

**SPECIAL ACCIDENT INVESTIGATION  
STUDIES: THE ROLE OF  
ALCOHOL/DRUG INVOLVEMENT**

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Special Accident Investigation Studies:

The Role of Alcohol/Drug Involvement

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## ABSTRACT

The NHTSA is sponsoring special accident investigation studies on the alcohol/drug involvement problem in the cities of Albuquerque, Baltimore, and Boston. These studies are in coordination with ongoing ASAP projects in each of the three cities. The first year's effort at Boston is described. A total of 50 accidents involving a fatality during an 8-month period in the Boston ASAP area were investigated. A Human Factors Index (HFI) was determined via interviews, records, and questionnaires on each driver designated to be "at-fault" in the accident. A hypothetical "modal" operator is described based upon the entire sample. Results discussed include: 42% of the focal operators were under the influence of alcohol at the time of the crash; 60% of the focal operators indicated chronic risk taking behaviors; 62% of the alcohol involved operators were considered to be "problem drinkers." Implications pointed to new areas of possible identification criteria for the Boston ASAP. A proposed two-year continuation of the study is described.

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THE FEDERAL GOVERNMENT, under the auspices of the National Highway Traffic Safety Administration (NHTSA), for the past five years has been sponsoring and conducting in-depth accident investigation research (1).<sup>#</sup> This basic accident research involves the investigation of crash events, plus the generation, collection, reporting, compiling and analysis of all the transient and permanent data associated with, or deemed important to, the crash event. A multidisciplinary approach has been taken with these accident studies involving teams of experts from all realms of highway safety. The objectives of the research teams are to determine all of the factors which cause or contribute to the initiation of, and the injuries involved in, these real-world accidents (Figure 1). Once these facts have been utilized to better understand the mechanisms and system failures in these accidents, appropriate countermeasures can be tested and implemented.

At present, there are 16 accident investigation studies being conducted by the NHTSA. All of these studies utilize the multidisciplinary approach (Figure 2), however, many of them differ in emphasis, scope, complexity and objectives. In the first few years of the federal effort, each of the study teams merely investigated, on an intensive basis, a select sample of 30 to 40 accidents per year. Their objectives were to research and report upon all of the mechanisms, factors, catalysts, etc. that could be identified or discovered in these accidents. As trends developed from these reports, the federal government was able to set certain priorities to countermeasure developments and issue safety standards in an effort to alleviate some of the system failures in these accidents. However, more basic, statistically controlled studies were needed in certain areas to provide a clearer picture on complex or controversial problems. Thus, many of the general multidisciplinary accident studies were converted to what are now called special studies, focusing upon certain problem areas in need of special emphasis (Figure 3). Statistical studies, including data collection and analysis on three levels of investigation, were also initiated. These tri-level studies (as they are labeled) place a "glass dome" over certain study areas and look at the accident picture compared to all the exposure information available in the area (i.e., total number of accidents; information on all registered drivers and vehicles; roadway configurations; mileage figures; etc.). (2) Accident findings are then compared to exposure figures to determine the significance of each.

With the emphasis now on special studies, it was logical to key three of the accident studies on the alcohol/drug involvement problem. The logic behind this reasoning was threefold:

- the NHTSA had identified alcohol as a major factor in fatal accidents in this country (i.e., countless research has shown that 50% of the fatal accidents involve the presence of alcohol) (3), (12), (13) and started up

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<sup>#</sup>Numbers in parentheses designate references at end of paper.

FIGURE 1



TO BETTER UNDERSTAND  
CAUSATION AND INJURY  
PRODUCING FACTORS

Figure 2

# MULTIDISCIPLINARY CRASH INVESTIGATION TEAM

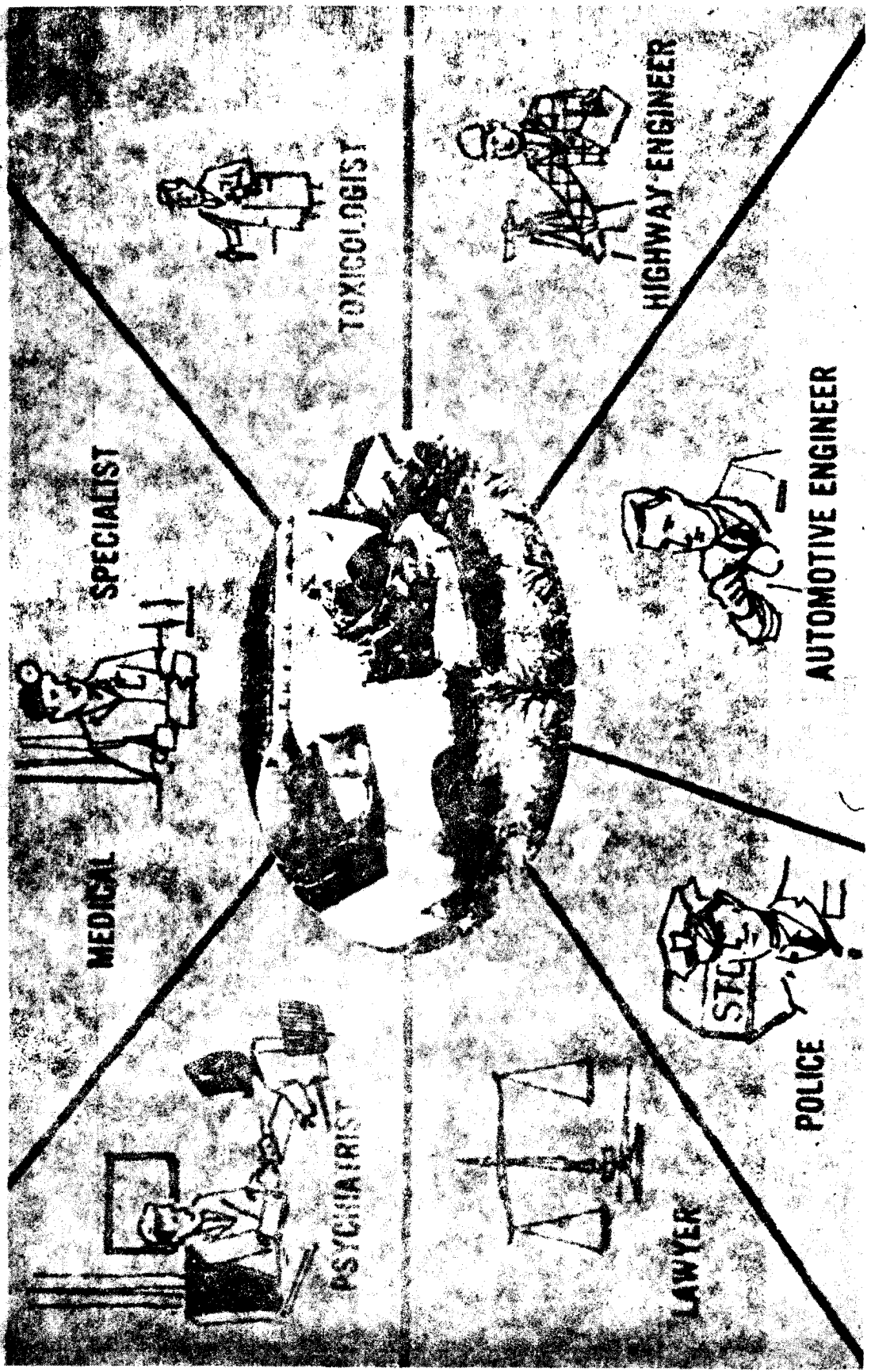
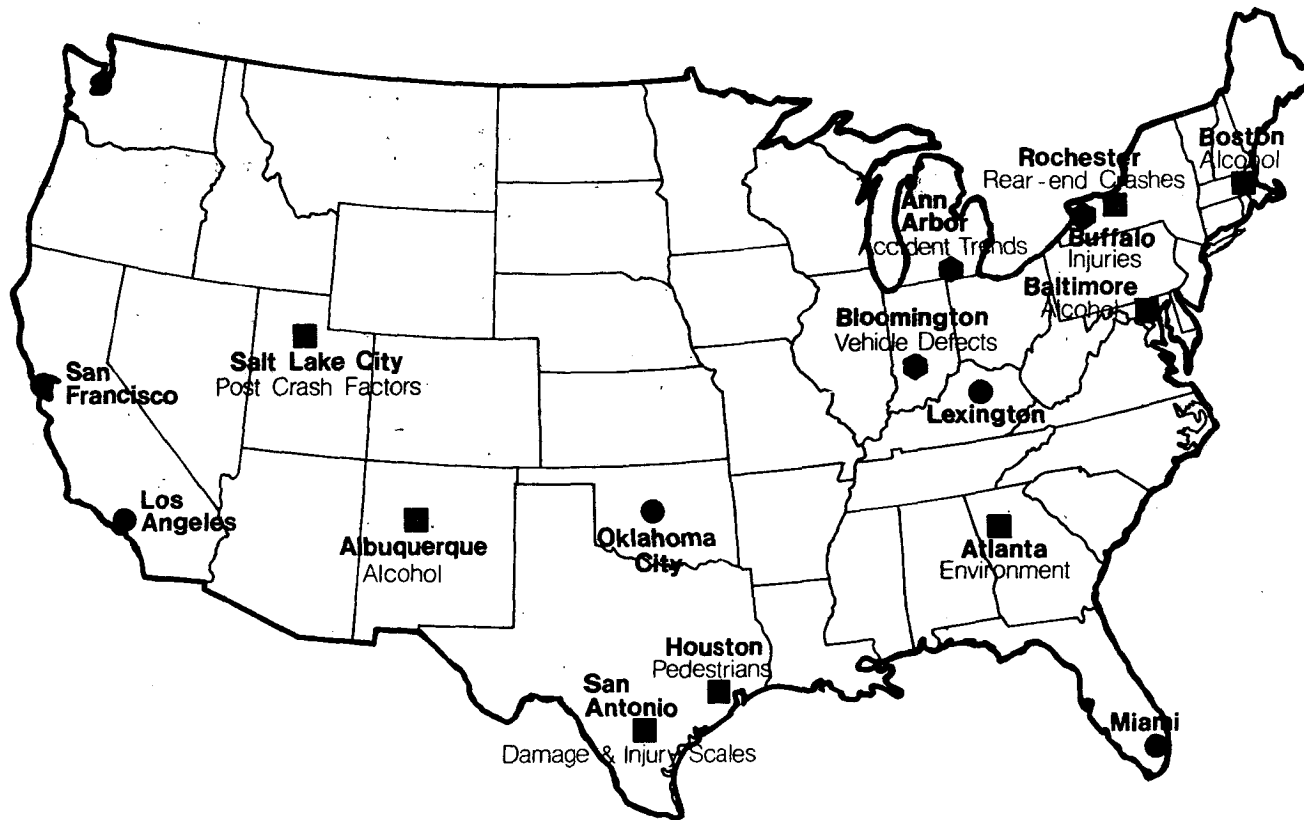


FIGURE 3

# accident investigation u. s. programs

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION



- General multidisciplinary studies (in-depth investigation of selected crashes)
- Special field studies (accident investigations focused on special problems)
- ▲ Multi-level studies (comprehensive data collection & analysis programs)

Chart No.	Source	Date
3-5-1	A160	5-1-77



numerous demonstration projects in an attempt to counteract the problem. These projects are the now well-publicized Alcohol Safety Action Projects (ASAP's) (4) located in 35 different communities (Figure 4).

- the three accident study areas were compatibly located with ASAP projects (See Figures 3 and 4) and coordination of the two efforts was certainly in order.
- the three ASAP programs were in need of in-depth accident data in their study area, especially in relation to alcohol involvement and contribution. They felt that past records of alcohol involvement in accidents were not accurate and that the accident teams could supply more reliable data. In addition, more could be learned by the ASAP people about the identification of problem drinkers and the potential rehabilitation of such.

The three sites chosen for special study of the role of alcohol and/or drugs in accidents were Albuquerque, Baltimore and Boston.

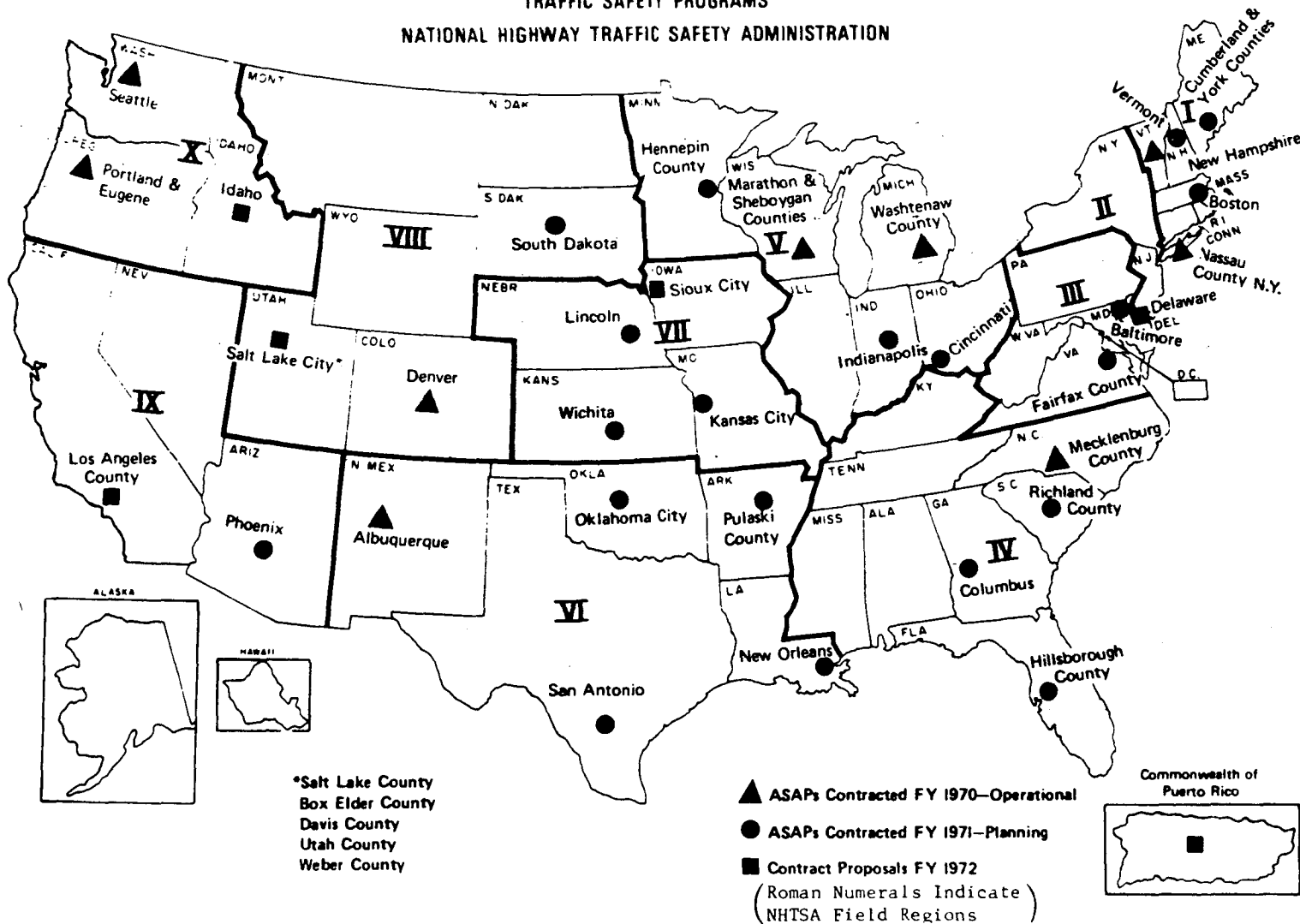
STUDY DESIGNS - Albuquerque - In Albuquerque, the University of New Mexico Accident Study Team at present is performing a "mini tri-level study." (5) As projected by the ASAP program, 1000 accidents will be reported in Bernalillo County as being alcohol related during a 12-month period beginning in April 1972. Of course, many more accidents will be alcohol related; however, this is the figure anticipated by ASAP as the number of reports which will be police reported as involving alcohol. Basic data will be gathered and coded by the accident study team on these police reported alcohol cases.

A random sample of 100 cases will be selected by the study team from this sample of 1000 alcohol cases for limited scope, in-depth analysis. All available records on the involved drivers will be collected in these cases, accident causal factors will be determined through examination of physical evidence, interviewing, mathematical reconstruction, etc., and specific psychological information will be collected on the alcohol involved drivers.

A sample of 25 serious injury producing or fatal accidents from the 100 case sample will be selected for full scope, in-depth analysis. The serious injury case selection will be based upon the criterion of at least one occupant hospitalized overnight, or some similar objective criteria. These full scope investigations will include the determination of both accident and injury causation, post-crash treatment problems, etc. Special efforts will be made to assess the combination of the effects of alcohol and stress, vehicle familiarity, vehicle control location, and personality factors on the accident causation, severity, and injury of the involved occupants.

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**FIGURE 4**  
**U.S. DEPARTMENT OF TRANSPORTATION**  
**ALCOHOL SAFETY ACTION PROJECTS (ASAPs)**  
**OFFICE OF ALCOHOL COUNTERMEASURES**  
**TRAFFIC SAFETY PROGRAMS**  
**NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION**



\*Salt Lake County  
 Box Elder County  
 Davis County  
 Utah County  
 Weber County

The study length will be two years, with preliminary data analysis being reported at the end of the first year. The following factors will be specifically examined:

- differences in blood-alcohol requests by the investigating officers in injury vs. non-injury accidents,
- reliability of notation of alcohol implication on the police accident report when blood or breath tests are not obtained,
- problems of providing blood alcohol requests from the medical professional standpoint, and
- injury differences in drinking vs. non-drinking occupants.

Baltimore - The Maryland Medical-Legal Foundation study team in Baltimore is presently conducting an entirely different type of accident study pursuant to Baltimore ASAP needs (6). All fatal driver accidents in the ASAP area are being investigated in-depth with special intensive study on the alcohol/drug involvement (if present) and the psychological histories of these drivers. Approximately 30 driver fatalities will be investigated during the year.

A "matched" sample of live drivers involved in similar accidents at similar times with similar alcohol incidence, but injured only slightly, will also be investigated in the same manner to serve as a control group. The injury threshold for this group will be an Abbreviated Injury Scale reading of 1 or 2 (7), with a blood sample obtained for analysis being the other limiting criterion. At least 20 "live driver" matched accidents will be studied.

In both samples, a validated psychological evaluation will be performed (8,9), with special emphasis on alcohol consumption, drinking patterns, alcoholism, psychopathology, etc. Blood alcohol concentrations (BAC's) will, of course, be obtained and examined on each driver in the two groups and determinations will be made as to the degree of contribution the role of alcohol played and the type of errors, nonperformances, or failures the drivers made.

Complex factors analyses will be performed on the two samples at the end of the study to determine any significant differences in drinking habits, attitudes, personality traits, psychopathology, alcoholism, rehabilitation efforts, etc. In the second year of the study, combined data from previous year's driver fatalities will be added to the sample and analyzed thoroughly for any time differences, alcohol involvement differences, etc. This is expected to aid the Baltimore ASAP people in the evaluation of their countermeasure programs and provide them with increased methods of detection of problem drinker drivers. An interim report on the first year of this study will be available in April of 1973.

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Boston - The Boston special study (10), the first year's results of which are the topic of this paper, is similar in nature to the Baltimore study. The key will be upon fatal accidents, but not necessarily driver fatalities. All fatal accidents which occurred in the Boston ASAP area were investigated with special emphasis on the drivers, regardless of whether they were killed or not. Fifty fatal accidents were studied over an 8-month period between November 1971 and June 1972 with data obtained on the causes of the accidents, the collision configurations, vehicles involved, etc. In addition, blood alcohol concentrations were determined for each deceased driver, passenger or pedestrian involved in the collisions. The drivers determined to be "most responsible" for these collisions were each exposed to a lengthy questionnaire to determine a "Human Factors Index" (HFI), which will be described later. This "HFI" was determined by interviewing the drivers (if they were alive), relatives, friends, colleagues, etc. Numerous other psychosocial data were obtained and a complete factors analysis was performed on the codable data from the "HFI."

#### METHODOLOGY

Under contract to NHTSA (10), the Boston Accident Investigation Team was authorized to collect human factor data on 50 motor vehicle accidents which resulted in a fatality. This pilot study took place in the interval between November 1971 and June 1972 when the team investigated systematically the first 50 appropriate vehicular accidents which resulted in fatal injuries to an operator, a passenger or a pedestrian. The prescribed geographical limits of the study included only the urban areas also under consideration by Boston's Alcohol Safety Action Project. In each case the relevant human factor information was collected on the operator of the vehicle judged to have been at fault or principally responsible by the law enforcement authorities at their preliminary investigation. The only fatal accidents excluded from this study were hit-and-run accidents where the operator of the vehicle was not apprehended (3 cases).

The basic instrument used for the recording of the data was a Human Factors Index designed for use in the pilot study (11). Included in this index were a number of corresponding variables collected on each operator within the following sections:

Basic Demographic Data - including family histories, domestic living environments, social class variables and other introductory demographics.

Psychosocial History - which was basically confined to historical information related to psychiatric care and a current evaluation of the operator's personality, interpersonal and intrapersonal relationships and social ambience.

Physical Health History - which included an abbreviated medical history, a physical disability evaluation and other related variables.

Alcohol/Drug Evaluation - which recorded a substantial amount of data related to the operator's history of alcohol use,

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prescribed and street drug use, and the use of marijuana. This section included historical information as well as any drug use related to the focal accident.

Legal/Arrest History - which tabulated information secured from the operator's probation and registry records.

Focal Arrest Data - which included basic facts related to the focal accident with a concentrated focus on information related to human factor causality.

Initial notification to the Boston team came through the office of Special Investigation in the Massachusetts Registry of Motor Vehicles and through the office of the Medical Examiner of Suffolk County. These sources assured the consistent collection of each appropriate case. With this notice the researchers began to secure data utilizing principally the following resources:

- The office of the Medical Examiner submitted pathological findings on the deceased.
- The Chief Toxicologist for the Commonwealth listed a complete analysis of the blood drawn from the deceased person which included Blood Alcohol Concentrations as well as findings for the presence of barbituates, salicylates, carbon monoxide and organic bases.
- When available Breathalyzer Reports were collected on the accident survivors.
- The local and state police officials submitted reports related to the focal accident.
- Information regarding legal/arrest histories came through the office of the Commissioner of Probation and the Massachusetts Registry of Motor Vehicles.
- Additional information relative to each case was collected from the news media, social service agencies and, where appropriate, other sources individual to each case.
- Telephone and personal interviews with the accident survivors, other persons significantly related to the operator under investigation, and professional associates with whom the operator had worked.

All pertinent information was collected, scaled, tabulated, transferred to computer data cards and submitted to an introductory descriptive analysis. Because of the limited size of the pilot population, other more sophisticated statistical procedures have been withheld pending future amplification.

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## RESULTS

The pilot study involving the systematic collection of only 50 appropriate fatally related motor vehicle accidents was not designed to produce conclusive nor particularly significant findings. Rather, this research was geared to give direction to future investigations related to human factor causality and fatal motor vehicle accidents. These tentative results are included herein.

Predictive factors, within the scope of human data generation, which could give highway safety investigators clues with which to identify the motor vehicle operator likely to become responsible for a fatal vehicular accident have been consistently elusive (12,13,14). The results of this reported study, though limited in scope and perspective, serve to amplify the ambiguity.

An initial descriptive analysis of the accumulated data related to the predescribed motor vehicle operators produced a somewhat modal individual. Taking into account that the modal definition of central tendencies of any population does not represent the strongest statistical procedure, the hypothetical operator typifying the Boston pilot research might look as follows (Tables I,II,III,IV,V,VI):

This operator would have been a caucasian male most likely of Irish extraction, about 29 years old who had not yet been married. He would have come from a rather typical family background and would have had three siblings. At the time of the focal accident this young man would have been living with about three other persons in a middle to lower middle class neighborhood. He would have been no more than a high school graduate whose professional expertise would have been as a skilled or semi-skilled manual employee. His position in Hollingshead's Index of Social Position (15) would have placed him in the fourth of five classes.

This hypothetical motor vehicle operator would have had no significant psychiatric nor medical history but would have had an appointment with a local physician within the past thirteen or fourteen months, most likely for a minor ailment.

As an individual he would have been generally well liked by his peers with many friends who shared his bar and party life style. Most observers would have considered him to have been unusually sensitive, industrious, who spent a great deal of his non-working time away from his place of residence. He would have been considered an individual who found some measure of enjoyment in taking chances and chronic risk taking, but who had never contemplated openly nor attempted suicide.

Most of his friends would have thought of him as a moderate imbibor of alcohol who was seldom drunk but who enjoyed a daily drink. It is almost certain that he had never been a member of Alcoholics Anonymous nor any other similar group and that his drinking habits had not caused undue problems at home, with his friends nor on the job. Even though he would have had three or four legal arrests in his history, most likely none of these would have been alcohol related. It is fairly certain that he was a cigarette smoker. There would have been an open possibility that he had at one time or another, or with some regularity, smoked marijuana or experimented with street drugs.

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At the time of the fatal accident under consideration, this hypothetical operator would most clearly not have been observed to have been under the influence of marijuana and would have stood about a 50-50 chance of having been noted to have been under the influence of alcohol.\*

The alcohol and drug related histories of the 50 operators included in this pilot study did not prove to be of significant value when submitted to tests for Linear Regression nor Chi Squares. However, the descriptive findings proved to have been of interest. Personal interviews with other persons significantly related to the focal operator considered him to have been a total abstainer or one who only had a social drink such as champagne at a wedding in 6% of the cases. Fifty percent considered the operator to have been a moderate social drinker and only 16% thought of him as either a sporadic binge drinker or an "alcoholic." In 22% of the cases alcohol use or abuse was thought to have been enough of a problem in at least acute situations to have warranted a suggestion by some other person that the operator temper his drinking habits. Fourteen percent of these operators were, on the other hand, encouraged to drink more than was their practice. Only 2, or 4%, of the total population of focal operators had ever belonged to Alcoholics Anonymous or a similar organization, and in both of these cases, the operators considered themselves to have been abstainers at the time of the focal accident (Table IV).

In this particular research effort, 14% of the operators had a history of at least one arrest for operating a motor vehicle while under the influence of alcohol (DUIL) whereas 28% had at least one arrest for non-vehicular drunkenness. Four drivers had arrest histories in both areas, so these categories were not mutually exclusive.

Drug usage other than alcohol showed that 34% of the operators had at least upon occasion smoked marijuana. This information was obtained either through personal interview with the surviving operators or from interviews with significant other persons. Thirty percent of the focal operators had either experimentally or regularly used street drugs of any variety. Because of projected fear of legal prosecution no effort was made in this pilot study to discriminate the type of street drug used. A distinction was made, however, between marijuana and street drugs. The significance of this particular finding is related to the fact that 64% of the focal operators were under 30 and 84% were under 40 years of age (Tables I and IV).

The medical and psychiatric histories of the 50 operators under consideration showed that only 20% of the population suffered from any chronic physical illness, often associated with street drug abuse. Seventy-two percent of the operators had no history of psychiatric care and only 6% were ever given in-house treatment for an emotional problem. Fifty percent never openly considered suicide as a viable option to their existence and only 18% had ever made a suicide attempt. Within the total population only one case could have been recorded as a completed suicide by a motor vehicle

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\*For the purposes of this paper, "under the influence" (or ETOH influence) means a BAC  $\geq$  .10 mg % or a clinical evaluation thereof.

accident. The operator was generally (46%) if not always well-liked (36%) by his peers but was, in 52% of the cases, considered to have been unusually sensitive. An additional variable which evaluated chronic risk taking behaviors found 60% of the operators to have been involved in some form of risky behavior considered to have been chronic in nature (Tables II - V).

Other legal/arrest histories revealed that within this pilot population, 68% of the operators had been arrested for one reason or another prior to their focal accident and that 58% had been arrested for a vehicular infraction. It should be noted that in these cases arrest does not necessarily indicate guilt. At one time or another in their driving history, which averaged 12 years, 48% of these operators had been arrested for driving to endanger or reckless driving on at least one occasion. Sixteen percent had their licenses suspended and 18% had been arrested for operating a motor vehicle without a valid license (Table V).

Alcohol and drug usage during the time of the focal accident revealed that a clinical and/or laboratory judgment found 42% of the operators to have been under the influence of alcohol at the time of the collision. Because there is within the Commonwealth of Massachusetts a statute that forbids the drawing of a blood sample to be used in legal prosecution from non-consenting survivors the preceding data was a clinical evaluation in 72% of the cases (Tables V and VI). As will be seen, the operators determined to have been under the influence at the time of the accident turned out to be quite different from the previously described "modal" operator (Tables VII and VIII).

In accordance with the research design the following results were divided according to accident class. Class I indicates operators who killed themselves in the focal accident. Class II indicates operators who killed another operator and/or passengers in the focal accident and Class III were operators who killed a pedestrian.

Twenty one, or 42% of the total population were noted to have been under the influence of alcohol at the time of the focal accident. Within each Class sample, 62% were under the influence in Class I, 53% were in Class II and 7% were in Class III. Twenty-nine operators, or 58% of the total population, were not noted to have been under the influence of alcohol at the time of the focal accident. Within each Class sample, 38% were not drinking in Class I, 47% were not in Class II and 93% were not in Class III (Table VI).

The results of intermediate charges leveled against the focal operators were as follows: 30% were judged not to have been at fault, 2% were charged with DUIL only, 4% were charged with Driving to Endanger (DTE) only and 4% were charged with manslaughter only. Two percent were charged with DUIL and DTE, 10% with DUIL, DTE and Manslaughter and 48% were charged with DTE and Manslaughter (Table VI). It should be noted that most of the 30% judged not to have been at fault were the drivers involved in pedestrian accidents and drivers in single vehicle accidents with no passengers who killed themselves.

Other human factors related to the focal accident in an overlapping design showed that 26% of the focal operators

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were influenced by domestic tension, 24% by professional tension and 40% by some sort of social tension. Twenty-two percent were influenced by some sort of depression often related to the aforementioned tensions. The factor of relative fatigue was somewhat causal in 40% of the cases and 10% suffered from an acute or chronic physiological problem. In 24% of the cases there appeared to have been some sort of psychiatric problem which may have had an influence upon the accident. In most of these cases the problem was of a mild, acute nature not necessarily indicating that the operator needed professional assistance. Twenty-two percent of the operators were distracted by tardiness and 26% by some variety of passenger distraction. Twelve percent were either in direct or indirect legal pursuit. Although 72% of the operators were judged to have been operating their vehicle with excessive speed for the current conditions, it should be noted that this does not indicate a subsequent charge of DTE but that he was judged not to have had his vehicle fully under his control.

#### CONCLUSIONS AND IMPLICATIONS

Given the limitations of a small sample size and the lack of certain exposure information, major conclusions would certainly be presumptuous. However, certain findings did support some of the ASAP premises, while others indicated possible areas in need of more emphasis.

The 42% (21 drivers) under the influence of alcohol falls short of the 50% or greater figures from numerous reports (3,13). Possible reasons for this include the small sample size, but more importantly, the fact that 15 of the drivers were involved in fatal pedestrian accidents. As reported in the results, only 7% (1 of 15 in Class III) of these drivers who struck pedestrians were impaired by alcohol whereas 20% of the pedestrians were under the influence. Past studies of drivers involved in fatal accidents were basically restricted to non-pedestrian accidents only. Our selection criterion was all fatal accidents during the 8-month period. Actually, 57% of the Class I and Class II operators were under the influence at the time of the accident.

As Table VII indicates, 62% of the alcohol involved drivers in this sample were clinically rated as either a heavy social drinker, a sporadic binge drinker, or an alcohol abuser (alcoholic). This compares favorably with the 2/3 figure the ASAP's use as a justification to key on the "problem drinker." In addition, 47% of the alcohol involved drivers in this sample either had previously been arrested for DUIL, had an arrest for non-vehicular drunkenness, or both.

The 34% figure for all operators (17 of 50) who at least upon occasion had smoked marijuana appears high, but in reality is not. Boston's population is inflated with young college students and young professionals and, as pointed out in the results, 64% of the drivers in the total sample were under 30 years of age. The 30% who experimentally or regularly used street drugs (excluding marijuana), however, may be significant. This could give the Boston ASAP people another identification criterion to key on.

Exposure figures, of course, need to be estimated.

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Probably of most significance in this pilot study was the finding that 60% of the total sample of drivers were involved in some form of risky behavior which was considered to have been chronic in nature. Forty-eight percent of all the drivers actually had previously been arrested for DTE or Reckless Driving. These risk-taking variables actually correlated higher with the focal drivers in this sample than the alcohol indicators did. Without exposure figures or a control group to compare these percentages with, the magnitude of this problem cannot be accurately determined. However, it certainly gives the ASAP people, and accident researchers in general, a definite area to research and possibly utilize in their identification procedures.

The highest proportions of alcohol involvement in these fatal accidents appeared in the Class I (operator killed himself) and the Class I and II single vehicle categories (62% and 60%, respectively). However, the 53% alcohol involvement in Class II (operators who killed another operator and/or passengers) category cannot be overlooked. Problem drinkers, indeed, are not just killing themselves.

There were numerous other proportions and findings which could be discussed, however, until further research and analyses are performed, the authors felt these should not be reported at this time. This Special Accident Study will continue for two more years under the directorship of the senior author and management of the second author. Approximately 125 fatal accidents will be investigated per year utilizing the methods described earlier, about half of which will occur in the Boston ASAP geographic area and the other half in surrounding Boston areas of similar topography not covered by ASAP. This will provide a total of 300 fatal accidents for analysis at the end of the two year period (50 from this pilot study and 250 to be investigated). In addition, the Boston ASAP people will provide a matched sample of live drivers arrested for DUIL (in plain arrests and non-fatal accident situations) in which many of the variables from the HFI will be collected. This study design for the next two years will provide the following comparison groups:

- ASAP Fatafs vs. Non-ASAP Fatafs  
Fatafs that occur in the Boston ASAP geographic area will be compared with fatafs in surrounding areas with similar topography.
- Fatal Accident Drivers vs. DUIL Arrested Drivers  
Data on the fatal accident drivers in the Boston ASAP area will be compared with data on drivers arrested for DUIL. The alcohol-involved portion of the fatafs will also be compared with the DUIL sample.

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● Alcohol-Involved Fatal vs. Non-Alcohol-Involved Fatal

Drivers who were drinking at the time of the fatal accidents will be compared to drivers who were not found to be drinking.

Future emphasis will not only be directed upon alcohol use/abuse in fatal accidents, but also the human causal factors associated with alcohol-involved accidents and non-alcohol involved accidents. Drugs other than alcohol will also be focused upon and studied.

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Table I - Basic Descriptive Demographics for the 50 Motor Vehicle Operators Included in the Pilot Study (Boston 1971-72)

Sex:		Occupation/Profession:*	
Female	12%	Higher executives, higher professionals	6%
Male	88%	Business mgrs., lesser professionals	8%
Age: (x = 29.06)		Administrators, minor businessmen	10%
10-19	18%	Clerical, sales, technicians	12%
20-29	46%	Skilled manual empl.	28%
30-39	20%	Semiskilled employees	16%
40-49	12%	Unemployed, unskilled, welfare	20%
50-59	0%		
60-69	2%		
70-79	2%		
80+	0%		
Race:		Index of Social Position:*	
Caucasian	76%	Class I	6%
Latin American	4%	Class II	6%
Negroid	20%	Class III	20%
		Class IV	38%
		Class V	30%
Marital Status:		Dominant Ethnic Background:	
Single	42%	Anglo Saxon	10%
Married	28%	Irish	33%
Common Law/Homosexual	6%	Northern European	2%
Widowed	2%	Southern European	24%
Separated/Divorced	22%	Latin American	4%
Education:*		African	20%
Graduate, Professional	6%	Near/Far Eastern	4%
University graduate	6%	Other:	2%
Partial University Trg.	12%		
High School Graduate	38%		
Partial High School Trg.	28%		
Junior High School	4%		
Grammar School	6%		

\* categories established in "Two Factor Index of Social Position" (15).

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Table II - Relevant Psychosocial Data Among the 50 Motor Vehicle Operators  
Included in the Boston Pilot Study (Boston 1971-72)

Had he received any psychiatric treatment prior to the focal accident:		Was he well liked by his peers:	
None	72%	No	12%
Outpatient only	10%	Generally	46%
Inpatient only	6%	Always	36%
Both	2%	Unknown	6%
Unknown	10%	Was he unusually high strung or sensitive:	
Personality Diagnosis:		No	46%
Oral	22%	Yes	52%
Compulsive	18%	Unknown	2%
Hysterical	6%	Does he have any known history of suicidal ideation or suicide attempts:	
Narcissistic	10%	None	50%
Masochistic	14%	Ideation only	20%
Paranoid	18%	Attempt only	18%
Schizoid	12%	Unknown	12%

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Table III - Relevant Medical Data Referring to the Histories Among the 50 Motor Vehicle Operators Included in the Pilot Study (Boston 1971-72)

Physical Health Prior to the Focal Accident:		Did the operator have a chronic physical illness:	
Poor	6%	No	74%
Fair	26%	Yes	20%
Good/Excellent	64%	Unknown	6%
No Information	4%		
Last LMD visits PTA: ( $\bar{x}$ = 13.1 mos.)		Did he wear correctional lenses for driving:	
Did he smoke cigarettes:		No	78%
No	12%	Yes	20%
Yes	88%	No information	2%

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Table IV - Historical and Focal Alcohol, Marijuana and Drug Use Among the 50 Motor Vehicle Operators Included in the Pilot Study (Boston 1971-72)

Friends/Relatives Consider the Operator to have been:		Where did he usually drink:	
An Abstainer, rarely drinks	6%	Only special occasions, none	4%
A moderate social drinker	50%	At home	16%
A Heavy Social Drinker	20%	At a friend's home	36%
A Sporadic, Binge Drinker	10%	At a bar/lounge	30%
An Alcohol Abuser (alcoholic)	6%	All of the above	10%
Unknown, no opinion	8%	Unknown	4%
Alcoholic preference:		Was he ever arrested for non-vehicular drunkenness:	
none, basic abstainer	6%	No	72%
wine	20%	Yes	28%
beer	26%	Was he ever arrested for DUIL:	
whiskey, whiskies	38%	No	86%
Other, unknown	10%	Yes	14%
During the past year has anyone attempted to make the operator drink less:		Did he smoke marijuana:	
No	78%	No	54%
Yes	22%	Yes	34%
		Unknown	12%
During the past year has anyone attempted to make the operator drink more:		Did he use street drugs experimentally or regularly:	
No	86%	No	64%
Yes	14%	Yes	30%
		Unknown	6%
Has the operator attempted to stop drinking:		Clinical ETOH Diagnosis (domestic, social or professional)	
No	82%	No ETOH related problems	44%
Yes	18%	Mild ETOH related problems	4%
Did he ever lose a job for alcohol related problems:		Moderate ETOH related problems	26%
No	66%	Severe ETOH related problems	14%
Yes	24%	Unknown, no diagnosis	2%
Unknown	10%	Was he observed to have been under the influence of ETOH during the accident:	
How frequently did he use Alcohol:		No	58%
Never, almost never	4%	Yes	42%
Once a month or less	22%	Was he observed to have been under the influence of marijuana during the accident:	
Weekly	28%	No	84%
Daily	40%	Yes	16%
Unknown	6%	Were barbiturates detected in his blood analysis (if deceased):	
Has he ever belonged to Alcoholics Anonymous:		No	88%
No	90%	Yes	12%
Yes	4%	Were salycilates, doriden or organic bases found in his blood analysis:	
Unknown	6%	No	100%



Table V - Legal/Arrest Data Among the 50 Motor Vehicle Operators  
Included in the Pilot Study (Boston 1971-72)

Had he ever been arrested:		Has he ever been principally responsible for an earlier fatal motor vehicle accident	
No	32%	No	100%
Yes	68%		
Had he ever been arrested for a vehicular violation:		Has he ever had his license suspended for any reason:	
No	42%	No	84%
Yes	58%	Yes	16%
Had he ever been arrested for DUIL:		Has he ever been arrested for operating without a valid license:	
No	86%	No	82%
Yes	14%	Yes	18%
Had he ever been arrested for DTE or Reckless driving:		How long had he been legally operating a motor vehicle:	
No	52%	(x = 11.9 years)	
Yes	48%		

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Table VI - Focal Accident/Arrest Data Among the 50 Motor Vehicle Operators Included in the Pilot Study (Boston 1971-72)

ACCIDENT CLASS:

- Class I - the principal operator was killed in the focal accident
- Class II - another operator was killed or a passenger sustained fatal injuries
- Class III - a pedestrian was killed

Class division:

	N	
Class I	16	32%
Class II	19	38%
Class III	15	30%

Total persons fatally injured 64

Was the focal operator noted to have been under the influence of alcohol:

No	29	58%
Yes	21	42%

What was the Class division among operators noted to have been driving under the influence of alcohol: (N=21, 42% of population)

Class I	10	62% (10/16)
Class II	10	53% (10/19)
Class III	1	7% (1/15)

What was the Class division among operators NOT noted to have been driving under the influence of alcohol:

Class I	6	38% (6/16)
Class II	9	47% (9/19)
Class III	14	93% (14/15)

The focal operator was finally cited following the initial investigation:

No charge	30%
DUIL only	2%
DTE only	4%
Manslaughter only	4%
DUIL and DTE	2%
DUIL, DTE and Manslaughter	10%
DTE and Manslaughter	48%

Human factors related causally to the focal accident and the focal operator:

Domestic Tension/Anxiety	26%
Professional Tension/Anxiety	24%
Social Tension/Anxiety	40%
Depression	22%
Fatigue	40%
Medical Problems	10%
Psychiatric Problems	24%
Tardiness	22%
Passenger Distraction	26%
Excessive Speed for Cond.	72%
Legal Pursuit	12%
Drug/Marijuana Abuse	14%
Alcohol Abuse	42%

What was the alcohol involvement among the 15 fatally injured pedestrians:

	N	
.00 mg%	8	53%
.01 to .09 mg%	3	20%
.10 to .19 mg%	1	7%
≥.20 mg%	2	13%
No information	1	7%

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Table VII - Class Breakdown (Table VI) Between Alcohol Related Histories (Tables IV,V) and Alcohol Influence at the Time of the Focal Accident for the 50 Motor Vehicle Operators Included in the Pilot Study (Boston 1971-1972)

ACCIDENT CLASS	Focal ETOH Infl* (N=21)			No Focal ETOH Infl (N=29)			Total (N=50)		
	I N=10	II N=10	III N=1	I N=6	II N=9	III N=14	I N=16	II N=19	III N=15
ETOH Histories:									
DUIL arrest only	0 0%	1 5%	0 0%	1 3%	0 0%	1 3%	1 2%	1 2%	1 2%
Non-vehicular ETOH arrest only	2 9%	3 14%	0 0%	0 0%	1 3%	3 10%	2 4%	4 8%	3 6%
DUIL and non-veh. arrests	3 14%	1 5%	0 0%	0 0%	0 0%	0 0%	3 6%	1 2%	0 0%
Friends/Relatives Consider the Operator to have been:									
Abstainer	0 0%	0 0%	0 0%	2 8%	0 0%	1 3%	2 6%	0 0%	1 2%
Moderate	4 19%	2 9%	1 5%	3 10%	4 14%	11 38%	7 14%	6 12%	12 24%
Heavy	3 14%	3 14%	0 0%	0 0%	3 10%	1 3%	3 6%	6 12%	1 2%
Sporadic	1 5%	4 19%	0 0%	0 0%	0 0%	0 0%	1 2%	4 8%	0 0%
Abuser	1 5%	1 5%	0 0%	1 3%	0 0%	0 0%	2 4%	1 2%	0 0%
Unknown	1 5%	0 0%	0 0%	0 0%	2 8%	1 3%	1 2%	2 4%	1 2%

\*As explained in the text, "Focal ETOH Influence" (or under the influence) means a BAC  $\geq$  .10 mg % or a clinical evaluation thereof.

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Table VIII - Class Breakdown (Table VI) Between Single and Multiple Vehicular Collisions Among the 50 Motor Vehicle Operators Included in the Pilot Study (Boston 1971-72)

Vehicular Involvement	Focal ETOH Infl (N=21)			No Focal ETOH Infl (N=29)			Total (N=50)		
	I N=10	II N=10	III N=1	I N=6	II N=9	III N=14	I N=16	II N=19	III N=15
Single Vehicle* Involvement	8 38%	4 19%	1 5%	4 14%	4 14%	13 44%	12 24%	8 16%	14 28%
Multiple Vehicle Involvement	2 9%	6 29%	0 0%	2 7%	5 17%	1 4%	4 8%	11 22%	1 2%

\*Note: Excluding the Class III (pedestrian) accidents, there were a total of 20 single vehicle accidents. There was one pedestrian accident which involved more than one vehicle.