Mar J DOT HS-801 241

1973 U.S. NATIONAL ROADSIDE BREATHTESTING SURVEY : PROCEDURES AND RESULTS

Contract No. DOT-HS-031-3-722
October 1974
Interim Report

PREPARED FOR :

U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
WASHINGTON,D.C. 20590

Document is available to the public through
the National Technical Information Services
Springfield, Virginia 22151

This report was prepared for the Department of Transportation, National Highway Traffic Safety Administration under Contract Number DOT-HS-031-3-722. The opinions, findings, and conclusions expressed in this publication are those of the author and not necessarily those of the National Highway Traffic Safety Administration.

This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

The United States Government does not endorse products of manufacturers. Trade or manufacturers' names appear herein solely because they are considered essential to the object of this report.

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
DOT HS-801 241		

4. Title and Subtitle	5. Report Date
1973 U.S. National Roadside Breathtesting Survey: Procedures and Results	October 1974
	6. Performing Organization Code
7. Author(s)	8. Performing Organization Report No.
Arthur C. Wolfe	UM-HSRI-AL-74-4
9. Performing Organization Name and Address	10. Work Unit No.
Highway Safety Research Institute The University of Michigan Huron Parkway & Baxter Road Ann Arbor, Michigan 48105	11. Contract or Grant No. DOT-HS-031-3-722
	13. Type of Report and Period Covered Interim Report October-December 1973
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Driver and Pedestrian Programs Washington, D. C. 20590	14. Sponsoring Agency Code

15. Supplementary Notes

16. Abstract

This first U.S. national roadside breathtesting survey was conducted at 185 roadside locations in 18 states. Random samples of 3,698 motorists were stopped between 10PM and 3AM on eight weekends in the fall of 1973. From these drivers 3,358 interviews and 3,192 breath tests were obtained.

The basic findings on the extent of drinking and driving during these times were that 22.6% of the drivers in the national sample were at a 0.02% BAC or higher; 13.5% were at a 0.05% BAC or higher; 5.0% were at a 0.10% BAC or higher; and 1.4% were at a 0.15% BAC or higher.

The report describes the sampling and operational procedures used in the survey and analyzes the BAC results in relation to a number of geographic and driver characteristics. It concludes that such a survey is a valuable means of providing useful evaluative data at a reasonable cost, and it suggests ten operational improvements for such a future survey. Extensive appendices include much detail on the survey operation and codebooks with marginals for the collected data.

17. Key Words	18. Distribution Statement
Drinking Drivers Roadside Breathtesting Surveys Nighttime Drivers	Document is available to the public through the National Technical Information Service, Springfield, Virginia 22151

19. Security Classif.(of this report)	20. Security Classif.(of this page)	21. No. of Pages	22. Price
Unclassified	Unclassified	165	

Form DOT F 1700.7 (8-69)

PREFACE

The 1973 U.S. national roadside breathtesting survey was conducted at 185 roadside locations in 34 different police jurisdictions. The author would like to express his appreciation to the hundreds of police officers, service club members, parking lot owners, etc. whose assistance was essential to the success of this survey. And a very special note of appreciation is due to the six HSRI interviewers, Carla Barnes, Arthur Boyd, Charles Compton, Robert Kay, Richard J. Lehman, and Lois McClellan, without whose dedication and perseverence this national survey operation would not have been possible. The author is also indebted to Dr. Martin Frankel of the National Opinion Research Center, Miss Irene Hess of the Institute for Social Research, and Dr. Donald Cleveland of the U-M College of Engineering for valuable advice and assistance in developing the survey sample design; and to his HSRI colleagues Lyle Filkins, Marion Compton, Marion Chapman, Cheryl Clark, and Fred Clark for their support and assistance throughout the survey operation.

TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

SUMMARY

In the fall of 1973 the Highway Safety Research Institute conducted a nationwide voluntary roadside breathtesting survey for the National Highway Traffic Safety Administration. This was the first such national survey to be conducted under the guidelines of the "OECD Initiated Group of Experts on the Effects of Alcohol and Other Drugs on Driver Behavior." A total of 3,698 motorists were randomly stopped at 185 roadside locations in 24 primary sampling areas in 18 states across the United States between 10PM and 4AM on Friday and Saturday nights during the period from October 26 to December 16. From these motorists 3,358 interviews and 3,192 satisfactory breath test analyses were obtained.

The basic objective of the survey was to estimate the extent of driving after drinking during the survey hours in the United States. The survey found that 22.6% of the national sample had been drinking (0.02%W/V Blood Alcohol Concentration or higher), 13.5% had been drinking enough to involve probable impairment of their driving (0.05 BAC or higher), 5.0% had been drinking enough to be considered legally impaired in all states (0.10 BAC or higher), and 1.4% were definitely intoxicated (0.15 BAC or higher). The proportions of motorists driving after drinking increased considerably from the beginning to the later survey hours, more than doubling between 10-11PM and 2-3AM. However, a comparison of the data from Friday and Saturday nights showed only slightly more driving after drinking on Saturday nights than on Friday nights.

In regard to type of roadway it was found that driving after drinking was slightly more prevalent on less heavily travelled roads and in more open and rural areas. When the various survey localities were compared with each other tremendous variation was found, as would be expected given the limited numbers of respondents in each locality. However, there was still a general

tendency for the more rural areas to have higher percentages of drinking drivers. This was also reflected in the regional comparisons which found somewhat higher percentages of probably impaired driving in the south (14.8%) and midwest (14.1%) than in the northeast (12.6%) and west (11.7%).

Turning to personal characteristics of the nighttime drivers, the data show disproportionately more driving after heavy drinking among males, blue collar workers, non-high-school-graduates, divorcees, persons aged 21-44, low mileage drivers, drivers travelling alone and on short trips, drivers travelling to or from eating or drinking places, and persons who consider themselves moderate or heavy drinkers. It was also found that heavy drinking drivers as compared with the other drivers were less likely to have discussed drunk driving in the previous month; were more likely to overestimate or to underestimate the percentage of traffic fatalities involving drinking drivers; were more likely to think problem drinkers cause more accidents than social drinkers; were more likely to have tried to persuade others not to drive in the previous year; and were less likely to express willingness to pay more taxes for governmental alcohol safety programs.

The remainder of this report explains the survey design and procedures and describes the analytical findings mentioned above in much greater detail. The report concludes with the observation that such a national roadside breathtesting survey has been demonstrated to provide useful information at a reasonable cost, and it offers ten suggestions for improving the operation of such a future survey.

Extensive appendices include much detailed information about the survey operation. The appendices also include codebooks with marginal distributions of the survey results, both for the 3,698 individual respondents and for the 185 roadside sites.

1.0 INTRODUCTION

Driving while under the influence of alcoholic beverages has long been known as a major contributing factor to automobile crashes in the United States and elsewhere. Careful research studies have shown that about 50% of adult drivers who die in automobile crashes are at an illegal blood alcohol concentration at the time of death.* Alcohol is somewhat less frequently involved in non-fatal accidents, but it is clearly a major factor in all types of accidents.

In response to this knowledge, the Office of Alcohol Countermeasures (OAC) was established within the National Highway Traffic Safety Administration (NHTSA). Its main purpose has been to devise and implement methods for reducing the extent of driving after drinking too much among American drivers, and thus to reduce alcohol-involved traffic accidents. Among its major activities have been the funding and evaluation of demonstration Alcohol Safety Action Programs (ASAPs) in 35 states or local areas, and the support of a large-scale public information and education campaign on drinking and driving through the mass media.

An important evaluation method which has been used in 28 of these local ASAPs is the voluntary roadside breathtesting survey. This involves the random stopping of samples of drivers at selected roadside locations, asking them to blow into a breathtesting instrument, and having them complete a short interview schedule. In all of these ASAPs the roadside surveys have been conducted at night only, usually between 7PM and 3AM, and in some ASAPs only weekend nights have been used. In some ASAPs the roadside locations were selected on the basis of police data on the frequency of crashes or drunk driving arrests;

*See, for example: Filkins, L., et al. Alcohol Abuse and Traffic Safety: A Study of Fatalities, DWI Offenders, Alcoholics and Court-Related Treatment Approaches. Highway Safety Research Institute, The University of Michigan, Ann Arbor, 1970.

in others a more random sample of relatively well-travelled roadside sites was used. About 75 of these local breathtesting surveys have been conducted since 1970 in many parts of the United States.

In July of 1973 the Office of Alcohol Countermeasures contracted with the Highway Safety Research Institute (HSRI) to conduct a similar voluntary roadside breathtesting survey on a national basis. The main purposes of this first nationwide survey were to provide national baseline data on the extent of the driving-after-drinking problem for comparison with the local ASAP surveys, and to permit the possibility of monitoring changes over time in the extent of driving-after-drinking through the use of similar national surveys in the future. The use of such surveys in the evaluation of the seriousness of the driving-after-drinking problem and of the effectiveness of national countermeasure activities had been strongly recommended by the Subgroup on Roadside Surveys of the"OECD-Initiated Group of Experts on the Effects of Alcohol and Other Drugs on Driver Behavior.*" The guidelines for the conduct of national roadside breathtesting surveys which were promulgated by this subgroup have been quite closely adhered to in this first United States national survey. This was also the first survey conducted in any nation under these international guidelines, so the HSRI experience should be of considerable interest to safety and survey specialists in many countries.

*Stroh, C. Roadside Surveys of Drinking-Driving Behavior. Ottawa, Department of Transport, Vol. IV of the Alcohol and Road Safety Series, 1973.

2.0 SURVEY DESIGN AND PROCEDURES

2.1 BASIC OBJECTIVE

The basic objective of the national roadside breathtesting survey was to obtain the best possible estimate of the extent of driving at various levels of alcohol impairment in the United States. Since the resources available for such an investigation were limited, it was decided by NHTSA/OAC officials to eliminate Alaska, Hawaii, and Puerto Rico from the survey universe and to conduct the survey only at the times when driving after drinking is most common, namely on Friday and Saturday nights, from 10:00PM to 3:00AM. For these time periods the goal was to estimate the percentages of all driving time which are spent by persons at various Blood Alcohol Concentrations (BACs), e.g., above 0.05%W/V BAC*, above 0.10 BAC, above 0.15 BAC.

Such estimates based on driving time can be translated directly into risk statements. For example, if the survey found that 10% of the driving time during the survey hours was spent by drivers at 0.10 BAC or greater, then one could say that on the average at any given point in time during these hours one out of ten drivers was impaired. However, if the average trip duration of the impaired drivers were only half the average trip duration of the non-impaired drivers, this would indicate that actually 18.2% of all persons who drove were impaired, although only 10% of the driving time was spent by impaired drivers. On the other hand, if the average trip durations of impaired drivers and non-impaired drivers were

*Blood Alcohol Concentrations are given in percent weight by volume; that is, grams of ethanol per 100 milliliters of blood. Hereafter, such BACs will be referred to by the decimal portion only; e.g., "0.10" will be used to indicate "0.10%W/V".

roughly comparable, then the estimated percentage of driving time by impaired drivers could also be used as the estimated percentage of drivers during these hours who were impaired.

Fortunately, the method of random selection of motorists from the driving stream at a controlled probability sample of roadside locations is well suited to estimates of time driven at various BACs, since the motorists' chance of selection is directly related to his trip duration, as well as to the speed at which he is travelling. The more time he is on the road and the greater his average speed the more likely he is to pass one of the roadside interviewing sites and to be selected as a respondent.

Besides the geographic and time restrictions mentioned above, there were some other practical considerations which had to be taken into account in establishing the geographic universe to be sampled. For the efficiency of the survey operation it was important that chosen roadside locations have sufficient nighttime traffic volume to keep the interviewers relatively busy throughout the survey period. Thus it was decided to exclude entirely from the survey universe counties under 20,000 in population. This excluded a large proportion of the area of the United States from the universe of potential roadside locations, but these counties contained only 8.1% of the population. In the remaining counties only roads estimated to have a traffic volume of at least 10 cars per hour in the 2-3AM period or 2,000 average daily traffic volume (ADT) were to be included. Also, due to safety considerations in operating the roadside interviewing stations, it was necessary to exclude freeways and other roadways lacking safe adjacent pull-off areas.

In summary, then, the basic objective of the survey was to estimate, for the 92% of the population living in the least rural areas of the contiguous United States, the percentages of alcohol-imapired driving time which were spent by drivers on medium and heavy volume roadways with sufficiently safe adjacent interviewing areas on Friday and Saturday nights from

10:00PM to 3:00AM. While precision requires this clarification of these restrictions in the survey universe, it is felt that their net effect on the meaningfulness and usefulness of the estimates for these hours of the week is quite small.

2.2 SAMPLE DESIGN

It is obvious that at a minimum a two-stage sampling design was called for, one for the selection of roadside interviewing locations and the other for the selection of motorists from the passing traffic streams at those locations. However, a single stage for the random selection of roadside sites from all the eligible roads in the nation was clearly inappropriate logistically and financially. Instead of only one stage, a multi-stage area sampling plan was devised for the selection of the roadside sites.

The decision as to how many primary sampling areas to utilize was based mainly on practical rather than theoretical considerations. The NHTSA contract which was awarded in early July required that the survey be conducted in the fall of 1973. This provided very little time for working out the sample design, hiring the interviewers, obtaining the necessary equipment, and seeking the needed cooperation from local officials in the selected areas. Thus it was decided as the basic operational plan to use three teams of interviewers working on eight weekends from October 26 to December 16 in a total of 24 primary sampling areas. Within each primary sampling area eight roadside sites were to be selected, making a total of 192 interviewing locations. While it would have been theoretically desirable to use a larger number of primary sampling areas, 24 were deemed sufficient to provide the basis for a reasonably representative national sample of roadside sites.

The first issue faced in the selection of these 24 primary sampling areas was what type of geographic unit to use. Entire states were clearly too large for one interviewing team to be able to cover in a single weekend, and there were too many census tracts to permit their efficient use as a sampling frame. The county seemed to be the ideal-sized unit in terms of being

small enough to permit interviewers to travel between sites but large enough to provide considerable heterogeneity among roadside locations. However, it was also considered important that large cities be given their appropriate chance of selection with certainty, so three types of geographic units were utilized in the first stage of the selection process--central cities of Standard Metropolitan Statistical Areas (SMSAs) as defined by the Census Bureau, the remaining parts of counties containing SMSA central cities, and whole counties not containing an SMSA central city. In Virginia, independent cities under 50,000 in population were combined with an adjacent county. When a county or part-county was selected as a primary sampling area, a second selection stage was used to obtain not more than two police jurisdictions within which to choose the roadside sites.

The second issue faced in the selection of these 24 primary sampling areas concerned the appropriate numerical criterion to employ as a basis for selection. Ideally the 24 areas should have been chosen in relation to the extent of driving during the survey hours in the hundreds of potential cities, part-counties, and whole counties. However, adequate measures of the extent of driving during these hours, or during any other time period, are not available for the counties and cities of the United States. Even estimates of total annual mileage driven based on gasoline sales taxes are not considered reliable for local areas and are seldom calculated for cities and counties. Numbers of licensed drivers or registered vehicles are sometimes determined for cities and counties, but these data are not readily available in all states and it would have been a long and expensive task to collect them as a basis for the sample selection. Similar problems would have faced the use of data on miles of heavy and medium volume roads in the various cities and counties.

Consequently, it was decided to make use of the area population, as determined in the 1970 census, as the basis for the selection of the 24 primary sampling areas. It was recognized

that there may not always be a direct one-to-one relationship between an area's population and the amount of late-night driving on weekends within its geographic confines, but in general the correlation between these two variables should be quite high. Population size seemed to be the best surrogate easily available for the extent of nighttime driving in a geographic unit, and it was used as the basis for selection of sampling areas in both the first and second stages of the sampling plan.

2.2.1 FIRST STAGE SELECTION PROCEDURE: PRIMARY SAMPLING UNITS. In drawing the national sample of primary sampling areas it was considered desirable to represent as fully as possible within the limitation of 24 selections both (1) the four major regions of the United States as defined by the Census Bureau and (2) areas of different rural-urban type. Three initial rural-urban classifications were used. These were central cities of Standard Metropolitan Statistical Areas (SMSAs) as defined by the 1970 census; other parts of SMSAs, which include both whole adjacent counties (parts of counties in New England) and main counties minus their central cities; and non-SMSA counties (including some part-counties in New England and independent cities in Virginia). These three rural-urban classifications were combined with the four regions to give twelve basic strata. The actual population size of each of these twelve strata was obtained from census data, and the number of sub-stratum selections in each stratum was determined as shown in Table 2.1. The range in substratum populations was from 5,015,030 to 11,133,677 with an average population for the 24 substrata of 7,721,000.

Over 3,400 separate cards containing unit names and populations were transcribed (or borrowed from the University of Michigan's Survey Research Center), and these cards were sorted into the twelve basic strata in order of increasing population size (excluding the 1,646 counties whose populations were under 20,000). When the basic stratum was large enough to require two or three selections, it was split into two or three substrata

TABLE 2.1. NUMBER OF SELECTIONS PER STRATUM IN CHOOSING 24 SUBSTRATA FROM 12 STRATA COMPOSED OF THE SMSA CENTRAL CITIES AND THE COUNTIES OF THE CONTIGUOUS UNITED STATES (EXCLUDING COUNTIES UNDER 20,000 IN POPULATION), BASED ON 1970 CENSUS POPULATIONS

Region	SMSA Central Cities (31.4%)		Other SMSA Parts (37.3%)		Non SMSA Counties (31.3%)		Total (100.0%)	
	Ideal	Actual	Ideal	Actual	Ideal	Actual	Ideal	Actual
North East (26.4%)	2.23	2	2.85	3	1.25	1	6.32	6
North Central (27.3%)	2.21	2	2.67	3	1.67	2	6.55	7
South (29.3%)	2.32	3	2.25	2	2.47	2	7.03	7
West (17.1%)	1.45	1	2.01	2	0.63	1	4.09	4
Total (100.0%)	8.22	8	9.75	10	6.02	6	23.99	24

Total Estimated Population = 185,293,000
Average Size Per Substratum = 7,721,000

as equally sized as possible. Within each stratum all the cards were then cumulated on a paper tape on an adding machine, and random numbers were used to make five primary sampling unit (PSU) selections in each substratum. The actual definition and population sizes of each substratum are shown in Appendix A along with the names of the selected PSUs in order of selection. Each PSU has a known probability of selection which is the ratio of its population to the total substratum population.

For a self-weighting sample the number of respondents to be obtained in each PSU would be directly proportional to the total substratum size. However, rather than establishing a certain quota of respondents to obtain in each PSU it was considered better to obtain as many interviews as possible in the available survey time at the eight roadside sites in each PSU and then to weight all of the PSU responses upward or downward as required at the time of analysis.

Five PSU selections were made initially in each substratum in the event that the necessary cooperation was not forthcoming from the relevant local officials for the first choice PSU. In such a case contacts were then initiated with officials in the second choice PSU, etc., until a cooperative jurisdiction could be found. However, since such substitutions would introduce some bias into the controlled probability procedures, they were avoided as much as possible. In Appendix A the actual PSUs used in the survey are marked with an asterisk. The 24 first-choice PSUs were located in 17 states, and another state was added by the PSU substitution procedure.

2.2.2 SECOND STAGE SELECTION PROCEDURE: SECONDARY SAMPLING UNITS. For the selected central cities and for a selected county with only one police jurisdiction no second stage of selection was necessary. However, in other counties it would have been impractical to have to elicit the cooperation of local officials in a large number of jurisdictions when only eight roadside sites per PSU were to be chosen. Therefore, to reduce the number of police jurisdictions to two, a secondary selection

process was followed which involved the listing of all relevant separate jurisdictions in order by decreasing population size. These populations were then cumulated on a paper tape on an adding machine, and five secondary selection units (SSUs) per PSU were chosen by the use of random numbers. In general, the first SSU selection was to be used for Friday night interviewing and the second SSU selection was to be used for Saturday night interviewing. If the first two random numbers both fell on the same SSU, it was to be used for both nights. In two SSUs (Tuscarawas County, Ohio, and Sunflower County, Mississippi) it was considered more convenient to use two roadside sites in each SSU on each interviewing night. Each selected SSU has a known probability of selection which is the ratio of its population to the total PSU population.

Again some SSU substitutions had to be made when contacted officials would not agree to provide the necessary police assistance. Appendix B lists the first five originally-selected SSUs in each of the originally-selected PSUs and also the SSU selections in the substituted PSUs. The SSUs actually used in the survey are marked with an asterisk.

2.2.3 THIRD STAGE SELECTION PROCEDURES: ROADSIDE SITES. As mentioned above, eight roadside sites were to be randomly chosen in each PSU. Four of these were to be in each SSU when there were two SSUs in one PSU. Since the operational plan called for using two interviewers at the same time at half of the sites, half of the sites in each SSU were to be chosen from heavy volume roads (defined as 6,000 or more ADT or 30 or more vehicles per hour in the 2-3AM period), and half were to be chosen from medium volume roads (defined as 2,000-6,000 ADT or 10-30 vehicles per hour in the 2-3AM period).

The first step in the selection procedure was to obtain a map showing all relatively well-traveled roads within the boundaries of the SSU. For most SSUs the second step was to draw a grid of half mile squares across this map and then to number the rows and columns of the grid. The third step was to use a random number table to select up to 20 squares as

potential roadside site locations, keeping track of the order of selection for each square. If a square contained no roads it was disregarded, and a new square was selected. Road segments of less than 1/4 mile in length and road segments on the left or lower borders of a selected square were also to be disregarded.

The next step was to seek local advice regarding traffic volumes on the potential roads in the selected squares. The quality of the traffic volume information available varied greatly in the different SSUs. In some there were extensive traffic count data available by day or by hour from professional traffic engineers. In others there were only rough guesses available from local police. In either case the best information available was used to determine which if any of the road segments in a selected square fit the heavy or medium volume definitions. If a selected square contained more than one road segment of sufficient traffic volume, then each eligible segment was numbered and one was selected by a random number table.

A final step in choosing potential roadside locations involved determining a preferred direction of traffic to be sampled from two-way roads. If the random number used for selecting the square was even, the preferred traffic direction was southerly or westerly (SE through WNW); if it was odd, the preferred direction was easterly or northerly (ESE through NW).

In some SSUs containing only a few eligible roads this procedure was simplified somewhat. Instead of making a grid on the map and randomly selecting squares, information was obtained about all the eligible roads in each volume category. These roads were than marked off in half-mile segments, each segment was given a number, and up to 20 medium and heavy volume segments were selected by use of a random number table.

Once the potential roadside segments were selected the final step was to visit them (usually with a local police officer) to check on the availability of suitable interviewing locations. A well lighted parking lot with easy ingress and

egress was preferred (gas stations were the most common type of site used), but sometimes road shoulders or curb lanes were the best that was available. Parking lots at or adjacent to open bars, taverns, or restaurants were not to be chosen, but the presence of such establishments along a selected road segment was not grounds for eliminating that segment. If no safe and suitable site could be found for sampling traffic in the preferred direction along the chosen segment and it seemed that the character of the traffic would not change much in adjacent segments, then suitable sites were sought on such adjacent segments. If this still did not produce a suitable site, the other side of a two-way road segment was canvassed in the same way. If no safe and suitable site could be found for a chosen segment, other eligible segments in the same square were checked. If no segment in or near the selected square contained a suitable site then it was dropped from consideration, and the potential segment in the next selected square was visited. This process was continued in each SSU until the necessary numbers of satisfactory heavy and medium volume sites had been determined. If it happened that two nearby segments on the same road were randomly selected as interviewing locations, then the preferred direction on the second chosen segment was to be opposite that of the first segment.

In some of the less populated SSUs it was not always possible to find enough roads which met the heavy volume criterion. In these cases the highest volume roads available were used, and the elaborate random selection procedure described above was not necessary.

The operational plan called for interviewing for four two-hour interviewing periods each night, two two-hour interviewing periods at separate sites from 10PM to 12PM, and two two-hour interviewing periods at separate sites from 1AM to 3AM. Thus during each time period each night one heavy volume site and one medium volume site were utilized. Two interviewers were to work at the heavy volume sites, and one interviewer was to work at the medium volume sites. No systematic procedure

was followed in determining which site was to be used during which time period. In general the more heavily traveled sites tended to be scheduled for the early morning hours in order to try to ensure sufficent traffic volumes for the survey, but logistical considerations, availability of the site parking areas, police preferences, etc., were also taken into account in this scheduling. The Roadside site Form used to describe each of the selected sites is shown in Appendix C.

The decision to select half heavy volume and half medium volume sites in each SSU was essentially an arbitrary one made for the convenience of the survey operation, and it did not necessarily represent the ratio of heavy to medium volume road segments in the SSU. However, satisfactory estimates of this ratio were available in very few of the sampling areas, and it is felt that both types of selected roadside sites can be considered together as providing reasonably representative samples of all roads of sufficient traffic volume in the selected SSUs.

2.2.4 FOURTH STAGE SELECTION PROCEDURES: INDIVIDUAL MOTORISTS. Motorists were to be randomly selected from the passing traffic stream not at a fixed sampling rate but on an approximate time-interval basis. When an interviewer was ready to begin he signaled to the assisting police officer(s) to flag down the next eligible vehicle traveling in the sampled direction. The interviewer then greeted the respondent, invited him to park and to come into the survey vehicle, and conducted the interview. When the interviewer was finished with a respondent (usually about six minutes later), he signaled the police officer(s) to flag down the next vehicle, and this procedure continued throughout the two-hour interviewing period.

A record was kept of the total number of eligible vehicles passing the site in the sampled direction(s). If a decision was made to sample traffic in two or more directions (occasionally intersecting streets were used also because of insufficient traffic volume in the preferred direction), then the traffic count was kept for all sampled directions. This permitted the calculation of a specific sampling fraction for

each roadside site. An estimate of the average speed at each site was also recorded for use in the calculation of sampling weights.

In accordance with the international roadside survey guidelines, drivers of all motorized vehicles were considered eligible for participation in the survey except those driving commercial vehicles and those driving vehicles with foreign license plates. Thus taxis, buses, and trucks with three or more axles were excluded. Police and fire vehicles, ambulances, and tow trucks were also excluded. Since it was often too dark for the traffic counter to check passing vehicles for non-USA license plates, no attempt was made to exclude them from the traffic count. But the traffic counter was to keep a tally of any non-USA registered vehicles actually stopped, and the total traffic count was reduced in the proportion that the number of these non-USA vehicles was to the total number of vehicles stopped. In actuality only four such vehicles were recorded as being stopped, all of them at one site in Brooklyn.

It was not the intention of the survey procedures to exclude all commercial drivers from the survey (e.g., pizza delivery men) but only the specific types of commerical vehicles referred to above. However, there was apparently some confusion among the various survey personnel on this point. Only two persons who were driving as part of their jobs were actually interviewed in the survey.

2.2.5 SAMPLE SIZE. It was expected that an average of 25 interviews would be obtained at the two-interviewer sites and that an average of 12.5 interviews would be obtained at the one-interviewer sites. No maximum or minimum quotas were established, but rather the interviewers were instructed to obtain as many interviews and as few refusals as possible within each interviewing period. They were also instructed to consider extending the interviewing period beyond 12:00PM or 3:00AM at a site where they had not been able to obtain the expected average within the regular time period. The beginning times at the 185 sites which were actually used in the survey varied

from 9:50PM to 11:20PM and from 12:50AM to 1:55AM, while the ending times varied from 11:35PM to 12:40AM and from 2:45AM to 4:00AM. However, in this report the two survey time periods will be referred to simply as 10-12PM and 1-3AM.

The actual number of eligible vehicles stopped at the 185 sites was 3,698, an average of 25.7 at the two-interviewer sites and of 12.0 at the one-interviewer sites (and an average of 41.5 at four three-interviewer sites in St. Louis County). The total number of interviews with satisfactory breath test readings was 3,144. There were also 215 interviews without a breath test reading (because of refusal, instrument failure, improper recording, etc.), and 48 breath test readings without interviews. Thus interviews were obtained with the drivers of 90.8% of the vehicles stopped, and breath test readings were obtained from the drivers of 86.3% of the vehicles stopped.

2.3 SUMMARY OF OPERATIONAL PROCEDURES

As mentioned above, the basic plan called for three teams of three interviewers each working eight consecutive weekends. Two interviewers per team were hired on a permanent basis, while the third interviewer and the four drivers in each SSU were recruited locally, usually through the local Jaycee Club. The local interviewer always worked in conjunction with a permanent interviewer at a two-interviewer site. The HSRI interviewers began work six weeks before the start of the survey, and this initial period was spent in training, in conducting a practice survey operation in Ann Arbor, and in making site visits to the selected PSUs in which they would be surveying. The purpose of these site visits was to work out the details with the assisting police, to select the roadside sites, to recruit the local assistants, etc. Prior to the site visits, the relevant police departments were usually sent a letter and a brief project summary (Appendix D), and then they were contacted by telephone. At the time of the visit they were provided with a list of other areas which had successfully conducted voluntary roadside breathtesting surveys, with endorsement letters from Chief Walter Krasny of the Ann Arbor Police Department and from

the International Association of Chiefs of Police, and with a brief description of the expected role of the police officers in assisting the survey operation (Appendix E).

Responses to the HSRI request for assistance varied greatly among the contacted police departments. Some offered their cooperation eagerly; some offered their assistance reluctantly; and some adamantly refused to help. The police officials were mainly concerned about the possibility of adverse public reactions and about the procedures for handling motorists found to be at an illegal BAC. In 15 of the 24 PSUs all of the selected police departments were willing and able to provide the needed police assistance. There were five substrata in which a PSU substitution had to be made, and there were four PSUs in which one or more SSU substitutions had to be made. The final survey schedule of the 34 SSUs in 18 states actually used by the three regional survey teams is shown on the next page

Each of the teams made use of slightly different equipment configurations in their survey operations. The east team traveled in a 24 foot motorhome which also served them as living accommodations and which provided space for two interviewing stations at the heavy volume sites on survey nights. At these sites the breath samples were analyzed on an Omicron Intoxilyzer, and at the medium volume sites the breath samples were collected in an Intoximeters Field Crimper for later analysis by gas chromatograph. A rental car was used as the survey vehicle at the medium volume sites.

The midwest team also traveled in a motorhome which they used both for living accommodations and for interviewing at the heavy volume sites. In addition they drove a long-wheelbase van which served as the survey vehicle at the medium volume sites. The Intoxilyzer was the basic breathtesting instrument for both heavy and medium volume sites during the midwest team's itinerary.

The west team traveled in a long-wheelbase van which served as a two-interviewer station at their heavy volume sites. They stayed in motels and rented a car locally for use as a

FINAL SCHEDULE OF REGIONAL SURVEY TEAMS

	West Team	Midwest Team	East Team
October 26	Franklin, Wis.	Buffalo, N.Y.	Oswego County, N.Y.
October 27	Wauwatosa, Wis.	Buffalo, N.Y.	Oswego County, N.Y.
November 2	Duluth, Minn.	Dover and Tuscarawas	Torrington, Conn.
November 3	Duluth, Minn.	County, Ohio	Winsted, Conn.
November 9	Sedro-Woolley, Wash.	Columbus, Ohio	Nassau County, N.Y.
November 10	Skagit County, Wash. (Wash. State Patrol)	Columbus, Ohio	Nassau County, N.Y.
November 16	Seattle, Wash.	Williams County, Ohio	Brooklyn, N.Y.
November 17	Seattle, Wash.	Williams County, Ohio	Brooklyn, N.Y.
November 23	Springfield, Ore.	Lapeer, Michigan	Madison, N.J.
November 24	Lane County, Ore.	Lapeer County, Mich.	Randolph, N.J.
November 30	Gilroy, Calif.	Hamilton County, Tenn.	Bristol, Va.
December 1	Palo Alto, Calif.	Hamilton County, Tenn. (Tenn. Highway Patrol)	Washington County, Va.
December 7	New Orleans, La.	(None)	Raleigh, N.C.
December 8	New Orleans, La.		Raleigh, N.C.
December 14	St. Louis County, Mo.	DeKalb County, Ga.	Miami, Fla.
December 15	St. Louis County, Mo.	and Indianola and Sunflower County, Miss.	Miami, Fla.

survey vehicle at their medium volume sites. The Intoxilyzer was used for breathtesting at the heavy volume sites (powered by a portable generator), and the Field Crimper was used at medium volume sites.

Each interviewer was also furnished with an Intoximeters Alco-Sensor for use at the carside with respondents who refused to leave their cars but were willing to provide a breath sample. The pocket-sized Alco-Sensor was also used sometimes at the Field Crimper sites in order to obtain a direct BAC reading from respondents suspected of being impaired by alcohol. Each team carried with it one Smith and Wesson Simulator calibrating the Intoxilyzers and Alco-Sensors each night and for obtaining a known Field Crimper sample.

The usual interviewing procedure involved (1) the interviewer signaling to the assisting police officer(s) that he was ready for a respondent; (2) the police officer(s) flagging down the next eligible vehicle moving in an appropriate direction and sending the motorist to the point where the interviewer was standing; (3) the interviewer explaining briefly that this was a survey of nighttime drivers and asking the respondent to park and to come into the survey vehicle for a few minutes; (4) the interviewer conducting the short interview (Appendix F) and then explaining that the final step was a breath test; (5) obtaining the breath tests; and (6) thanking the respondent (Appendix G) and sending him on his way. If the respondent were known to be or suspected of being at an illegal BAC, the interviewer would try to persuade him to have a sober passenger drive or to accept a ride from the local drivers. Of 174 drivers who tested at or above 0.10 BAC 20 accepted rides home and 30 said they would have a passenger drive. The local drivers assisted in keeping the traffic count as well as being ready to provide rides for impaired motorists. The average interview time was about five minutes including the breath test, but the overall average time per stopped vehicle came to almost nine minutes.

There were 287 of the 3,698 selected motorists (7.8%) who refused to participate in the survey at all, and there were a

further 147 respondents (4.0%) who refused to provide a breath sample at the end of the interview. The interviewers filled out a brief cover sheet on all refusals and interviewees which included an estimate of the respondent's drinking condition at the time of contact. Forty-eight breath tests were obtained at the carside from persons who refused to take time for the interview, and another 150 complete interviews were obtained at the respondent's car using the Alco-Sensor as the breathtesting device. Only four selected respondents were removed by the police before an interview could take place, and none were arrested after the interview.

The questionnaire was designed for direct keypunching, and only a brief editing procedure was required at HSRI before computerizing the survey results. Appendix H contains the complete codebook for the individual data records, including various types of frequency and percentage distributions in the left margin. Appendix J contains the codebook for the various types of information concerning the 185 roadside sites, including frequency distributions in the left margin.

The information in this section on the operational methodology of the survey is explained in much greater detail in Appendix K of this report. However, readers who do not find their methodological questions answered satisfactorily there should feel free to contact the author.

3.0 DATA ANALYSIS AND RESULTS

3.1 WEIGHTING PROCEDURES

Due to the complex multi-stage sampling design, the first step in the analysis was to construct the weighting factors. There were three sampling variables to be taken into account in the weighting procedures. At the SSU level there were population weight factors to be used in relation to the actual proportion of the eligible U.S. population residing in each substratum. At the site level there were the two factors of different sampling rates and different average vehicle speeds which affected the individual vehicle's chances of being stopped.

In order to compute the population weight factor for each SSU the proportion of the national eligible population residing in each PSU's substratum was determined, and when one PSU contained two SSUs the PSU proportion was simply divided in half to obtain the proportion of the total eligible U.S. population represented by each SSU. These proportions were then multiplied by the actual national total numbers of vehicles stopped and of BAC readings obtained to produce two ideal quotas of vehicles stopped and of BAC readings obtained for each SSU. Then these ideal quotas were divided by the actual numbers of vehicles stopped and BAC readings obtained in each SSU to determine the two SSU population weight factors. These weights varied from 0.567 to 2.476. The same process was carried out for the two survey time periods separately, and here the range was somewhat greater, from 0.559 to 8.518.

The second sampling weight factor was constructed to take into account the joint effects of average speed and traffic density on the individual's chance of selection at each site. These two variables would have opposite effects. The higher the average speed of a driver on the road during the survey hours the greater his likelihood of passing a survey site and being selected as a respondent. On the other hand, the higher

the traffic density the less likely that a given motorist would be selected. Thus for each roadside site the total traffic count was divided by the average speed, these ratios were summed for all the sites in an SSU, and the percentage of this sum contributed by each site was calculated. This percentage was then divided by the percentage of all SSU vehicles stopped at a given site to determine the site's traffic/speed weight. This same process was followed in regard to the number of BAC readings obtained at each site. The traffic/speed weight factors for the total sample varied from 0.164 to 3.003, while for the time periods the weight factors varied from 0.244 to 2.630.

The final weight factor was constructed to attempt to take into account the lack of a satisfactory BAC reading from 13.7% of the motorists stopped. As mentioned previously, the interviewer made a subjective assessment of the drinking condition of each selected motorist at the time of the initial contact. The results of this estimate for the respondents with satisfactory BAC readings are shown in Table 3.1. It is obvious that the interviewers were far from perfect judges of the motorists' drinking condition from the very brief contact at the vehicle, but at least they were correct much more than they were wrong.

TABLE 3.1. DRINKING ESTIMATE AND ACTUAL BAC READINGS, UNWEIGHTED DATA, IN PERCENT

		Blood Alcohol Concentrations			
Drinking Estimate	N	.00-.01	.02-.04	.05-.09	.10+
Had not been drinking	2269	81.5	8.9	6.6	3.0
Had been drinking a little	822	60.9	12.2	16.8	10.1
Had been drinking a lot	47	27.7	8.5	21.3	42.6
No estimate made	54	88.9	3.7	1.9	5.6

In Table 3.2 the drinking estimates are compared for the 3192 respondents with satisfactory BAC readings and for the 506 respondents lacking satisfactory BAC readings. The interviewers

were somewhat more likely to judge persons in the latter group to have been drinking, but the largest difference is in the no-estimate category. Apparently interviewers were much more prone to neglect to check that item on the questionnaire cover sheet when the selected motorist was unwilling to participate in the survey.

TABLE 3.2. COMPARISON OF INTERVIEWER DRINKING ESTIMATES FOR RESPONDENTS WITH AND WITHOUT BAC READINGS, UNWEIGHTED DATA, IN PERCENT

Type of Respondent	N	Drinking Estimate None	A Little	A Lot	No Estimate
With BAC	3192	71.1	25.8	1.5	1.7
Without BAC	506	52.0	26.7	4.9	16.4

There were 61 cases of respondents who participated in an interview but then refused to give a breath sample in which the interviewers made a second drinking estimate at the end of the interview. Of course there was not perfect agreement between the preliminary and the second estimates, but in general the correspondence was fairly good--providing further support for a procedure utilizing the drinking estimate to attempt to overcome any potential bias from the missing BACs.

The procedure used in calculating the drinking estimate weights was based on the assumption that the non-BAC respondents who were estimated not to have been drinking were similar in their BACs to the BAC respondents who were estimated not to have been drinking, etc. The drinking estimate weight factor for each of these BAC respondents was calculated by dividing the total number of such respondents (weighted by the speed/traffic factor) into the total number of BAC and non-BAC respondents estimated not to have been drinking. This was done separately for each of the three interviewing teams, and then a similar process was repeated for each of the other three drinking estimate categories, making twelve weight factors in all. These factors were then adjusted in each SSU to make the

number of BAC readings obtained multiplied by the drinking estimate weight equal to the total number of vehicles stopped in the SSU. This process was also followed for each time period separately. The adjusted drinking estimate weight factors varied from 0.955 to 7.166 with an average of about 1.16.

These various weight factors were then multiplied together for use in the subsequent analyses. The largest combined weight factor calculated was 12.669, while the smallest was 0.118. But these extremes were rare, and the largest standard deviation of any of the weight variables was 0.816. More detail on the construction and values of the 18 weight factors is given in the codebook (Appendix H) under Variables 119-136.

In Table 3.3 the national BAC results are compared both unweighted and with two different weight factors. As would be expected, use of the speed/traffic weights leads to lower impaired percentages for the total sample as compared with the unweighted results because the sampling rates tended to decline considerably during the later survey hours while the impaired percentages increased. However, within each time period the use of these speed/traffic weights had very little effect. Also a comparison of the results using the two combinations of weight factors indicates only miniscule differences in the total sample and time period BAC distributions. The use of the drinking estimate weight factors in order to take into account possible bias from missing BAC readings demonstrates very little bias in the BAC results from the failure to obtain satisfactory BAC readings from all selected respondents. Nevertheless, the subsequent tables in this analysis, unless specified otherwise, will make use of the combinations of all three types of weights: population, speed/traffic, and drinking estimate.

3.2 SAMPLING ERROR

As would be expected in this type of multistage sampling design with a relatively small number of PSUs, the sampling errors for the survey findings are greater than would be expected from a simple random sample design of the same total

TABLE 3.3. COMPARISON OF NATIONAL BAC RESULTS USING UNWEIGHTED DATA, DATA WEIGHTED BY SPEED/TRAFFIC FACTORS AND POPULATION FACTORS, AND DATA WEIGHTED BY SPEED/TRAFFIC AND POPULATION AND DRINKING ESTIMATE FACTORS, FOR TOTAL SAMPLE AND TWO TIME PERIODS, IN PERCENT

Time and Weight Factors	N	BAC Reading .00-.01	.02-.04	.05-.07	.08-.09	.10-.14	.15+
10-12PM	1686						
No Weighting		83.5	7.5	4.4	1.6	2.0	0.9
Speed/Traffic and Population		83.1	7.8	4.7	1.5	2.0	1.0
Speed/Traffic, Population and Drinking Estimate		82.9	7.7	4.8	1.5	2.1	1.1
1-3AM	1506						
No Weighting		66.7	12.0	8.4	4.7	6.4	1.9
Speed/Traffic and Population		66.0	12.7	8.1	4.6	6.7	1.8
Speed/Traffic, Population,and Drinking Estimate		66.5	12.4	8.0	4.5	6.7	1.9
Total	3192						
No Weighting		75.5	9.6	6.3	3.1	4.1	1.4
Speed/Traffic and Population		77.2	9.4	6.1	2.4	3.5	1.4
Speed/Traffic, Population,and Drinking Estimate		77.4	9.2	6.1	2.4	3.6	1.4

size. For a given percentage or mean the ratio of the actual calculated variance to the expected simple random sample variance based on the same number of cases is known as the design effect (DEFF). This design effect was calculated by a special computer program* for a number of percentages obtained from the survey analysis. While there was considerable variation in the design effects found with different variables and subgroups, the average design effect was about 2.25. Since it is the square root of the design effect that affects the sampling error, this means that for most of the survey findings the sampling error is about 1.5 times greater than it would have been with a simple random sample design of the same sample size.

Table 3.4 below provides the sampling errors for various percentages with various sample sizes at a 95% confidence level based on the assumption of a design effect of 2.25. They may be used to provide a rough estimate of the interval within which the true value of an obtained percentage may be expected to lie with 95% confidence, assuming that there is no significant nonresponse bias. Hopefully any such potential bias has already been mitigated by the weighting procedure. The sampling errors given here may also be used for rough estimates as to whether the difference between two percentages is statistically significant at a 95% confidence level. If the difference is greater than the sum of the two sampling errors multiplied by .707, it is likely to be statistically significant.

In the initial planning for this survey consideration had been given to a cheaper sample design for each PSU which would have used four heavy volume sites with two interviewers at each site and which would not have used medium volume sites at all. A comparison of the design effects for the total sample and for the subsample interviewed at the heavy volume sites shows that the decision to expand the sample design was a wise one. The

*See L. Kish, M.R. Frankel, and N. Van. Eck. SEPP: Sampling Error Program Package. Institute for Social Research, The University of Michigan, Ann Arbor, no date.

TABLE 3.4. SAMPLING ERRORS* FOR PERCENTAGES BASED ON VARIOUS SAMPLE SIZES, ASSUMING DEFF=2.25

Percentages Around	N of Sample or Subgroup					
	4000	3000	2000	1500	1000	500
50%	2.37	2.73	3.36	3.87	4.74	6.72
30% or 70%	2.16	2.52	3.06	3.54	4.35	6.15
20% or 80%	1.89	2.19	2.67	3.09	3.78	5.37
10% or 90%	1.68	1.95	2.40	2.76	3.39	4.80
5% or 95%	1.02	1.20	1.47	1.68	2.07	2.91

*The sampling error used is two times the estimated standard error, that is, the sampling error based on a 95% confidence level.

design effects are roughly comparable for the two sample designs, despite the fact that the heavy-volume-site design is much more restrictive in its survey universe. The expanded sample design provided lower sampling errors by increasing both the total sample size and the dispersion of the sample, and it also provided a sample which better represented the universe of nighttime drivers.

3.3 THE BAC FINDINGS

Clearly the variable of most interest in this study is that containing the 3,192 BAC readings obtained from the random sample of motorists between 10PM and 3AM on Friday and Saturday nights. As can be seen in Table 3.5, the best weighted estimate of the percentage of driving at these times by drivers who had been drinking is 22.6% (0.02 BAC or greater). The estimated percentage of driving by those who had been drinking enough to make likely some impairment of driving performance is 13.5% (0.05 BAC or greater). The estimated percentage of driving by those who were at a BAC level considered illegal in all states (0.10 BAC or greater) is 5.0%. The estimated percentage of driving by those at a clearly intoxicated level (0.15 BAC or greater) is 1.4%. Thus, on the average, more than one eighth of the driving during these hours in America is by drivers who are likely to be impaired by alcohol, and one twentieth is by drivers who are illegally impaired by alcohol.

TABLE 3.5. NATIONAL BAC RESULTS, THEIR SAMPLING ERRORS,* AND ESTIMATED REDUCTIONS NECESSARY FOR A STATISTICALLY SIGNIFICANT CHANGE: USING SPEED/TRAFFIC, POPULATION, AND DRINKING ESTIMATE WEIGHTS (BASED ON WEIGHTED N OF 3719)

	BAC Reading			
	.02+	.05+	.10+	.15+
Percentage	22.63	13.46	4.92	1.36
Sampling Error	3.05	2.18	1.06	0.49
Maximum Statistically Significant Reduced Percentage	19.08	10.92	3.69	0.79
Percentage Change Needed for Statistical Significance	16%	19%	25%	42%

*The sampling error used is two times the standard error; that is, the sampling error based on a 95% confidence level.

Table 3.5 also shows the sampling errors calculated for each of these percentages. Thus it is estimated at a 95% confidence level that the true percentage of drivers who had been drinking at these times is between 19.58 and 25.68; that the true percentage who were probably impaired was between 11.28 and 15.64; that the true percentage who were driving at an illegally impaired level was between 3.86 and 5.98; and the true percentage who were clearly intoxicated was between .087 and 1.85.

In spite of the fairly large number of cases obtained in this survey, it would still require a considerable change in American drinking and driving practices for such change to be demonstrated as statistically significant in a subsequent survey of the same size and design. Table 3.5 indicates that reductions of 16% in driving after drinking, of 19% in probably impaired driving, of 25% in illegally impaired driving, and of 42% in intoxicated driving would be necessary to show statistically significant changes in a subsequent survey of the same type (assuming a one-tailed test of significance).

3.3.1 TIME OF NIGHT AND DRIVING AFTER DRINKING. Table 3.6 shows the BAC results by time of night, both for hour periods and for the two main time periods. It will be readily seen that the drinking percentages tend to increase regularly by time of night. In the early morning hours (1-4AM) more than one fifth of the driving is by probably impaired drivers, and one twelfth of the driving is by illegally impaired drivers. In the 2-3AM time period almost one quarter of the driving is by probably impaired drivers, and one ninth is by legally impaired drivers. This trend of increasing alcohol impairment later at night seems to stop in the 3-4AM time period, but there were only 64 persons tested after 3AM, so the findings for this time period are not as reliable as for the earlier periods. These fractions indicate directly the risk of meeting an alcohol impaired driver that the average motorist would face while driving during these time periods.

3.3.2 DATE AND DRIVING AFTER DRINKING. Differences between drinking and driving behavior are much less dramatic when the Friday and Saturday results are compared than when times of night are compared. Table 3.7 suggests that overall driving after drinking may be slightly greater on Saturday nights than on Friday nights. Twenty-four percent of Saturday night driving is by drivers who have been drinking, compared to 21% of Friday night driving, and similar small differences are found for probably impaired driving (13.9% compared to 13.0%) and for illegally impaired driving (5.7% compared to 4.3%). However, these differences are not consistent over the eight weekends. On four weekends Saturday night had the higher proportion of probably impaired drivers, but on the other four weekends Friday night had the higher proportion.

Nor were there any clear time trends over the eight fall weekends of the survey. The highest proportion of probably impaired drivers (20.4%) was found on the last night of the survey, December 15, but the second highest proportion (19.6%) was found on the first night of the survey, October 26. Friday night, December 14, was lower than ten other survey nights, so

TABLE 3.6. NATIONAL BAC RESULTS BY TIME OF NIGHT; USING SPEED/TRAFFIC POPULATION, AND DRINKING ESTIMATE WEIGHTS, IN PERCENT

Time Period of Interview	Wtd. N	BAC Reading .00-.01	.02-.04	.05-.07	.08-.09	.10-.14	.15+
10-11PM	1032	85.5	6.4	3.9	1.8	1.5	0.9
11-12PM	1210	81.8	8.4	5.5	1.3	2.0	1.1
12-1AM	133	75.1	12.0	7.5	0.0	3.8	1.6
10-1 Subtotal	1685	82.9	7.7	4.8	1.5	2.1	1.1
1-2AM	573	66.0	12.8	8.9	3.8	5.8	2.6
2-3AM	524	64.3	11.2	8.2	5.3	9.3	1.8
3-4AM	46	75.1	4.2	10.4	4.9	4.4	1.0
1-4 Subtotal	1505	66.5	12.4	8.0	4.5	6.7	1.9
Total	3719	77.4	9.2	6.1	2.4	3.6	1.4

TABLE 3.7. NATIONAL BAC RESULTS FOR FRIDAY AND SATURDAY NIGHTS; USING SPEED/TRAFFIC POPULATION, AND DRINKING ESTIMATE WEIGHTS, IN PERCENT

	Wtd. N	BAC Readings .00-.01	.02-.04	.05-.07	.08-.09	.10-.14	.15+
Friday Nights	1972	78.7	8.3	6.4	2.4	3.2	1.1
Saturday Nights	1747	75.9	10.2	5.8	2.4	4.0	1.7

there is no strong indication of greater drinking and driving as Christmas approached. There was also only a slightly above average amount of drinking and driving found on Thanksgiving weekend. Obviously with only three SSUs being surveyed on any given night, one could not offer very reliable support for a seasonal trend even if it were more consistently found in the data.

3.3.3 TYPE OF ROAD AND DRIVING AFTER DRINKING. Almost half of the motorists stopped were traveling on two lane, two direction roads. Next most frequent type of roadway used was the four or five lane, two direction main road. The data show a decline in the percentages of drinking drivers on these higher volume roads. For example, 25.2% of the driving on the first type of road was by drinking drivers compared to 21.4% on the second type. However, this difference is not quite large enough to be considered statistically significant.

As would be expected, this same difference persists when the BAC results in the expected heavy volume sites are compared with the results in the expected medium volume sites. Table 3.8 shows a little more drinking and driving on the medium volume roads. However, there is only a weak inverse relationship between actual traffic count and the proportion of drivers who had been drinking.

3.3.4 URBAN/RURAL LOCATION, REGION, SSU, AND DRIVING AFTER DRINKING. There also seems to be a substantial relationship between the ruralness of a roadside site location and the extent of drinking and driving found. Table 3.9 provides comparison data in eight locational categories. It is apparent from these data that the rural areas had more driving after drinking than the towns and cities and that the smaller towns and cities had more driving after drinking than the larger towns and cities in the national sample. Also within the towns and cities there may be a tendency for more drinking and driving on roads in open areas than in more congested areas, but the numbers of cases in these categories are too small to assert this definitively.

TABLE 3.8. NATIONAL BAC RESULTS FOR HEAVY AND MEDIUM VOLUME ROADSIDE SITES; USING SPEED/TRAFFIC, POPULATION, AND DRINKING ESTIMATE WEIGHTS; IN PERCENT

Expected Traffic Volume	N	BAC Readings .00-.01	.02-.04	.05-.07	.08-.09	.10-.14	.15+
Heavy	2415	78.3	8.6	6.0	2.4	3.4	1.2
Medium	1304	75.6	10.1	6.3	2.5	3.8	1.7

TABLE 3.9. NATIONAL BAC RESULTS BY URBAN/RURAL LOCATIONS; USING SPEED/TRAFFIC, POPULATION, AND DRINKING ESTIMATE WEIGHTS; IN PERCENT

Type of Site Location	N	BAC Reading .00-.01	.02-.04	.05-.07	.08-.09	.10-.14	.15+
City Over 25,000 - Commercial	1500	80.0	8.6	5.6	2.3	2.5	1.0
City Over 25,000 - Residential	316	80.6	7.7	4.8	2.2	2.7	1.0
City Over 25,000 - Open Space	150	70.4	12.9	7.3	4.6	3.9	1.0
City Under 25,000 - Commercial	469	72.5	8.7	9.3	2.2	6.3	0.9
City Under 25,000 - Residential	197	83.8	7.5	3.8	0.7	3.0	1.2
City Under 25,000 - Open Space	79	73.9	16.9	3.3	2.7	2.5	0.7
Rural - Congested Area	551	73.7	9.6	7.9	2.0	4.8	2.0
Rural - Open Space	458	75.3	10.2	4.4	3.5	3.7	2.9

The data comparing the BAC findings in the four regions and the 34 SSUs are shown in Appendix L, for the total SSU samples and separately for the two time periods. Because the number of particular roadside locations in each SSU varied from a minimum of three to a maximum of eight and the number of BAC readings obtained in each SSU varied from 35 to 169, there is great variability in the reliability of these data for individual SSUs. For the separate time periods these BAC totals vary from 6 to 92. Even for the larger sample sizes sampling errors from 4-8% would be expected for the figures presented in Appendix L. Clearly more elaborate surveys would need to be conducted in each SSU to provide more reliable data on the extent of driving after drinking in each locality.

Nevertheless it is interesting to compare the findings in the various SSUs. The SSU with the highest percentage of probably impaired drivers was suburban Franklin in Milwaukee County, Wisconsin (28.7%), but second highest was a rural area, Sunflower County, Mississippi (23.9%). The SSU with the lowest percentage was also a rural area, Tuscarawas County, Ohio (2.7%), while second lowest was suburban Nassau County, New York (4.8%). In spite of the overall rural/urban differences indicated in Table 39, such differences are far from consistent across all the SSUs. For example, comparing big cities the percentages were 18.6 in New Orleans and 18.5 in Duluth, while they were 8.5 in Miami and 9.4 in Seattle. Other suburban comparisons range from 19.0% in DeKalb County, Georgia, to 9.5% in St. Louis County, Missouri. Other rural comparisons range from 21.7% in Washington County, Virginia, to 7.1% in Lane County, Oregon.

On a regional basis the data suggest that there is somewhat more drinking and driving in the south and in the midwest than in the west and northwest. For example, motorists at .05% BAC or above did 14.8% of the driving in the south and 14.1% in the midwest, compared to 11.7% in the west and 12.6% in the northeast. But none of these regional differences are large enough to be considered statistically significant at a 95% confidence level.

3.3.5 DEMOGRAPHIC CHARACTERISTICS AND DRIVING AFTER DRINKING. Table 3.10 presents the BAC results in relation to six demographic variables: sex, race, age, education, marital status, and occupation. Clearly one of the sharpest distinctions which shows up in this table is that between males and females. Women are much less likely than men to be driving late on weekend nights, and when they do drive they are much less likely to have been drinking at all or to have been drinking heavily. Another significant distinction shows up in marital status where the divorced, separated, and widowed respondents were much more likely to have been drinking than were either the married or the single respondents.

As would be expected, there were also significant differences among age groups. The least driving after drinking was found among the 16-17 years olds, while second lowest was the over 65 group. The heaviest drinking was found in the 25-34 age group, but the 35-44 and 21-24 age groups were not far behind. The 18-20 year old group had been drinking less than the overall sample average, but still substantial numbers of them had been drinking and 4.2% were at an illegal level. When the 547 respondents in the 18-20 age group were looked at separately in states which do and do not legalize 18 year old drinking, it was found that 14.8% were at .05 BAC or above in the states with an 18 year old minimum drinking age, compared to 10.8% in states which do not permit 18 year old drinking. But this difference is not large enough for statistical significance.

In the occupation area there was almost no difference between the percentages of blue collar workers and white collar workers who had been drinking, but there were many more blue collar workers who had been drinking heavily (6.1% compared to 3.9% at 0.10 or above). Not surprisingly this same pattern is found in the education variable, where those who had not completed high school had been drinking more heavily than the more educated groups. This pattern was accentuated when respondents who were current students were removed from the education analysis.

TABLE 3.10. NATIONAL BAC RESULTS AND DEMOGRAPHIC CHARACTERISTICS OF THE DRIVERS: SEX, RACE, AGE, EDUCATION, MARITAL STATUS, AND OCCUPATION; USING SPEED/TRAFFIC, POPULATION, AND DRINKING ESTIMATE WEIGHTS, IN PERCENT

	Wtd. N	BAC Reading					
		.00-.01	.02-.04	.05-.07	.08-.09	.10-.14	.15+
Sex							
Male	3101	75.7	9.8	6.4	2.7	3.8	1.6
Female	586	85.1	6.5	4.7	1.1	2.3	0.3
Race							
White	3230	77.9	8.9	5.7	2.5	3.7	1.3
Black	328	72.9	11.9	7.2	2.5	2.7	2.8
Age							
16-17	242	88.4	3.3	3.8	1.7	2.7	0.0
18-20	596	81.5	7.3	5.3	1.7	3.0	1.2
21-24	622	74.6	10.6	6.7	2.9	4.2	1.0
25-34	948	74.1	10.7	6.9	2.2	4.6	1.6
35-44	481	74.6	9.5	6.1	3.9	4.3	1.6
45-54	436	78.6	8.0	6.6	2.4	2.2	2.2
55-64	231	78.2	11.5	4.6	2.6	1.0	2.1
65+	71	85.8	5.0	5.5	1.8	2.0	0.0
Education							
High School Not Finished	956	79.0	6.2	6.4	2.1	4.3	2.0
High School Finished	1257	77.0	10.0	5.6	2.9	3.5	1.2
Some College	873	77.6	8.8	6.3	2.6	3.3	1.4
College Finished	542	74.9	13.0	6.4	2.2	2.7	0.9

TABLE 3.10. (cont'd)

	Wtd. N	BAC Reading .00-.01	.02-.04	.05-.07	.08-.09	.10-.14	.15+
Marital Status							
Married	1799	77.8	8.6	5.9	2.6	3.5	1.5
Single	1497	79.8	9.0	4.9	2.2	3.3	0.8
Divorced	222	61.1	15.6	11.0	4.7	4.6	3.0
Separated	69	62.6	11.1	15.3	0.0	7.2	3.9
Widowed	45	69.5	2.0	12.5	0.0	1.1	4.9
Occupation							
Unemployed	180	76.5	13.3	4.3	2.0	3.9	0.0
White Collar	1172	75.7	12.2	5.7	2.4	3.0	0.9
Blue Collar	1732	76.0	8.2	6.9	2.9	4.1	2.0
Farmer	23	82.2	15.8	0.0	0.0	1.9	0.0
Housewife	90	92.9	3.0	2.3	1.2	0.0	0.5
Student	433	84.3	4.8	6.1	1.8	2.9	0.1

As would be expected from the age and sex data, the student and housewife categories showed much less drinking than did the employed categories.

In regard to race, a larger proportion of black respondents than of white respondents had been drinking some, but at the higher blood alcohol concentrations this difference almost disappeared.

3.3.6 DRIVING CHARACTERISTICS AND DRIVING AFTER DRINKING. BAC results in relation to four types of driving characteristics are presented in Table 3.11. Clearly the most significant variable in this group is trip purpose. More than half of the 105 respondents who said they were traveling between eating or drinking places had been drinking, and almost 10% of them were at illegal BACs. And almost one-third of those who were coming from or were on their way to an eating or drinking place had been drinking and 7.9% of such drivers were at an illegal BAC. Persons driving to and from work were least likely to have been drinking, but even in this group 7.6% were probably impaired and 2.0% were illegally impaired. Respondents who had been at a friend's home were also more likely to have been drinking than respondents who had been shopping, at a recreational or cultural event, etc.

The differences in percentages who had been drinking are rather small in regard to number of passengers and annual mileage categories. However, drivers traveling alone and drivers with low annual mileages were more likely to have been drinking heavily.

In regard to duration of driving time on the current trip there is a slight tendency for persons on shorter trips to have been drinking more than persons on longer trips, but it does not appear as a neat monotonic relationship. Probably the national estimates of the percentages of driving time at various BAC categories come fairly close to the percentages of nighttime drivers at these BACs categories.

3.3.7 REPORTED ALCOHOL USE AND DRIVING AFTER DRINKING. Before the breath test was mentioned in the interview each

TABLE 3.11. NATIONAL BAC RESULTS AND DRIVING CHARACTERISTICS OF THE DRIVERS: PASSENGERS ANNUAL MILEAGE, TRIP PURPOSE, TRIP LENGTH: USING SPEED/ TRAFFIC, POPULATION AND DRINKING ESTIMATE WEIGHTS, IN PERCENT

	Wtd. N	BAC Reading .00-.01	.02-.04	.05-.07	.08-.09	.10-.14	.15+
No. of Passengers							
None	1186	79.2	8.0	5.3	1.5	4.1	1.9
One	1368	75.9	10.6	5.6	3.3	3.3	1.1
Two or More	917	76.4	8.9	8.0	2.4	2.8	1.4
Annual Mileage							
Under 10,000	820	76.8	8.2	5.8	2.3	4.9	2.1
10,000-20,000	1472	78.3	9.2	5.8	2.3	3.4	0.9
20,000-30,000	622	74.7	11.5	6.2	3.8	3.0	0.8
Over 30,000	578	79.7	7.5	6.5	2.0	2.3	1.9
Trip Purpose							
Social (Friend's Home)	1122	76.9	10.0	7.0	2.2	3.0	1.1
Recreational, Cultural	370	88.8	5.5	2.7	0.9	2.1	0.0
To or From Eating or Drinking Places	874	67.0	14.0	7.3	3.8	5.9	2.0
Between Eating or Drinking Places	105	46.2	19.6	15.6	8.8	7.5	2.3
To or From Work	561	89.2	3.1	4.1	1.6	0.8	1.2
Just Driving Around	68	80.1	3.8	9.0	1.6	5.5	0.0
Other	518	81.2	7.2	3.7	1.9	3.8	2.2
Trip Time							
0-5 minutes	343	76.4	9.0	5.3	2.8	4.7	1.7
6-10 minutes	506	70.9	13.0	8.1	2.6	3.6	1.9
11-20 minutes	1185	76.4	8.4	7.5	2.7	3.8	1.3
21-30 minutes	647	81.6	8.5	5.0	2.1	1.9	0.9
31-50 minutes	426	78.4	9.3	3.7	2.5	4.0	2.2
51-100 minutes	271	82.3	8.3	4.1	1.9	3.0	0.4
101-200 minutes	134	75.7	8.1	6.3	2.0	5.0	3.0
More Than 200 minutes	66	89.5	1.7	7.0	1.8	0.0	0.0

respondent was asked if he ever drank alcoholic beverages or if he was a total abstainer. If he said he did drink, he was asked to describe the extent of his drinking on a five-category scale and whether he had had anything to drink today. If he answered "yes" to the latter-question, he was asked how long ago he had finished his last drink. The relation of the answers to these questions to respondents' BAC readings is shown in Table 3.12.

In general the data show the relationship one would expect. Very few of the "abstainers" (1.4%) had positive blood alcohol readings, and not very many (3.0%) of the drinker respondents who said they had not drunk today had positive BACs. Similarly persons who classified themselves as very light drinkers were much less likely to have been drinking than persons in the heavier drinking categories (although one wonders about 3.3% of the "very light" drinkers being at illegal BAC levels). These data tend to support the survey assumption that most people try to give honest answers to survey questions, but they also indicate that not all answers on sensitive questions can be taken at face value.

In regard to recency of drinking and BAC it is apparent that the more recent drinkers show the highest BACs. The interviewers were to try to delay the breath test on respondents who said they had been drinking within the previous ten minutes, so presumably few of the high readings in these categories are due to contamination by mouth alcohol. There is an almost perfect monotonic decrease in the percentages of respondents at illegal BACs as the time since the last drink becomes greater.

3.3.8 CONCERN ABOUT DRUNK DRIVING AND DRIVING AFTER DRINKING. Finally the survey respondents were asked a few questions indicative of their knowledge and concern about the drunk driving problem. The answers to these questions in relation to BAC results are shown in Table 3.13.

The first question asked the respondent if he recalled taking part in any conversations in which drinking and driving or drunk driving was mentioned during the previous month.

TABLE 3.12. NATIONAL BAC RESULTS AND REPORTED DRINKING CHARACTERISTICS OF THE DRIVERS: DRINKING TYPE AND RECENCY OF LAST DRINK; USING SPEED/ TRAFFIC, POPULATION, AND DRINKING ESTIMATE WEIGHTS, IN PERCENT

	Wtd. N	BAC Reading					
		.00-.01	.02-.04	.05-.07	.08-.09	.10-.14	.15+
Drinking Type							
Abstainer	646	98.4	0.7	0.4	0.4	0.0	0.0
Very Light	1393	83.3	7.9	4.2	1.3	2.4	0.9
Fairly Light	888	72.6	10.4	6.8	3.6	4.2	2.4
Moderate	667	53.3	18.2	13.4	5.1	7.9	2.0
Fairly Heavy	23	31.9	4.4	37.0	11.6	9.7	5.5
Heavy	13	47.3	19.1	0.0	0.0	22.8	10.8
Last Drink Recency							
None Today	1983	97.0	1.2	1.1	0.5	0.1	0.2
1-5 minutes	73	29.4	23.6	15.7	12.4	14.8	4.2
6-10 minutes	103	23.4	27.7	26.6	11.5	8.4	2.5
11-20 minutes	146	31.8	22.5	20.6	5.6	14.6	4.8
21-30 minutes	178	42.3	27.4	8.6	6.9	11.3	3.5
31-50 minutes	72	29.3	24.8	25.3	2.6	11.6	6.3
51-100 minutes	330	48.7	23.5	11.4	6.0	8.1	2.4
101-200 minutes	353	60.4	14.2	10.9	4.5	7.5	2.4
More than 200 minutes	385	82.2	8.9	5.4	0.6	1.0	1.9

TABLE 3.13. NATIONAL BAC RESULTS AND CONCERN ABOUT DRUNK DRIVING: CONVERSATION, KNOWLEDGE OF ALCOHOL FATALITIES, SOCIAL VERSUS PROBLEM DRINKER, ATTEMPTED PERSUASION OF DRUNK NOT TO DRIVE, TAX SUPPORT FOR ASAP; USING SPEED/TRAFFIC, POPULATION AND DRINKING ESTIMATE WEIGHTS, IN PERCENT

	Wtd. N	BAC Reading .00-.01	.02-.04	.05-.07	.08-.09	.10-.14	.15+
Drunk Driving Conversation							
Yes	1251	80.0	8.8	5.8	1.8	3.1	0.6
No	2379	76.0	9.3	6.2	2.8	3.8	1.8
Alcohol Fatalities Est.							
0-19%	282	72.5	9.9	6.3	3.8	5.4	2.1
20-34%	392	75.8	10.9	5.8	3.0	3.9	0.6
35-49%	251	83.2	7.6	4.6	1.2	3.1	0.3
50%	898	80.0	8.6	4.2	2.1	3.9	1.2
51-65%	503	78.7	8.5	7.8	2.6	2.1	0.3
66-79%	757	79.9	9.0	5.3	2.0	2.4	1.4
80-100%	344	74.8	10.3	6.2	2.7	3.7	2.3
Social Versus Problem Drinkers							
Social	1784	79.8	8.3	5.6	2.8	3.1	0.5
Problem	1340	74.7	10.8	6.3	2.3	4.0	1.9
About Even	268	83.4	6.5	3.8	2.4	2.6	1.5
Persuade Not to Drive							
Yes	2161	67.0	10.4	7.3	3.4	5.0	1.4
No	1463	84.7	7.1	4.2	1.0	1.4	1.4
ASAP Tax Support							
Yes	2322	77.8	9.0	6.0	2.2	3.4	1.5
No	678	74.7	9.7	6.3	3.8	4.3	1.2

Respondents who said "no" were slightly more likely to have been drinking, but the differences were not very great. They were also asked to estimate the percentages of fatal accidents in which a drinking driver is involved. Persons who gave rather extreme answers (less than 20% or greater than 80%) tended to have been drinking more than persons in the middle categories, but otherwise there was no significant pattern in the responses.

Less than half of the sample thought that "problem drinkers" caused more accidents than "social drinkers," but those who chose "problem drinkers" were somewhat more likely to have been drinking. Similarly those who said they had tried to persuade someone not to drive in the past year were considerably more likely to have a positive BAC themselves than were those who had not attempted such persuasion. Presumbably this is a result of drinking drivers associating more with other drinking drivers and thus having more occasions to attempt such persuasion. To a more abstract indication of concern, the question on willingness to support governmental alcohol safety action efforts with tax dollars, the minority who were non-supportive were slightly more likely to have been drinking. Overall, however, one does not get the impression from these data that the drinking drivers are much different from the non-drinking drivers in their awareness and concern about drunk driving and highway safety.

4.0 CONCLUSIONS AND RECOMMENDATIONS

There are two general conclusions to be drawn from this first national roadside survey effort. The first is that such surveys on a national scale are feasible at less than prohibitive cost. While there were many operational problems, the survey was carried out successfully and provided useful data for assessing and evaluating the driving-after-drinking problem throughout the United States.

The second conclusion is the obvious one that driving after drinking is a serious problem in the U.S., at least on Friday and Saturday nights from 10PM to 3AM. Large numbers of motorists are operating vehicles during these times while at least somewhat impaired by alcohol, and all the past efforts of police departments, other concerned governmental agencies, insurance companies, automobile clubs, etc. have failed to stop a lot of motorists from driving when they should not. The problem of high accident rates for such drivers is still very important in the highway safety picture, and innovative ways of dealing with this problem are still badly needed.

The major recommendation of this study is that future surveys of this sort should be undertaken periodically. As suggested by the international subgroup on roadside surveys, the roadside breathtesting survey seems an extremely useful and practical means for assessing a country's drinking and driving problem and for evaluating efforts to do something about it. Specific suggestions for improving operational procedures in such future surveys are listed below.

(1) In view of the generally poorer response rates and interviewing quality from the local interviewers, it would seem desirable to try to hire all interviewers as permanent staff for the duration of the survey. This also avoids the potential problem of respondents being known to the interviewer personally, although this was apparently not a serious matter in any of the

SSUs in the 1973 survey. Perhaps in areas where there are large numbers of non-English speakers a local interviewer who speaks the minority language should be recruited to help in the communication process.

(2) Considering the many problems in finding satisfactory camping areas, the lack of privacy in cramped motorhome living, the problems encountered in upkeep of the motorhomes, etc., it would be better for all interviewers to stay in motels in the SSUs. Travel between SSUs could be by car or plane with one or more vehicles rented locally as needed. Staying in motels with their easily available telephones would also enhance the communication process for interviewers, both with headquarters and with local contacts.

(3) In view of the small number of respondents actually driven home by the local drivers (21), serious consideration should be given to not providing such a transportation service for impaired drivers unless the cooperating police department insists upon it. At issue are the degree of legal and moral responsibility of the survey organization at least to try to remove from the highway respondents who are identified as impaired by alcohol in the interview and the willingness of police departments to provide assistance if such alternate transportation is not offered.

(4) It is recommended that the Intoxilyzer not be used again in a field survey operation. While it provided a direct BAC reading quite rapidly, its bulk, its need for a substantial electric power source, and its dependence on a stable ambient temperature made it poorly suited for a field operation. Its noise and its need for ten seconds of blowing by a respondent were added nuisances. The pocket-sized, self-powered Alco-Sensor would be an ideal breathtesting instrument if it were more durable and reliable. The interviewers found that it did tend to drift somewhat over time and had to be re-calibrated each night, and a number of the instruments failed entirely and had to be repaired, Other similar but less simple devices of this sort which should be looked into include the DOT

Transportation Systems Center Alcohol Screening Device, the Borg-Warner ALERT, and the Energetic Science Alco-Limiter. For a delayed BAC analysis the Intoximeter Field Crimper proved fairly satisfactory, but it is somewhat cumbersome to use and indium tubes are very expensive. Other delayed systems which should be explored for use in a future survey include the Vacutube for later analysis by gas chromatograph and the Smith and Wesson Field Collection and Transfer Unit for later analysis by a Breathalyzer.

(5) The questionnaire needs some small revisions to make it clearer and more easily understandable. The interviewers found it very hard to observe seat belt use and often just asked the respondents directly, so the validity of this item is open to question. The five questions (Q13-17) concerning drunk driving knowledge and concern tended to be harder for respondents to understand and to give intelligent answers to than the earlier more personal and factual questions. The social versus problem drinker question (Q15) would be difficult for many people to understand at any time, and it seemed to be particularly so in the middle of the night with respondents who often had been drinking. Some of the interviewers were also skeptical about the large proportion of respondents who said they were willing to support an effective alcohol safety program with their taxes (Q17).

(6) Many of the interviewers thought that a more elaborate field trial of the survey procedures would have been desirable, complete with working out arrangements with local police and drivers themselves. This undoubtedly would have reduced later field problems, but there is still a question as to whether the additional practice would have been worth the additional trouble to the other people necessarily involved. Another suggestion was that all interviewing teams return to headquarters for a group conference after the first weekend of interviewing.

(7) Efforts should be made to obtain police officers experienced in traffic control, and a more detailed set of recommended procedures should be developed for the police to

follow in flagging down the selected motorists, including placement of patrol car flasher, placement of signs, flagging procedure, etc. Perhaps orange reflective vests and lighted hand-held stop signs should be provided.

(8) Battery-powered flashing yellow lights and magnetic identification signs should be provided for use with rental cars to make the interviewing station seem more "official".

(9) Orange rain parkas or yellow hats and slickers with organization identification should be provided interviewers for use during inclement weather.

(10) Consideration should be given to the provision of tape recorders for easy interviewer recording of pertinent survey information while it is fresh in his mind.

APPENDIX A

PSU SELECTIONS IN EACH SUBSTRATUM
(Random Numbers in Parentheses)

Northeast Selections (Using P.16 of Rand's Random Digits)

IA. New York City (Total = 7,895,563)
(Random number range 09361-17256)

*1. (16638) Brooklyn
2. (11789) Manhattan
3. (17105) Brooklyn
4. (09876) Bronx
5. (17241) Brooklyn

IB. 68 Other SMSA Central Cities (Total = 9,361,294)
(Random number range 0=93612)

*1. (58932) Buffalo, N.Y.
2. (73073) Boston, MASS
3. (42665) Springfield, MASS
4. (59985) Buffalo, N.Y.
5. (50943) Jersey City, N.J.

IIA. 7 Non-Central City SMSA Parts Above 650,000 in Population (Total = 7,116,647) (Random number range 14857-21973)

*1. (21871) Nassau County, N.Y.
2. (20707) Nassau County, N.Y.
3. (15248) Erie County, N.Y. (excluding Buffalo)
4. (17823) Middlesex County, MASS, part of Boston SMSA
5. (18903) Alleghany County, PENN. (excluding Pittsburgh)

IIB. 18 Non-Central City SMSA Parts from 260,000 to 640,000 in Population (Total = 7,466,947) (Random number range 07390-14857)

1. (14672) Montgomery County, PA
2. (10474) Bucks County, PA
3. (08249) Chester County, PA
4. (09866) Westmoreland County, PA
5. (12421) Norfolk County, MASS, part of Boston SMSA
6. (07636) Lancaster County, PA (excluding Lancaster)
7. (07911) Onondaga County, N.Y. (excluding Syracuse)
8. (09065) Essex County, MASS, part of Boston SMSA
9. (11444) Hartford and Middlesex Counties, CONN, parts of Hartford SMSA (excluding Hartford City)
*10. (10153) Morris County, N.J.

IIC. 71 Non-Central City SMSA Parts Below 260,000 in Population (Total = 7,390,238) (Random number range 0-73902)

*1. (22402) Oswego County, N.Y.
2. (47854) Albany County, N.Y. (excluding Albany)
3. (22993) Plymouth County, MASS, part of Boston SMSA
4. (70063) Niagara County, N.Y.
5. (42292) Northampton County, PA (excluding Bethlehem)

*PSU used in final survey schedule.

III. 129 Non-SMSA Counties Above 20,000 in Population and Part-Counties Above 18,800 in Population (Total = 9,615,769) (Random number range 0-96157)

*1. (60927) Non-SMSA Parts of Litchfield County and adjacent Non-SMSA Parts of Fairfield and Hartford Counties
2. (39253) Cayuga County, N.Y.
3. (90113) Monmouth County, N.J.
4. (89126) Monmouth County, N.J.
5. (53217) Northumberland County, PA

North Central Selections (Using P.21 of Rand's Random Digits)

IA. 8 SMSA Central Cities Over 500,000 in Population (Total = 8,753,368) (Random number range 08264-17017)

*1. (09065) Columbus, Ohio
2. (11444) Cleveland, Ohio
3. (10153) Milwaukee, WIS
4. (09129) Columbus, Ohio
5. (15638) Chicago, ILL

IB. 73 Other SMSA Central Cities (Total = 8,264,604) (Random number range 0-82646)

*1. (28328) Duluth, MINN
2. (71928) Toledo, Ohio
3. (47626) Gary, IND
4. (12965) Muncie, IND
5. (03328) Jackson, MI

IIA. 6 Non-Central City SMSA Parts Above 600,000 in Population (Total = 6,735,611) (Random number range 13868-20603)

*1. (16283) St. Louis County, MO (excluding St. Louis)
2. (19619) Cook County, ILL (excluding Chicago)
3. (19470) Cook County, ILL (excluding Chicago)
4. (14273) Macomb County, MI
5. (19620) Cook County, ILL (excluding Chicago)
6. (18415) Wayne County, MI (excluding Detroit)

IIB. 27 Non-Central City SMSA Parts from 130,000 to 600,000 in Population (Total = 7,097,030) (Random number range 06771-13868)

*1. (11481) Milwaukee County, WIS (excluding Milwaukee)
2. (13692) Hennepin County, MINN (excluding Minneapolis)
3. (08288) Kent County, MI (excluding Grand Rapids)
4. (08149) Kent County, MI (excluding Grand Rapids)
5. (13741) Hennepin County, MINN (excluding Minneapolis)
6. (07958) Lake County, Ohio

IIC. 110 Non-Central City SMSA Parts Below 130,000 in Population (Total = 6,771,339) (Random number range 0-67713)

1. (51442) Butler County, Ohio (excluding Hamilton and Middletown)
2. (43582) St. Charles County, MO
*3. (14965) Lapeer County, MI
4. (28185) Sangamon County, ILL (excluding Springfield)
5. (47475) Winnebago County, ILL (excluding Rockford)

IIIA. 96 Non-SMSA Counties above 42,000 in Population (Total = 6,479,505) (Random number range 06479-12969)

*1. (10375) Tuscarawas County, Ohio
2. (09186) Knox County, ILL
3. (10872) Howard County, IND
4. (06836) Macoupin County, ILL
5. (07629) Williamson County, ILL

IIIB. 224 Non-SMSA Counties from 20,000 to 42,000 in Population (Total = 6,490,009) (Random number range 0-64900)

*1. (42113) Williams County, Ohio
2. (28079) Mecosta County, MI
3. (58261) Wright County, MINN
4. (20028) Dallas County, Iowa
5. (22793) Lafayette County, MO

South Selections (Using P.22 of Rand's Random Digits)

IA. 8 SMSA Central Cities Above 500,000 in Population (Total = 6,139,429) (Random number range 11799-17938)

1. (16144) Baltimore, MD
2. (17723) Houston, TEX
3. (17484) Houston, TEX
*4. (12383) New Orleans, LA
5. (14219) Washington, DC

IB. 20 SMSA Central Cities from 160,000 to 500,000 in Population (Total = 5,806,599) (Random number range 05806-11799)

*1. (09707) Miami, FLA
2. (10949) Nashville, TENN
3. (06289) Knoxville, TENN
4. (06760) Corpus Christi, TEX
5. (06057) Baton Rouge, LA

IC. 81 SMSA Central Cities Below 160,000 in Population (Total = 5,992,475) (Random number range 0-59924)

*1. (42186) Raleigh, NC
2. (25542) Lake Charles, LA
3. (42240) Raleigh, NC
4. (23720) Huntington, W. VA
5. (25006) Lake Charles, LA
6. (03616) Petersburg, VA

IIA. 23 Non-Central City SMSA Parts Above 175,000 in Population (Total = 8,657,770) (Random number range 08657-17245)

1. (09130) Cobb County, GA
2. (09632) Orange County, FLA (excluding Orlando)
3. (10915) Pinellas County, FLA (excluding St. Petersburg)
*4. (12530) DeKalb County, GA (excluding Atlanta, part)
5. (11575) Jefferson County, KY (excluding Louisville)

IIB. 153 Non-Central City SMSA Parts Below 175,000 in Population (Total = 8,588,001) (Random number range 0-85880)

*1. (72001) Hamilton County, TENN (excluding Chattanooga)
2. (55612) Clayton County, GA
3. (22973) San Patricio County, TEX
4. (23515) Caddo County, LA (excluding Shreveport)
5. (52775) Chesapeake City, VA

IIIA. 115 Non-SMSA Counties Above 45,420 in Population
(Total = 9,685,915) (Random number range 09686-19372)

*1. (12026) Washington County and Bristol City, VA
2. (13198) Mississippi County, ARK
3. (13873) Lauderdale County, MISS
4. (18840) Spartanburg County, SC
5. (10556) Lowndes County, MISS

IIIB. 331 Non-SMSA Counties from 20,000 to 45,420 in Population
(Total = 9,686,262) (Random number range 0-96862)

*1. (77454) Sunflower County, MISS
2. (63961) Ware County, GA
3. (45139) Union County, SC
4. (16453) Knox County, KY
5. (14277) Watauga County, NC

West Selections (Excluding Alaska and Hawaii) (Using P.16 of Rand's Random Digits)

I. 47 SMSA Central Cities (Total = 11,133,677) (Random number range 0-11134)

1. (09254) Los Angeles, CAL
2. (09454) Los Angeles, CAL
3. (03426) Sacramento, CAL
4. (02799) Spokane, WASH
5. (05171) San Jose, CAL
*6. (05919) Seattle, WASH

IIA. 7 Non-Central City SMSA Parts Above 556,000 in Population (Total = 8,007,042) (Random number range 0-80070)

*1. (05919) Santa Clara County, CAL (excluding San Jose)
2. (55355) Los Angeles County, CAL (excluding city)
3. (78961) Los Angeles County, CAL (excluding city)
4. (13757) King County, WASH (excluding Seattle)
5. (01184) San Mateo County, CAL

IIB. 45 Non-Central City SMSA Parts Below 556,000 in Population (Total = 7,461,770) (Random number range 0-74617)

*1. (16640) Lane County, ORE (excluding Eugene)
2. (26486) Clackamas County, ORE
3. (39900) Jefferson County, COL
4. (15018) Stanislaus County, CAL (excluding Stockton)
5. (63011) Maricopa County, ARIZ (excluding Phoenix)

III. 100 Non-SMSA Counties Above 20,000 in Population (TOtal = 5,015,030) (Random number range 0-50150)

*1. (23931) Skagit County, WASH
2. (34163) Linn County, ORE
3. (17048) Chaves County, N.M.
4. (38194) Weld County, COL
5. (37361) Whatcom County, WASH

APPENDIX B

SSU SELECTIONS IN EACH SELECTED PSU (RANDOM NUMBERS IN PARENTHESES)

Northeast

IA. *Brooklyn, N.Y. Population = 2,602,012

IB. *Buffalo, N.Y. Population = 462,768

IIA. *Nassau County, N.Y. Population = 1,428,080

IIB. Montgomery County, PENN. Population = 623,921

1. (62153) Red Hill Borough--Population = 1,201
2. (11514) Abington Township--Population = 62,899
3. (21680) Pottstown Borough--Population = 25,355
4. (26925) Upper Merion Township--Population = 23,743
5. (52804) Skippack Township--Population = 5,316

Morris County, N.J. Population = 383,454

*1. (22232) Randolph Township--Population = 13,296
*2. (12809) Madison Borough--Population = 16,710
3. (22613) Randolph Township--Population = 13,296
4. (13126) Madison Borough--Population = 16,710
5. (13664) Madison Borough--Population = 16,710

IIC. Oswego County, N.Y. Population = 100,897

1. (08894) Fulton City--Population = 14,003
2. (09013) Fulton City--Population = 14,003
*3. (05048) Villages or Unincorporated Areas--Population = 63,050
*4. (02647) Villages or Unincorporated Areas--Population = 63,050
5. (04372) Villages or Unincorporated Areas--Population = 63,050

III. Litchfield County, CONN. Population = 109,870

*1. (02837) Torrington City--Population = 31,952
2. (04182) New Milford Town--Population = 14,601
3. (08449) North Canaan Town--Population = 3,045
4. (09243) Burkhamsted Town--Population = 2,066
5. (06252) Litchfield Town--Population = 7,399
6. (07681) Salisbury Town--Population = 3,573
7. (03049) Torrington City--Population = 31,952
8. (05790) Litchfield Town--Population = 7,399
*9. (05266) Winsted City--Population = 8,954

*SSU used in final survey schedule.

North Central

IA. *Columbus, Ohio Population = 539,677

IB. *Duluth, MINN Population = 100,578

IIA. St. Louis County, MO (excluding St. Louis) Population = 951,671

1. (47487) Florissant City--Population = 65,908
**2. (08592) Villages & Unincorporated Parts--Population = 424,807
3. (79248) Maplewood City--Population = 12,785
4. (16277) Villages & Unincorporated Parts--Population = 424,807
5. (86983) Glendale City--Population = 6,891

IIB. Milwaukee County, WIS (excluding Milwaukee) Population = 336,964

*1. (29058) Franklin City--Population = 12,247
*2. (07221) Wauwatosa City--Population = 58,676
3. (32123) Hales Corners Village--Population = 7,771
4. (24450) Greendale Village--Population = 15,089
5. (04291) West Allis City--Population = 71,723

IIC. Butler County, Ohio (excluding Hamilton and Middeltown) Population = 109,575

1. (00482) Villages under 6,000 and Unincorporated Parts Population = 79,027
2. (09755) Fairfield City--Population = 14,680
3. (08558) Oxford Village--Population = 15,868
4. (01734) Villages under 6,000 and Unincorporated Parts Population = 79,027
5. (01936) Villages under 6,000 and Unincorporated Parts Population = 79,027

Lapeer County, Mich. Population = 52,317

*1. (52003) Lapeer City--Population = 6,270
*2. (18559) Villages and Unincorporated Areas--Population = 46,047

IIIA. Tuscarawas County, Ohio Population = 77,211

*1. (66061) Dover City--Population = 11,516
*2. (20969) Villages and Unincorporated Areas--Population = 44,780
3. (40150) Villages and Unincorporated Areas--Population = 44,780
4. (02635) Villages and Unincorporated Areas--Population = 44,780
5. (47487) New Philadelphia City--Population = 15,184

IIIB. Williams County, Ohio Population = 33,669

*1. (13626) Villages and Unincorporated Areas--Population = 26,661
*2. (26590) Villages and Unincorporated Areas--Population = 26,661
3. (02927) Villages and Unincorporated Areas--Population = 26,661
4. (24582) Villages and Unincorporated Areas--Population = 26,661
5. (02440) Villages and Unincorporated Areas--Population = 26,661

South

IA. *New Orleans, LA Population = 593,471

IB. *Miami, FLA Population = 334,859

IC. *Raleigh, NC Population = 121,577

IIA. Cobb County, GA Population = 196,793

1. (05722) Unincorporated Areas--Population = 137,802
2. (04855) Unincorporated Areas--Population = 137,802
3. (00179) Unincorporated Areas--Population = 137,802
4. (11178) Unincorporated Areas--Population = 137,802
5. (08581) Unincorporated Areas--Population = 137,802

DeKalb County, GA (excluding Atlanta part) Population = 368,700

*1. (03955) Towns and Unincorporated Areas--Population = 322,687
*2. (10779) Towns and Unincorporated Areas--Population = 322,687
3. (01277) Towns and Unincorporated Areas--Population = 322,687
4. (13977) Towns and Unincorporated Areas--Population = 322,687
5. (12922) Towns and Unincorporated Areas--Population = 322,687

IIB. Hamilton County, TENN (excluding Chattanooga) Population = 135,154

*1. (03347) Unincorporated Areas--Population = 82,802
*2. (02237) Unincorporated Areas--Population = 82,802
3. (05092) Unincorporated Areas--Population = 82,802
4. (06975) Unincorporated Areas--Population = 82,802
5. (06485) Unincorporated Areas--Population = 82,802

IIIA. Washington County and Bristol City, VA Population = 55,692

*1. (49565) Bristol City--Population = 14,857
*2. (07544) Washington County--Population = 40,835
3. (51396) Bristol City--Population = 14,857
4. (27059) Washington County--Population = 40,835
5. (51011) Bristol City--Population = 14,857

IIIB. Sunflower County, MISS Population = 37,047

*1. (36065) Indianola City--Population = 8,947
*2. (18542) Towns and Unincorporated Areas--Population = 28,100
3. (09288) Towns and Unincorporated Areas--Population = 28,100
4. (11450) Towns and Unincorporated Areas--Population = 28,100
5. (28372) Indianola City--Population = 8,947

West

I. *Seattle, WASH Population = 530,831

IIA. Santa Clara County, CAL (excluding San Jose) Population = 618,935

1. (05348) Unincorporated Areas--Population = 177,477
2. (50585) Saratoga--Population = 27,110
3. (44879) Mountain View--Population = 51,092
*4. (59981) Gilroy--Population = 12,665
5. (01508) Unincorporated Areas--Population = 177,477
6. (41883) Mountain View--Population = 51,092
*7. (37495) Palo Alto--Population = 55,966

IIB. Lane County, ORE (excluding Eugene) Population = 137,012

*1. (11591) Springfield City--Population = 27,047
*2. (10344) Unincorporated Areas and 8 Smallest Cities--Population = 103,961
3. (06459) Unincorporated Areas and 8 Smallest Cities--Population = 103,961
4. (10984) Springfield City--Population = 27,047
5. (07559) Unincorporated Areas and 8 Smallest Cities--Population = 103,961

III. Skagit County, WASH. Population = 52,381

*1. (44879) Sedro-Woolley City--Population = 4,598
*2. (01508) Unincorporated Areas and Towns--Population = 28,140
3. (04361) Unincorporated Areas and Towns--Population = 28,140
4. (09315) Unincorporated Areas and Towns--Population = 28,140
5. (06716) Unincorporated Areas and Towns--Population = 28,140

1973 NATIONAL ROADSIDE SURVEY

ROADSIDE SITE FORM

PSU_____ SSU_____

DESCRIPTION (Incl. preferred direction)_____

_____ _____

_____ _____

ESTIMATED ADT_____ M or H_____

PARKING LOT OWNER AND APPROVAL DATE_____

_____

NOT USED

DATE OF USE_____ SHIFT_____ WEATHER_____

TRAFFIC COUNT_____ BEG. TIME_____ END TIME_____

BEGINNING TIME OF SAMPLING IN BOTH DIRECTIONS_____

ESTIMATED AVERAGE SPEED_____ ESTIMATED TEMPERATURE_____

NO. OF INTERVIEWS_____ NO. OF REFUSALS_____

TOTAL CASES_____ NO. DRIVEN HOME_____

DIAGRAM:

APPENDIX D

NATIONAL VOLUNTARY ROADSIDE SURVEY OF DRIVERS

PLAN SUMMARY

SPONSOR: Office of Alcohol Countermeasures
National Highway Traffic Safety Administration
Alfred V. Crancer, Contract Technical Manager (202) 426-1675

RESEARCH CONTRACTOR: Highway Safety Research Institute
The University of Michigan
Ann Arbor, Michigan 48105
Arthur C. Wolfe, Project Director (313) 763-2465

PURPOSE: To determine the characteristics of a random sample of night-time drivers throughout the United States, particularly their use of alcoholic beverages prior to driving. These results on a national basis will be used for comparison with the many local roadside surveys which have been carried out by Alcohol Safety Action Projects in 35 states. They will also be used as a national benchmark for efforts to reduce the drinking driver problem and as part of an international survey of the problem.

TIME PERIOD: 10 P.M. to 3 A.M. on Friday and Saturday nights.

DATES: October 26-December 16 , 1973

LOCATIONS: 24 primary sampling areas (counties or major cities) representing the four main regions of the United States, 1 weekend in each area.

ROADSIDE INTERVIEW SITES: Four to eight sites in each primary sampling area, chosen on a random basis from segments of medium and heavy volume roads containing a safe pull-off area.

INTERVIEWERS: Two HSRI staff members plus locally recruited assistants.

TOTAL EXPECTED NATIONAL SAMPLE: 2400-3600

PROCEDURES: Policeman waves randomly selected motorist over to interviewer who explains survey to driver and asks him/her to come into the van for the interivew. A count of all passing traffic will be made so that the actual site sampling rate can be determined.

REFUSALS: Participation in the survey will be voluntary. Experience in other roadside surveys has shown a 90-95% cooperation rate. The interviewer will make an estimate of the drinking condition of all persons stopped in order to determine if there is any bias due to the refusal of a few selected drivers to participate.

HANDLING INTOXICATED RESPONDENTS: A respondent who appears intoxicated in the interview or who tests intoxicated on the Intoxilyzer will be offered a ride home by the interviewing staff, if there is not a sober passenger present who can take the wheel. In other roadside surveys this procedure has eliminated the need for arresting any of the motorists who voluntarily participate in the research project.

APPENDIX E

THE ROLE OF THE POLICE OFFICER IN THE NATIONWIDE ROADSIDE SURVEY

The Nationwide Roadside Survey (NRS) that will be conducted in the fall of 1973 by teams of researchers from the Highway Safety Research Institute of The University of Michigan is part of an international effort investigating the extent and severity of the drinking-driving problem. The recommendations of the international committee (Alcohol and Road Safety) states the following with respect to police involvement:

> In the case of voluntary surveys (as will be conducted by most countries) the police contact with the driver should be minimal. The survey should be introduced and explained to the driver by the trained survey personnel, and not by the police officers.

By the very nature of the work involved, the NRS teams will be operating in intimate association with local police authorities. The NRS teams will require assistance in site selection and lay-out, and traffic control around and into the survey area. It is expected that such cooperation can be achieved. What follows is a detailed description of the two phases of local police involvement mentioned above.

SITE SELECTION AND LAY-OUT

The primary objective in the selection of the specific locations for the NRS must be the assurance of the maximum safety of the drivers selected for the sample and all other persons in the survey team. This includes the physical location of the survey vehicle, and safe parking areas for the drivers selected, as well as the placement of warning signs, flares, and cones, etc. Consideration must also be given to the safe passage of non-selected vehicles past the survey site.

Because of their extensive knowledge of their communities, the local police will be best able to assist the NRS teams in the selection of the best location from possible alternatives within selected road segments. The NRS team will not attempt to use a survey location which is not considered suitable from a safety point of view by the participating police.

TRAFFIC CONTROL

Because of their authority as law enforcement officers, the local police will have to be responsible for traffic control at the survey sites. As civilians, the NRS team members have no legal authority and insufficient experience to stop randomly selected vehicles.

Most of the time the police officer spends on the site will be spent directing traffic past the survey. Despite this, the officer's most important task will be to select vehicles for the survey and direct them into the survey area. It is expected that the police officer will, upon signal from the NRS vehicle, direct the very next eligible vehicle that approaches the survey site into the survey area. Only taxis, buses, emergency and police vehicles, trucks with three or more axles, vehicles with non-US license plates, and non-motorized vehicles are ineligible. Following the signal from the interviewer, it is essential that the very next car which can be stopped safely be flagged into the interview area, so that there is no bias in the random selection process resulting from the officer's suspicions, partialities, or any other possible cause.

It is desired that a minimum of interaction take place between the officer and the driver of the selected car. The ideal situation would be one in which the officer does no more than direct the driver into the survey area with his hands or a lighted wand. If any verbal communication does take place, the officer should merely request that the driver pull into the survey area so that the person in the white coat can speak to him. In all cases it will be up to the member of the NRS team to persuade the driver to participate in the survey.

It is essential that the citizen not feel that he has been arrested, pulled over for a violation, or that he is under legal duress to participate in the survey.

If the officer observes an approaching motorist engaging in behavior that would normally result in a police stop for

questioning and/or subsequent arrest, the police officer may follow his normal procedures for such circumstances. Included under suspicious acts are:

(1) Serious equipment violations on the vehicle.
(2) Obviously illegal or erratic driving behavior.
(3) Failure to stop for the initial police signal.
(4) Recognition of a person in the vehicle who has a warrant outstanding for his arrest.
(5) Recognition of a vehicle that is wanted in connection with some offense.

In addition, of course, the officer is responsible for the safety of the NRS team members, and he should be prepared to take appropriate action with a belligerent or threatening respondent if his help is requested by a team member.

Since the NRS survey requires voluntary cooperation on the part of motorists, it is not possible to make a contact with the driver, or to perform surveillance operations directed toward the driver that are not directly related to the survey, except as indicated above. This is necessary in order to guarantee the driver complete confidentially regarding the information collected as part of the survey.

APPENDIX F

HSRI, Univ. of Michigan

1973 NATIONAL ROADSIDE SURVEY

COVER SHEET

(1-5) IDENT. NO. _____ (5 DIGITS)

(6) Interviewer (1)___Barnes (3)___Boyd (5)___Compton (7)___Local
(2)___Lehman (4)___Kay (6)___McClellan

(7) Vehicle Type (1)___Passenger (sedan, station wagon, minibus, etc.)
(2)___Cargo (pickup, truck, delivery van, etc.)
(3)___Recreational (camper, ATV, etc.)
(4)___Motorcycle (5)___Other: _____

(8) Sex of Driver (1)___Male (2)___Female

(9) Race/Ethnicity of Driver (1)___White (3)___Chicano (5)___Not sure
(2)___Black (4)___Other: _____

(10) Number of Passengers _____(NUMBER)

(11) Seat Belt Use of Driver (1)___Using shoulder belt (3)___Not using any belt
(2)___Using lap belt only (4)___Not sure

(12) Estimate of Driver's Drinking
(1)___Probably had not been drinking
(2)___Probably had been drinking a little
(3)___Probably had been drinking a lot

(13) or (13-14) Driver's Willingness to Participate
(10)___Accepted interview readily
(2)___Accepted interview reluctantly
(3)___Refused to be interviewed but gave breath sample
(4)___Refused to be interviewed or to give breath sample
(50)___Removed by police before interview
(60)___Selected vehicle turned around or failed to stop

(14) Reason for Reluctance/Refusal
(1)___In a hurry -- going to work or taking someone to work
(2)___In a hurry -- shopping, appointment, meeting someone
(3)___In a hurry -- going home
(4)___In a hurry -- other reason or NA why
(5)___Negative about survey purpose, fearful of consequences
(6)___Didn't want to be bothered -- no special reason evident
(7)___Other: _____

(15) R Heard of Survey Before Tonight? (1)___Yes (2)___No

(16-19) Time Entered Vehicle _____(HOUR AND MINUTE -- 4 DIGITS)

First I have a few background questions.

(20-21) 1. How old are you? _____(YEARS)

(22) 2. How far have you gone in school?

(1)____7 grades or less
(2)____8 grades
(3)____9-11 grades
(4)____High school diploma
(5)____Business or trade school
(6)____1-3 years of college
(7)____College degree
(8)____1 or more years graduate work

(23) 3. Are you married now -- or are you divorced, separated, widowed, or single?

(1)____Married
(2)____Divorced
(3)____Separated
(4)____Widowed
(5)____Single (never married)

(24) or (24-25) 4. Are you presently employed; or are you unemployed, or retired, (or a housewife), or a student, or what?

(1)____Employed (2)____Unemployed (3)____Retired, Disabled (49)____Housewife (59)____Student (GO TO Q.5)

(25) 4a. What kind of work do you do? (PROBE ENOUGH TO FIT A CATEGORY) (IF UNCERTAIN OF PROPER CATEGORY WRITE IN MARGIN FOR LATER CODING)

(0)____Professional, technical
(1)____Managerial, administrative
(2)____Clerical
(3)____Sales
(4)____Farming
(5)____Craftsman, foreman
(6)____Operative, semi-skilled
(7)____Service worker
(8)____Laborer

(26-28) 5. About how many thousand miles would you estimate that you drive in an average year?

_____(THOUSAND -- 3 DIGITS)
(USE 001 FOR 1500 OR LESS)

(29-30) 6. About what percent of your total driving time would you estimate takes place at night?

_____(PERCENT -- 2 DIGITS)

(31) 7. Do you now have a regular driver's license or a chauffeur's license?

(1)____Regular
(2)____Chauffeur's (or endorsement)
(3)____Both
(4)____License suspended
(5)____No license
(6)____Other:_____

(32-35) 8. About how many miles away are you from where you live?

_____(4 DIGITS)
(USE 0001 FOR 1.5 MILES OR LESS)

(36) 9. Where were you when you last entered your vehicle? What kind of place?

(37) 9a. And where will you be when you next leave your vehicle?

COMING FROM	GOING TO	
_____	_____	(1) Own home
_____	_____	(2) Friend's or relative's home
_____	_____	(3) Work or class
_____	_____	(4) Restaurant or other eating place
_____	_____	(5) Bar, tavern, club
_____	_____	(6) Sport or recreational facility
_____	_____	(7) Cultural event, lecture, meeting, church
_____	_____	(8) Other: _____
_____	_____	(0) Refused to say

(38-40) 10. About how many miles will you have driven between these two places?

_____(MILES -- 3 DIGITS)

(41-43) 11. About how much driving time will this involve?_____(MIN. -- 3 DIGITS)

(44) or (44-50) 12. Now I have a question about your use of alcohol. Do you ever drink alcoholic beverages such as beer, wine, or liquor -- or are you a total abstainer?

(1)____Yes (2100000)____No, total abstainer → (GO TO Q.13)

12a. In general would you describe yourself as a:

(2)____very light drinker, (5)____fairly heavy drinker,
(3)____fairly light drinker, or
(4)____moderate drinker, (6)____heavy drinker?

(46) or (46-50) 12b. Have you had anything to drink today?

(1)____Yes (20000)____No → (GO TO Q.13)

12c. How long ago did you finish your last drink?

_____ _____
(HOURS) (MINUTES) (2 DIGITS EACH)

(51) 13. During the past month do you recall taking part in any conversation in which drinking and driving or drunk driving was mentioned?

(1)____Yes (2)____No

(52-53) 14. Out of every 100 traffic accidents in which someone is killed how many would you guess involve a driver who has been drinking?

_____(OUT OF 100 -- 2 DIGITS)
(USE 97 FOR 97-100)

(54) 15. Would you guess that more of such alcohol-related accidents are caused by the many social drinkers who occasionally drink too much, or by the smaller number of problem drinkers who frequently drink a great deal?

(1)____Social drinkers (3)____About even

(2)____Problem drinkers (4)____No opinion

(55) or (55-59) 16. During the past year have you ever tried to persuade a person not to drive because you felt he had drunk too much for safe driving?

(1)____Yes (20000)____No → (GO TO Q.17)

16a. About how many times did you try? _____

16b. About how many times were you successful? _____

(60) 17. If there were a government program which could cut down on alcohol-related accidents by as much as one third or one half, would you personally be willing to pay more taxes to support such a program?

(1)____Yes (2)____No

18. Now as the final step in the survey would you please blow into this tube on the Intoxilyzer. We are collecting breath samples as a routine part of this nighttime driver survey.

(61-63) Final BAC Reading at Site _____(3 DIGITS)

(64) Number of Direct Readings Obtained _____

(65) Breathtesting Instrument for Final Direct Reading (1)____Intoxilyzer (2)____ASD (3)____None

(66-69) Use of Field Crimper (1)____Used (2999)____Not used

_____BAC(TO BE ADDED AT HSRI)

(70-73) Time Left Vehicle _____(HOUR AND MINUTE -- 4 DIGITS)

(74-75) Total Elapsed Time _____(MINUTES -- 2 DIGITS -- CODE LATER)

(76) Disposition of Respondent

(1)____Alternate transportation not suggested

(2)____Transportation suggested but R said passenger would drive

(3)____Transportation suggested and R accepted ride to destination

(4)____Transportation suggested and R taken to a motel

(5)____Transportation suggested but R refused and drove self _____ (ENTER LICENSE PLATE NO.)

(6)____Transportation suggested but R refused and was arrested at site

(7)____Other: _____

COMMENTS:

APPENDIX G

HIGHWAY SAFETY RESEARCH INSTITUTE
Institute of Science and Technology
Huron Parkway and Baxter Road
Ann Arbor, Michigan 48105

THE UNIVERSITY OF MICHIGAN

October 19, 1973

Dear Roadside Survey Participant:

Thank you very much for your participation in this roadside survey which is being conducted for the National Highway Traffic Safety Administration. The assistance of community-minded citizens is vital to the success of this effort to reduce the misery and death in highway accidents caused by irresponsible drinking and driving.

Research studies have shown that the risk of being involved in a highway accident begins to increase at .05% Blood Alcohol Concentration (BAC), and this risk increases rapidly as more alcohol is consumed. For example, drivers at .10% BAC are six times more likely to be involved in an accident than drivers who have not been drinking; and drivers at .15% BAC are 25 times more likely to be in an accident than drivers who have not been drinking.

Furthermore, every state now considers a BAC of .10% or higher as presumptive evidence of intoxication, and in many states a driver can be prosecuted for impaired driving at BACs below .10%.

Your cooperation in staying within safe drinking and driving limits, and in encouraging your friends and acquaintances to do so can play an important role in making highway travel safer for all of us. At the bottom of this letter is a Blood-Alcohol Chart which shows the BAC that would result from consuming various numbers of drinks at various body weights. You might want to cut it out and keep it handy.

Happy (and safe) Motoring!

Sincerely,

Arthur C. Wolfe

Arthur C. Wolfe
Director
National Roadside Survey

BLOOD-ALCOHOL CHART

SHOWING ESTIMATED % OF ALCOHOL IN THE BLOOD BY NO. OF DRINKS IN RELATION TO BODY WEIGHT

BODY WEIGHT	DRINKS 1	2	3	4	5	6	7	8	9	10	11	12
100 lb.	.038	.075	.113	.150	.188	.225	.263	.300	.338	.375	.413	.450
120 lb.	.031	.063	.094	.125	.156	.188	.219	.250	.281	.313	.344	.375
140 lb.	.027	.054	.080	.107	.134	.161	.188	.214	.241	.268	.295	.321
160 lb.	.023	.047	.070	.094	.117	.141	.164	.188	.211	.234	.258	.281
180 lb.	.021	.042	.063	.083	.104	.125	.146	.167	.188	.208	.229	.250
200 lb.	.019	.038	.056	.075	.094	.113	.131	.150	.169	.188	.206	.225
220 lb.	.017	.034	.051	.068	.085	.102	.119	.136	.153	.170	.188	.205
240 lb.	.016	.031	.047	.063	.078	.094	.109	.125	.141	.156	.172	.188

To determine your BAC use this chart and then subtract .015 for each hour that you were drinking.

APPENDIX H

CODEBOOK WITH MARGINALS FOR THE NATIONAL ROADSIDE SURVEY RESPONDENT DATA

The following codebook lists the variables and codes for the 3698 individual respondent records from the 1973 national roadside breathtesting survey. Various frequency and percentage distributions are also presented in the left margin.

For variables 3-39, which consist of various sampling and site characteristics, four sets of numbers are presented in the left margin. Under the heading "TS" is shown the total number of cases (i.e., vehicles stopped) for a given code category. Under the heading "I" is shown the percentage of these cases from whom interviews were obtained, and under the heading "B" is shown the percentage of these cases from whom BAC readings were obtained. In the last column under the heading "HD" (heavy drinker) is shown the weighted percentage of the total BAC readings in the category which were at or above 0.05%.

For the remaining variables, which have to do with individual characteristics, the four columns of numbers have different meanings. Under the heading "TS" are shown the weighted percentages of the total sample falling into each code category. Under the heading "TB" is shown the weighted percentages of the 3192 respondents from whom BACs were obtained which fall into each code category. Under the heading "MD" (moderate drinker) are shown the weighted percentages of the 307 respondents in the 0.02-0.04 BAC range which are in each code category. And under the heading "HD" are shown the weighted percentages of the 473 respondents at 0.05 BAC or above which are in each code category.

For a number of numeric variables (e.g., V66 Usual Annual Mileage) percentage distributions would be inappropriate, so the tenth, thirtieth, fiftieth, seventieth, and ninetieth percentiles are presented for these variables.

A number in the marginal distributions which is preceded by an asterisk represents an actual frequency rather than a percentage. In general, missing data are not included in the percentage distributions.

V1 S1 Study Number (73)

V2 R1 Respondent ID (5 digits)

V3 R2 Region

TS	I	B	HD	
904	86	79	13	1. Northeast
1139	94	91	14	2. Midwest
975	91	87	15	3. South
680	92	88	12	4. West

V4 R3 Primary Sampling Unit (PSU)

TS	I	B	HD	
175	71	55	9	10. Brooklyn, NY
154	94	93	16	11. Buffalo, NY
159	83	75	5	12. Nassau County, NY
163	91	88	15	13. Morris County, NJ
116	90	81	19	14. Oswego County, NY
137	91	86	15	15. Litchfield County, CONN
160	89	86	10	20. Columbus, OHIO
179	96	93	19	21. Duluth, MINN
166	92	86	9	22. St. Louis County, MO
140	93	87	20	23. Milwaukee County, WIS
158	95	92	19	24. Lapeer County, MI
154	96	93	7	25. Tuscarawas County, OHIO
156	97	94	10	26. Williams County, OHIO
189	89	87	19	30. New Orelans, LA
107	84	82	9	31. Miami, FLA
146	88	87	8	32. Raleigh, NC
154	95	80	19	33. DeKalb County, GA
157	92	95	10	34. Hamilton County, TENN
116	91	85	17	35. Washington County and Bristol City, VA.
131	97	95	21	36. Sunflower County, MISS
197	92	86	9	40. Seattle, WASH
162	96	91	15	41. Santa Clara County, CALIF.
157	90	87	11	42. Lane County, ORE
165	88	87	13	43. Skagit County, WASH

V5 R3A State

TS	I	B	HD	
137	91	86	15	01. Connecticut
163	91	88	15	12. New Jersey
604	84	75	12	13. New York
158	95	92	19	23. Michigan
470	94	91	9	24. Ohio
140	93	87	20	25. Wisconsin
179	96	93	19	33. Minnesota
166	92	86	9	34. Missouri
116	91	85	17	40. Virginia
107	84	82	9	43. Florida
154	95	80	19	44. Georgia
189	89	87	19	45. Louisiana
131	97	95	21	46. Mississippi
146	88	87	8	47. North Carolina
157	92	95	10	54. Tennessee
162	96	91	15	71. California
157	90	87	11	72. Oregon
362	90	87	10	73. Washington

V6 R47 SSU Number

TS	I	B	HD	
77	87	83	14	01. Bristol, VA
175	71	55	9	02. Brooklyn, NY
154	94	93	16	03. Buffalo, NY
160	89	86	10	04. Columbus, Ohio
154	95	80	19	05. DeKalb County, GA
80	95	93	11	06. Dover, Ohio
179	96	93	19	07. Duluth, MINN
80	91	81	29	08. Franklin, WIS
65	97	94	13	09. Gilroy, CALIF
157	92	95	10	10. Hamilton County, TENN
61	97	93	19	11. Indianola, MISS
70	89	87	7	12. Lane County, Oregon
77	91	91	21	13. Lapeer, MI
81	99	94	16	14. Lapeer County, MI
82	88	85	17	15. Madison, NJ
107	84	82	9	16. Miami, FLA
159	83	75	5	17. Nassau County, NY
189	89	87	19	18. New Orleans, LA
116	90	81	19	19. Oswego County, NY
97	95	90	17	20. Palo Alto, CALIF
146	88	87	8	21. Raleigh, NC
81	94	90	13	22. Randolph, NJ
166	92	86	9	23. St. Louis County, MO
197	92	86	9	24. Seattle, WASH
79	89	86	9	25. Sedro-Woolley, WASH
86	87	88	16	26. Skagit County, WASH

V6 R47 SSU Number (cont'd)

TS	I	B	HD
87	92	86	15
70	97	96	24
65	94	91	18
74	97	95	3
39	97	90	22
60	97	95	9
156	97	94	10
72	87	82	12

27. Springfield, ORE
28. Sunflower County, MISS
29. Torrington, CONN
30. Tuscarawas County, OHIO
31. Washington County, VA
32. Wauwatosa, WIS
33. Williams County, OHIO
34. Winsted, CONN

V7 R4 Site (A 3 digit representation with the first 2 digits signifying the PSU and the third digit signifying the site number within that PSU.)

V8 R4A Site Type

TS	I	B	HD
670	87	84	9
311	92	91	10
592	91	87	21
263	95	92	22
676	90	84	9
300	94	91	11
620	90	84	23
266	94	88	22

1. Friday 10-12PM - heavy
2. Friday 10-12PM - medium
3. Saturday 1-3AM - heavy
4. Saturday 1-3AM - medium
5. Saturday 10-12PM - heavy
6. Saturday 10-12PM - medium
7. Sunday 1-3AM - heavy
8. Sunday 1-3AM - medium

V9 R4B Day of Week

TS	I	B	HD
1836	90	87	13
1862	91	85	14

1. Friday
2. Saturday

V10 R4C Time Period

TS	I	B	HD
1957	90	86	10
1741	92	87	21

1. 10-12PM
2. 1-3AM

V11 R4D Estimated Traffic Volume (Average Daily Traffic)

TS	I	B	HD
2558	90	84	13
1140	93	91	14

1. Heavy (6000 + ADT)
2. Medium (2000-6000 ADT)

V12 S41 Month

0. October
1. November
2. December

V13 S42 Date (Actual two digit Date of Interview)

V14 S42A Date-16 (Including the early morning hours of the following day)

TS	I	B	HD	
203	91	85	19	1. October 26
207	94	90	16	2. October 27
230	95	93	15	3. November 2
240	94	90	13	4. November 3
223	87	83	10	5. November 9
261	87	83	7	6. November 10
274	84	81	8	7. November 16
254	90	75	11	8. November 17
247	92	89	16	9. November 23
231	92	89	13	10. November 24
215	92	90	12	11. November 30
220	94	92	17	12. December 1
154	88	85	12	13. December 7
181	88	88	14	14. December 8
290	93	90	12	15. December 14
268	92	81	20	16. December 15

V15 S39 Type of Roadway

TS	I	B	HD	
1569	93	89	14	1. Two lane - 2 directions
25	88	88	10	2. Two lane - 1 direction
166	93	86	10	3. Three lanes - 2 directions
62	93	95	12	4. Three or more lanes - 1 direction
1092	90	85	14	5. Four or five lanes - 2 directions
255	86	71	15	6. Six or more lanes - 2 directions
515	88	86	11	7. Divided highway (includes Boulevards)
14	86	86	17	9. NA

V16 S40 Rural/Urban Location

TS	I	B	HD	
1404	87	81	11	1. City over 25,000 - commercial
345	95	92	11	2. City over 25,000 - residential
180	93	93	17	3. City over 25,000 - open space
481	94	90	19	4. City under 25,000 - commercial
184	92	90	9	5. City under 25,000 - residential
109	88	83	9	6. City under 25,000 - open space
506	92	88	17	7. Rural - congested area
489	95	89	15	8. Rural - open space
0	0	0	0	9. Rural - NA type of area
0	0	0	0	0. City - NA type of area

V17 S8 Estimated ADT (100's) (The estimated traffic volume for each particular site) MD=999

999. NA

TS Percentiles	
.10	22
.30	52
.50	80
.70	142
.90	315

V18 S15 Traffic Count/Hour MD=99

999. NA

V19 S15A Traffic Count /Hour-8 (S15 collapsed) MD=9

TS	I	B	HD
99	95	94	18
316	96	93	22
573	94	91	19
661	92	85	11
437	91	90	19
851	92	88	12
478	83	73	9
283	85	79	9
0	0	0	0

1. 1-9 vehicles
2. 10-24 vehicles
3. 25-49 vehicles
4. 50-74 vehicles
5. 75-99 vehicles
6. 100-199 vehicles
7. 200-399 vehicles
8. 400-900 vehicles
9. NA

V20 S14 Total Traffic County (Total traffic count per site.)

V21 S18 Sampling Rate (Computed by dividing V20 by V23)

TS Percentiles	
.10	30
.30	35
.50	40
.70	45
.90	55

V22 S23 Estimated Speed (The average speed of vehicles passing the local interviewing site.)

V23 S17 Number of USA Vehicles (Including refusals and arrestees, per site.)

V24 S48 Number of BAC Readings
(# of successful BACs per site)

V25 S20 Weather (weather conditions at the site)

TS	I	B	HD
2914	91	86	14
326	91	90	11
121	93	89	7
215	89	86	11
45	89	78	21
0	0	0	0
0	0	0	0
77	91	91	21

1. Clear or cloudy
2. Raining
3. Snowing
4. Clear or cloudy and raining
5. Clear or cloudy and snowing
6. Raining and snowing
7. Clear or cloudy, raining and snowing
8. Fog

V26 S22 Estimated Temperature (at site)

TS Percentiles	
.10	25
.30	33
.50	36
.70	40
.90	45

V27 S45 Estimated Altitude (of site in hundreds of feet)

TS Percentiles	
.10	.05
.30	1.12
.50	4.45
.70	7.11
.90	8.85

V28 S24 Breathtesting Equipment

TS	I	B	HD
677	86	78	16
0	0	0	0
2029	92	89	13
992	91	87	13

1. Intoxilyzer only
2. Field Crimper only
3. Intoxilyzer and Alco-sensor
4. Field Crimper and Alco-sensor

V29 S25 Power Source (Source of electricity used to operate breathtesting equipment.)

TS	I	B	HD
1373	89	83	14
1222	92	89	14
937	92	87	13
0	0	0	0
166	92	86	9

1. Motorhome generator
2. Portable generator
3. Battery
4. 110 volt external source
5. Combination

V30 S26 Use of Sign

TS	I	B	HD
858	93	90	13
902	88	83	12
1889	91	86	14
49	90	75	29

1. Used with barricade
2. Used alone
3. Not used
9. NA

V31 S27 Use of Cones

TS	I	B	HD
485	85	79	10
212	93	90	18
163	90	88	12
2838	92	87	14

1. Used in street
2. Used in parking area
3. Used both places
4. Not used

V32 S28 Warning Signals

TS	I	B	HD
2108	93	90	15
199	92	87	12
942	87	78	11
194	87	85	13
175	90	85	7
33	82	82	4
0	0	0	0
47	94	87	15

1. Police car flasher only
2. Flares only
3. Police car flasher and flares
4. Other only
5. Police car flasher and other
6. Flares and other
7. Flasher, flares and other
9. NA or none

V33 S29 Policeman's Hand Signal Device

TS	I	B	HD
121	95	93	7
1038	91	88	14
2420	91	85	14
0	0	0	0
85	94	91	13
34	85	85	2

1. Flare
2. Wand
3. Flashlight
4. Lantern
5. Combination
0. None

V34 S30 Greeting Place

TS	I	B	HD
246	91	89	16
945	89	85	11
2238	92	87	13
269	87	81	18

1. Middle of Street
2. Curbside
3. Parking area
4. Combination

V35 S31 Number of Drivers at Site MD=9

TS	I	B	HD	
406	87	74	16	0. None
483	86	83	11	1. One
2265	93	90	14	2. Two
203	89	85	16	3. Three
274	88	83	11	4. Four
61	85	87	14	5. Five
6	100	100	0	6. Six

V36 S32 Number of Police at Site

TS	I	B	HD	
2014	92	88	14	1. One with car
113	85	83	8	2. One with motorcycle
76	88	84	12	3. One without car
1291	90	84	13	4. Two with car
0	0	0	0	5. Two with motorcycles
0	0	0	0	6. Two without car
8	100	100	26	7. One with car plus another car on hand
182	91	87	9	8. Two with car plus another car on hand
0	0	0	0	0. Other
14	86	86	17	9. NA

V37 S33 Sex of Local Interviewer MD=9

TS	I	B	HD	
2258	90	85	12	1. Male
300	89	84	19	2. Female
1140	93	91	14	0. Inap., no local interviewer

V38 S3 Team

TS	I	B	HD	
1119	85	79	12	1. East
1224	94	91	14	2. Midwest
1355	92	88	14	3. West

V39 R5 Interviewer

TS	I	B	HD	
513	94	89	15	1. Carla Barnes
416	94	92	15	2. Jeff Lehman
360	95	95	15	3. Arthur Boyd
385	95	92	12	4. Bob Kay
377	91	91	11	5. Charles Compton
392	85	76	12	6. Lois McClellan
1165	87	82	13	7. Local interviewer
47	96	51	25	8. Arthur Wolfe
42	100	100	22	0. Marion Chapman

V40 R6 Vehicle Type MD=9

TS	TB	MD	HD	
93	93	91	94	1. Passenger (sedan, station wagon, minibus, etc.)
5	5	6	5	2. Cargo (pickup, truck, delivery van, etc.)
1	1	4	0	3. Recreational (camper, ATV, etc.)
*5	*4	0	*1	4. Motorcycle
*2	*2	0	0	5. Other
*71	*43	*1	*5	9. NA

V41 R7 Sex of Driver MD=9

TS	TB.	MD	HD	
83	84	89	90	1. Male
17	16	11	10	2. Female
*38	*18	0	*2	9. NA

V42 R8 Race of Driver MD=9

TS	TB	MD	HD	
87	88	85	86	1. White
9	9	11	10	2. Black
2	2	3	3	3. Chicano
1	1	1	1	4. Other
1	1	1	*2	5. Not sure
*65	*40	*2	*4	9. NA

V43 R9 Number of Passengers MD=9

TS	TB	MD	HD	
34	35	29	33	0. None
39	39	45	39	1. One
14	14	12	15	2. Two
7	7	9	9	3. Three
3	3	3	2	4. Four
1	1	1	1	5. Five
1	1	*1	*3	6. Six
*5	*1	0	*1	7. Seven
*3	0	0	0	8. Eight or more
*274	*209	*18	*31	9. NA

V44 R9A Passengers-3 MD=9

TS	TB	MD	HD	
34	35	29	32	0. None
39	39	45	39	1. One passenger
27	26	26	28	2. Two or more passengers
*274	*209	*18	*31	9. NA

V45 R10 Seat Belt Use MD=9

TS	TB	MD	HD	
6	6	6	5	1. Using shoulder belt
17	18	22	12	2. Using lap belt only
69	70	68	75	3. Not using any belt
9	6	4	8	4. Not sure
*189	*96	*9	*14	9. NA

V46 R11 Estimate of Driver's Drinking

TS	TB	MD	HD	
71	73	67	47	1. Probably had not been drinking
24	24	31	46	2. Probably had been drinking a little
2	1	1	6	3. Probably had been drinking a lot
3	2	1	1	9. NA, no drinking estimate made

V47 R11A Second Drinking Estimate MD=9

TS	TB	MD	HD	
91	98	97	98	1. Gave interview & good breath sample
1	2	3	2	2. Gave good breath sample only
5	0	0	0	3. Interview only--no drinking estimate
1	0	0	0	4. Interview only--probably had not been drinking
1	0	0	0	5. Interview only--probably had been drinking a little
1	0	0	0	6. Interview only--probably had been drinking a lot
*291	0	0	0	9. No interview or breathtest

V48 R12A Interview Location MD=9

TS	TB	MD	HD	
94	95	93	94	1. In survey vehicle
5	5	7	5	2. At the respondent's vehicle
1	1	*1	1	8. NA where
*291	0	0	0	9. No interview or breathtest

V49 R12B Interview/BAC Location Summary

TS	TB	MD	HD	
81	95	93	94	1. Interviewed in vehicle, BAC obtained
3	0	0	0	2. Interviewed in vehicle, refused BAC
2	0	0	0	3. Interviewed in vehicle, NA BAC
3	3	4	4	4. Interviewed at carside or NA where, & BAC obtained
1	0	0	0	5. Interviewed at carside or NA where, refused BAC
1	0	0	0	6. Interviewed at carside or NA where, NA BAC
2	2	3	2	7. Refused interview, BAC only at carside
7	0	0	0	8. Refused interview & BAC
*4	0	0	0	9. Removed by police before interview

V50 R12 Driver Participation (Driver's willingness to participate.) MD=9

TS	TB	MD	HD	
83	91	90	90	1. Accepted interview readily
8	7	7	8	2. Accepted interview reluctantly
1	2	3	2	3. Refused to be interviewed but gave breath sample
7	0	0	0	4. Refused to be interviewed or to give breath sample
*4	0	0	0	5. Removed by police before interview
*40	*36	*1	*4	9. Accepted interview, NA if readily or reluctantly

V51 R13 Resistance Reason (Reason for reluctance/refusal.) MD=9

TS	TB	MD	HD	
2	1	*1	*1	1. In a hurry--going to work or taking someone to work
2	1	2	3	2. In a hurry--shopping, appointment, meeting someone.
3	2	1	2	3. In a hurry--going home
1	1	*1	1	4. In a hurry--other reason or NA why
2	1	1	2	5. Negative about survey purpose, fearful of consequences
1	1	2	1	6. Didn't want to be bothered-no special reason evident
2	1	1	*2	7. Other
*172	*109	*10	*16	9. NA
86	93	93	92	0. Inap., accepted interview readily, or removed by police before interview

V52 S44 Survey Publicity

TS	TB	MD	HD
33	33	27	32
42	42	46	48
0	0	0	0
7	7	7	4
0	0	0	0
8	8	7	8
11	11	13	7

0. None
1. Article(s) in local paper only
2. Announced on radio only
3. Newspaper & radio
4. Other
5. Newspaper, radio & television
9. NA

V53 R14 Heard of NRS (Had you heard of this survey before tonight?)

TS	TB	MD	HD
9	9	8	13
91	91	92	87
*416	*145	*12	*26

1. Yes
2. No
9. NA

V54 R15 Time Entered Vehicle (A four digit number with the first 2 digits representing the hour, & the last 2 the minutes) MD=9999

9999. NA

V55 R15A Time of Night-7 (R15 collapsed) MD=9

TS	TB	MD	HD
*4	*3	1	0
28	29	21	17
33	34	32	25
4	4	5	3
17	16	23	25
16	15	18	27
1	1	1	2
*473	*146	*20	*19

1. Before 10
2. 10-10:59
3. 11-11:59
4. 12-12:59
5. 1-1:59
6. 2-2:59
7. 3-3:59
9. NA or no interview

V56 R16 Age (Q1. How old are you?) MD=99

Percentiles	TS	TB	MD	HD
10.	18	18	19	19
30.	22	22	23	23
50.	27	27	27	29
70.	36	36	37	36
90.	52	52	53	48

99. NA
00. DK, Refusal

V57 R16A Age-8 (R16 Collapsed) MD=9

TS	TB	MD	HD
7	7	3	4
17	17	14	14
17	17	20	19
27	26	30	30
14	13	14	16

1. 15-17 yrs.
2. 18-20 yrs.
3. 21-24 yrs.
4. 25-34 yrs.
5. 35-44 yrs.

V57 R16A Age-8 (cont'd)

TS	TB	MD	HD	
12	12	10	11	6. 45-54 yrs.
6	6	8	5	7. 55-64 yrs.
2	2	1	1	8. 65-95 yrs.
*344	*52	*8	*9	9. NA
*3	*2	0	0	0. DK, refusal

V58 R16B Age-6 (R16 collapsed) MD=9

TS	TB	MD	HD	
18	18	13	13	1. 15-19 yrs.
38	38	41	40	2. 20-29 yrs.
18	17	21	22	3. 30-39 yrs.
13	13	13	15	4. 40-49 yrs.
9	9	6	6	5. 50-59 yrs.
4	4	7	4	6. 60-95 yrs.
*344	*52	*8	*9	9. NA
*3	*2	0	0	0. DK, refusal

V59 R17 Education (Q2. How far have you gone in school?) MD=9

TS	TB	MD	HD	
4	4	3	7	1. 7 grades or less
4	4	2	5	2. 8 grades
18	18	13	17	3. 9-11 grades
31	31	34	31	4. High school diploma
4	4	4	3	5. Business or trade school
24	24	23	24	6. 1-3 years of college
9	9	14	10	7. College degree
6	6	7	3	8. 1 or more years of graduate work
*343	*51	*7	*7	9. NA
0	0	0	0	0. DK, refusal

V60 R17A Education-4 (R17 collapsed) MD=9

TS	TB	MD	HD	
26	26	18	29	1. Didn't finish high school
35	35	38	34	2. High school graduate with or without some non college training
24	24	23	24	3. Some college
15	15	21	13	4. Finished college
0	0	0	0	0. Refused to say
*343	*51	*7	*7	0. NA

V61 R18 Marital Status (Q3. Are you married now--or are you divorced, separated, widowed or single?) MD=9

TS	TB	MD	HD	
49	49	47	49	1. Married
6	6	10	11	2. Divorced
2	2	2	4	3. Separated
1	1	*1	2	4. Widowed
41	42	40	35	5. Single (never married)
*341	*50	*8	*7	9. NA
0	0	0	0	0. DK, Refusal

V62 R19 Employment Status (Q4. Are you presently employed; or are you unemployed, or retired, (or a housewife) or a student, or what?) MD=9

TS	TB	MD	HD	
79	78	84	84	1. Employed
5	5	7	4	2. Unemployed
2	2	2	2	3. Retired, Disabled
3	3	*3	*5	4. Housewife
12	12	6	10	5. Student
*339	*48	*7	*7	9. NA
0	0	0	0	0. DK, Refusal

V63 R20 Occupation (Q4a. What kind of work do you do?) MD=9

TS	TB	MD	HD	
15	14	22	12	0. Professional, technical
13	13	14	11	1. Managerial, administrative
7	7	8	5	2. Clerical
6	6	5	6	3. Sales
1	1	1	*1	4. Farming
14	14	13	19	5. Craftsmen, foreman
19	20	19	19	6. Operative, semi-skilled
10	11	10	8	7. Service worker
15	15	8	21	8. Laborer
*977	*655	*48	*79	9. NA or Refusal; or Inap., R is a housewife or student

V64 R20A Occupation-5 (R20 collapsed) MD=9

TS	TB	MD	HD	
35	34	46	30	1. White collar
49	50	46	59	2. Blue collar
1	1	1	*1	3. Farm
3	3	1	1	4. Housewife
12	13	7	10	5. Student
*476	*174	*23	*26	9. NA or Refusal

V65 R20B Occupation-International Categories

TS	TB	MD	HD
10	11	12	9
11	11	19	10
11	12	6	10
5	5	5	5
5	5	7	4
1	1	1	*1
11	12	7	17
11	11	11	15
24	27	25	23
13	6	9	6

1. Managerial, administrative
2. Professional, technical
3. Student
4. Sales
5. Clerical
6. Farming
7. Laborer
8. Craftsman, foreman
9. Other (service workers, operatives, housewives)
0. NA or Refusal

V66 R21 Usual Annual Mileage (Q5. About how many thousand miles would you estimate that you drive in an average year?)

MD=999,000

(1500 MILES OR LESS IS CODED AS 001)

999. NA
000. DK, refusal

Percentiles

	TS	TB	MD	HD
10.	5	5	5	4
30.	10	10	10	10
50.	14	13	14	14
70.	20	20	20	20
90.	35	35	30	40

V67 R21A Annual Mileage-4 (R21 collapsed)

MD=0,9

TS	TB	MD	HD
23	23	21	27
42	42	43	39
18	18	22	19
17	17	13	16
*355	*62	*9	*9
*122	*118	*11	*21

1. Less than 10,000 miles (001-009)
2. 10,000-19,000 miles (010-019)
3. 20,000-29,000 miles (020-029)
4. 30,000 miles and over (030-250)
9. NA
0. DK, refusal

V68 R21B Annual Mileage-9 (R21 collapsed)

MD=9

TS	TB	MD	HD
3	3	1	3
5	5	3	5
6	6	7	7
9	9	9	10
28	28	28	23
25	25	26	27
16	16	15	14
6	6	6	6
*355	*62	*9	*9
3	3	3	5

1. 0-1,000 miles (001)
2. 2,000-3,000 miles (002-003)
3. 4,000-5,000 miles (004-005)
4. 6,000-9,000 miles (006-009)
5. 10,000-14,000 miles (010-014)
6. 15,000-24,000 miles (015-024)
7. 25,000-49,000 miles (025-049)
8. 50,000 miles or more (050-600)
9. NA
0. DK, refusal

V69 R22% Night Driving (Q6. About what percent of your total driving time takes place at night?) MD=00,99

97. 97-100%
99. NA
00. DK, Refusal

V70 R22B Night Driving % - 9 (R22 collapsed) MD=9

TS	TB	MD	HD
3	3	6	3
8	8	7	10
20	21	22	24
19	18	20	18
12	12	8	9
5	5	3	5
23	23	24	18
8	9	10	9
*344	*53	*7	*8
2	2	1	3

1. 0-4%
2. 5-9%
3. 10-19%
4. 20-29%
5. 30-39%
6. 40-49%
7. 50-74%
8. 75-100%
9. NA
0. DK, Refusal

V71 R23 Type of License (Q7. Do you now have a regular driver's license or a chauffeur's license?) MD=9

TS	TB	MD	HD
87	87	85	86
9	9	11	8
3	3	2	4
*2	*2	0	0
*5	*5	*1	*2
1	1	1	1
*339	*48	*7	*7
0	0	0	0

1. Regular
2. Chauffeur's (or endorsement)
3. Both
4. License suspended
5. No license
6. Other
9. NA
0. DK, Refusal

V72 R24 Miles from Home (Q8. About how many miles away are you from where you live?) MD=000,999
(1.5 MILES OR LESS IS CODED AS 0001)

Percentiles

	TS	TB	MD	HD
10.	1	1	1	1
30.	2	2	2	2
50.	5	5	5	5
70.	10	10	12	9
90.	30	30	40	25

9999. NA
0000. DK, Refusal

V73 R24A Miles from Home - 9 (R24 collapsed) MD=9

TS	TB	MD	HD	
46	46	43	49	1. 0-4 miles
21	21	21	23	2. 5-9 miles
15	15	14	16	3. 10-19 miles
7	6	9	4	4. 20-29 miles
5	5	4	4	5. 30-49 miles
2	2	2	1	6. 50-99 miles
2	2	1	1	7. 100-299 miles
2	2	5	2	8. 300-6,000 miles
*342	*51	*7	*8	9. NA
*8	*6	*2	0	0. DK, Refusal

V74 R25 Origin of Trip (Q9. Where were you when you last entered your vehicle? What kind of place?) MD=9

TS	TB	MD	HD	
13	13	10	9	1. Own home
31	30	32	30	2. Friend's or relative's home
12	13	5	7	3. Work or class
14	14	19	15	4. Restaurant or other eating place
10	10	20	23	5. Bar, tavern, club
5	5	4	3	6. Sport or recreational facility
4	4	1	1	7. Cultural event, lecture, meeting, church
11	11	8	11	8. Other (store or gas station primarily)
*368	*73	*9	*13	9. NA
*3	*2	0	*1	0. Refused to say

V75 R26 Destination (Q9a. And where will you be when you next leave your vehicle?) MD=9

TS	TB	MD	HD	
68	67	62	65	1. Own home
13	13	16	13	2. Friend's or relative's home
3	3	*2	2	3. Work or class
5	5	4	6	4. Restaurant or other eating place
3	4	7	6	5. Bar, tavern, club
1	1	1	*1	6. Sport or recreational facility
*8	*6	1	*1	7. Cultural event, lecture, meeting, church
7	7	9	7	8. Other (store or gas station primarily)
*352	*59	*7	*10	9. NA
*2	0	*1	0	0. Refused to say

V76 R26A Trip Purpose-9 (R25 & R26 combined & collapsed) MD=9

TS	TB	MD	HD
31	31	33	30
10	10	6	5
25	24	37	34
3	3	6	7
15	15	5	9
*2	*2	0	0
2	2	1	2
15	15	11	13
*1	0	0	0
*346	*53	*7	*9

1. Social - own home to friend's home or vice-versa or between friend's
2. Recreational, cultural, etc.
3. Going to or coming from a restaurant or bar
4. Travelling between two eating or drinking places
5. Commuting - to or from work
6. Commercial - on the job
7. Just driving, own home to own home
8. Other
0. Refused
9. NA

V77 R26B Trip Purpose-5 (R24A, R25, & R26 combined & collapsed) MD=9

TS	TB	MD	HD
*1	0	0	0
81	81	89	88
4	4	6	3
*2	*2	0	0
15	15	5	9
*346	*53	*7	*9

0. Refused
1. Pleasure
2. Trip - 100 miles or more
3. Commercial
4. To or from work
9. NA

V78 R27 Trip Miles (Q10. About how many miles will you have driven between these two places?) MD=000,999

Percentiles

	TS	TB	MD	HD
10.	2	2	2	2
30.	5	5	5	5
50.	10	10	9	8
70.	18	17	15	15
90.	42	40	31	31

999. NA
000. DK, Refusal

V79 R27A Trip Length-9 (R27 collapsed) MD=9

TS	TB	MD	HD
30	31	33	37
25	25	28	25
20	21	17	20
9	9	11	7
7	7	5	5
4	4	4	3
2	2	1	2
1	1	*1	0
*358	*66	*11	*7
1	1	2	*2

1. 0-5 miles
2. 6-10 miles
3. 11-20 miles
4. 21-30 miles
5. 31-50 miles
6. 51-100 miles
7. 101-200 miles
8. 200 miles or more
999. NA
0. DK, Refusal

V80 R28 Trip Time (Q11. About how much driving time will this involve?) MD=000,999

(CODED IN ACTUAL MINUTES)

999. NA
000. DK, Refusal

Percentiles

	TS	TB	MD	HD
10.	6	6	6	6
30.	15	15	11	13
50.	20	20	20	18
70.	30	30	30	30
90.	60	60	55	60

V81 R28 Trip Time-9 (R28 collapsed) MD=9

TS	TB	MD	HD	
9	9	9	10	1. 0-5 minutes
14	14	20	17	2. 6-10 minutes
33	33	30	37	3. 11-20 minutes
17	18	17	13	4. 21-30 minutes
12	12	12	11	5. 31-50 minutes
8	8	7	5	6. 51-100 minutes
4	4	3	5	7. 101-200 minutes
2	2	*2	1	8. More than 200 minutes
*358	*64	*9	*7	9. NA
1	1	1	2	0. DK, Refusal

V82 R29 Drink or Abstain (Q12. Now I have a question about your use of alcohol. Do you ever drink alcoholic beverages such as beer, wine or liquor--or are you a total abstainer?) MD=9

TS	TB	MD	HD	
83	82	99	99	1. Yes
17	18	1	1	2. No
*343	*50	*7	*7	9. NA
0	0	0	0	0. Refused to say

V83 R30 Drinking Type (Q12a. In general would you describe yourself as a:) MD=9

TS	TB	MD	HD	
17	18	1	1	1. Inap., R is a total abstainer
38	38	33	25	2. Very light drinker
25	25	28	31	3. Fairly light drinker
18	18	37	39	4. Moderate drinker
1	1	*2	3	5. Fairly heavy drinker
*14	*6	*1	1	6. Heavy drinker
*345	*51	*7	*8	9. NA

V84 R31 Drink Today (Q12b. Have you had anything to drink today?) MD=9

TS	TB	MD	HD
47	45	93	93
36	37	6	6
*345	*52	*7	*7
17	18	1	1

1. Yes
2. No
9. NA
0. DK, Refusal, or Inap., R is a total abstainer

V85 R33 Time Last Drink (Q12c. How long ago did you finish your last drink?) MD=999

(CODED IN TOTAL MINUTES)

999. NA
000. DK, Refusal, or Inap., R is a total abstainer, or R didn't drink today

V86 R33B Time Last Drink-8 (R33 collapsed) MD=9

TS	TB	MD	HD
53	55	7	7
2	2	5	7
3	3	8	10
4	4	10	13
5	5	15	11
2	2	5	7
10	9	23	19
10	10	15	18
11	11	10	7
*353	*58	*8	*7

0. None, R didn't drink today
1. 1-5 minutes
2. 6-10 minutes
3. 11-20 minutes
4. 21-30 minutes
5. 31-50 minutes
6. 51-100 minutes
7. 101-200 minutes
8. More than 200 minutes
9. NA, DK, Refusal

V87 R34 DAD Conversation (Q13. During the past month do you recall taking part in any conversation in which drinking and driving or drunk driving was mentioned?) MD=9

TS	TB	MD	HD
35	35	33	29
65	65	67	71
*343	*48	*7	*7
*6	*3	0	*2

1. Yes
2. No
9. NA
0. DK, Refusal

V88 R35 Alcohol Fatalities % (Q14. Out of every 100 traffic accidents in which someone is killed how many would you guess involve a driver who has been drinking?) MD=00,99

97. 97-100%
99. NA
00. DK, Refusal

Percentiles

	TS	TB	MD	HD
10.	20	20	20	15
30.	50	50	50	50
50.	50	50	50	50
70.	70	70	70	70
90.	85	85	85	90

V89 R35A Alcohol Fatalities %-8 (R35 collapsed) MD=9

TS	TB	MD	HD
8	8	8	10
11	11	13	11
7	7	6	5
25	25	23	21
13	14	13	13
21	21	21	18
10	10	11	10
*364	*66	*9	*12
5	5	5	11

1. 0-19%
2. 20-34%
3. 35-49%
4. 50%
5. 51-65%
6. 66-80%
7. 81-100%
9. NA
0. DK, Refusal

V90 R36 Social/Problem Drinker (Q15. Would you guess that more of such alcohol-related accidents are caused by the many social drinkers who occasionally drink too much, or by the smaller number of problem drinkers who frequently drink a great deal?) MD=9

TS	TB	MD	HD
49	50	46	43
37	37	43	40
7	7	5	5
6	6	5	9
*352	*56	*8	*9
1	1	1	2

1. Social drinker
2. Problem drinker
3. About even
4. No opinion
9. NA
0. DK, Refusal

V91 R37 Persaude Not Drive (Q16. During the past year have you ever tried to persuade a person not to drive because you felt he had drunk too much for safe driving?) MD=9

TS	TB	MD	HD
60	60	69	76
40	40	31	24
*347	*51	*7	*7
*5	*3	0	0

1. Yes
2. No
9. NA
0. DK, Refusal

V92 R38 Persuasion Tried (Q16a. About how many times did you try?) MD=98,99

00. Inap., didn't try
98. Refusal, DK
99. NA

Percentiles	TS	TB	MD	HD
10.	0	0	0	0
30.	0	0	0	1
50.	2	2	2	3
70.	4	4	5	6
90.	14	12	15	20

V93 R39 Persuasion Success (Q16b. About how many times were you successful?) MD=98,99

00. None; or Inap, didn't try
98, Refusal, DK
99. NA

Percentiles	TS	TB	MD	HD
10.	0	0	0	0
30.	0	0	0	0
50.	0	0	1	1
70.	2	2	3	3
90.	6	6	10	10

V94 R38A Persuasion Tried-8 (R38 collapsed) MD=9

0. Didn't try in the past year
1. 1-4 times
2. 5-9 times
3. 10-24 times
4. 25-49 times
5. 50-74 times
6. 75-100 times
8. DK, Refusal
9. NA

TS	TB	MD	HD
40	40	31	25
33	34	38	36
10	10	11	14
10	10	12	15
2	2	1	3
2	2	4	3
2	2	1	3
1	1	*3	*2
*384	*83	*8	*22

V95 R39A Persuasion Success-9 (R37 & R39 combined) MD=9

0. Didn't try
1. Tried, no success
2. Tried, 1-4 successes
3. Tried, 5-9 successes
4. Tried, 10-24 successes
5. Tried, 25-49 successes
6. Tried, 50-74 successes
7. Tried, 75-100 successes
8. DK, refused to say whether tried; or tried but DK, refused to say, or NA how many successes
9. NA, whole question

TS	TB	MD	HD
40	40	31	24
11	11	11	15
32	33	38	35
7	7	9	10
4	4	6	7
1	1	2	2
1	1	2	1
1	1	*2	1
3	3	1	4
*347	*51	*7	*7

V96 R39B Persuasion Success Rates (Percentage - R39 divided by R38) MD=9.99

9.99. NA on R38 and/or R39
0.00. No success; or Inap., didn't try; or DK or refusal on R38 and/or R38

Percentiles

	TS	TB	MD	HD
10.	0	0	0	0
30.	0	0	0	0
50.	0	0	50	40
70.	60	62	87	67
90.	100	100	100	100

V97 R39C Persuasion Success Rate-8 (R39 collapsed) MD=9

0. Inap., didn't try; or DK or refusal on R38 and/or R39
1. Tried, 0%
2. Tried, 1-19%
3. Tried, 20-39%
4. Tried, 40-59%
5. Tried, 60-79%
6. Tried, 80-99%
7. Tried, 100%
9. NA, on R38 and/or R39

TS	TB	MD	HD
41	41	31	25
11	11	11	16
2	2	1	3
5	5	3	5
9	9	11	16
6	6	9	10
3	3	4	3
22	22	29	22
*460	*148	*12	*32

V98 R40 ASAP Tax Support (Q17. If there were a government program which could cut down on alcohol-related accidents by as much as one third or one half, would you personally be willing to pay more taxes to support such a program?) MD=9

1. Yes
2. No
9. NA
0. DK, Refusal

TS	TB	MD	HD
77	78	78	76
19	18	20	21
*353	*55	*9	*7
3	3	3	3

V99 S4 Intoxilyzer Pre-Simulations MD=0

1. All readings in .095-.105 range
2. Mixture of readings in .095-.105 range & in .090-.094 range
4. All readings in the .090-.094 range
9. Intoxilyzer used, but not simulated just before use
0. Inap., Intoxilyzer not used at site

TS	TB	MD	HD
66	67	66	63
14	14	13	11
3	3	2	3
17	16	18	22
*937	*435	*44	*83

V100 S5 Intoxilyzer Post-Simulations MD=0

TS	TB	MD	HD
54	55	54	55
5	5	7	5
0	0	0	0
5	5	4	5
0	0	0	0
0	0	0	0
36	35	35	35
*937	*733	*72	*117

1. All readings in .095-.105 range
2. Mixture of readings in .095-.105 range & .090-.094 range
3. Mixture of readings in .095-.105 range & the .085-.089 range
4. All readings in the .090-.094 range
5. Mixture of readings in the .090-.094 range & the .085-.089 range
6. All readings in the .085-.089 range
9. Intoxilyzer used, but apparently not simulated afterwards
0. Inap., Intoxilyzer not used at site

V101 S6 Alco-Sensor Use MD=9

TS	TB	MD	HD
42	41	45	42
34	34	27	32
0	0	0	0
12	13	14	13
0	0	0	0
13	12	14	13
0	0	0	0
*25	*25	*1	*1

1. One functioning well
2. Two functioning well
3. One functioning doubtfully
4. One functioning well & one functioning doubtfully
5. Two functioning doubtfully
6. None functioning
8. Functioning, NA how well
9. NA

V102 S7 Field Crimper Standard MD=999

(BAC READING OBTAINED USING THE FIELD CRIMPER WITH THE SIMULATOR--CODED IN PERCENT TO 3 DECIMAL PLACES, BUT THE DECIMAL IS IGNORED)

999. NA; or Inap., field crimper not used at site

V103 R41 Direct BAC Reading (Q18. Now as the final step in the survey would you please blow into this tube on the Intoxilyzer. We are collecting breath samples as a routine part of this nighttime driver survey.) MD=998,999

(IF MORE THAN 1 READING OBTAINED, FINAL BEST READING IS CODED--IN PERCENT TO 3 DECIMAL PLACES, BUT THE DECIMAL IS IGNORED)

998. Refusal at end of interview
999. Not requested, NA, total refusal, or removed

V104 R42 Number of Direct Readings MD=9

TS	TB	MD	HD
30	27	29	24
67	71	69	62
3	3	2	14
*7	*1	*1	1
*330	*17	*3	*6

0. No direct readings (including those respondents who took the interview but refused to give a breath test)
1. One
2. Two
3. Three
9. NA

V105 R43 Breathtest Device (For final direct reading) MD=9

TS	TB	MD	HD
62	65	59	65
8	8	12	12
30	27	29	23
*308	0	0	0

1. Intoxilyzer
2. Alco-Sensor
3. No direct reading
9. NA

V106 R44 Use Field Crimper MD=9

TS	TB	MD	HD
29	29	34	29
71	71	66	71
*333	*25	*1	*8

1. Used
2. Not used
9. NA

V107 R45 BAC on Field Crimper MD=998,999

(IN PERCENT TO 3 DECIMAL PLACES, BUT THE DECIMAL IS IGNORED)

998. Refusal at end of interview
999. Not requested, NA, total refusal, or removed

V108 R46 Time Left Vehicle (Hour and Minutes) MD=9999

9999. NA

V109 R47 Total Interview Minutes MD=99

TS	TB	MD	HD	
*8	*8	1	0	01. One minute
3	3	1	3	02. Two minutes
8	9	7	6	03. Three minutes
17	17	16	7	04. Four minutes
27	27	24	19	05. Five minutes
17	16	19	16	06. Six minutes
12	11	15	15	07. Seven minutes
7	7	8	9	08. Eight minutes
4	4	2	8	09. Nine minutes
3	3	3	5	10. Ten minutes
1	1	1	3	11. Eleven minutes
1	1	1	2	12. Twelve minutes
1	1	1	2	13. Thirteen minutes
*12	*10	0	1	14. Fourteen minutes
*11	*10	1	1	15. Fifteen minutes
*2	*2	0	*2	16. Sixteen minutes
*2	*2	0	0	17. Seventeen minutes
*1	*1	0	*1	18. Eighteen minutes
*3	*3	0	*3	19. Nineteen minutes
*2	*2	0	*1	20. Twenty minutes
*551	*207	*27	*30	99. NA

V110 R48 R's Disposition MD=9

TS	TB	MD	HD	
96	97	98	75	1. Alternate transportation not suggested
1	1	0	9	2. Transportation suggested but R said passenger would drive
1	1	0	4	3. Transportation suggested & R accepted ride to destination
0	0	0	0	4. Transportated suggested & R taken to a motel
2	2	2	12	5. Transportation suggested but R refused & drove self
0	0	0	0	6. Transportation suggested but R refused & was arrested at the site
*3	*3	0	*2	7. Other
*368	*35	*3	*13	9. NA

V111 R43A Intoxilyzer/Alco-Sensor Use (R41 & R43 combined)

TS	TB	MD	HD	
56	65	59	65	1. Intoxilyzer only
7	8	12	12	2. Alco-Sensor only
3	0	0	0	3. Refusal of breathtest at the end of interview
1	0	0	0	4. Intoxilyzer used but reading no good
*7	*7	0	*1	5. Alco-Sensor used but reading no good
25	27	29	23	6. No direct attempt at end of interview (Field Crimper sites)
8	0	0	0	9. Total refusal or removed, or R41-R45 left blank by the interviewer

V112 R44A Field Crimper Use (R44 & R45 combined)

TS	TB	MD	HD
25	29	34	28
1	0	0	0
1	0	0	0
65	71	66	72
8	0	0	0

1. Used okay
2. Refusal at the end of interview
3. Used but reading no good
4. No attempt at end of interview
9. Total refused, or removed, or R41-R45 left blank by the interviewer

V113 R43B Breathtest Device Sum (R41, R43 & R45 combined)

TS	TB	MD	HD
56	65	59	65
23	27	29	23
5	6	7	7
2	2	5	5
1	0	0	0
1	0	0	0
*7	0	0	0
3	0	0	0
1	0	0	0
	0	0	0

1. Intoxilyzer only
2. Field crimper only
3. Alco-Sensor only
4. Field Crimper & Alco-Sensor
5. Intoxilyzer only used--but NA(reading no good)
6. Field Crimper only used--but NA (reading no good)
7. Alco-Sensor only used--but NA(reading no good)
8. Intoxilyzer/Alco-Sensor available--refusal at end
9. Field Crimper available--refusal at end
0. Total refusal, or removed, or interview but NA why no breath test

V114 R41A Final BAC Reading MD=998,999

(IN PERCENT TO 3 DECIMAL PLACES, BUT DECIMAL IS IGNORED)

998. Refusal at end of interview
999. NA, or total refusal, or removed

V115 R41B Final BAC-7 (R41A collapsed) MD=8,9

TS	TB	MD	HD
71	71	0	0
6	6	0	0
9	9	100	0
6	6	0	45
3	2	0	18
3	3	0	26
1	1	0	10
*114	0	0	0
*392	0	0	0

1. .000-.009
2. .010-.019
3. .020-.049
4. .050-.079
5. .080-.099
6. .100-.149
7. .150-.300
8. Refusal at end of interview
9. NA, or total refusal, or removed

TS	TB	MD	HD
77	77	0	0
9	9	100	0
9	8	0	64
5	5	0	36
*114	0	0	0
*392	0	0	0

V116 R41C Final BAC-4 (R41 collapsed)
MD=8,9

1. .00-.019
2. .020-.049
3. .050-.099
4. .100-.300
8. Refusal at end of interview
9. NA,,or total refusal, or removed

TS	TB	MD	HD
86	100	100	100
14	0	0	0

V117 R41D Successful BAC-2 (R41B collapsed)

1. BAC successfully taken
2. R refused BAC; or BAC NA, including no proper readings or missing readings; or total refusal, or removed

TS	TB	MD	HD
77	77	0	0
9	9	100	100
13	13	0	100
*114	0	0	0
*392	0	0	b0

V118 R41E Final BAC-3 (R41A collapsed)
MD=8,9

1. .000-.019
2. .020-.049
3. .050 or above
8. Refusal at end of interview
9. NA, or total refusal, or removed

Range: 0.164-2.812
Mean: 1.000
St. Deviation: 0.520

V119 S49 Site Vehicle Weight (4 DIGITS IN FORM X.XXX) This weight factor was constructed separately for each site as follows:

1. The site percentage of all vehicles stopped in its SSU was calculated ($R_1 = V_i/V_{ij}$)
2. The total traffic count (T_i) at each site was divided by the average speed (S_i) at that site (TS_i). The resulting values were summed for all sites in an SSU, & the percentage of this sum belonging to each site was determined ($R_2 = TS_i/TS_{ij}$)
3. The first percentage was divided into the second percentage (SVW= R_2/R_1)

V120 S50 Site BAC Weight (4 DIGITS IN FORM X.XXX) (APPLICABLE TO BAC CASES ONLY)

Range: 0.176-3.003
Mean: 1.00
St. Deviation: .554

This weight factor was constructed following the same procedure as for V119, except that the number of BACs obtained at each site (B_i) was used instead of the number of vehicles stopped.

V121 S51 Time Site Vehicle Weight (4 DIGITS IN FORM X.XXX) (APPLICABLE TO TIME ANALYSIS ONLY)

Range: 0.247-2.630
Mean: 1.000
St. Deviation: 0.384

This weight factor was constructed in the same manner as V119, except that it was done separately for sites used during the 10-12PM and 1-3AM time periods.

V122 S52 Time Site BAC Weight (4 DIGITS IN FORM X.XXX) (APPLICABLE TO BAC CASES AND TIME ANALYSIS ONLY)

Range: 0.244-2.569
Mean: 1.000
St. Deviation: .392

This weight factor was constructed in the same manner as V120, except that it was done separately for sites used during the 10-12PM and the 1-3AM time periods.

V123 PVW Pop Veh Wt (4 DIGITS IN FORM X.XXX)

Range: 0.580-2.476
Mean: 1.000
St. Deviation: 0.264

This weight factor was constructed separately for each SSU as follows:

1. The SSU percentage of all vehicles stopped in the national survey was determined ($R_1=V_j/TV$)
2. The percentage of the total national eligible population in each SSU's substratum was determined (dividing the substratum population equally among both SSUs in a two-SSU PSU) ($R_2=P_j/TP$)
3. The first percentage was divided into the second percentage ($PVW=R_2/R_1$).

V124 PBW Pop BAC Wt (4 DIGITS IN FORM X.XXX) (APPLICABLE TO BAC CASES ONLY)

Range: 0.567-2.381
Mean: 1.000
St. Deviation: 0.273

This weight factor was constructed in the same manner as V123, except that the number of BACs obtained in each SSU (B_j) was used instead of the number of vehicles stopped.

V125 TPVW Time Pop Veh Wt (4 DIGITS IN FORM X.XXX) (APPLICABLE TO TIME ANALYSIS ONLY)

Range: 0.559-8.518
Mean: 1.000
St. Deviation: 0.388

This weight factor was constructed in the same manner as V123, except that it was done separately for SSU sites used during the two time periods.

V126 TPBW Time Pop BAC Wt (4 DIGITS IN FORM X.XXX) (APPLICABLE TO BAC CASES & TIME ANALYSIS ONLY)

Range: 0.565-7.338
Mean: 1.000
St. Deviation: 0.378

This weight factor was constructed in the same manner as V124, except that it was done separately for SSU sites used during the two time periods.

V127 DEW Drinking Est Wt (4 DIGITS IN FORM X.XXX) (APPLICABLE TO BAC CASES ONLY)

Range: 1.010-7.166
Mean: 1.158
St. Deviation: 0.312

This weight factor was constructed separately for respondents interviewed by each of the three interviewing teams. It was calculated by dividing the number of BAC cases in a given drinking estimate category into the total number of respondent contacts in the same drinking estimate category (V/B for each of the four drinking estimate categories and three interviewing teams). This initial factor was then adjusted in order to make the weighted number of BACs obtained in each SSU equal to the number of vehicles stopped in each SSU.

V128 TDEW Time Drkg Est Wt (4 DIGITS IN FORM X.XXX) (APPLICABLE TO BAC CASES & TIME ANALYSIS ONLY)

Range: 0.955-6.348
Mean: 1.158
St. Deviation: 0.298

This weight factor was constructed in the same manner as V127, except that it was done separately for SSU sites used during the two time periods.

V129 DSBW Drnk Site BAC Wt (5 DIGITS IN FORM XX.XXX) (APPLICABLE TO BAC CASES ONLY)

Range: 0.202-12.669
Mean: 1.156
St. Deviation: 0.730

This weight factor was constructed by multiplying V120 by V127.

V130 TDSBW T Drnk Site BAC Wt (5 DIGITS IN FORM XX.XXX) (APPLICABLE TO BAC CASES & TIME ANALYSIS ONLY)

Range: 0.257-9.654
Mean: 1.159
St. Deviation: 0.549

This weight factor was constructed by multiplying V121 by V128.

V131 PSVW Pop Site Veh Wt (5 DIGITS IN FORM XX.XXX)

Range: 0.118-3.688
Mean: 1.000
St. Deviation: 0.581

This weight factor was constructed by multiplying V119 by V123.

V132 PSBW Pop Site BAC Wt (5 DIGITS IN FORM XX.XXX) (APPLICABLE TO BAC CASES ONLY)

Range: 0.128-3.229
Mean: 0.999
St. Deviation: 0.611

This weight factor was constructed by multiplying V120 by V124.

V133 TPSVW T Pop Site Veh Wt (5 DIGITS IN FORM XX.XXX) (APPLICABLE TO TIME ANALYSIS ONLY)

Range: 0.226-8.518
Mean: 0.999
St. Deviation: 0.557

This weight factor was constructed by multiplying V121 by V125.

V134 TPSBW T Pop Site BAC Wt (5 DIGITS IN FORM XX.XXX)(APPLICABLE TO BAC CASES AND TIME ANALYSIS ONLY)

Range: 0.209-7.338
Mean: 0.999
St. Deviation: 0.541

This weight factor was constructed by multiplying V122 by V126.

V135 DPSBW D Pop Site BAC Wt (5 DIGITS IN FORM XX.XXX)(APPLICABLE TO BAC CASES ONLY)

Range: 0.143-10.275
Mean: 1.165
St. Deviation: 0.816

This weight factor was constructed by multiplying V129 by V132.

V136 TDPSBW TD Pop Site BAC Wt (5 DIGITS IN FORM XX.XXX)(APPLICABLE TO BAC CASES AND TIME ANALYSIS ONLY)

Range: 0.219-9.544
Mean: 1.169
St. Deviation: 0.737

This weight factor was constructed by multiplying V128 by V134.

APPENDIX J

CODEBOOK WITH MARGINALS FOR THE NATIONAL ROADSIDE SURVEY ROADSIDE SITE DATA

The following codebook lists the variables and codes used in recording information about the 185 roadside sites at which the national roadside survey was conducted. The number of sites in each code category are shown in the left margin.

V1 S1 Study #

V2 S2 Site # (3 DIGITS)

TS	V3	S3 Team
TS		
61		1. East
64		2. Midwest
60		3. West

V4 S4 Intoxilyzer Pre-Simulations MD=0

TS	
78	1. All readings in .095-.105 range
12	2. Mixture of readings in .095-.105 range & in the .090-.094 range
0	3. Mixture of readings in .095-.105 range & in the .085=.089 range
3	4. All readings in the .090-.094 range
0	5. Mixture of readings in the .090-.094 range & in the .085-.089 range
0	6. All readings in the .085-.089 range
0	7. Other
21	9. Intoxilyzer used, but not simulated before use
71	0. Inap., Intoxilyzer not used at site

V5 S5 Intoxilyzer Post-Simulations MD=0

TS	
66	1. All readings in .095-.105 range
10	2. Mixture of readings in .095-.105 range & in the .090-.094 range
0	3. Mixture of readings in .095-.105 range & in the .085-.089 range
3	4. All readings in the .090-.094 range
0	5. Mixture of readings in the .090-.094 range & the .085-.089 range
0	6. All readings in the .085-.089 range
0	7. Other
35	9. Intoxilyzer used, but not simulated after use
71	0. Inap., Intoxilyzer not used at site

V6 S6 Alco-Sensor Use MD=9

TS	
97	1. One functioning well
50	2. Two functioning well
0	3. One functioning doubtfully
17	4. One functioning well & one functioning doubtfully
0	5. Two functioning doubtfully
20	6. None functioning
1	9. NA

V7 S7 Field Crimper Standard (ACTUAL NUMBER) MD=999

999. NA; Inap., Field Crimper not used

V8 S8 Estimated ADT's (IN HUNDREDS) MD=999

999. NA

V9 S9 Beginning Time (ACTUAL) MD=9999

9999. NA

V10 S10 Ending Time (ACTUAL) MD=9999

9999. NA

V11 S11 Total Survey Time (AT SITE) MD=999

999. NA

V12 S12 Number of Beginning Directions

TS	
144	1. One
38	2. Two
3	4. Four
0	9. NA

V13 S13 Direction Change (CHANGE OF DIRECTIONS SAMPLED) MD=9

TS	
160	0. None
3	1. Change in first 15 minutes
3	2. Change in second 15 minutes
6	3. Change in second half hour
10	4. Change in third half hour
2	5. Change after third half hour
1	6. Changed whole site
0	9. NA

V14 S14 Total Traffic Count (PER SITE) MD=9999

9999. NA

V15 S15 Total Traffic Count Per Hour (IN ONE DIRECTION ON MAIN SITE ROAD, 60xS14/S11) MD=999

999. NA

V16 S16 Number of Non-USA Vehicles Stopped (1 DIGIT)

V17 S17 Number of USA Vehicles Stopped (Interviews, refusals and arrestees) (2 DIGITS)

V18 S18 Sampling Rate (S14/S16+S17) MD=99

99. NA

V19 S19 Number of Vehicles Failed to Stop MD=999

999. NA

V20 S20 Weather

TS	
148	1. Clear or cloudy
19	2. Raining
3	3. Snowing
10	4. Clear or cloudy and raining
1	5. Clear or cloudy and snowing
0	6. Raining and snowing
0	7. Clear or cloudy, raining and snowing
4	8. Fog
0	9. NA

V21 S21 Snow on Ground

TS	
4	1. Yes
181	2. No or NA

V22 S22 Estimated Temperature (2 DIGITS)

V23 S23 Estimated Average Speed (OF APPROACH VEHICLES) (2 DIGITS)

V24 S24 Breathtesting Equipment (AT SITE)

TS	
31	1. Intoxilyzer only
0	2. Field Crimper only
79	3. Intoxilyzer and Alco-Sensor
71	4. Field Crimper and Alco-Sensor
4	5. Intoxilyzer, Field Crimper and Alco-Sensor
0	9. NA

V25 S25 Power Source

TS	
54	1. Motorhome generator
56	2. Portable generator
71	3. Battery
0	4. 110-volt external source
4	5. Combination
0	9. NA

V26 S26 Use of Warning Sign

TS	
39	1. Used with barricade
46	2. Used alone
97	3. Not used
3	9. NA

V27 S27 Use of Cones

TS	
23	1. Used in street
12	2. Used in parking area
13	3. Used both places
137	4. Not used
0	9. NA

V28 S28 Warning Signals

TS	
108	1. Police car flasher only
10	2. Flares only
45	3. Police car flasher & flares
11	4. Other only
6	5. Police car flasher & other
1	6. Flares & other
0	7. Flares, Flasher & other
4	9. NA or None

V29 S29 Policeman's Hand Signal Device

TS	
5	1. Flare
50	2. Wand
123	3. Flashlight
0	4. Lantern
4	5. Combination
3	0. None

V30 S30 Interviewer's Greeting Place

TS	
18	1. Middle of Street
43	2. Curbside
111	3. Parking area
12	4. Combination
1	9. NA

V31 S31 Number of Drivers (AT SITE)

TS	
23	0. None
20	1. One
120	2. Two
11	3. Three
8	4. Four
2	5. Five
1	6. Six

V32 S32 Number of Policemen at Site

TS	
103	1. One with car
7	2. One with motorcycle
4	3. One without car
62	4. Two with car
0	5. Two with motorcycle
0	6. Two without car
1	7. One with car plus another car on hand
7	8. Two with car plus another car on hand
0	0. Other
1	9. NA

V33 S33 Sex of Local Interviewer

TS	
82	1. Male
12	2. Female
91	0. Inap., no local interviewer

V34 S34 Local Interviewers on Time

TS	
89	1. Yes or NA
3	2. No, later than scheduled but still worked
2	3. No, didn't show & had to be replaced at the last minute
91	0. Inap., no local interviewer

V35 S35 Drivers on Time

TS	
155	1. Yes or NA
7	2. One or more late or left early
23	0. No drivers

V36 S36 Police on Time

TS	
158	1. Arrived on time, didn't leave early, or NA any problem
16	2. Arrived late, didn't leave early
4	3. Arrived on time, left early
7	4. Arrived late, left early

V37 S37 Police Away from Site During Interviewing Period

TS	
181	1. No, or NA any problem
3	2. Yes, under 15 minutes
0	3. Yes, 15-30 minutes
1	4. Yes, 30-45 minutes
0	5. Yes, 45-60 minutes
0	6. Yes, over an hour
0	7. Yes, NA how long

V38 S38 Police Arrests

TS	
180	0. None, or NA
3	1. Police arrested selected R before interview
0	2. Police arrested selected R after interview
2	3. Police arrested some other motorist
0	4. Combination or more than one arrest

V39 S39 Type of Roadway

TS	
92	1. Two lane - 2 directions
2	2. Two lane - 1 direction
9	3. Three lanes - 2 directions
4	4. Three or more lanes - 1 direction
44	5. Four-five lanes - 2 directions
8	6. Six or more lanes - 2 directions
25	7. Divided highway (includes boulevards)
1	9. NA

V40 S40 Rural/Urban Location

TS	
62	1. City over 25,000 - commerical
19	2. City over 25,000 - residential
11	3. City over 25,000 - open space
24	4. City under 25,000 - commercial
11	5. City under 25,000 - residential
6	6. City under 25,000 - open space
21	7. Rural - congested area
31	8. Rural - open space

V41 S41 Month

TS	
24	1. October
108	2. November
53	3. December

V42 S42 Date (2 DIGITS)

V43 S43 Source of Local Interviewers/Drivers

TS	
141	1. Jaycees
24	2. Kiwanis
8	3. University students
12	4. Other

V44 S44 Survey Publicity

TS	
79	1. Article(s) in local paper
0	2. Announced on radio
16	3. Newspaper & radio
0	4. Other
12	5. Newspaper, radio & television
62	0. None
	9. NA

V45 S45 Estimated Altitude (IN HUNDREDS - 2 DIGITS)

V47 S47 SSU Number

TS	
4	01. Bristol, Va
8	02. Brooklyn, N.Y.
8	03. Buffalo, N.Y.
8	04. Columbus, Ohio
8	05. DeKalb County, Ga.
4	06. Dover, Ohio
8	07. Duluth, Minn
4	08. Franklin, Wis
4	09. Gilroy, Calif
8	10. Hamilton County, Tenn
4	11. Indianola, Miss
4	12. Lane County, Ore
4	13. Lapeer, Mi
4	14. Lapeer County, Mi
4	15. Madison, N.J.
6	16. Miami, Fla
8	17. Nassau County, N.Y.
8	18. New Orleans, La
8	19. Oswego County, N.Y.
4	20. Palo Alto, Calif
8	21. Raleigh, N.C.
4	22. Randolph, N.J.
4	23. St. Louis County, Mo
8	24. Seattle, Wash
4	25. Sedro-Woolley, Wash
4	26. Skagit County, Wash
4	27. Springfield, Ore
4	28. Sunflower County, Miss
4	29. Torrington, Conn
4	30. Tuscarawas County, Ohio

V47 SSU Number (con'd)

TS	
3	31. Washington County, Va
4	32. Wauwatosa, Wis
8	33. Williams County, Ohio
4	34. Winsted, Conn

V48 S48 Number of BAC Readings Obtained at Site (2 DIGITS)

(ACTUAL NUMBER)

APPENDIX K

DETAILED DESCRIPTION OF OPERATIONAL PROCEDURES

DETAILED DESCRIPTION OF OPERATIONAL PROCEDURES

The basic survey plan called for three teams of three interviewers each working eight consecutive weekends. Since there were to be two sites operating concurrently in each PSU, each team of interviewers needed at least two sets of breath-testing equipment, two assisting police officers, and two pairs of drivers ready to provide transportation for impaired respondents.

K.1. PERSONNEL

Two interviewers for each team were hired on a permanent basis, while the third interviewer in each PSU was recruited locally. The four drivers were also recruited locally.

Through cooperation with the University of Michigan School of Social Work two interviewers were hired who would be able to obtain field placement credit for their work on the survey. By the time the survey became definite it was too late to obtain all the interviewers through the School of Social Work field placements. However, four other well qualified interviewers were found. Two of them had been employed in other alcohol studies projects at HSRI, and two of them had been working with the recently-terminated Alcohol Safety Action Program in Washtenaw County. Two of the six interviewers had had previous experience using breathtesting equipment, one on a roadside survey in Washtenaw County. The employment agreement signed by each of the HSRI interviewers is available as Supplemental Item A.

For logistical convenience the six HSRI interviewers were organized into an east team, a midwest team, and a west team. For the east team a 24 foot motorhome was leased, and the two HSRI interviewers traveled in this vehicle and lived in it except for a few nights in the Nassau County and Brooklyn areas where camping facilities were not available. The motorhome was also used to house two interviewing stations at all of their heavy volume sites, while a rental car was obtained locally in each PSU for use at the medium volume sites.

The midwest team had the shortest distances to travel, and the two interviewers from HSRI drove both a 22 foot motorhome and a long-wheelbase van especially equipped for accident investigations over their whole itinerary. Except in Sunflower County the motorhome was used as their living accommodations and provided two interviewing stations at each of their heavy volume sites. The van was painted yellow and marked with HSRI identification, and, except for the awkwardness of its low ceiling, it made an excellent interviewing station for the midwest team's medium volume sites. It was also used to provide two interviewing stations at the heavy volume sites in Sunflower County.

The west team had the greatest distances to travel, and rather than using a motorhome, the two HSRI interviewers drove another HSRI yellow van and stayed in motels throughout their itinerary. The van served as two interviewing stations at their heavy volume sites, but due to its low ceiling and limited interior space it proved rather awkward for this expanded use. A rental car was obtained in each PSU for use at the medium volume sites.

The HSRI interviewers were originally hired for a 15-week period from September 10 to December 21. The original planned schedule of activities is available as Supplemental Item B. Basically it called for one week of orientation and training; four weeks of arrangements with the SSUs; one week of final preparation and field trial; eight weeks of survey operation; and one week for return, report writing, and debriefing. This schedule was largely adhered to, except for a two-week extension of the last period in order to complete all reports and records on the survey procedures. The one-night field trial was conducted with the assistance of the Ann Arbor Police Department, and each HSRI interviewer was given an opportunity to practice using each type of breathtesting equipment with randomly selected motorists.

During the course of the survey operation the east team drove over 6,000 miles in its motorhome; the midwest team drove its two vehicles a total of 12,200 miles; and the west team drove its van over 9,300 miles. The national fuel shortage was

becoming worse during the course of the survey operation, but fortunately none of the teams faced serious problems in obtaining enough gasoline to operate their vehicles during the survey hours and between PSUs.

In most of the SSUs the local interviewer and the four drivers were recruited through local Jaycee organizations. An attempt was made to obtain a general endorsement for the survey from the organizers of the National Jaycee responsible drinking program called Operation Threshold. However, in the limited time available it was not possible to obtain this endorsement before contacting the relevant local Jaycee organizations directly. In most SSUs the Jaycees provided the desired manpower in return for a payment for services rendered. These payments varied from $100 to $300, depending on the manpower provided. In four SSUs local Kiwanis clubs provided the interviewers and drivers, and in one SSU the local Lions Club provided the local assistants. There was also one SSU in which college students were recruited and paid directly, and in New Orleans staff members of the Alcohol Safety Action Program recruited the local assistants.

K.2. SCHEDULING AND OBTAINING POLICE ASSISTANCE

As soon as the initial sample of PSUs was drawn, a tentative survey schedule was developed for each of the three regional teams. The HSRI interviewers began work six weeks before the survey was to begin, and much of the intervening time was spent in making arrangements in the selected PSUs. In most PSUs this involved an actual visit to work out details with the cooperating police department, to select the roadside sites, to obtain approval from parking lot owners, to make arrangements for local interviewers and drivers, to arrange for survey publicity, to check on available camping locations, etc. In their first PSU visits each HSRI interviewer was accompanied by a regular HSRI staff member, but most of the later visits were made by the interviewers alone or as a team.

The initial contact with most police departments in the selected SSUs was made by a letter and brief project summary (Appendix D) from the project director to the chief of police,

but in some cases NHTSA regional personnel or state Governor's Representatives for Highway Safety were used. The letter was then followed by a phone call attempting to set up a visit. At the time of the visit the police officials were provided with a list of other areas which had successfully conducted voluntary roadside breathtesting surveys, endorsement letters from Chief Walter Krasny of the Ann Arbor Police Department (Supplemental Item C) and from the International Association of Chiefs of Police (Supplemental Item D), and a brief description of the expected role of the police officers in assisting the survey operation (Appendix E).

Initial visits with local police departments drew a wide variety of responses. Some raised few questions and offered their help almost immediately; others raised a number of questions and offered their assistance with obvious reluctance; and others refused to help at all. The biggest issue raised by police officials concerned the legality or appropriateness of police stopping motorists for research purposes without "probable cause". Even when the legal authority for such stops was not at issue, many officials were concerned about adverse public reactions to such police activity. In answer, HSRI staff pointed to the many surveys which had been successfully conducted in many different areas with almost no public complaints and to the minimal role of the police officer who only had to wave the motorist over to the civilian interviewer who then had to persuade the motorist to participate voluntarily. In most localities the police officials seemed to make the decision regarding provision of assistance to the survey on their own, but in the few instances in which elected officials were also involved concern about negative public reactions was very important.

The second major concern expressed by many police officials had to do with the disposition of motorists found to be at an illegal blood alcohol concentration. The HSRI position was that (1) the survey was voluntary and the BAC results obtained were confidential; (2) drivers would be available to take impaired respondents home; and (3) therefore if such respondents refused

the offered ride HSRI responsibilities were considered fulfilled, since the selected motorist would have continued down the road without being stopped if the survey were not being conducted. However, a few police departments said they would not cooperate unless such refusals were turned over to the police, and HSRI reluctantly agreed to this deviation from the planned procedures. It was also pointed out that the police were expected to follow their normal procedures if they observed a motorist behaving in a dangerous or erratic manner, but that if a selected respondent was arrested, HSRI would still like to obtain a breath sample from him/her.

In 15 of the 24 originally selected PSUs all the selected police departments were willing to cooperate, although not without considerable persuasive effort in some cases. However, five PSUs had to be changed entirely. In South Stratum IA it was learned that the selected PSU, Baltimore, had not been willing to conduct a roadside survey as part of its Alcohol Safety Action Program, and it was apparent that this decision was not likely to be changed for a national survey. Second-choice Houston also refused to take part, and finally the cooperation of third-choice New Orleans was obtained with the valuable help of the New Orleans ASAP staff. In West Stratum I Los Angeles City refused to participate, second-choice Sacramento also refused, third-choice Spokane was too inconvenient geographically, fourth-choice San Jose was too close to another PSU (Santa Clara County), and fifth-choice Seattle was finally substituted. In South Stratum IIA Cobb County, Georgia, backed out at the last minute, and its neighboring county, fourth-choice DeKalb County, was substituted.

In Northeast Stratum IIB the police chiefs in the selected SSUs in Montgomery County, Penn., said they would not cooperate without approval of the state attorney general. After many weeks of discussion with persons in the attorney general's office it was decided that this approval was not available due to a legal technicality. This ruled out the first four and the sixth selections in this stratum, since they were Pennsylvania counties.

The fifth and eighth selections, two counties in Massachusetts, were also ruled out as likely candidates by the director of the Boston ASAP who felt that police cooperation in such a survey would not be available in Massachusetts. Seventh-choice Onondaga County (N.Y.) and ninth-choice Hartford County (Conn.) were also eliminated as being adjacent to other selected PSUs. So tenth-choice Morris County, N.J., was finally substituted in this stratum.

The final PSU change involved Midwest Stratum IIC. When the Butler County, Ohio's, Sheriff would not agree to participate, second-choice St. Charles County, Mo., was passed over as being too close to the St. Louis County PSU, and third-choice Lapeer County, Michigan, was successfully substituted.

There were also four selected PSUs in which some SSU substitutions had to be made. In Santa Clara County, Calif., the Sheriff said he was too short-handed to provide the needed assistance in the county and in second-choice Saratoga (where he also provided traffic patrol services); third-choice Mountain View refused to help; and fourth-choice Gilroy and fifth-choice Palo Alto were substituted. In St. Louis County first-choice Florissant refused to participate, but the second-choice county police department was agreeable to assisting at four sites just outside of Florissant as well as in other non-incorporated areas of the county. In Litchfield County, Conn., second-choice New Milford refused to assist, and ninth-choice Winsted was the next community with a large enough police force to be able to provide the necessary help. And in Oswego County, N.Y., first-and-second-choice Fulton refused to cooperate, and the third-and-fourth-choice Sheriff's Department was satisfactorily substituted.

It should be mentioned that in Seattle and in Sedro-Woolley, the local police felt they were prevented by state law from actually stopped the selected vehicles, but they were willing to provide police personnel at the sites for general assistance. In these communities additional men were recruited from the Jaycees to do the actual flagging down of the motorists. The

FINAL SCHEDULE OF REGIONAL SURVEY TEAMS

	West Team	Midwest Team	East Team
October 26	Franklin, WIS	Buffalo, N.Y.	Oswego County, NY
October 27	Wauwatosa, WIS	Buffalo, N.Y.	Oswego County, N.Y.
November 2	Duluth, MINN	Dover & Tuscarawas	Torrington, CONN
November 3	Duluth, MINN	County, Ohio	Winsted, CONN
November 9	Sedro-Woolley, WASH	Columbus, OHIO	Nassau County, N.Y.
November 10	Skagit County, WASH (Wash. State Patrol)	Columbus, OHIO	Nassau County, N.Y.
November 16	Seattle, WASH	Williams County, OHIO	Brooklyn, N.Y.
November 17	Seattle, WASH	Williams County, OHIO	Brooklyn, N.Y.
November 23	Springfield, ORE	Lapeer, MI	Madison, N.J.
November 24	Lane County, ORE	Lapeer County, MI	Randolph, N.J.
November 30	Gilroy, CAL	Hamilton County, TENN	Bristol, VA
December 1	Palo Alto, CAL	Hamilton County, TENN (Tenn. Highway Patrol)	Washington County, VA
December 7	New Orleans, LA	None	Raleigh, N.C.
December 8	New Orleans, LA	None	Raleigh, N.C.
December 14	St. Louis County, MO	DeKalb County, GA and	Miami, FLA
December 15	St. Louis County, MO	Indianola and Sunflower County, MISS	Miami, FLA

Jaycees were provided with orange safety vests for this purpose, although very few regular police officers used such vests in other areas. Local police forces were used in all SSUs except Skagit County, Wash., and Hamilton County, Tenn., where the state highway patrols provided the necessary police assistance.

In most SSUs the cooperating police departments provided one police officer and one patrol car, but there were quite a number which provided two officers with the car. There was also one SSU in which the officers were only equipped with a motorcycle and one in which they had no vehicle at all. For the most part police assistance in the survey operations was very good, although some particular officers proved somewhat inept at flagging down the selected vehicles. There were also a few problems with police being late or leaving early. They were late at 16 sites; one site had to be abandoned because they didn't show up at all; they left early at four sites; and they arrived late and left early at seven sites. On the other hand, many officers proved willing to work considerably over the scheduled survey hours to try to increase the number of interviews. There was also a small problem with police at four sites being called away for brief periods for other duties, and in Miami two sites had to be abandoned entirely after the police were called to the scene of an airplane crash. Also when the interviewers arrived in St. Louis County they were informed that the expected number of police officers could not be provided, and the four medium volume sites had to be abandoned.

Money was available to pay the police departments for the services provided, but in some cases the departments involved did not charge for their help, particularly in the larger communities. Usually such payments were made via purchase orders to the police departments, but in a few SSUs the assisting police officers were paid directly in cash.

K.3 BREATHTESTING EQUIPMENT

The basic device used for most of the breathtesting was the Omicron Intoxilyzer, a large instrument providing rapid breath test results by infra-red absorption photometry. It was used at

all of the heavy volume, two-interviewer sites except in Nassau County where the motorhome generator failed, and it was also used in most of the midwest team's medium volume sites. Four instruments were leased from Omicron, Inc., one instrument being shared by the two interviewers at each heavy volume site. In the two motorhomes the Intoxilyzer was powered by the motorhome generator, while in the two vans it was powered by a Honda 800 portable generator. The latter was a rather heavy and noisy machine which had to be set up and started sometime in advance of the interviewing in order to warm up the Intoxilyzer and get it stabilized. One of the interviewers constructed two special folding covers to be used with the generators in case of rain.

After the four leased Intoxilyzers were obtained it was necessary to qualify each of them according to the standards contained in the NHTSA contract. These called for 50 tests with known alcohol concentrations in the range from 0.05 to 0.15 with a standard deviation no greater than 0.003, and 50 tests in the range from 0.15 to 0.30 with a standard deviation no greater than 2%. On each instrument 50 tests were conducted with a 0.100 solution and 50 tests were conducted with a 0.200 solution. The standard deviations for the four sets of tests at a 0.100 solution ranged from 0.00173 to 0.00289, and the standard deviations for the four sets of tests with a 0.200 solution ranged from 1.1% to 1.5%. The Intoxilyzer used by the east team began to malfunction during the fourth weekend of operation, and there was not sufficient time to completely qualify the replacement instrument which was airfreighted from Omicron in Palo Alto. However, ten tests conducted with a 0.100 solution resulted in readings ranging from 0.093 to 0.098 with a standard deviation of 0.002, and ten tests conducted with a 0.200 solution resulted in readings ranging from .191 to .196 with a standard deviation of 1.14%.

At the four sites each night which made use of rental cars (two east and two west) the Intoximeters Field Crimper was the basic breathtesting device used. This is a device which collects the breath sample in a crimped indium tube for later analysis on

a Gas Chromatograph. This instrument had to be kept warm, but it did not draw very much power, and attaching it and an oven to the car battery proved quite satisfactory for warming the indium tubes. The Field Crimper was also used for all breath samples in Nassau County and for the samples collected at the medium volume sites in Sunflower and DeKalb Counties. After an indium tube was crimped, the interviewer copied the respondent's identification number from the questionnaire on to the aluminum housing surrounding the tube by scratching it with a ballpoint pen.

In all, 815 good field crimper samples were obtained, slightly over one quarter of the total sample. The first weekend's indium tubes were sent to Intoximeters, Inc., in St. Louis for analysis, but the remaining 700 or so used tubes were brought back to HSRI and were analyzed on a leased Gas Chromatograph after the survey was completed. This process was complicated by a defective part on the instrument and by an unexpected difficulty in obtaining the required hydrogen/nitrogen carrier gas, and thus the analysis of the tubes was not completed until February 25. The analyst followed a procedure of calibrating the instrument with a 0.200 solution and checking it with a 0.100 solution each day.

A third breathtesting device which was to be carried by each interviewer was a pocket-sized Alco-Sensor (also manufactured by Intoximeters, Inc.). This device is a fuel cell, and it makes use of body heat to maintain its required operating temperature. It was used at the Field Crimper sites to obtain a direct BAC reading on respondents who were suspected of being drunk and who might need to be offered a ride home. It was also available for all interviewers to use at the carside with respondents who refused to come into the survey vehicle. It was the only instrument used with 198 respondents, including 49 who gave only a breath sample without an interview, and it was also used 64 times along with the Field Crimper. The product-moment correlation of the Alco-Sensor and Field Crimper results was .916 which seems quite a satisfactory relationship. Unfortunately,

there was some problem with the durability of the Alco-Sensors, and a number of them had to be sent back for repairs when they could not be properly calibrated. There were a total of 20 sites out of the 185 at which the interviewers lacked a satisfactorily functioning Alco-Sensor, and there were a number of others at which two interviewers had to share one Alco-Sensor.

Each team carried with it one Smith and Wesson Simulator, and the standard procedure was to check the Intoxilyzers and Alco-Sensors with a 0.10% alcohol solution each evening before and after the survey period. A Field Crimper sample was also to be made with this solution each survey evening for later analysis and comparison with the other Field Crimper samples. Instructions for preparing the alcohol solution and using the simulator are available as Supplemental Item E.

K.4 THE FIELD OPERATION

The HSRI interviewers usually arrived in a PSU by the Tuesday before the survey weekend there, although in a few cases they were not able to arrive until the Thursday before due to the long distances between PSUs. Overall the average travel time between PSUs was eleven hours, so travel was quite a significant portion of each week's survey activity. For the west team the problem of long distances between some PSUs was compounded by the imposition of a 50 mph speed limit in Washington and 55 mph limits in Oregon and California. A professional driver was hired to drive their van from San Francisco to El Paso, and they flew between these two points and then completed the drive to New Orleans (2,300 miles total).

When the interviewers arrived in a PSU there were a number of essential activities to be carried out in preparation for the survey operation. These included confirming arrangements with the police and service club liaisons; visiting the sites to make sure they were still suitable; training the local interviewer; renting a car; arranging with a local restaurant to fill the coffee thermoses; arranging for local publicity; etc. A more detailed description of the general tasks of the HSRI interviewers in each PSU is available as Supplemental Item F. It

also includes the record forms used by the interviewers in each PSU and some additional instructions which they received while in the field. Supplemental Item G contains the operational procedures to be followed during the interviewing process, including explanations of the question-by-question objectives for the questionnaire. It was prepared as a separate document so that it would cover just the items the local interviewers needed to learn in their training session.

The itineraries had been planned to begin in the north and to end up in the south in order to avoid winter weather as much as possible. However, the west team had to work in a light snowfall in Duluth in early November and a heavy snowfall in St. Louis County in mid-December. They were also delayed by a blizzard in Montana and Idaho as they drove from Duluth to Washington. Estimated temperatures during the interviewing periods ranged from a low of 20^{o} in Duluth and Columbus to a high of 65^{o} in Miami, with a mean of 38^{o}. There were also 29 sites at which the interviewers had to contend with rainy weather and four sites at which heavy fog was a problem.

About half of the roadside sites were situated on two-lane roads, while almost three eighths were along multi-lane roads and over one eighth were along divided roadways. Including the last group there were a total of 31 sites with traffic moving in one direction only. Among the remaining 154 sites there were 41 in which traffic was sampled in two directions from the beginning of the interviewing period, and in 24 others the number of directions was increased during the interviewing period due to low traffic flows. The number of eligible vehicles per hour passing the roadside sites in one direction ranged from a high of 771 to a low of 4, with a median of 65 and a mean of 112. The estimated average speeds of the passing vehicles ranged from 20 mph to 68 mph, with a mean of 39 mph.

There was considerable variation in the procedures used by the cooperating police to flag down the selected motorists. At most of the sites the police used the flashing light of the patrol car as a warning device, and a number of police placed warning

flares also. The HSRI-provided TRAFFIC SURVEY AHEAD sign was used at less than half of the sites and was used in conjunction with a flashing yellow light on a barricade at less than one quarter of the sites. The most common hand signaling device used by the police was a flashlight, but lighted wands were also frequently used, and at five sites the police held flares in their hands. Traffic cones were used to channel traffic in the street at 36 sites and in the parking area at 25 sites.

There was also considerable variation in the skill with which individual selected vehicles were flagged down. The interviewers were instructed to record the number of clearly selected vehicles which failed to stop or which turned around before reaching the interviewing area. A total of 302 such vehicles were recorded, but almost half of these were in Sedro-Woolley where inexperienced Jaycees were doing the flagging. In heavy traffic it was often difficult to communicate to a particular motorist that he had been selected out of the traffic stream. Even veteran police officers sometimes had trouble with this task, and the reserve and special-duty officers who were frequently assigned to the survey tended to have even more trouble. When vehicles turned on to a side road prior to reaching the interviewing area it was also difficult to know whether this was a deliberate action to avoid the survey or not. However, the general impression of the interviewers was that the majority of the selected vehicles which failed to stop did so primarily due to misunderstanding rather than to a deliberate desire to avoid the survey. It is considered that this inability to stop all selected vehicles did not introduce much bias into the survey findings.

The task of keeping the traffic count at each site was variously shared by the police and by the local drivers. If there were two police officers, one of them usually held the hand counter, but if there was only one police officer one of the drivers usually held the counter. This second procedure was followed except when the driver was called on to take someone home,

in which case the police officer had to keep the traffic count along with his traffic control activities while the driver was gone.

At most sites the police officer would send the selected vehicle to the interviewer who would be standing at the edge of the parking area, but sometimes the interviewer had to greet the respondent in the curb lane, and at 18 sites the interviewer had to greet the respondent in the middle of the road. The interviewers wore white lab coats with HSRI patches as their outer jacket. Sometimes the police officer was able to wave the selected vehicle on to the interviewer without any verbal communication, but more frequently the motorist would stop completely next to the officer and the officer would then ask him to move on to the interviewer in the white coat. The officers were asked to avoid giving an explanation of the survey to the respondent, and most of the officers complied with this suggestion quite satisfactorily.

When he greeted the potential respondent the interviewer would briefly explain that a survey of nighttime drivers was being conducted and would ask him to step into the survey vehicle for a few minutes. The breath test was not mentioned at this point. Most respondents were willing to participate without further discussion. Others required more persuasion, and some refused to participate at all. If the motorist refused to get out of his car, the interviewer would try to conduct the interview at the carside, and about 150 successful interviews were obtained in this way. If the respondent was unwilling to participate in the interview, the interviewer then asked him if he would at least blow into the Alco-Sensor before driving off, and a further 48 breath test readings were obtained in this way. However, there were still 287 respondents who refused to participate at all, and there were four respondents who were removed by the police at three sites without permitting them to be interviewed. Most of the persons who refused or were reluctant to participate said they were in a hurry--to get to work, to get home, to meet someone, etc.--but there were also a number who just

seemed negative about the survey purpose or fearful of its consequences. The interviewer made an estimate of the drinking condition of all selected motorists contacted, and a comparison of these estimates for the participating and refusing respondents is discussed in the analysis section of this report.

A comparison of response rates for the local interviewers versus the HSRI interviewers indicates that the local interviewers in general were not nearly as successful as the HSRI interviewers in obtaining respondent participation. The complete refusal rate for the six HSRI interviewers together was only 6.3% compared to 11.8% for all of the locally-hired interviewers together (although there was great variation among individual local interviewers). The latter group also tended to have more breath test refusals at the end of the interview.

Some efforts at advance publicity in the local news media were made in about two fifths of the SSUs, sometimes through the cooperating police department or service club and sometimes directly by the interviewers. In most cases this involved one or more articles in a local paper announcing plans for the survey in general terms, but not including specific dates or locations or its breathtesting purpose. In Tuscarawas and Williams counties radio publicity was also used, and in Duluth and in St. Louis County both television and radio publicity was used in addition to newspaper articles. The first question asked the survey respondents was whether they had heard of the survey previously, and apparently the publicity efforts did make a difference. Where there was no publicity only 4% of the respondents answered that they had heard of the survey; where there was newspaper publicity 11% said they had heard of the survey; and where there was also radio or radio and television publicity 20% said they had heard of the survey previously. Unfortunately, there were two many other influencing factors to permit a determination as to whether the publicity efforts actually had an effect in improving the response rate, but the general impression is that motorists who had heard of the survey felt less suspicious about being stopped in the middle of the night.

The interview schedule used was quite short, containing a cover sheet to be filled in largely by observation (sex, race, drinking condition, etc.) and three pages of questions. The 24 questions related to the respondent's personal and driving characteristics (age, education, annual mileage, etc.); to aspects of his current trip (purpose, distance, etc.); to his customary and recent drinking behavior; and to his concern and knowledge about the drunk driving problem. The questions on the first two topics were largely taken from the questions suggested by the international guidelines. The questionnaire was designed to permit direct keypunching of the coded answers, and only a brief checking and editing procedure was required at HSRI before the questionnaires were converted to computer cards. Information about characteristics common to a whole site were coded separately and added to the individual data records during the analysis stage. Appendix H contains the complete codebook for the individual data records, including various types of frequency and percentage distributions in the left margin. Appendix J contains the codebook for the roadside site information, including frequency distributions in the left margin.

When the questions were finished the respondent was told that the final step in the survey involved the collection of a breath sample from each respondent. Most respondents accepted this without any problem, and some expressed considerable interest in seeing the breathtesting device. When a respondent was reluctant to take the breath test, the interviewer would stress the confidential nature of the findings and would try to persuade him to participate. However, there were 147 respondents who refused to take the breath test at the end of the interview, and there were 68 respondents who took the breath test for whom the BAC readings are not available due to instrument failure, improper recording, lost indium tubes, etc.

For most of the interviews in the survey vehicle the interviewers recorded the beginning and ending times on the interview form. The elapsed times for 3,147 cases varied from one minute to 21 minutes, with a mode of five minutes. Over 60% of the

interviews fell within the expected range of 4-6 minutes, but a little over 3% lasted ten minutes or longer. However, besides the actual interviewing time additional time was needed to get ready for the next interview, to wait for another vehicle to be selected, to convince the driver to participate, and occasionally to arrange for transportation for an impaired driver. During the 10-12PM survey period the average time per stopped vehicle was 8.2 minutes per interviewer at the heavy volume sites and 8.5 minutes at the medium volume sites. During the 1-3AM time period these averages fell to 9.2 minutes at the heavy volume sites and 10.1 minutes at the medium volume sites.

At the end of an interview the respondent was given a "thank you" letter signed by the Project Director (Appendix G). This letter also contained a copy of a drinks-weight blood alcohol chart which could be cut out for future use. Many of the respondents were also given a small paper litter bag containing a "thank you" message and several safe driving messages as a token gift from the project (Supplemental Item H).

If a driver was found to be at an illegal BAC, the plan called for the interviewer to offer him a ride home by the pair of locally-recruited drivers (one of whom was to drive the respondent's car while the other was to follow in his own car in order to bring the driver back). However, if a sober passenger with a driver's license was available, then the respondent was encouraged to let him take the wheel. This plan for providing alternate transportation was complicated by the fact that many of the local drivers failed to show up as scheduled* and by the fact that even where drivers were available the interviewers using the Field Crimper usually did not obtain a direct BAC reading with the Alco-Sensor. Of the 44 respondents with BACs of 0.15 or greater 18 were not offered a ride home, but 3 of

*At 23 sites there were no drivers available, and at 14 sites outside of New Orleans only one driver was available. In New Orleans the plan called for the use of only one driver who was to drive the respondent's car home while a cab took the respondent home and brought the driver back.

these were at sites at which no drivers were available, and 11 were individuals who were tested on the Field Crimper only. Similarly among 130 respondents with 0.10-0.14 BACs 58 were not offered a ride, but 10 of these were at sites lacking local drivers and 23 were individuals who were tested on the Field Crimper only.

The dispositions of the 196 respondents with BACs of .08 or greater for whom both local drivers and a direct BAC reading were available are shown in Table K.1 below. It will be seen that most of the respondents at the higher BACs were at least offered rides and that of those who were offered rides about half of them accepted or said they would have a passenger drive. A total of 21 persons were actually driven home, while 33 said they would have a passenger drive, and 53 refused a ride and drove themselves. When a ride was refused the interviewers were instructed to record the license plate number of the motorists in the event that some problem should come up during his subsequent driving, but the interviewers were not informed of any such incidents occurring among the respondents who refused a ride. It should be noted also that not every impaired respondent who said he would have a passenger drive actually turned the wheel over to the passenger when he got back to his vehicle. In the event that an impaired respondent lived so far away that driving him home did not seem practical the interviewers were prepared to pay his expenses at a motel, but this did not prove necessary at any of the survey sites. Nor was there any case in which a respondent was arrested by the police at the survey site following an interview.

While in the field the interviewers were instructed to call in to HSRI once a week, or more often when special problems developed. This procedure was followed, but there were a number of problems of communication and supervision during the field operation, some of which were probably inherent in such a far-flung enterprise. Communication problems were aggravated by the fact that two of the teams were usually staying in campgrounds

TABLE K.1. DISPOSITION OF IMPAIRED RESPONDENTS FOR WHOM DIRECT BAC READINGS WERE OBTAINED, AT SITES WHERE LOCAL DRIVERS WERE AVAILABLE, BY BAC CATEGORY, IN PERCENT (Ns IN PARENTHESES)

BAC	Ride Not Offered	Passenger To Drive	Ride Accepted	Ride Refused	Total
.08-.09	79% (60)	12% (9)	1% (1)	8% (6)	100% (76)
.10-.14	28% (25)	20% (18)	15% (14)	37% (34)	100% (91)
.15+	14% (4)	21% (6)	21% (6)	45% (13)	100% (29)
Total	45% (89)	17% (33)	11% (21)	27% (53)	100% (196)

where telephone contact was not possible, and even the west team staying in motels did not always know in advance at which motels it would be staying. Early in the field operation it became apparent that the average work week of the interviewers was running more than the expected 40 hours, and some of the changes reflected in the additional instructions in Supplemental Item F were designed to reduce the interviewers' work load during the post-interviewing period. In regard to on-site supervision, the project director visited the midwest and east teams on the first weekend of the survey in Buffalo and in Oswego County respectively, and the Contract Technical Manager visited the west team on its last night in St. Louis County. Each team also hosted one visit from outsiders: a U-M School of Social Work professor in New Orleans, two Canadians involved in planning the Canadian national roadside breathtesting survey in Lapeer County, and a group from the Virginia Highway Research Council in Bristol.

K.5 SUPPLEMENTAL ITEMS AVAILABLE UPON REQUEST TO THE AUTHOR

A. HSRI Interviewer's Employment Agreement
B. General Duties of HSRI Interviewers
C. Chief Krasny (Ann Arbor) Endorsement Letter
D. International Association of Chiefs of Police Endorsement Letter
E. Alcohol Breath Simulator--Preparation and Use
F. General Instructions for HSRI Teams
G. Operational Procedures (for Local Interviewers)
H. "Thank You" Litter Bag

APPENDIX L

BAC RESULTS BY REGION OF THE UNITED STATES AND INDIVIDUAL SSUs (POLICE JURISDICTIONS) IN RELATION TO SURVEY TIME PERIOD: USING TIME/SPEED AND DRINKING ESTIMATE WEIGHTS (FOR REGION USING POPULATION WEIGHTS ALSO); IN PERCENT

Region and SSU Name (Code Number)	Time Period	Number of Sites	Number of Drivers Selected	% with BACs (Number Obtained)	% of BAC Readings 3 Drinking Categories		
					.02-.04	.05-.09	.10+
NORTHEAST REGION	10-3	48	904	79.1(715)	9.2	8.2	4.4
	10-12	24	468	78.8(369)	8.6	6.8	2.2
	1-3	24	436	79.4(346)	11.3	12.0	9.4
Brooklyn (Borough),	10-3	8	175	55.4(97)	3.2	7.3	1.6
New York (02)	10-12	4	82	59.8(49)	2.9	9.6	2.9
	1-3	4	93	51.6(48)	7.6	5.7	1.8
Buffalo, New York (03)	10-3	8	154	92.9(143)	7.9	10.1	5.5
	10-12	4	75	96.0(72)	3.4	4.7	3.5
	1-3	4	79	89.9(71)	16.9	21.4	9.6
Madison, New Jersey (15)	10-3	4	82	85.4(70)	6.0	12.0	4.6
	10-12	2	43	83.7(36)	4.9	11.6	1.6
	1-3	2	39	87.2(34)	8.6	12.6	11.1
Nassau County, New York	10-3	8	159	75.5(120)	3.5	2.2	2.6
(17)	10-12	4	79	65.8(52)	2.7	1.2	1.1
	1-3	4	80	85.0(68)	5.3	4.2	6.0
Oswego County, New York	10-3	8	116	81.0(94)	15.2	10.0	8.7
(19)	10-12	4	66	77.3(51)	14.7	5.3	4.1
	1-3	4	50	86.0(43)	15.5	20.2	18.8
Randolph, New Jersey	10-3	4	81	90.1(73)	6.1	7.5	5.1
(22)	10-12	2	44	88.6(39)	4.4	6.9	0.0
	1-3	2	37	91.9(34)	9.1	8.6	13.0

Torrington, Conn.	10-3	4	65	90.8(59)	21.2	15.4	2.7
(29)	10-12	2	38	89.5(34)	26.1	17.0	1.7
	1-3	2	27	92.6(25)	14.4	13.7	4.2
Winsted, Conn. (34)	10-3	4	72	81.9(59)	19.1	5.7	6.7
	10-12	2	41	87.8(36)	21.9	2.9	0.0
	1-3	2	31	74.2(23)	14.2	11.5	19.3
MIDWEST REGION	10-3	56	1139	90.6(1032)	9.5	9.3	4.8
	10-12	28	593	90.4(536)	7.7	4.9	2.7
	1-3	28	546	90.8(496)	13.5	16.0	8.6
Columbus, Ohio (04)	10-3	8	160	85.6(137)	11.5	6.4	3.4
	10-12	4	84	83.3(70)	11.5	3.7	1.0
	1-3	4	76	88.2(67)	11.4	12.5	8.4
Dover, Ohio (06)	10-3	4	80	92.5(74)	8.5	5.4	5.6
	10-12	2	42	92.8(39)	8.7	0.0	4.2
	1-3	2	38	92.1(35)	8.3	19.2	9.0
Duluth, Minnesota (07)	10-3	8	179	93.3(167)	9.2	9.1	9.4
	10-12	4	95	92.6(88)	6.0	5.7	8.4
	1-3	4	84	94.0(79)	15.1	15.8	12.0
Franklin, Wisconsin (08)	10-3	4	80	81.3(65)	10.6	20.0	8.7
	10-12	2	43	81.4(35)	11.9	5.2	3.3
	1-3	2	37	81.1(30)	9.6	32.4	12.9
St. Louis County,	10-3	4	166	86.1(143)	7.4	7.4	2.1
Missouri (23)	10-12	2	87	86.2(75)	3.6	4.7	0.0
	1-3	2	79	86.1(68)	19.6	16.1	8.9

Lapeer, Michigan (13)	10-3	4	77	90.9(70)	5.5	16.7	4.1
	10-12	2	40	92.5(37)	2.6	11.1	2.9
	1-3	2	37	89.2(33)	9.1	23.9	5.7
Lapeer County, Michigan	10-3	4	81	93.8(76)	9.6	10.4	5.7
(14)	10-12	2	42	90.5(38)	8.6	2.2	7.3
	1-3	2	39	97.4(38)	10.3	15.8	4.7
Tuscarawas County, Ohio	10-3	4	74	94.6(70)	13.8	2.0	0.7
(30)	10-12	2	38	97.4(37)	13.6	2.6	0.0
	1-3	2	36	91.7(33)	14.7	0.0	2.9
Wauwatosa, Wisconsin	10-3	4	60	95.0(57)	17.0	7.8	1.7
(32)	10-12	2	34	100.0(34)	8.1	6.8	0.0
	1-3	2	26	88.5(23)	37.9	10.1	5.7
Williams County, Ohio	10-3	8	156	94.2(147)	6.2	6.5	3.9
(33)	10-12	4	83	94.0(78)	6.3	3.9	0.0
	1-3	4	73	94.5(69)	6.0	11.4	11.1
SOUTH REGION	10-3	53	975	87.1(849)	9.3	8.7	6.1
	10-12	27	527	86.5(456)	7.0	7.6	4.5
	1-3	26	448	87.7(393)	12.2	9.7	8.5
Bristol, Virgina (01)	10-3	4	77	83.1(64)	4.6	11.3	1.4
	10-12	2	39	82.1(32)	4.3	8.6	0.0
	1-3	2	38	84.2(32)	6.3	21.3	7.3
DeKalb County, Georgia	10-3	8	154	79.9(123)	6.7	12.6	6.4
(05)	10-12	4	81	79.0(64)	4.7	14.8	4.3
	1-3	4	73	80.8(59)	10.6	8.3	10.5

Hamilton County,	10-3	8	157	94.9(149)	9.6	4.3	6.1
Tennessee (10)	10-12	4	81	9216(75)	10.2	1.9	5.9
	1-3	4	76	97.4(74)	9.0	8.0	6.3
Indianola, Mississippi	10-3	4	61	93.4(57)	11.1	4.6	14.4
(11)	10-12	2	32	81.5(28)	2.3	4.8	14.0
	1-3	2	29	100(29)	28.1	4.2	16.0
Miami, Florida (16)	10-3	6	107	82.2(88)	19.2	5.9	2.6
	10-12	4	78	82.1(64)	19.5	6.5	2.4
	1-3	2	29	82.8(24)	17.3	1.6	3.4
New Orleans, Louisiana	10-3	8	189	86.8(164)	11.8	14.3	4.3
(18)	10-12	4	105	87.6(92)	12.5	13.4	3.3
	1-3	4	84	85.7(72)	9.3	18.1	8.0
Raleigh, North Carolina	10-3	8	146	87.0(127)	4.3	5.6	2.0
(21)	10-12	4	73	87.0(65)	3.3	4.3	0.0
	1-3	4	73	84.9(62)	6.6	8.7	6.8
Sunflower County,	10-3	4	70	95.7(67)	5.6	15.0	8.9
Mississippi (28)	10-12	2	37	94.6(35)	0.0	13.1	11.4
	1-3	2	33	97.0(32)	15.9	18.6	4.6
Washington County,	10-3	3	39	89.7(35)	9.2	9.4	12.3
Virginia (31)	10-12	1	6	100(6)	0.0	0.0	0.0
	1-3	2	33	87.9(29)	10.4	10.5	13.9
WEST REGION	10-3	32	680	87.6(596)	8.5	7.7	4.0
	10-12	16	369	88.1(325)	7.0	5.3	6.3
	1-3	16	311	87.1(271)	12.4	12.1	7.2

Gilroy, California	10-3	4	65	93.8(61)	10.5	11.9	1.2
(09)	10-12	2	37	94.6(35)	6.2	13.0	0.0
	1-3	2	28	92.9(26)	22.7	8.7	4.8
Lane County, Oregon	10-3	4	70	87.1(61)	0.6	3.3	3.8
(12)	10-12	2	46	84.8(39)	0.0	2.4	3.4
	1-3	2	24	91.7(22)	5.7	11.2	7.5
Palo Alto, California	10-3	4	97	89.7(87)	6.7	15.4	1.8
(20)	10-12	2	50	96.0(48)	6.5	17.1	0.0
	1-3	2	47	83.0(39)	8.3	5.3	12.5
Seattle, Washington (24)	10-3	8	197	85.8(169)	11.7	5.7	3.7
	10-12	4	105	82.9(87)	11.1	3.3	2.6
	1-3	4	92	89.1(82)	13.2	11.4	6.6
Sedro-Woolley, Washington	10-3	4	79	86.1(68)	12.0	6.3	2.9
(25)	10-12	2	41	95.1(39)	6.8	0.0	2.5
	1-3	2	38	76.3(29)	17.5	13.2	3.6
Skagit County, Washington	10-3	4	86	88.4(76)	13.6	9.4	6.4
(26)	10-12	2	44	90.9(40)	12.0	4.5	0.0
	1-3	2	42	85.7(36)	15.5	15.2	14.0
Springfield, Oregon	10-3	4	87	86.2(75)	1.0	5.5	9.5
(27)	10-12	2	46	80.4(37)	0.0	0.0	11.5
	1-3	2	41	92.7(38)	4.4	23.4	3.0