

Specific project goals were established for each phase of the dissemination stage. These goals represented an amalgam of the original proposal's outline of the proposed project and the utilization determinants discussed above. In this way the goals represented a level of specificity which

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[38] R.G. Havelock and E. Markowitz, Highway Safety Research Communication: Is There a System? (Ann Arbor, Mich.: Institute for Social Research, University of Michigan, 1973).

[39] E. Suchman, Evaluative Research (New York: Russell Sage, 1967); and C. Weiss, Evaluation Research (Englewood Cliff, N.J.: Prentice-Hall, 1972).

could serve as a guide for actions to be taken with each agency. The project liaison person for each agency then converted these overall project goals into specific steps to be taken with respect to her/his particular agency. In carrying out this activity, project liaison persons were given an outline of the utilization determinants (Table 9) and of Davis's A VICTORY model of organizational behavior vis-a-vis innovation (see Table 7 and related discussion on pages 26-30) to supplement several working sessions concerning these factors and their relationship to the overall project goals. In addition, the logs which project liaison persons used for reporting contacts with agency personnel were organized by project phase goals; thus, progress towards each goal could be easily assessed at the completion of each phase.

It was considered essential for all project team members to be thoroughly familiar with the research knowledge available, current regulations, and the utilization determinants. Therefore, the following goals were established for the period preceding the entry phase:

(1) review the relevant traffic literature, previous project results, and project methodologies;

(2) determine the content of current ordinances with respect to distractors; and

(3) understand organizational variables pertinent to effective utilization of information.

The first formal phase of the dissemination stage of the project was entry. The general purpose of this phase was to establish a working relationship with the city agencies. The following goals were established for this phase:

Phase I = Entry = establish a positive and constructive working relationship between the project team and the city organizations

--make initial contacts within the Urban Transportation Department and the Police Department

--familiarize the agencies with the purpose, history and objectives of the research component of our project

--develop shared objectives with the agencies with respect to the proposed research

TABLE 9

UTILIZATION DETERMINANTS FOR PROJECT LIAISON PERSONS

ORGANIZATIONAL VARIABLES

- Clarity of Goals: with respect to job descriptions, expectations of their clients, the public, or funding agency, and other external forces
- Distribution of Power: bureaucratic structure; degree of occupational specialization; the size, influence, and capacity of the organization; stage in the organizational cycle; adaptability to changing society (self-renewal)
- Communication and Decision-Making: degree of open communication; administrative and colleague support; degree of participation in decision-making
- Leadership and Staff: personality and role of leaders; tenure and vested interests; staff morale and cohesiveness; professional qualities; change-related experience

PERSONAL VARIABLES OF ORGANIZATION MEMBERS

- Age
- Economic and Social Status
- Issues of Professionalism
- Psychological factors: needs for achievement or personal security

STAGE IN PROCESS OF ORGANIZATIONAL CHANGE

- A concern about or awareness of the problem (of distractors vis-a-vis traffic signals) and of the need for change
- The clarification of the problem or diagnosis of its causes
- Consideration of alternative strategies and the gathering of information concerning those alternatives
- Implementation or experimentation with an innovation
- The follow-through evaluation and modification or stabilization of the innovation

--determine the respective needs and orientations of the city agencies: their explicit formal and implicit informal goals; their formal and informal patterns of communication and decision-making; their communication with other agencies; identify those individuals within the respective agencies who are primarily involved in the compilation and/or dissemination of information on distractors for policy formation and/or advocacy of traffic safety changes based on such information

--determine and incorporate their respective suggestions and/or requests for additional research or technical information

--determine their "ripeness" or readiness for utilizing this information and the organizational characteristics relevant to effective utilization of new information

--determine the most relevant and important areas of knowledge concerning distractors and the formation of policy and enforcement concerning these areas that will further the objectives of the respective agencies

--determine the appropriate form and means of communication or presentation of such information to each agency

--establish a basis for a continued relationship with each agency.

The second phase involved the formal feedback of pertinent psychological knowledge and information concerning the decision-making system to the city agencies. The following goals were established:

Phase II = Feedback = formal feedback of pertinent information to the agencies

--compile information on previous project research and relevant background literature, plus information obtained from other agencies about important dimensions of distractors and policy-implementation-enforcement processes

--transform that information into a content, written form, and presentation mode appropriate to the needs and preferences of and geared to the utilization effectiveness strategies for each agency

--prepare the actual written materials and visual aids.

The third phase involved the actual working sessions with agency personnel in which the results and other information were disseminated.

The general objective of this phase was to facilitate the application of this knowledge through an appropriate mode of presentation:

Phase III = Facilitation = facilitate the practical application of the knowledge

--carry out the dissemination plan; distribute the written materials to appropriate persons; hold the workshops or other appropriate personal explications as a supplement to the written materials.

The final phase actually encompassed the full range of the project's life. The evaluation of the utilization and usefulness of the disseminated information began with the establishment of the project goals and included a follow-up assessment achieved through the administration of a formal evaluation questionnaire to the key personnel in the city agencies. The questionnaire (Appendix A) sought the opinions of Urban Transportation and Police Department contacts as to the usefulness of the knowledge and information provided and its understandability, immediate relevance, and practical applicability; their judgment as to the effectiveness of the working sessions in terms of efficiency, cooperation, clarity of communication, and responsiveness to agency concerns; and finally, their views concerning alternative strategies for both future research and dissemination efforts.

The following goals were thus established for the evaluation phase:

Phase IV = Evaluation

--establish goals for each phase of the project for each agency and establish subgoals for the accomplishment of those overall goals

--establish a reporting format for each participating agency to incorporate continuous information concerning their activities relevant to each of the subgoals

--compile the activities reports and information gleaned from each agency at the conclusion of each phase

--perform a follow-up assessment of the overall project by administering a formal evaluation questionnaire to appropriate personnel in the agencies and to the project team members concerning the usefulness, understandability, relevance, and practical applicability of the knowledge conveyed and assessing the effectiveness of each separate phase of the project, providing space for suggestions for future dissemination efforts.

An example of the way in which the overall project goals were converted into specific steps to be taken by each liaison person can be demonstrated by the following:

> Overall Goal: To identify individuals within the organganization who would benefit from the research information and be able to incorporate the results of the research into policy changes.
>
> APD Goal: To identify people at several levels within the police department who may be able to benefit from the project, especially people in the following areas:
>
> 1. Traffic Section and Selective Traffic Enforcement Project (STEP)
> 2. Training Division, especially Inservice Training
> 3. Informal collision-investigation experts in the department
>
> Steps to obtain APD goal: Talk to the key people at each level for advice, input, and reactions.
>
> 1. In the Traffic Section and STEP Program: Commander of the Uniformed Division; Captain of the Traffic Section; and Lieutenant in Charge, Traffic
> 2. In the Training Division: Lieutenant, In-Service Training
> 3. As informal experts: Sergeant, Uniformed Patrol; and Lieutenant, Community Relations.

## IV. PROJECT IMPLEMENTATION

Several preparatory activities were undertaken prior to the initiation of the consultative relationships. Special care was taken in the selection of two liaison persons to handle the consultations with the two city agencies. Both were selected because of their good working relationships with the project director, their concern for the application and practical utility of psychological research, and their considerable experience with local level governmental agencies. Following their selections, several extensive project team sessions were held to familiarize all members with existing literature on commercial distractors, the results and methodologies of the project team's own research, and the key factors involved in promoting utilization. Additional information concerning local ordinances and other regulations involving commercial distractors was obtained and discussed. The overall goals by phase were established and the consultants

were assisted in generating possible steps for their achievement. This activity was undertaken for one phase at a time so that the planning of each successive phase could benefit from the results of the previous ones.

The project liaison person to the Urban Transportation Department sought a preliminary orientation to that agency from a graduate student with experience working with the UTD. Subsequently, his initial contact was made with the Assistant Director, Systems Development Division.* A reciprocating relationship was generated over several meetings by discussing not only the potential usefulness of the research information we had compiled but also our interest in their input concerning the nature of the regulatory system and needs they may have had for additional research. Having familiarized top management with our purposes, our liaison person expanded his contacts to include two key personnel identified by the Assistant Director: the Supervisor, Traffic Control, and the Civil Engineer, Operations Division.

During the entry phase of the consultative relationship, the emphasis was on the UTD's providing information about their role in regulating and promoting traffic safety. Discussions centered around the responsibilities of the Department, its involvement in new legislation, its investigation activities, its relationships to other agencies, and its use of external research. The liaison person gained further familiarity with the UTD's activities through touring the traffic sign construction facilities and accompanying the Civil Engineer, Operations Division, on inspections of intersections.

At the completion of the entry phase, the key staff had been identified for receiving information on psychological knowledge concerning distractors and the information we were compiling on the other components of the

---

*UTD is divided into three divisions: Operations, Systems Development, and Planning and Design, each under the direction of an Assistant Director. The Systems Development Division, with whose Assistant Director we were in contact, is responsible for instituting policy changes concerning traffic safety.

regulatory system. An analysis of the organizational structure and communication style of the UTD indicated that the appropriate means of disseminating this information was through informal discussions with these key personnel. Materials used to stimulate these discussions included those prepared by the project team and those requested from the Department itself, including an organizational chart of the city administration (Figure 4), the current ordinances governing environmental distractors, and the research reports of our previous research. Following dissemination and discussions of this information with each staff member on an individual basis (the feedback phase), a meeting with both the Supervisor, Traffic Control, and the Civil Engineer, Operations Division, was held to determine possible applications of this information and suggestions for future research efforts. Additional efforts during this (facilitation) phase included determining the perceived value of input from the Police Department concerning the role of distractors as observed in their accident investigations. In this way, the final contacts with the UTD centered around priming them for additional future inputs from both researchers and other city agencies and enhancing their readiness to utilize such information on an ongoing basis.

After our preliminary analysis of the regulatory structure and our initial discussions with the UTD, we became aware of the important role played by the City's Building Inspection Department (BID) in the regulation of commercial distractors. For this reason, the UTD liaison person, upon the referral of the Assistant Director, Systems Development Division, met with a representative of the BID. The discussions at the BID centered around the role of that agency in regulating environmental distractors and their interest in the results of research on the effects of such distractors. Again the objective was to determine their readiness to implement any changes in enforcement based on new knowledge. The UTD liaison person also rode on a traffic investigation beat with a key person. This contact facilitated a better understanding of the total system and of the relationship between the UTD and the APD, and this enhanced his discussions with his target agency.

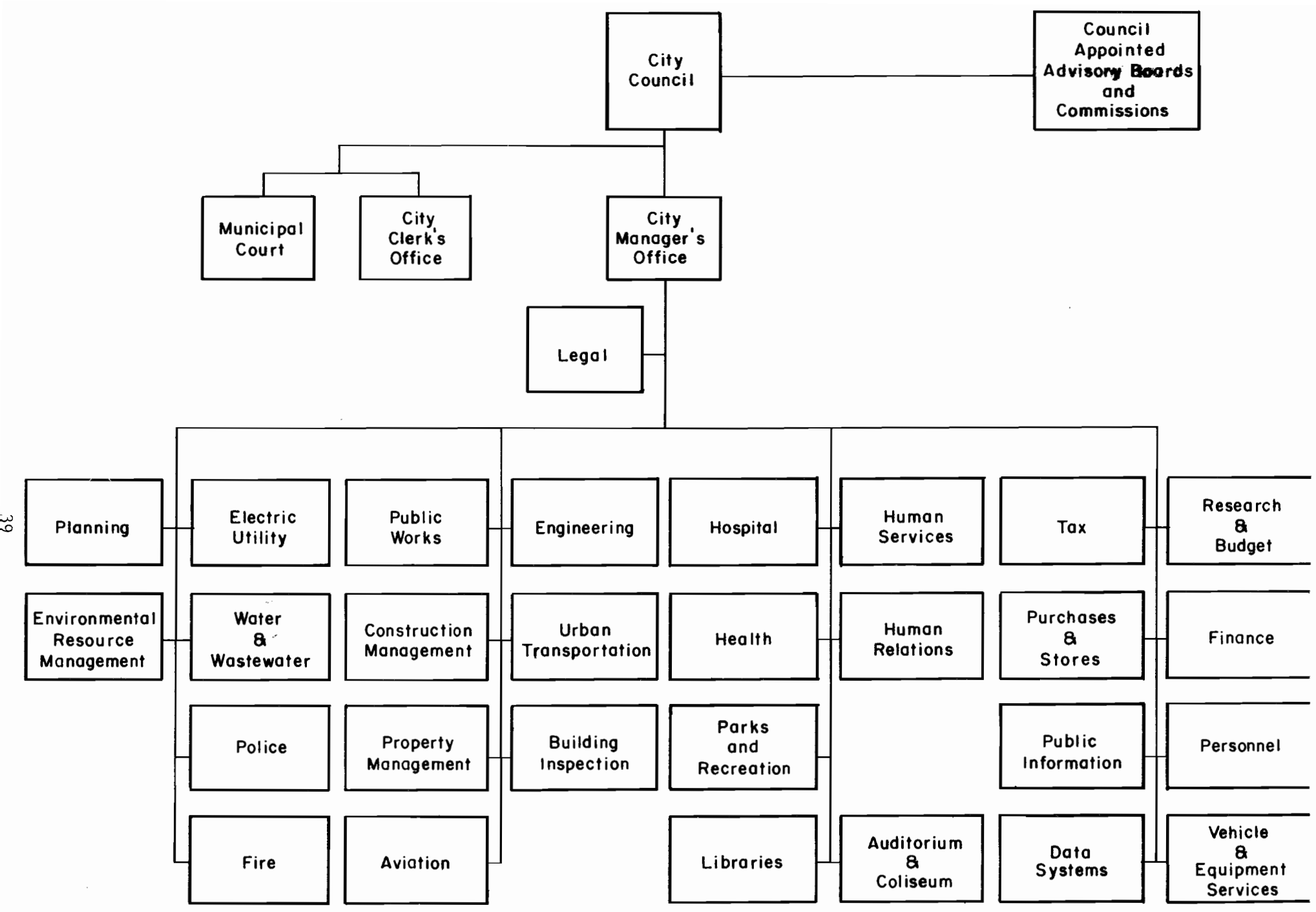



FIGURE 4 - Organizational chart of City Administration

The liaison person to the APD was selected partly because of his ongoing involvement with that department in another consultative capacity. His familiarity with the structure and style of the agency and with certain personnel greatly facilitated his entry with respect to the Traffic Office. The initial contact was with the Commander of the Uniformed Division, which includes the Traffic Section (see the APD organizational chart, Figure 6). Having familiarized the top level management with the project, the liaison person expanded his contacts to include two key individuals to whom he was referred by the Commander of the Uniformed Division: the Lieutenant in Charge, Traffic, and the Sergeant in Uniformed Patrol.

As with the UTD, regular contact was maintained with these key individuals. Initially the discussions centered around their input to us, until credibility and common interest were developed. These discussions included the philosophy of the Department and the Division toward traffic safety, distractors in particular. Also discussed was their role in generating information concerning distractors and accidents and their relationship to other agencies in the system. Following completion of the objectives in the entry phase, the results of our previous research were presented to these key personnel. The actual research reports were then supplemented by informal discussions, as in the UTD, centering around the relevant sections of the city ordinances (reported below) and the APD organizational chart (Figure 6). In addition, the APD's Annual Statistical Report (Appendix B) and their accident report forms (Appendix C) were studied to generate discussions of alternative means of implementing changes with respect to distractors and ideas concerning possible areas for future investigation. Again, following this facilitation phase, efforts were made to sensitize these individuals to the need for a closer and continuing relationship with other agencies in the system, particularly the UTD. As with the UTD, contact with key personnel included accompanying them on their regular patrols in order to understand the context of and the constraints involved in generating and utilizing new knowledge.

Throughout the tenure of these consultations, regular meetings were held for the project team as a whole to review progress toward the project goals, to exchange information about each agency's role in the system for feedback to the other agency, and to provide advice for analyzing the

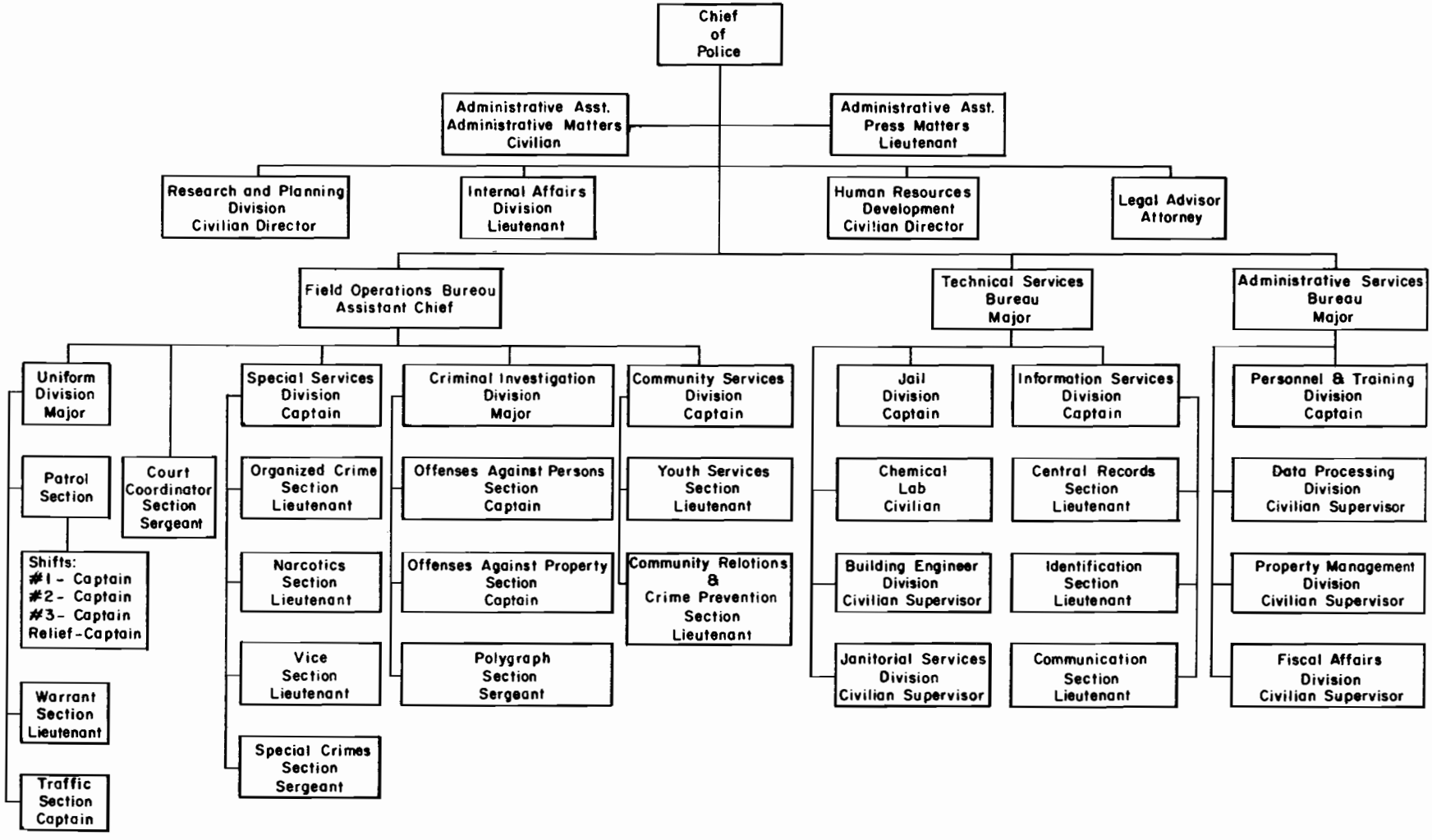



FIGURE 5 - Organizational Chart of Austin Police Department

organizational factors and determining appropriate strategies for dissemination.

## V. SYSTEMS ANALYSIS OF THE REGULATION OF ENVIRONMENTAL DISTRACTORS

This section presents the information gathered during the consultation stage of the present project. It includes an analysis of the factors affecting utilization of research knowledge by each target agency. In addition, the interrelationships between these agencies and their responsibilities with respect to environmental distractors are discussed, including potential blockages to further collaborations.

The process of changing standards regulating environmental distractors in accordance with new empirical findings involves several functions:

(1) observation of the distraction phenomenon;

(2) systematic research and analysis of specific elements of that phenomenon;

(3) distillation of that knowledge into a form presentable to decision makers;

(4) implementation of the knowledge into policy and/or legislative changes; and

(5) establishment of new enforcement procedures or standards.

One purpose of the present project was to facilitate this change process through the participation of applied researchers willing to take appropriate steps to disseminate the results of their research. Therefore, the analysis of the agencies involved in this project's consultation efforts is placed in the context of this total system. The information to follow is designed to orient future researchers in this area as to the nature of the system and their potential role in it.

According to the current ordinances of the City of Austin, the Building Inspection Department is responsible for granting a license to a commercial establishment permitting it to erect a commercial sign. The BID is also responsible for the actual inspection of such signs to ensure they comply with the size and spacing limitations set out in the city code. The following are the relevant portions of Chapter Three of the Austin City Code:

> Sec. 3-16 Inspection; issuance of certificate of acceptance; permit or license tags.
>
> (a) Any person who causes a sign to be erected shall

immediately notify in writing the director of the building inspection department and request a final inspection. If upon final inspection the said director finds the sign to be erected according tothe requirements of this chapter, he shall issue a certificate of acceptance without further charge. Service for electrical signs shall not be ordered turned on by the electrical inspector until he has received notice of acceptance from the director of the building inspection department.

Sec. 3-17. Size of certain signs and billboards.

Within the highway control zone no sign or billboard except on-premises signs, shall exceed a maximum area of twelve hundred square feet, a maximum height of twenty-five feet, a maximum length of sixty feet, including border and trim but excluding supports from the dimensions. The maximum size limitation shall apply to each side of a sign structure or structures which is visible to approaching traffic. Signs may be back-to-back, side-by-side, stacked or V-type construction with not more than two displayed to each facing and each structure shall be considered one sign. Signs which exceed three hundred and fifty square feet in area, however, may not be stacked or built side-by-side.

Sec. 3-18. Spacing of signs and billboards.

(a) Within the incorporated limits of the City of Austin, no sign or billboard shall be located in such a manner as to obscure or interfere with the effectiveness of official traffic signs, signals, or devices, nor in such a manner as to obstruct or interfere with the view by a driver of a motor vehicle or other vehicle, of approaching, merging, or intersecting traffic.

Sec. 3-19. Lighting.

(b) Throughout the City of Austin those signs which are lighted and which are visible from any public street, must be so designed and so maintained that the lights are effectively shielded so as to prevent beam rays of light from being directed at any portion of the traveled ways, or of such intensity or brilliance to cause glare, or to impair the vision of the driver of any vehicle.

(c) No sign may be so illuminated that it interferes with the effectiveness of or obscures an official traffic sign, signal or device.

In contrast to the specific guidelines governing the size and location of signs, those dealing with the relationship between commercial signs and traffic signals are vague and leave much to discretion in their enforcement. There are no administrative guidelines established by the BID for determining when a commercial sign or lighting "interfere [s] with the effectiveness of official traffic signs, signals, or devices..." Our contacts with the BID showed it to be purely an enforcement agency. It does not see its role as one involving policy decisions but simply as one of following existing specifications. Given that the BID perceives its role as one of implementing policies and standards set elsewhere, it seems unlikely that it would involve itself in developing guidelines concerning commercial distractors and traffic signals. For this reason, the project team decided not to disseminate its information to the BID. Thus any changes in BID activity will have to come from changes in legislation proposed to the City Council by the UTD or the APD or in guidelines stating city policy developed by the UTD and forwarded to the BID. (Both the UTD and the BID are within the same branch of the city administrative structure, as shown in Figure 4.)

The UTD is more concerned with public or regulatory signing than commercial signing. However, the UTD is concerned with commercial signing when it poses a threat to traffic safety. The UTD is responsibile for the construction and placement of the regulatory signs and has flexibility with respect to their size and reflectivity. Investigations are made of accident-prone intersections and modifications are made. Research from external sources has been utilized in the design and placement of public signs. The vast majority of the UTD studies are instituted by citizen complaints. Sometimes they are requested by other city departments, including the Police Department, or the City Council itself. Periodically UTD personnel review collision reports for the city and initiate a traffic study if a suspect pattern appears. Should an ordinance be proposed by the City Council or one of its members, it is delivered to the Director of the UTD, who then solicits input from his staff. He subsequently makes his recommendations to the sponsoring party.

In general, the UTD is a research-oriented and change-oriented organization which is open to input from other sources. Comprised of a younger group of professionals, the agency values contributions from academic research. After the entry phase of our project, the Assistant Director with whom we had

had contact was replaced by another person. This event created a climate of change conducive to establishing new procedures for continuous interchange with other agencies and researchers. Accumulated data from research such as ours can be incorporated into criteria for determining visual distraction by signs and used by the UTD in its inspection of intersections. Research such as ours may also lead to changes in regulatory signing (e.g., use of larger stop signs and highly reflective stop signs.

There was considerable accord between the UTD personnel and the project team liaison person on major values. Both groups valued the contributions of research to traffic safety and both agreed on a preventative philosophy. The key staff involved in the consultation were able to understand and discuss the technical research reports presented to them and generate several alternative strategies for utilization. They agreed with the idea that roadside signs may contribute to traffic hazards but that, because of minimal objective evidence available, more research is required before policy decisions are made. Thus there were no major resistances within the UTD to the dissemination and implementation of the psychological knowledge concerning environmental distractors. However, the influence of the commercial sign industry necessitates that policy decisions be made cautiously and with multiple sources of replicated evidence.

The discussions with key staff in the UTD concerning input from the APD produced considerable interest. Existing agency procedure includes responding to Police Department requests for inspections. The UTD expressed further interest in a regular format for receiving continuous input from the APD concerning its observations of the role of commercial distractors in accidents it investigates.

The APD is in a unique position with respect to distractors regulation. Police on patrol are probably in the best position to observe existing distractors; more importantly, they investigate at the scene of an accident and interview the participants. Thus they have much raw information concerning the role of distractors in accidents and potentially could provide even more. Nevertheless they have no formalized procedure either for documenting or for feeding in such information to the other components of the regulatory system. In fact, our contacts report that officers will revert to their own tactics of forceful

persuasion if they discover a particularly harmful distractor. The APD, like the UTD, recognizes the contributions of environmental distractors to accidents and is therefore amenable to utilizing supportive evidence of that fact to justify changes in its present procedures.

Current APD accident investigation forms do not include a section for noting the presence of environmental distractors at the scene, either by observation or by interview of participants (Appendix C). Their annual report of the contributing causes of accidents includes only the violation involved (Appendix B). These two instruments provide potential mechanisms for a regularized accumulation of data concerning distractors and accidents which could be systematically investigated with the assistance of research personnel. The results of such studies could then be forwarded to the UTD for inclusion in policy statements or in recommendations for changes in the City Code.

The Police Department is a paramilitary organization with a formal rank structure and chain-of-command. The division that is primarily responsible for traffic safety is the Traffic Section (see Figure 6). This section is primarily responsible for policy decisions concerning selective enforcement of traffic laws, accident investigations and prevention, and the handling of complaints involving traffic problems. The congruence between the values of the key staff and those of the project liaison person was high; and their understanding of the ideas presented was good, even though they hadn't conceptualized them in this form before. With a steadily rising rate of accidents in Austin, The APD staff's motivation for instituting impactive changes is high. Nevertheless, some staff members were somewhat pessimistic about instituting departmental changes because of the amount of time and energy it would take to continuously educate new police officers and remind existing police officers to be aware of distractors that contribute to accidents.

Although there was considerable congruence between objectives of the APD and those of the project liaison person, there was a slightly different emphasis in philosphy. The APD contacts tended to express the belief that

accidents were primarily caused by psychological, rather than environmental, distractors. In other words, APD personnel would contend that most people when they driver are "lost in thought" and are not really paying sufficient attention to their driving. This suggests the APD's preference for research on the effects of distractors. They would place public distractors in the driving environment to deliberately distract people back to the task of driving (e.g., by using speed bumps, groves in the roadways, and "idiot" bumps between lanes). Traffic Section personnel are pessimistic about getting drivers to change their habits withoug actually phsyically restructuring the driving environment to force people to drive safely.

In discussing the relationship between the UTD and the APD it became apparent that a feedback system of information about existing distractors and their role in accidents would be as welcome in the APD as in the UTD. The problem is not with the key personnel identified in the two agencies but resides within the communication lines between street officers and the Traffic Section itself. Information which reaches the Traffic Section is forwarded to the UTD for inspection and study, and the UTD has always responded promptly to these requests, sending a copy of their report to the Traffic Section and to the officer making the report. The problem is getting the officers and the dispatchers to report problems to the proper agencies. Often an officer will report a hazard by calling in over the radio rather than filling out papers on it. Frequently, dispatchers will send the reports to the wrong agencies (e.g., to the Department of Roads and Bridges, or to the Building Inspector, or to the State Highway Department) rather than to the UTD. The major need appears to be to educate both the officers and the dispatchers as to the proper places to send complaints.

Key personnel in both the UTD and the APD who are responsible for policies concerning distractors recognize that commercial signs and lights have accident-causing potential. The UTD has more flexibility and direct input with respect to changes in city policy, while the APD has greater access to raw data through its investigations of accidents. Both agencies, however, face considerable resistances, both external (commercial sign industry) and internal (poor APD communication flow from line patrolmen), which must be overcome before initiatives can be taken.

In order to overcome these obstacles, research such as ours must be replicated and demonstrated by multiple sources to be considered sufficient. With such evidence, these key personnel will act as advocates for appropriate change.

## VI. PROJECT EVALUATION RESULTS

As discussed above, the evaluation of the dissemination stage of this project was designed prior to project implementation. This facilitated a greater coordination of personnel with respect to the project's objectives and provided the logs of agency contacts with a reporting format which incorporated those goals. In this way, the first component of the evaluation could be smoothly carried out by matching the progress of the project as reported in the logs to the goals for that particular phase. The other major component of the evaluation involved the analysis of the questionnaires completed by key agency personnel concerning their appraisal of the present project. The following discussion is based on both these sources of evaluative information and is designed to provide an understanding of the consequences of this type of dissemination activity.

With the completion of the entry phase, key personnel in each agency had been identified. In addition, contact had been made with the Building Inspection Department to determine its role in the regulation of distractors. This contact provided sufficient information to reinforce our original supposition that the other agencies were the most appropriate targets for the dissemination of our research knowledge. Regular ongoing relationships were established with these key personnel on the basis of a common interest in past research and potential input for future research efforts.

Through these discussions, enough information concerning the organizational factors affecting utilization was compiled to permit decisions to be made concerning the appropriate form in which to disseminate the research knowledge. In addition, information about the whole system of distractors regulation was obtained and also compiled for dissemination. Continuous project team working sessions facilitated this compilation and analysis of utilization factors.

Following this analysis of the organizational readiness to receive research findings and the establishment of ongoing relationships, the determination was made to disseminate the actual research reports to the key personnel in each agency through informal meetings with their respective liaison person. This strategy was chosen in lieu

of a major workshop presentation involving a larger number of agency personnel because of the agencies' previous histories of utilizing research knowledge, their congruence in beliefs about distractors, and the specialized control over policy concerning distractors vested in these few key individuals.

This project could have simply performed a one-shot dissemination of a particular piece of research knowledge to relevant authorities. As such, the impact of this new knowledge would have suffered from the weak bargaining position of an outside research group. Instead, the present project attempted to set in motion an ongoing system-wide process in which research such as ours would play an important role. This process would include information being gathered from observations of intersections by the UTD and the APD and from interviews of accident participants by the APD about the contributions of distractors. Such raw information could then be systematically investigated by researchers, analyzed, compiled, translated, and disseminated to policy makers such as the UTD. The UTD would then incorporate this knowledge into criteria for determining the distraction potential of a sign or light, and these criteria could either be forwarded to the BID for its use in inspections and licensing or to the City Council for incorporation into the City Code.

This dissemination project made considerable progress towards initiating such an observation, research, policy implementation, and enforcement process. Our research results were able to stimulate key personnel in both the UTD and the APD to reconsider the effectiveness of current procedures with respect to commercial distractors. Our facilitative discussions encouraged these personnel to specify alternate ways in which such information could be implemented (e.g., as licensing criteria or as indicators of the need for larger or more reflective public traffic signs and signals). By providing them with information about other agencies in the regulatory system, key personnel were primed for further collaboration with these components. In particular, they were cued to specify and discuss the resistances to any policy or procedural changes and were able to identify certain blockages to their efforts.

The cumulative effects of these activities have yielded a heightened concern on the part of these two agencies for the importance of investigating environmental distractors and their role in accidents. In addition, their belief in the value of research knowledge has been reinforced. A measure of this belief is the considerable effort generated on their part to suggest areas

and dimensions for future research (reported in the following section). Another yield involves their increased concern for improving their collaborative efforts with other agencies, as expressed in their willingness to establish a regularized procedure for police input and UTD study.

The project team has successfully amassed considerable information concerning the responsibilities of these agencies within the total system of regulation of environmental distractors. We have, in addition, pinpointed several procedures within each agency which would be appropriate for implementing changes to incorporate this research knowledge. The key personnel have been identified and their readiness to incorporate such knowledge has been assessed. And our activities have demonstrated one possible approach to disseminating research knowledge. Further insight as to the effectiveness of the strategy chosen can be gained by examining the responses to the evaluation questionnaire.

The UTD personnel considered the evidence we presented to be useful for their efforts. For example, one staff member reported:

> Evidence concerning commercial sign distraction at stop signs is useful. It can serve as documentation of the need to better emphasize the importance of stop sign placement and regulation of adjacent commercial signing. Agency policy and procedure may be adjusted to better address these statements.

The APD personnel saw our evidence as most useful for other city agencies responsible for establishing enforcement policy. But they agreed that they could play a role in improving such research by having "specialized collision investigators" to recognize and compile important distractor dimensions.

Both agencies reported that the quality of their interactions with their project liaison person was high. As an example, one staff member said:

> Meetings with the project team representative have been quite favorable. He was cooperative and willing to assist us with our needs. Communication was clear and adequate to express goals of intended research and anticipated findings.

In one case, an APD contact expressed concern about his understanding of some of the statistical representations of the results in the research reports. While this was not an issue with the research-oriented personnel in the UTD, some personnel within the APD may be more effectively reached if summaries of research findings use alternate means of representing the probabilities of their findings.

No actual changes in procedures or policies were implemented during the short time span between the feedback of the research knowledge and the administration of the evaluation questionnaire. The potential for future actions appears stronger in the UTD, as reflected in their responses, than in the APD, the latter's position being more the product of realistic organizational resistances to procedural changes in training than a conflict with our evidence or presentation. Again, both agencies sympathasize with our view of the potential role of distractors in contributing to traffic accidents. But because of considerable administrative and political obstacles, they will require multiple sources of replicated evidence before they will effectively advocate any dramatic changes. However, it is important to note that these key personnel are willing to take an advocacy stand and are now primed for further collaboration with both researchers and other agencies to further such efforts.

## VII. RECOMMENDATIONS FOR FUTURE RESEARCH

Incorporated into the evaluation questionnaire was a request for specific suggestions as to topics for future research which would be potentially most useful to the respondents' agencies. While stimulating many energetic responses, the questionnaire was not the only source of input to future research efforts. Throughout our ongoing consultation with key personnel of both agencies, they continually identified areas of concern and specific dimensions or strategies which best matched their working appraisals of the phenomena. We took this as an indication of their interest in and enthusiasm for our project and others like it, and the consulting sessions became one of the central foci for our establishing common objectives.

Since neither agency is directly involved in enforcing standards concerning commercial signs and because of the political ramifications of more stringent restrictions on commercial signing, both agencies encouraged research into the positive uses of distractor dimensions. The most consistently novel suggestions generated by both agencies involved investigating the potential of various types of public signs or lights to "distract" the attention of the driver back to the business of driving. Examples of this type of suggestion include investigations into ways of increasing the visibility of regulatory signs and

lights by such means as increasing the size of the sign, using highly reflective signs, and attaching a back shield to traffic signals. Another example involves applying knowledge of visual distractors to making pavement markings more understandable.

Other suggestions involve the types of intersections that it would be important to investigate, including those that are highly developed commercially, those in residential areas still inside Highway 183, and those in rural areas surrounding the city. The three types of intersections, according to the APD differ in the amount of traffic flow they experience and the presence of background lighting. Intersections may also differ as to the number of cross streets and lanes of traffic entering them.

Additional concerns for future research expressed by the UTD and the APD cover a variety of related areas. Their interests for further collaboration center around investigations of the following:

- the angle of a light or sign with respect to the street
- the distraction properties of public regulatory signs and signals themselves, as when an intersection is "oversigned" or "overlighted" or when a traffic sign or signal intended to govern one lane can be seen by drivers in other lanes
- the effectiveness of a warning sign indicating that the driver is approaching a regulatory signal or sign, particularly in an area with many commercial distractors
- the durability of various signing materials, including those for pavement signing
- the costs involved in public signing: are there more economical yet effective materials?
- the absence of signs prior to an intersection ("reduced stimulation") contributing to the driver's being unprepared to react to the traffic signal
- the importance of "dynamic" commercial signs, e.g., those with flashing lights and/or moving parts, in distracting drivers' attention away from traffic signals
- the relationship of the extent of distraction and the severity of the collision in terms of financial damage and the number and extent of injuries (this latter data being available from an officer's field report)
- midblock collisions, usually rear-end collisions, which may involve a greater contribution by commercial distractors.

APPENDIX A

EVALUATION QUESTIONNAIRE

This questionnaire is designed to provide our project team and the Office of Traffic Safety with feedback concerning the value of your meetings with our project team representative. We have attempted to stimulate interest in and solicit suggestions for the investigation of distractors through an exchange centered around our pilot study results. Your input will enhance the usefulness of future investigations by this project team and others. We wish to express our appreciation for the time and interest you have shared with our project team representative.

Distractors Research Project
Department of Psychology
University of Texas at Austin

1. Please comment on the usefulness to your agency of the information provided by our project team representative. Include such things as the understandability, relevance, and practical applicability of this information. Are any changes in policy or procedure likely to occur as a result of this information being made available?

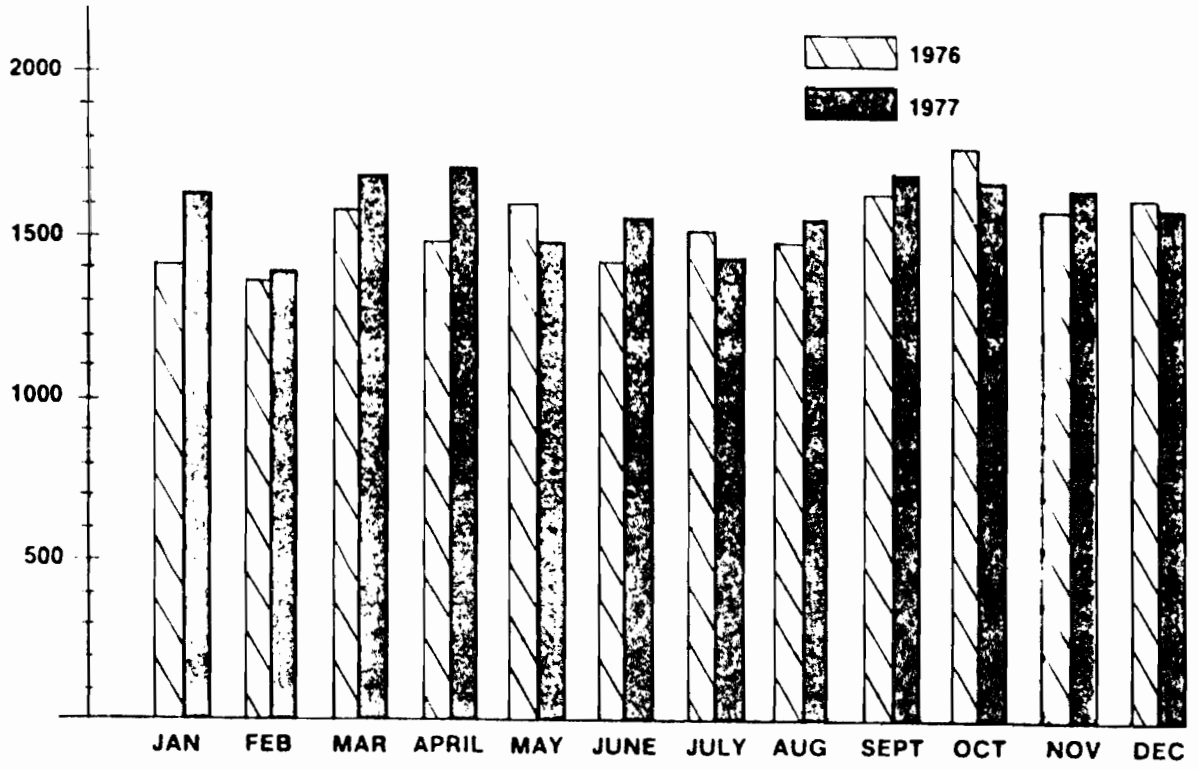
2. Please comment on your impressions of the meetings you've had with our project team representative. Include such things as the extent of cooperation, clarity of communication, and responsiveness to agency concerns.

3. Please indicate your suggestions as to strategies for determining additional areas of research and appropriate means of disseminating the results of that research to maximize its potential usefulness for your agency's activities (include actual areas of research you'd like to see explored).


# 1977 Annual Statistical Report

# Traffic

## Total Motor Vehicle Collisions By Month




| | 1976 | 1977 | Percent Change |
|---|---|---|---|
| Persons Killed | 33 | 42 | +27.3% |
| Persons Injured | 5,702 | 5,950 | + 4.3 |
| Pedestrians Killed | 8 | 8 | None |
| Pedestrians Injured | 145 | 190 | +31.0 |
| Fatal Collisions | 32 | 40 | +25.0 |
| Injury Collisions | 3,852 | 4,132 | + 7.3 |
| Property Damage Collisions | 14,167 | 14,455 | + 2.0 |
| Total Major Collisions | 18,051 | 18,627 | + 3.2 |
| Moving Violation Citations | 70,172 | 79,887 | +13.8 |
| Parking Violation Citations | 198,538 | 207,323 | + 4.4 |
| Warning Violation Citations | 33,822 | 45,266 | +33.8 |

# Moving Violation Arrests And Citations

| Offense | 1976 | 1977 |
|---|---|---|
| Violations Contributing to Collisions | 9,087 | 9,216 |
| Speeding | 20,645 | 22,680 |
| Fail to Yield Right of Way | 2,785 | 2,954 |
| Wrong Way on One Way | 507 | 681 |
| Illegal Overtaking | 744 | 847 |
| Stop Sign | 2,310 | 2,782 |
| Traffic Signal | 5,480 | 6,317 |
| Following too Closely | 123 | 143 |
| Illegal Turns | 4,325 | 4,940 |
| Other Hazardous | 480 | 461 |
| Driving While Intoxicated (DWI) | 1,592 | 1,666 |
| Illegal Lights | 204 | 252 |
| Illegal Brakes | 151 | 106 |
| Other Non-Hazardous | 30,667 | 35,846 |
| Driving While License Suspended (DWLS) | 150 | 207 |
| Parking: Police | 48,202 | 32,007 |
| Parking: Parkaidettes | 129,358 | 144,647 |
| Parking: Other | 20,978 | 30,669 |
| Warnings | 33,822 | 45,266 |
| Others | 9 | 5 |
| Totals | 302,532 | 332,476 |

# Contributing Circumstances

| | 1976 | | 1977 | |
|---|---|---|---|---|
| Speeding over limit | 18,122 | 46.5% | 18,699 | 43.0% |
| Speeding under limit, unsafe | 2,523 | 6.5 | 3,981 | 9.2 |
| Right of Way to Vehicle | 2,785 | 7.2 | 2,954 | 6.8 |
| Disregard Stop Sign, Light | 2,310 | 5.9 | 2,782 | 6.4 |
| Disregard Stop and Go Signal | 5,480 | 14.1 | 6,317 | 14.5 |
| Disregard Flashing Yellow | 0 | .0 | 0 | .0 |
| Improper Turn Violations | 4,325 | 11.1 | 4,940 | 11.4 |
| Wrong Side Not Passing | 206 | .5 | 282 | .6 |
| Wrong Way on One Way Road | 301 | .8 | 399 | .9 |
| Following too Closely | 118 | .3 | 143 | .3 |
| Overtaking and Passing | 306 | .8 | 188 | .4 |
| Passing in No Passing Zone | 187 | .5 | 314 | .7 |
| Other Illegal Passing | 235 | .6 | 345 | .8 |
| No Signal or Wrong Signal | 55 | .1 | 62 | .1 |
| Improper Start from Parked | 212 | .5 | 204 | .5 |
| Fail to Yield to Pedestrian | 7 | .0 | 9 | .0 |
| Improper Parking | 0 | .0 | 0 | .0 |
| Driving under Influence | 1,592 | 4.1 | 1,666 | 3.8 |
| Other Violations | 212 | .5 | 191 | .5 |
| | 38,976 | 100.0% | 43,476 | 99.9% |

## Collisions

| | | |
|---|---|---|
| Fatal Collisions | 40 | .2% |
| P.I. Collisions | 4,132 | 21.8 |
| P.D. Collisions | 14,455 | 76.3 |
| Total Major Collisions | 18,627 | 98.3 |
| Total Minor Collisions | 311 | 1.6 |
| Total All Collisions | 18,938 | 99.9% |
| | | |
| Collisions Arrest Made | 9,267 | 49.8% |
| Collisions No Arrests | 9,360 | 50.2 |
| Total Collisions | 18,627 | 100.0% |

## Enforcement

| | | |
|---|---|---|
| DWI Arrests | 1,666 | 1.4% |
| Other Hazardous | 41,810 | 34.4 |
| Total Hazardous | 43,476 | 35.8 |
| Non-Hazardous | 32,811 | 27.0 |
| Total Warnings | 45,266 | 37.2 |
| Total Traffic | 121,553 | 100.0% |

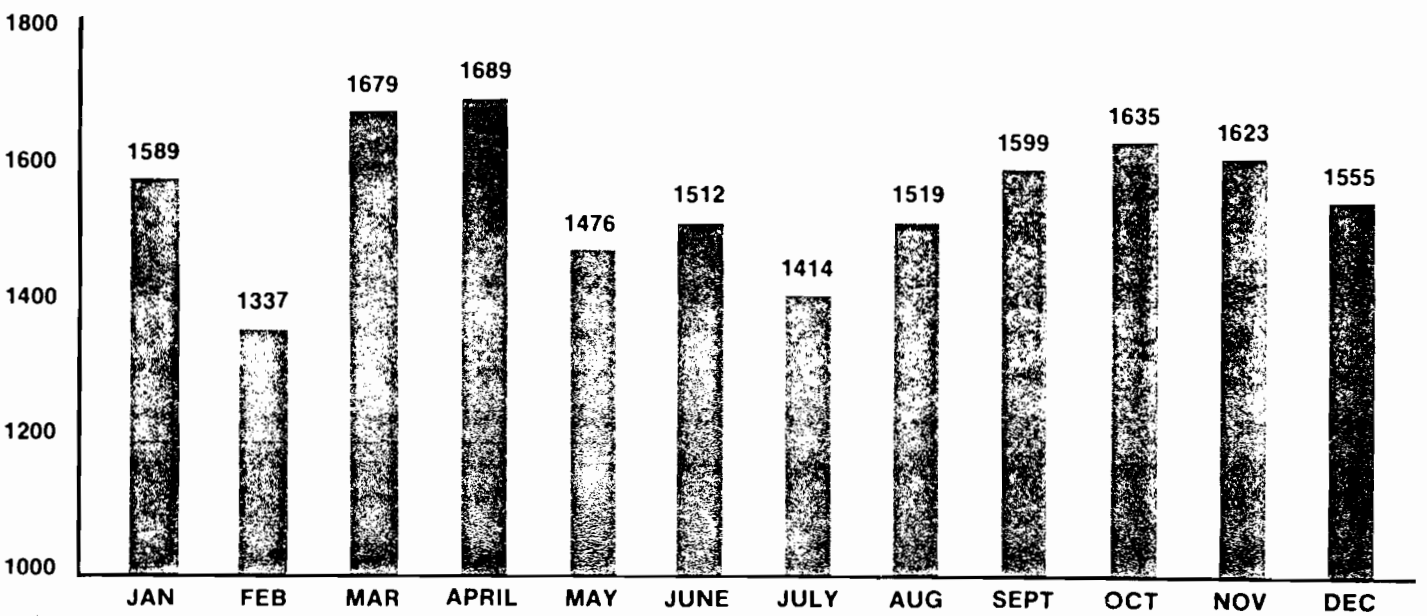
## Age Of Drivers (Male And Female)

| | | | | |
|---|---|---|---|---|
| 25-34 | 9,498 | 28.5% | 13,303 | 30.6% |
| 20-24 | 8,413 | 25.3 | 13,627 | 31.3 |
| 35-44 | 3,539 | 10.6 | 4,127 | 9.5 |
| 45-54 | 2,436 | 7.3 | 2,486 | 5.7 |
| 18-19 | 2,758 | 8.3 | 4,632 | 10.7 |
| 55-64 | 1,942 | 5.8 | 1,637 | 3.8 |
| Not Stated | 1,750 | 5.2 | 490 | 1.1 |
| 65-74 | 1,116 | 3.4 | 867 | 2.0 |
| 17 | 896 | 2.7 | 1,366 | 3.1 |
| 75 Yrs. and Over | 424 | 1.3 | 314 | .7 |
| 16 | 437 | 1.3 | 522 | 1.2 |
| 15 Yrs. and Under | 94 | .3 | 101 | .2 |
| Total | 33,303 | 100.0% | 43,472 | 99.9% |

## Race And Sex

| | | | | |
|---|---|---|---|---|
| White Male | 15,010 | 45.1% | 24,052 | 55.3% |
| White Female | 9,035 | 27.1 | 10,082 | 23.2 |
| Black Male | 2,568 | 7.7 | 3,207 | 7.4 |
| Black Female | 1,235 | 3.7 | 1,253 | 2.9 |
| Mexican American Male | 2,554 | 7.7 | 3,251 | 7.5 |
| Mexican American Female | 1,061 | 3.2 | 924 | 2.1 |
| Other Male | 178 | .5 | 371 | .9 |
| Other Female | 63 | .2 | 67 | .1 |
| Unknown | 1,599 | 4.8 | 265 | .6 |
| Total | 33,303 | 100.0% | 43,472 | 100.0% |

## Collisions By Month



# APPENDIX C

AUSTIN POLICE DEPARTMENT
ACCIDENT REPORTING FORMS

OFFENSE NO. _____

# COLLISION REPORT

*Use only black ink or pencil in completing this form.* _____ Copy to D.P.S.

**PLACE WHERE COLLISION OCCURRED** — COUNTY of TRAVIS, CITY of AUSTIN — Major ☐ Minor ☐

**DO NOT WRITE IN THIS SPACE**

Local No. _____
DPS No. _____
Loc. _____
Fat. Rec. _____ Dr. Rec. _____
Code _____ Severity _____
Type _____

ROAD ON WHICH COLLISION OCCURRED _____ (Block Number / Street or Road Name / Route Number) Under Const. ☐ Yes ☐ No Speed Limit _____

Check and complete one only:
AT ITS INTERSECTION WITH _____ (Street or Road Name / Route Number) Under Const. ☐ Yes ☐ No Speed Limit _____
IF NOT AT INTERSECTION _____ feet ☐ North ☐ S ☐ E ☐ W of _____
Show milepost or nearest intersecting numbered highway. If urban, show nearest intersecting street or reference point.

**DATE OF COLLISION** _____ 19____ Day of Week _____ Hour _____ ☐ A.M. ☐ P.M. If exactly noon or midnight, so state.

## UNIT NO. 1 — MOTOR VEHICLE

YEAR MODEL _____ COLOR & MAKE _____ MODEL NAME _____ BODY STYLE _____ VEH. IDENT. NUMBER _____ LICENSE PLATE Year _____ State _____ Number _____

OPERATOR'S NAME _____ (Last / First / Middle / Address / City / State) OCCUPATION _____

OPERATOR'S LICENSE _____ (State / No. / Type / Restrictions) DATE OF BIRTH _____ SEX _____ RACE _____ Was driver or passenger in this vehicle injured? ☐ Yes ☐ No If answer is yes, complete data on back side.

BUSINESS ADDRESS _____ RES. PHONE _____ BUS. PHONE _____

OWNER'S NAME _____ (Last / First / Middle / Address / City / State) DAMAGE RATING _____ If damage rating 4 or more, complete back side.

## UNIT NO. 2 — MOTOR VEHICLE, TRAIN, PEDALCYCLIST, PEDESTRIAN, TOWED OR OTHER. INDICATE WHICH _____

(If pedestrian or cyclist injured, show data on back).

YEAR MODEL _____ COLOR & MAKE _____ MODEL NAME _____ BODY STYLE _____ VEH. IDENT. NUMBER _____ LICENSE PLATE Year _____ State _____ Number _____

OPERATOR'S NAME _____ (Last / First / Middle / Address / City / State) OCCUPATION _____

OPERATOR'S LICENSE _____ (State / No. / Type / Restrictions) DATE OF BIRTH _____ SEX _____ RACE _____ Was driver or passenger in this vehicle injured? ☐ Yes ☐ No If answer is yes, complete data on back side.

BUSINESS ADDRESS _____ RES. PHONE _____ BUS. PHONE _____

OWNER'S NAME _____ (Last / First / Middle / Address / City / State) DAMAGE RATING _____ If damage rating 4 or more, complete back side.

## DAMAGE TO PROPERTY OTHER THAN VEHICLES

DOLLAR DAMAGE ESTIMATE $ _____

Object _____ Name and address of owner _____ How damaged _____ Feet from curb _____

## DESCRIBE WHAT HAPPENED

Describe Weather _____
Describe Road and Surface Condition _____
Light Condition _____
Type of Traffic Control _____
If Not Operative, Explain _____

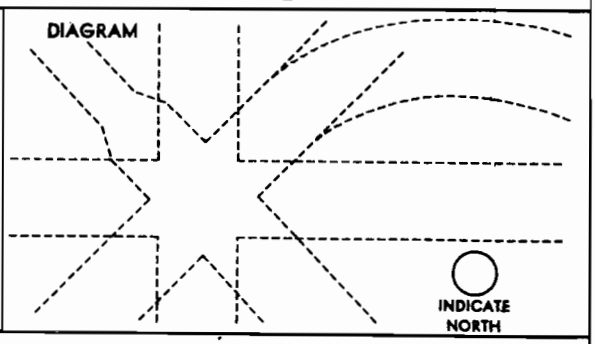
In your opinion, was damage to any one person's property $250 or more? Yes ☐ No ☐

## FACTORS CONTRIBUTING TO ACCIDENT (OFFICER'S OPINION)

(Check for each driver above)

| | Driver 1 | Driver 2 |
|---|---|---|
| 1 Speeding over limit | ☐ | ☐ |
| 2 Speed under limit-unsafe | ☐ | ☐ |
| 3 Fail to Yield ROW to Vehicle | ☐ | ☐ |
| 4 Disregard Stop Sign or Light | ☐ | ☐ |
| 5 Disregard Stop and Go Signal | ☐ | ☐ |
| 6 Disregard Flashing Yellow Signal | ☐ | ☐ |
| 7 Improper turn-wide right | ☐ | ☐ |
| 8 Improper turn-cut corner on left | ☐ | ☐ |
| 9 Improper turn-wrong lane | ☐ | ☐ |
| 10 Wrong side-not passing | ☐ | ☐ |
| 11 Wrong way 1 way road | ☐ | ☐ |
| 12 Following too closely | ☐ | ☐ |
| 13 Overtake and pass insufficient clear | ☐ | ☐ |
| 14 Pass in no Passing Zone | ☐ | ☐ |
| 15 All other improper passing | ☐ | ☐ |
| 16 No signal or wrong signal of intent | ☐ | ☐ |
| 17 Improper start from parked position | ☐ | ☐ |
| 18 Fail to yield ROW to pedestrian | ☐ | ☐ |
| 19 Improper parking | ☐ | ☐ |
| 20 Under influence ☐ alcohol ☐ drugs | ☐ | ☐ |
| 21 Defective brakes | ☐ | ☐ |
| 22 Defective lights | ☐ | ☐ |
| 23 Other Defective equipment | ☐ | ☐ |
| 24 Other factors _____ | ☐ | ☐ |

## DIAGRAM




## POLICE ACTIVITY

SHOW ARRESTS AND CHARGES

Name _____ (Last / First / Middle) Charge _____ Ticket Number _____ Type Alcohol Test _____

Name _____ (Last / First / Middle) Charge _____ Ticket Number _____ Type Alcohol Test _____

Time notified of accident _____ (Date / Hour) M How _____ Time arrived at scene of accident _____ (Date / Hour) M

SIGNATURE _____ (Investigator's name and Ident. No. / Department) Date report made _____ Is report complete? ☐ Yes ☐ No

PD 0039 REV. 11/77

**UNIT NO. 1**

DAMAGE RATING

VEHICLE REMOVED TO

BY

☐ Request
☐ Rotation
☐ Slip Signed

**CODE FOR INJURY SEVERITY**
(Use only the most serious one in each space for injury.)
K — Killed
A — Serious visible injury, as deep, bleeding wound, distorted member, etc.
B — Minor visible injury, as bruises, abrasions, swelling, limping, etc.
C — No visible injury but complaint of pain or momentary unconsciousness.
O — Uninjured.

| ITEM NO. | SEAT POSITION | OCCUPANTS NAMES (Show Last Name First) | ADDRESS | State Yes or No: HEAD REST | STRAP USED | BELT USED | AGE | SEX | INJURY CODE |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Front Left | Driver, See Front | | | | | | | |
| 2 | Front Center | | | | | | | | |
| 3 | Front Right | | | | | | | | |
| 4 | Rear Left | | | | | | | | |
| 5 | Rear Center | | | | | | | | |
| 6 | Rear Right | | | | | | | | |

**UNIT NO. 2**
(Complete only if Unit No. 2 was a motor vehicle.)

DAMAGE RATING

VEHICLE REMOVED TO

BY

☐ Request
☐ Rotation
☐ Slip Signed

| ITEM NO. | SEAT POSITION | OCCUPANTS NAMES (Show Last Name First) | ADDRESS | State Yes or No: HEAD REST | STRAP USED | BELT USED | AGE | SEX | INJURY CODE |
|---|---|---|---|---|---|---|---|---|---|
| 7 | Front Left | Driver, See Front | | | | | | | |
| 8 | Front Center | | | | | | | | |
| 9 | Front Right | | | | | | | | |
| 10 | Rear Left | | | | | | | | |
| 11 | Rear Center | | | | | | | | |
| 12 | Rear Right | | | | | | | | |

COMPLETE IF CASUALTIES NOT IN MOTOR VEHICLE

| | PEDESTRIAN, BICYCLIST, ETC. | CASUALTY NAME (Show Last Name First) | CASUALTY ADDRESS | AGE | SEX | INJURY CODE |
|---|---|---|---|---|---|---|
| 13 | | | | | | |
| 14 | | | | | | |

**DISPOSITION OF KILLED AND INJURED**

| ITEM NUMBERS | TAKEN TO | BY |
|---|---|---|
| | | |
| | | |
| | | |

IF AMBULANCE USED SHOW — Time Ambulance Driver Notified ____ M — Time arrived at Scene ____ M — Number of Ambulance Attendants Incl. Driver ____

# AUSTIN POLICE DEPARTMENT COLLISION CASUALTY SUPPLEMENT

## COLLISION IDENTIFICATION (Copy information in this section exactly as shown on Basic Report)

COUNTY of TRAVIS, CITY of AUSTIN

Road on which Collision Occurred ..... Date of collision ..... 19 ..... Hour ..... ☐ AM ☐ PM

Unit No 1 Operator ..... Last ..... First ..... Middle ..... License Plate .....

## SECTION I - MOTOR VEHICLE COLLISION DEATH (Driver or Passenger in Passenger or Truck Type Vehicle)

Name of Person Killed ..... Last ..... First ..... Middle ..... In Unit No. .....

Date of Death ..... 19 ..... Hour ..... ☐ AM ☐ PM Ejected from vehicle .....

Describe injuries .....

Part of vehicle causing injury .....

Blood sample taken? ☐ Yes ☐ No Blood sample sent to .....

## SECTION II - MOTORCYCLE OR MOTORSCOOTER CASUALTIES (Deaths or injuries)

Name of Casualty ..... Last ..... First ..... Middle ..... ☐ Operator ☐ Possenger

If killed, date of death ..... Describe injuries .....

Color shirt or coat ..... Color trousers or skirt ..... Was Helmet worn? ☐ Yes ☐ No Was Helmet damaged? ☐ Yes ☐ No

Type of eye protective device ..... Color of lens or shield ..... Equipped with: Crash bars? ☐ Yes ☐ No Wind-shield? ☐ Yes ☐ No Footrest for this casualty? ☐ Yes ☐ No

Blood sample taken? ☐ Yes ☐ No Blood sample sent to .....

## SECTION III - PEDESTRIAN CASUALTIES (Deaths or injuries)

Name of Casualty ..... Last ..... First ..... Middle ..... If killed, date of death .....

WHAT PEDESTRIAN WAS DOING

Pedestrian was going ☐ N ☐ S ☐ E ☐ W ☐ Along ☐ Across or into From ..... (Street name, highway No.) To ..... (N.E. corner to S.E. corner, or west to east side, etc.) If not in roadway explain .....

1. ☐ Crossing or entering at intersection
2. ☐ Crossing or entering not at intersection
3. ☐ Getting on or off vehicle
4. ☐ Walking in roadway with traffic
5. ☐ Walking in roadway against traffic
6. ☐ Hitch-hiking in roadway
7. ☐ Standing in roadway
8. ☐ Pushing or working on vehicle
9. ☐ Other working in roadway
10. ☐ Playing in roadway
11. ☐ Other in roadway
12. ☐ Not in roadway

Describe injuries .....

Color shirt or coat ..... Color trousers or skirt .....

Pedestrian condition ..... Pedestrian drinking? ☐ Yes ☐ No

Blood sample taken? ☐ Yes ☐ No Blood sample sent to .....

## SECTION IV - OTHER CATEGORY DEATH (Road mochinery, bicyclist, standing on porch, go-cart, etc.)

Name of Person Killed ..... Last ..... First ..... Middle ..... Category ..... Date of Death .....

**SIGNATURE** ..... Investigator's rank and name or # ..... Division ..... AUSTIN POLICE DEPARTMENT UNIT # ..... Date report made .....

PD-0040

**TOTAL VEHICLE DAMAGE $**_____

| WITNESS NAME | ADDRESS | PHONE |
|---|---|---|
| 1. | | |
| 2. | | |
| 3. | | |
| 4. | | |
| 5. | | |

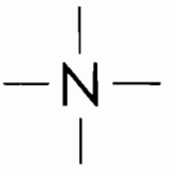
WITNESS DESCRIPTION OF WHAT HAPPENED:

DRIVER'S DESCRIPTION OF WHAT HAPPENED:

OFFICER'S NOTES:

## COLLISION DIAGRAM

(Name All Streets)




10 100

10 10

100 100

10 100

| 1 Skid Marks |
|---|
| To Impact |
| From Impact |
| Out from Curb |
| To Intersection |
| **2** |
| To Impact |
| From Impact |
| Out from Curb |
| To Intersection |

**Point of Impact**

#1 Driver_____

#2 Driver_____

#3 Driver_____

AUSTIN POLICE DEPARTMENT — SUPPLEMENTARY REPORT (FIELD) — APD 1-1-64-11

| 1. OFFENSE NO. | 2. OFFENSE REPORTED | 3. CLASSIFICATION AFTER INVESTIGATION | |
|---|---|---|---|
| 4. ORIGINALLY CLASSIFIED AS | 5. VICTIM'S NAME | 6. ADDRESS | 7. DATE REPORTED |

8. NARRATIVE: RECORD HERE ALL DEVELOPMENTS IN THE CASE SUBSEQUENT TO THE SUBMISSION OF THE LAST REPORT. DESCRIBE ANY PROPERTY RECOVERED, NAMES AND ARREST NUMBERS OF ANY PERSONS ARRESTED. IF OFFENSE CLASSIFICATION IS CHANGED EXPLAIN WHY. INDICATE CLEARLY DISPOSITION OF PROPERTY RECOVERED.

9. STATUS (CHECK ONE) CLEARED BY ARREST ( ) UNFOUNDED ( ) EXCEPT. CLEARED ( ) CLEARED CITATION ( ) NOT CLEARED ( )

10. FURTHER POLICE ACTION AND REPORT REQUIRED (CHECK ONE) YES ( ) NO ( )

| REPORTING OFFICER | EMP.# | REPORTING OFFICER | EMP.# | TIME & DATE OFFICER'S REPORT RECEIVED IN CENTRAL REC. |
|---|---|---|---|---|
| | | | | |

| NAME OF SUP. OFFICER APPROVING REPORT | EMP.# | TIME & DATE APPROVED | NAME C.R. CLERK RECEIVING OFFICERS REPT. | EMP.# |
|---|---|---|---|---|
| | | | | |

PD 0011

AUSTIN POLICE DEPARTMENT MISCELLANEOUS INCIDENT REPORT

| 1. CASE NO. | 2. WHERE COMMITTED | 3. CAR |
|---|---|---|
| | | |

4. NATURE OF CALL (OR INCIDENT)
Collision (Private Property)

5. REPORTED BY
PERSON( ) SIGHT( )
PHONE ( ) RADIO( )
LETTER( )

6. VICTIM OR COMPLAINANT ADDRESS PHONE

7. REPORTED BY (OTHER THAN COMPLAINANT ADDRESS PHONE

12. NARRATIVE: (SUSPECT OR REMARKS) DESCRIBE INCIDENT REPORTED - OR DISCOVERED
GIVE NAMES & ADDRESSES OF PERSONS INTERVIEWED.

8. DATE & TIME COMMITTED

Veh. #1 Year Model License Plate Driver's License

9. RECEIVED BY EMP NO.

Driver Address

10. DATE & TIME RECEIVED

Owner Address

11. DATE & TIME OFFICER ARR.

Veh. #2 Year Model License Plate Driver's License

TOTAL VEHICLE DAMAGE: $

Driver Address

Owner Address

Describe what happened:

| REPORTING OFFICER | EMP.# | REPORTING OFFICER | EMP.# | TIME & DATE OFFICER'S REPORT RECEIVED IN CENTRAL REC. |
|---|---|---|---|---|
| | | | | |

| NAME OF SUP. OFFICER APPROVING REPORT | EMP.# | TIME & DATE APPROVED | NAME C.R. CLERK RECEIVING OFFICERS REPT. | EMP.# |
|---|---|---|---|---|
| | | | | |

PD 0010A

DRIVER'S CONFIDENTIAL ACCIDENT REPORT - FORM ST-2 (Rev. 8/29/77) TEXAS DEPARTMENT OF PUBLIC SAFETY

# PLEASE READ INSTRUCTIONS ON REVERSE SIDE

**LOCATION**

**PLACE WHERE ACCIDENT OCCURRED** County ..... City or Town .....

If accident was outside city limits, indicate distance from nearest town ..... miles ☐ North ☐ S ☐ E ☐ W of ..... City or Town

ROAD ON WHICH ACCIDENT OCCURRED ..... Block Number ..... Street or Road Name ..... Route Number ..... Under Const. ☐ Yes ☐ No Speed Limit .....

Complete one — INTERSECTING STREET ..... Block Number ..... Street or Road Name ..... Route Number ..... Under Const. ☐ Yes ☐ No Speed Limit .....

— NOT AT INTERSECTION ..... feet ☐ North ☐ S ☐ E ☐ W of .....

Show milepost or nearest intersecting numbered highway. If urban, show nearest intersecting street or reference point.

**DO NOT WRITE IN THIS SPACE**

DPS No. .....

Loc .....

Code .....

Severity .....

Type .....

**TIME**

Date of Accident ..... 19 .. Day of Week ..... Hour ..... ☐ A.M. ☐ P.M. If exactly noon or midnight, so state

**VEHICLES**

**YOUR VEHICLE**

Were you towing a trailer? ..... (Yes or No) If Yes, Type .....

Year Model ..... Make ..... (Ford, Chev., etc.) Type of Vehicle ..... (sedan, pickup, truck, etc.) License Plate ..... Year ..... State ..... Number .....

Owner ..... Name ..... Mail Address ..... City and State ..... Zip .....

Driver ..... Name ..... Mail Address ..... City and State ..... Zip .....

Driver's License ..... State ..... Number ..... Date of Birth ..... Sex ..... Race ..... (White, Black, etc.) Occupation ..... (Carpenter, doctor, sales clk.)

Driving Experience ..... Years — Speed you were driving when you first saw you might have this accident ..... m.p.h. — What was the speed limit? ..... m.p.h.

Approx. cost to repair your vehicle $ .....

**OTHER UNIT** — Motor Vehicle, Train, Pedestrian, Bicyclist, etc. - indicate which .....
(Complete information you have available - if unknown, mark "NOT KNOWN")

For Other Vehicles Use Another Form

Total Vehicles Involved

Year Model ..... Make ..... (Ford, Chev., etc.) Type of Vehicle ..... (sedan, pickup, truck, etc.) License Plate ..... Year ..... State ..... Number .....

Owner ..... Name ..... Mail Address ..... City and State ..... Zip .....

Driver ..... Name ..... Mail Address ..... City and State ..... Zip .....

Approx. cost to repair this vehicle $ .....

**DAMAGE TO PROPERTY OTHER THAN VEHICLES** ..... Name object, show ownership, and state nature of damage

Approximate cost to repair $ .....

**CASUALTIES**

**NO. 1** (Show only pedestrians or persons injured in your vehicle)

Name ..... Address ..... Age ..... Sex ..... Race ..... Was person killed? ..... Date of Death .....

Describe injury .....

☐ Driver ☐ Passenger ☐ Right Front ☐ Right Rear ☐ Center Rear ☐ Left Rear

Seat Belt ☐ Used ☐ Not Used

☐ Pedestrian

**NO. 2**

Name ..... Address ..... Age ..... Sex ..... Race ..... Was person killed? ..... Date of Death .....

Describe injury .....

☐ Driver ☐ Passenger ☐ Right Front ☐ Right Rear ☐ Center Rear ☐ Left Rear

Seat Belt ☐ Used ☐ Not Used

☐ Pedestrian

**STATE BRIEFLY WHAT HAPPENED** (IF SPACE IS INSUFFICIENT CONTINUE ON ANOTHER PAGE)

★ DRIVER'S SIGNATURE ..... Date of report .....

**IMPORTANT! COMPLETE REQUIRED INSURANCE INFORMATION ON OTHER SIDE**

## PLEASE READ ALL INSTRUCTIONS CAREFULLY

**THIS FORM CONTAINS TWO SEPARATE REPORTS WHICH WILL BE DESTROYED AFTER COMPLETION OF ALL PROCESSING**

These reports must be completed and forwarded, in accordance with the instructions below, within ten (10) days after an accident which resulted in injury to or death of any person, or damage to the property of any person, including himself, to an apparent extent of at least Two Hundred Fifty ($250.00) Dollars. This requirement applies without regard to the number of vehicles involved or who suffered the injury or damage.

### INSTRUCTIONS FOR COMPLETING DRIVER'S CONFIDENTIAL ACCIDENT REPORT (FORM ST-2)

(On other side of this form)

NOTE: The Driver's Confidential Accident Report (Form ST-2) is classified by law as privileged and for confidential use in accident prevention purposes.

1. The report on the other side of this sheet should be prepared and signed by the driver, if possible, as the intent of the report is to correlate the information provided by the driver with other data to establish the factors involved in the accident. If the driver is unable to make the report because of injuries or for other valid reasons, the report may be submitted by another person with a notation as to the reason the driver could not report.
2. Print all names and addresses. Include sufficient information for "Location" and "Time" so that exact date and place of accident may be determined. Answer all questions to the best of your knowledge. If unable to answer any question, mark "not known."
3. If the "other unit" is a pedestrian, bicycle, train or other non-motor vehicle, please specify and show the name of pedestrian, bicyclist, etc. on line labeled "Driver."
4. If accident involved a fixed object, describe it fully, show its exact location and state whether it was protected by flags, painting and/or lights.
5. The narrative description of the accident should contain a brief statement of the facts regarding the accident. If additional space is needed, use a full size sheet of paper for continuation.
6. An accurate original signed report will avoid the necessity for a supplemental report.

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### TEXAS MOTOR VEHICLE ACCIDENT INSURANCE INFORMATION (FORM SR-21) Rev. 8-77

### IMPORTANT

NOTE: Under certain conditions the Texas Motor Vehicle Safety-Responsibility Act (V.C.S. 6701h) requires suspension of driver's license, registration receipts and license plates of uninsured motorists involved in motor vehicle accidents resulting in bodily injury or death, or damages to the property of any one person of at least $250.00. The Accident Insurance Information (Form SR-21) is a public document.

1. This report may be prepared and signed by either the driver or owner of the involved vehicle.
2. Accurate, complete reporting of at least minimum liability insurance coverage will avoid additional correspondence and prevent possible suspension of your driving and registration privileges.
3. If garage estimates are attached to non-injury accidents, processing will be expedited.

DID YOU HAVE AT LEAST $10,000/20,000 BODILY INJURY AND $5,000 PROPERTY DAMAGE LIABILITY INSURANCE IN EFFECT ON THE DATE OF THE ACCIDENT? ☐ Yes ☐ No

If the above is answered "Yes" answer all the items in the box below.

Date of Accident ..... Place of Accident ..... City or Town ..... County

Make of Vehicle Involved in Accident ..... Year ..... Type ..... Vehicle Identification No. .....

..... Owner's Name .....

Name of Your Liability Insurance Co. (Not the Agent)

Owner's Address .....

Policy No. ..... Driver's Name .....

☐ Owner
☐ Driver

..... Driver's Address .....

Usual Signature

If your vehicle was operating under Texas Railroad Commission Carrier Authority, give No. _____

When completed, mail this form to:

STATISTICAL SERVICES BUREAU
TEXAS DEPARTMENT OF PUBLIC SAFETY
BOX 4087, AUSTIN, TEXAS 78773

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Holahan is the author of many articles on psychological effects of envionmental change and on environmental influences on behavior. He has presented papers at meetings of the Eastern Psychological Association, the Southwestern Psychological Association, and the American Psychological Association.

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