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WORKSHOP TO REVIEW—BEHAVIOR RESEARCH PROGRAMS: ALCOHOL, DRUGS, AND HIGHWAY SAFETY

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16. Abstract

This report presents the proceedings of a workshop on alcohol, drugs, and highway safety. The purpose of this workshop was to develop specific recommendations for the planning and implementation of NHTSA research, development, and demonstration projects in the program area of Alcohol and Drugs. Workshop participants represented both the practitioner and researcher communities. General issues related to the program area of alcohol and other drugs were discussed, and specific program elements reviewed in-depth. Two working groups participated in a series which dealt with the following topics: General Objectives of the Alcohol and Drugs Program; Problem Identification; Countermeasure Development, Test, and Evaluation; Knowledge Transfer; Demonstration and Other Techniques; and Other Drugs and Other Topics. This report summarizes discussions of these topics. Conclusions about the general objectives of an alcohol and drugs program and recommendations concerning specific program elements concerning the direction of future research in this area are presented.

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METRIC CONVERSION FACTORS

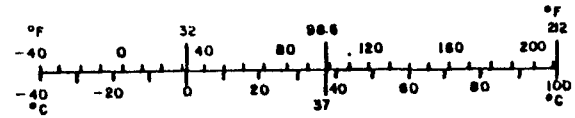
Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
in	inches	*2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
		AREA		
in^2	square inches	6.5	*square centimeters*	cm^2
ft^2	square feet	0.09	square meters	m^2
yd^2	square yards	0.8	square meters	m^2
mi^2	square miles	2.6	square kilometers	km^2
	acres	0.4	hectares	ha
		MASS (weight)		
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
		VOLUME		
tsp	teaspoons	5	*milliliters*	ml
Tbsp	*tablespoons*	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.96	*liters*	l
gal	gallons	3.8	liters	l
ft^3	cubic feet	0.03	cubic meters	m^3
yd^3	cubic yards	0.76	cubic meters	m^3
		TEMPERATURE (exact)		
°F	*Fahrenheit* temperature	5/9 (after subtracting 32)	Celsius temperature	°C

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.

Approximate Conversions from Metric Measures

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



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This report is a result of the efforts of many persons and stems from their able and varied contributions. We thank all who assisted in its development, preparation, and production.

Special recognition is due to those who participated in the workshop and whose expert contributions formed the basis for the report. All gave generously of their time, energy, and knowledge. Their willing support has made this report possible. The participants and their affiliations are listed in Appendix C.

We also acknowledge the staff of the Holiday Inn Conference Center, and in particular Ms. Barbara Rassin who facilitated the planning and arranging of this workshop.

This report was drafted primarily by Mary E. Marks and Alan C. Donelson from notes and records of the workshop sessions. Kent B. Joscelyn and John R. Treat served as moderators at those sessions. Other HSRI personnel also made important contributions. The report was edited by James E. Haney. Anne L. VanDerworp served as production editor. Douglas J. VanDenBerg, word processing operator, produced the report.

We thank all who contributed.

Kent B. Joscelyn
Principal Investigator

Ralph K. Jones
Principal Investigator

WORKSHOP TO REVIEW PROBLEM-BEHAVIOR RESEARCH PROGRAMS: WORKSHOP ON ALCOHOL, DRUGS, AND HIGHWAY SAFETY

SUMMARY

This paper is a summary of the proceedings of a workshop on alcohol, drugs, and highway safety. The workshop was held on 12-13 May 1980 at the Holiday Inn Conference Center, Silver Spring, Maryland. The workshop is one of a series conducted by The University of Michigan Highway Safety Research Institute under the sponsorship of the U.S. Department of Transportation, National Highway Traffic Safety Administration contract no. DOT-HS-8-02031, entitled "Workshop to Review Problem-Behavior Research Programs."

The workshop approach was designed: (1) to provide an opportunity to discuss general issues related to the program area of alcohol and other drugs, and (2) to permit an in-depth review of specific program elements. Two working groups participated in a series which dealt with the following topics:

- General Objectives of the Alcohol and Drugs Program;
- Problem Identification;
- Countermeasure Development, Test, and Evaluation (two sessions);
- Knowledge Transfer: Demonstration and Other Techniques; and
- Other Drugs and Other Topics.

General Objectives of the Alcohol and Drugs Program

The initial working session dealt with general objectives of an alcohol and drugs program. The nature and overall thrust of the proposed program were also examined to provide a framework for comments on specific projects within the program.

General objectives of a NHSTA program on alcohol and drugs recommended by participants included the following:

- Problem Identification
  - monitor the nature and extent of the alcohol-crash problem to measure changes over time, for example, changes in its magnitude and in the nature of target groups for countermeasures;
  - discover the "root causes" of drinking-driving behavior;

- determine the nature and magnitude of a possible "other drugs and driving" problem.

- Countermeasures

  - continue emphasis on general deterrence with programs focused on increased enforcement in conjunction with public information and education;

  - improve and incorporate (explicitly) evaluation components in projects designed to test countermeasure approaches.

- Knowledge Transfer (including demonstration projects)

  - improve dissemination both of knowledge gained from research and of products for use by states in their traffic safety programs, in particular, evaluation techniques;

  - identify, develop, and evaluate mechanisms to support additional efforts to transfer knowledge.

General comments on the alcohol and drugs program included the following:

- Research on the nature and magnitude of the alcohol-crash problem requires focus. Study of the "same old questions" is interesting but not useful. In examining the root causes of the problem, which to some extent lie beyond highway safety per se, collaboration with other agencies, such as NIAAA, is encouraged.

- Terming field tests "demonstrations" heightens expectations of all concerned and lessens objectivity in evaluating the results. Demonstration projects should be used as a technique of advocacy and be restricted to those projects of proven effectiveness.

- In transferring knowledge, increased sensitivity to local factors that influence a program's effectiveness is needed. Input from minority populations and their representation in policymaking as well as in the "selling" of programs are essential.

- Along with increased enforcement and public information and education efforts, attention must be given to the adjudication and sanctioning elements, which can be a limiting factor in alcohol-related programs.

Some participants questioned (1) what knowledge base exists to support the current emphasis on the general deterrence approach within the alcohol program area, and (2) whether the reliance on this approach represents too narrow a program direction to successfully affect the impaired driver problem. The group noted that an approach with an emphasis on detection and arrest has a very small target group of drivers who drink (i.e., those drivers with a BAC of 0.10% w/v or greater). Furthermore, it does not address the general issue of driver impairment, which involves a much broader class of drivers (e.g., the aged; users of legitimate drugs; fatigued drivers).

The workshop recommended that NHTSA consider broadening its approach in the alcohol and drugs program area. For example, NHTSA should consider using a systems approach to identify other ways of intervening (e.g., reducing substance availability; providing alternate transportation; changing social attitudes) in the impaired driver problem.

Problem Identification

A better understanding of socialization in the use of alcohol and of restraints against its excessive use is needed to deal more effectively with the alcohol and highway safety problem. The workshop noted that this objective requires a long-range research program and recognized that this luxury has not yet been afforded to NHTSA. Participants noted, however, that NHTSA's approach to the alcohol and highway safety problem traditionally has focused on identifying ways to arrest the drinking driver. NHTSA should consider adopting a broader approach in this area.

Two specific NHTSA projects were identified and discussed in this area: "Survey of Drinking Drivers," and "Background Survey of Fatally Injured Drivers." The workshop generally agreed with the approach taken in the "Survey of Drinking Drivers" study for identifying the characteristics of the population on the road driving under the influence of alcohol. The focus upon the DWI arrest group (as opposed to earlier studies of DWI Convictions) was supported.

It was recommended that the scope of the "Background Survey of Fatally Injured Drivers" study be expanded to include other accident types. Both personal injury and property damage accidents were suggested. NHTSA should also consider interviewing drivers who survived a crash in which a fatality did occur. Drivers who have low (less than 0.05% w/v) or zero BAC should be included in both surveys for the purpose of comparison.

A number of additional research questions in this area were identified. The workshop indicated that these issues need to be addressed if NHTSA is to develop a more effective approach to the alcohol and highway safety problem. These issues are:

- the physiological effects of alcohol in the driving context and subsequent response differences between sober and drinking drivers;

- the decision-making processes of drinking drivers; and
- the differences and similarities between the novice and the chronic drinker.

Finally, the workshop group recommended that effort be directed at defining the driving task. The problem of defining "impaired driving" without a "good driving" standard was pointed out. The workshop noted that very little is really known about the behavioral demands placed upon drivers on the roadway. Measures of the overall performance of driving behavior are needed.

Countermeasure Development, Test, and Evaluation

Three themes emerged in the workshop regarding this area of NHTSA's program. The issues that NHTSA should carefully consider include:

- prevention;
- long-term research; and
- evaluation.

The workshop noted that the driver has for the most part been the focus for the countermeasure approach to the alcohol and highway safety problem. It suggested that other groups be looked at as possible control mechanisms for the development of **preventive measures.** Conditions for controlling the availability of alcohol, such as hours sold, where sold, etc., could be more thoroughly explored as prevention measures.

Participants observed that in general the NHTSA research programs have lacked continuity; projects are scheduled for one year, and a new one begun in the next year. The workshop emphasized the necessity of including **long-term research** in the NHTSA research program. The workshop recognized that NHTSA operates within certain constraints, one being a limited amount of funding. Nevertheless such constraints do not obviate the need for long-term research.

Finally, the importance of **evaluation** was a recurring theme throughout the workshop session for any countermeasure or prevention programs that are undertaken. Participants suggested that independent contractors be used for this task rather than either those who have developed the project or persons from the NHTSA central office. This issue was exemplified in the workshop discussions on the "Develop NHTSA/NIAAA Treatment Programs for PDs" projects. Participants suggested that not enough data is now available to support the development of national guidelines for referral and questioned the wisdom of advocating such programs when treatment outcomes remain unknown. The workshop noted that what is needed is evaluation of existing programs rather than the development of new ones.

Knowledge Transfer: Demonstration and Other Techniques

A concern of the workshop was the narrow range of projects within the knowledge transfer project area. This area for the most part appears to be limited to product development with only limited dissemination of these products. The plan does not appear to encompass identification and analysis of user groups; no effort in developing a distribution system or a system of information transfer could be readily identified. The group noted that this was one of the major TRB recommendations with regard to this program area.

The workshop group recommended that NHTSA reallocate its efforts in this area to focus upon the design of an information distribution system. These efforts should include:

- identifying the users;
- determining the appropriate forms to present the materials to the various user groups;
- developing the appropriate mechanisms for informing the user groups and for updating their information; and
- developing a feedback mechanism within the information transfer system by which the user can question, respond to, or seek materials from NHTSA.

Drugs Other Than Alcohol

The workshop generally supported NHTSA's proposed projects dealing with drugs other than alcohol, especially their emphasis on problem identification. The working groups as a whole agreed that epidemiologic research is now required to determine the nature and magnitude of the drug and driving problem. Participants noted that the proposed epidemiologic studies will complement experimental research. They also recommended that behavioral research methods be further developed and applied to measure the effects of priority drugs on driving skills and to estimate their potential risk to drivers who use them.

Participants cautioned that traditional approaches to dealing with the alcohol-crash problem may not be appropriate for other drugs. For example, BAC-equivalents have not been established for any drug besides alcohol and may never be established for some drugs of interest in highway safety. The workshop supported NHTSA's intention to sponsor an examination of this and related issues, in particular, the feasibility of developing behavioral tests for driving impairment.

The workshop was critical of the lack of provision for knowledge transfer activity in this particular program area. Participants noted that knowledge about the effects on human performance does currently exist for many drugs, including therapeutic drugs, but is not being used. The

workshop suggested that NHTSA make use of the information that exists in other areas (e.g., industrial settings; recreational settings) and disseminate it to the appropriate user groups.

CONTENTS

1.0 INTRODUCTION

This report presents the findings of a workshop that reviewed research, development, and demonstration needs in the area of alcohol, drugs, and highway safety. The workshop was held on 12-13 May 1980 at the Holiday Inn Conference Center, Silver Spring, Maryland. The workshop was one of a series conducted by the Policy Analysis Division of the University of Michigan Highway Safety Research Institute, under the sponsorship of the U.S. Department of Transportation, National Highway Traffic Safety Administration contract no. DOT-HS-8-02031.

1.1 Background

From 1976 through 1978, The University of Michigan Highway Safety Research Institute (HSRI) conducted a series of small-group workshops to examine drug research methodology issues and problems. These workshops were sponsored by the National Highway Traffic Safety Administration (NHTSA contract no. DOT-HS-7-01530). They were seen to be a successful method for bringing both practitioner comment and scientific comment to the attention of the individuals responsible for planning specific NHTSA research programs.

In September 1978, HSRI received the contract entitled "Workshop to Review Problem-Behavior Research Programs" from the National Highway Traffic Safety Administration (NHTSA). Its general objective is to provide information from researchers and practitioners that will assist NHTSA in developing specific research programs to address current needs. This effort is part of NHTSA's plan to conduct periodic conferences to review technical developments, new information, and changing state and local needs in terms of traffic safety priorities. The program areas addressed by this contract are:

- Alcohol and Drugs;

- Bicycle, Pedestrian, and Pupil Transportation Studies; and
- Safe Driving Conformance.

During this same time period, NHTSA announced its first public plan describing research, development, and demonstration activities to be conducted under funds provided by Section 403 of the Highway Safety Act of 1966 (23 USC 403). That plan covered the Fiscal Year 1980-1984 time period. After it was announced, the Transportation Research Board (TRB) of the National Academy of Sciences (NAS) was asked to convene a general meeting of the scientific and practitioner communities to provide comment on the plan. A legal docket was also opened by NHTSA for other public comment.

As a follow-up to these activities the workshops to be conducted under the Problem-Behavior Workshop contract were enlarged from six to ten outside participants to thirty outside participants to discuss in greater detail specific program areas. The concerns of the Problem-Behavior Workshops are two-fold. The first of these is to identify program areas and projects that should be undertaken by NHTSA. The second concern is to provide NHTSA with as much project-specific comment as possible with regard to:

- technical content;
- estimate of schedules; and where appropriate
- suggestions for funding or level of effort needed to undertake a project in a satisfactory manner.

1.2 The Purpose of Workshop I, Alcohol, Drugs, and Highway Safety

The purpose of this workshop was to develop specific recommendations for the planning and implementation of NHTSA research, development, and demonstration projects in the program area of Alcohol and Drugs. Project priority, design and method, scheduling, and cost were to be considered.

The workshop approach was designed (1) to provide the opportunity to discuss and comment on important issues in the areas of alcohol, drugs, and highway safety, and (2) to permit an in-depth review of specific

program elements. Emphasis was placed on small-group working sessions. Participants were divided into two groups of approximately fifteen people. Attempts were made to have an equal representation of practitioners and researchers within each group. Two NHTSA staff members were available to each group as resource people: one from Traffic Safety Programs, and one from Research and Development. HSRI staff members were assigned to each group to serve as moderators and recorders.

A total of six small-group working sessions were held during the workshop. Topics included:

- General Objectives of the Alcohol and Drugs Program;
- Problem Identification;
- Countermeasure Development, Test, and Evaluation (two sessions);
- Knowledge Transfer: Demonstration and Other Techniques; and
- Other Drugs and Other Topics.

Background materials were provided to participants prior to the workshop and served as the frame of reference for the workshop discussions. Primary among these materials were:

Transportation Research Board. 1979. Highway Safety Research, Development, and Demonstration: Conference Proceedings. National Highway Traffic Safety Administration contract no. DOT-HS-9-02113.

U.S. Department of Transportation. 1979. Proposed Plan for Highway Safety Research, Development, and Demonstration (Section 403 of Title 23, USC): Fiscal Years 1980-1984. National Highway Traffic Safety Administration.

U.S. Department of Transportation. 1979. Marijuana, Other Drugs, and Their Relation to Highway Safety: A Report to Congress. National Highway Traffic Safety Administration report no. DOT-HS-803-229.

NHTSA Project Summaries: Fiscal Year 1980, Research and Development.

NHTSA Project Summaries: Fiscal Year 1981, Research and Development.

NHTSA Project Summaries: Fiscal Year 1981, Traffic Safety Programs.

TRB Issues.

1.3 Scope of Report

This report has seven sections. The six that follow are briefly described below.

Section 2.0, General Objectives of the Alcohol and Drugs Program, summarizes the workshop discussion focusing on NHTSA's 403 Program and its approach as well as the proposed Alcohol and Drugs Program.

Section 3.0, Problem Identification, presents the discussion of projects having as their focus fundamental research and discovery.

Section 4.0, Countermeasure Development, Test, and Evaluation, focuses on projects comprising efforts related to research and development to assist in meeting 402 goals. The concerns and recommendations of the panel are summarized.

Section 5.0, Knowledge Transfer, presents the discussion concerned with dissemination of research products for use by practitioners and researchers.

Section 6.0, Other Drugs, decribes the project-related issues and recommendations dealing with drugs other than alcohol discussed in the workshop.

Section 7.0 synthesizes the conclusions and recommendations of the panel.

Presentations by the NHTSA representatives for TSP and R&D can be found in Appendices A and B, respectively. Appendix C provides a list of the workshop participants. References cited in the report are listed in a bibliography following the appendices.

2.0 OBJECTIVES OF THE ALCOHOL AND DRUGS PROGRAM

To provide a framework for later comments on proposed projects, each of two working groups examined (1) the general objectives of the proposed Five-Year 403 Program in relation to the alcohol and drugs area and (2) the process by which these objectives are met. In addition, the working groups identified specific objectives that should be the focus of NHTSA's activity in this program area.

The ensuing discussion covered three topical areas:

- the purpose of the alcohol and drugs program;
- categories of NHTSA activity; and
- specific program objectives and their relative importance.

Discussions of these topics are summarized below. Background sections precede each discussion and include information drawn from two publications provided to workshop participants as resource material (U.S. Department of Transportation [DOT] 1979; Transportation Research Board [TRB] 1979).

2.1 Purpose of the Proposed Five-Year 403 Program Plan

The ultimate aim of the Section 403 Program is to "improve the ability of safety programs . . . to save lives and reduce injuries" (U.S. Department of Transportation 1979, p.1). The statutory basis of the 403 Program, its interpretation by NHTSA, and comments from the program review by the TRB Conference are summarized below. This is followed by a summary of the workshop discussion.

2.1.1 Background. NHTSA presented its proposed five-year 403 program plan in a document entitled "Proposed Plan for Highway Safety Research Development and Demonstration (Section 403 of Title 23, USC) Fiscal Years 1980-1984" (U.S. Department of Transportation 1979). This document

provided the U.S. highway safety community with an opportunity to participate in the 403 program planning process. At the request of NHTSA, the proposed plan was reviewed in the 1979 Conference on Highway Safety Research, Development, and Demonstration conducted by the Transportation Research Board of the National Academy of Sciences (Transportation Research Board 1979).

According to NHTSA, the stated objectives of the proposed plan are:

- To provide an internal planning document to guide NHTSA officials and program managers in preparing program strategies and estimating resource requirements.

- To provide the public, private groups and government at all levels an insight into NHTSA plans and thus an opportunity to comment during the early planning stages; and to permit States and local communities, as well as the highway safety research community, to anticipate NHTSA's programs in their own planning . . .

  The ultimate goal of the Section 403 Program, and thus this proposed five-year plan, is to improve the ability of safety programs conducted with the use of Section 402 grants and State/local revenues to save lives and reduce injuries; as well as to improve the efficiency of State and local highway safety programs. (U.S. Department of Transportation 1979, p.1)

NHTSA further outlined the nature and direction of the 403 Program as stemming from the Highway Safety Act of 1966.

> Congress enacted the Highway Safety Act of 1966 in order to establish a coordinated national program to reduce motor vehicle accidents, injuries and fatalities, and to improve basic highway safety programs at the Federal, State and local levels. The 1966 Act contained two major thrusts. First, Section 402 (codified as 23 USC 402) required States to have highway safety programs in accordance with uniform standards established by the Secretary of Transportation. Second, under Section 403 (23 USC 403) Congress empowered the Secretary to carry out safety research, development and demonstrations in order to upgrade the effectiveness of State and community programs. (U.S. Department of Transportation 1979, p.3)

NHTSA notes that past criticisms of the 403 Program have centered on

its lack of responsiveness to State and local needs and the inadequate dissemination of products of research and development (U.S. Department of Transportation 1979, p.4). Meeting the goals and objectives of the 403 Program is hampered by issues that, according to NHTSA, remained largely unresolved but which were considered in developing each program area (U.S. Department of Transportation 1979, p.5).

The TRB Conference, in addition to reviewing specific program elements, also addressed issues related to "the general significance of Section 403 and of NHTSA's policies and procedures in carrying out the intent of 403" (Transportation Research Board 1979, p.22).

> The workshops produced a number of recommendations on how the 403 role should be interpreted. For example, Section 403 purposes should be broader in scope than merely supporting 402 programs; 403's activities should serve all the direct and indirect needs of state and local highway safety programs. If Section 403 is interpreted as being solely an adjunct to Section 402, many large and common needs of the states would not be addressed at all. In addition, the 403 program should be confined to problems of interstate magnitude; research and development efforts directed at intrastate or unique, local problems in highway safety would be carried out under the aegis of Section 402. Identified needs or problems and current progress in establishing countermeasures should determine the type of activity (research, development, transfer) to be undertaken. (Transportation Research Board 1979, p.111)

> A vital part of NHTSA's 403 role--indeed, its ultimate objective—is to transfer the results of its research efforts to highway safety practitioners who will use them to reduce accidents and save lives. A related objective is to disseminate project descriptions among researchers. Practitioners need appropriate and implementable traffic safety programs, procedures, and materials to help them make the most effective and efficient use of their resources. Researchers need a point of reference on which to build future research efforts. (Transportation Research Board 1979, p.114)

The Alcohol and Drug Program represents one of nine program areas within NHTSA, ranked third based on a set of six criteria: accident impact; effectiveness; implementation costs; probability of implementation; increased efficiency of current state safety systems; and implementation

time (U.S. Department of Transportation 1979, pp.12-18).

> 3. Alcohol and Drugs. Given the problem size--alcohol present in nearly one-half of fatal crashes--alcohol safety programs have remained near the top of NHTSA's priority list for the last decade. Extensive research and demonstration work has indicated that alcohol is a difficult but not intractable problem. Evidence from the former ASAP program and from foreign experience (e.g., British Road Safety Act of 1967) showed that systematic efforts to increase enforcement against drinking-drivers could be effectively carried out. Evaluations showed an overall reduction in drinking-driving in some ASAP sites. These programs are moderate to high in cost but much of the cost can be recouped from client fines or fees.
>
> The ASAP program continues to have a major effect on State enforcement and judicial programs, and thus influences much of the 1980-1984 effort. Alcohol programs enjoy public and official support and provide an opportunity for a limited control of this problem. (U.S. Department of Transportation 1979, pp.16-17)
>
> This plan also includes the area of drugs other than alcohol. It is not possible, at the present time, to define in any scientific way just what the nature and scope of the drug highway safety problem is, if in fact there is one. The term drug, as used here, includes a myriad of substances taken for both licit and illicit purposes, purchased legally either by prescription or over the counter, or illegally on the street. A larger majority of the drugs taken by drivers may in fact have a significant positive therapeutic value, and yet result in a significant impairment vis-a-vis driving. One additional factor which adds even more complexity to the problem is that many individuals take drugs in combination with other drugs and with alcohol. The chemical nature of a drug, how the human body breaks it down, how the drug and its derivatives effect [SIC] the body and how long the effect lasts all contribute to determine a drug's potential impairing effect. For many drugs of interest the chemical complexity is an order of magnitude more complex than the simple drug alcohol, of which we know so much. (U.S. Department of Transportation 1979, p.50)

2.1.2 Discussion. The purpose of the 403 Program and its relation to state and local efforts in traffic safety received general consensus from workshop participants. At issue, however, was the scope of 403 activities.

Some panel members expressed dissatisfaction with the narrow focus of

the proposed alcohol program. They pointed to the short-range character of many of the projects. Such projects fail to address the depth and complexity of the alcohol-crash problem. Participants emphasized the need for long-range program elements to balance short-term responses, projects that sought the "root causes" of drinking-driving behavior and that would support the development of countermeasures to attack the problem at its source.

A number of participants also cited the need for more fundamental research to develop an adequate knowledge base from which to conduct research directed toward development of innovative countermeasures. They questioned (1) what knowledge base exists to support the current emphasis on the general-deterrence approach within the alcohol program area, and (2) whether the reliance on this approach represents too narrow a program direction to successfully affect the impaired driver problem. The group noted that an approach with an emphasis on detection and arrest has a very small target group of drivers who drink (i.e., those drivers with a BAC of 0.10% w/v or greater). Furthermore, it does not address the general issue of driver impairment, which involves a much broader class of drivers (e.g., the aged; users of legitimate drugs; fatigued drivers).

Other participants questioned whether NHTSA's mission and its scope of activities included an examination of--and the dealing with—"root causes." The use and misuse of alcohol obviously predate modern transportation. Alcohol-related social problems extend far beyond traffic safety per se. Can highway safety researchers answer the question of why drivers drink in the first place, and, even if so, can the traffic safety system deal with it? These participants advocated restricting programmatic goals to those proximate to traffic safety.

The workshop generally agreed that research on the nature and magnitude of the alcohol-crash problem requires focus, but recommended that NHTSA still consider broadening its approach in this program area. Study of the "same old questions" was seen as interesting but not useful. In examining the root causes of the problem, which to some extent lie beyond highway safety per se, participants encouraged collaboration with

other agencies. Other approaches, such as a systems approach, could be used to identify ways of intervening in the impaired driver problem other than detection and arrest (e.g., reducing substance availability; providing alternate transportation; changing social attitudes).

Also in this regard, participants noted that one of the shortcomings of the 403 program is the inability of NHTSA to fund unsolicited proposals. "Research" thus becomes a simple response to RFPs originated in Washington. Sole reliance upon the RFP process was seen as stifling originality to a great extent. It was pointed out that this issue was also discussed during the TRB conference.

2.2 Categories of NHTSA 403 Activity

The process by which programmatic goals are achieved by NHTSA was also examined. The categorization of 403 Program activity both by NHTSA and an alternative scheme developed at the TRB Conference are described below.

2.2.1 Background. In characterizing the proposed five-year 403 Program, NHTSA described a new approach to administering the fourteen Highway Safety Standards, termed the "management process" approach (U.S. Department of Transportation 1979, pp.8-11). This approach to highway safety management is defined in terms of six "categories of effort" (see Table 2-1).

> Each program area follows a logical sequence of steps, each step being represented by one or more projects in the proposed plan. In some cases, the plan contains parallel approaches to solve a particular problem. In many cases, funding estimates for future years are relatively "soft" since they are dependent on the success of earlier work. Consequently, future year funding will be subject to changes since unsuccessful projects will be terminated, while others will be expanded. (U.S. Department of Transportation 1979, p.10).

The 1979 TRB Conference identified three major categories of activity: "research on fundamental issues, research and development to assist in meeting 402 goals, and advocacy programs related to state and local

TABLE 2-1

NHTSA "MANAGEMENT PROCESS" APPROACH
CATEGORIES OF EFFORT

I. **Problem Identification and Analysis.** Includes the following:

- Identification of problem areas requiring attention.
- Analysis of identified problems describing their scope, nature, and magnitude.
- Review and analysis of existing information on a problem area and the state of the art with respect to solutions.
- Determine needs, as perceived by States, communities and others that, if met, would improve the overall effectiveness of highway safety programs.

II. **Program/Countermeasure Development.** Identification and development of programs or specific means to address safety problems defined through accident data analysis or research, development and pilot testing of innovative responses to previously defined problems.

III. **Test and Demonstration.** This involves the actual testing of new developments under realistic but controlled conditions using special personnel as needed to assess effectiveness. During this phase, new techniques are applied by State and local governments and community organizations in an operating environment. The intent is to test and document the effectiveness as well as to identify areas for potential improvement.

IV. **Evaluation.** This phase involves the evaluation of existing safety programs (including State and community activities) to determine their utility and effectiveness, as well as areas for potential improvement.

V. **Technology Transfer.** The purpose of this phase is to transfer new developments and findings to States and communities. Methods used include the development of program manuals, workshops and seminars for local officials, collection and dissemination of information on successful safety activities, and publicizing the results of national efforts.

VI. **State Program Management and Technical Assistance.** This step entails development of improved management guidelines, and employment of management and technical consultation to upgrade State and local program decisions and operations (including public information to create safety problem awareness and thereby create support of State efforts) and instructional materials for use by State and local personnel in carrying out programs. The overall goal is to assure availability of qualified people to conduct safety programs, and to continually improve their management capability.

highway safety problems and goals" (Transportation Research Board 1979, p.111) (see Table 2-2).

The TRB categories of NHTSA 403 activity reflect the goals and objectives of the program and also incorporate the six steps of the "management process" approach. As such, these categories provide a way to discuss specific projects in terms of the various stages of research, development, and transfer. In addition, the three general categories group projects so that their relative contribution to achieving 403 Program goals and objectives can be assessed.

2.2.2 Discussion. Participants were asked to comment on whether differences between the two schemes were meaningful or superficial. Discussion of this topic centered particularly on the respective roles of **demonstration projects** and **evaluation** in the 403 Process.

Panel members generally agreed that TRB's approach to categorizing NHTSA 403 activity made critical distinctions in areas where confusion has arisen in the past. For example, traffic safety practitioners pointed out that demonstrations were not perceived as "research," but as a means of "selling" programs and techniques for increasing the effectiveness of safety efforts. This view corresponds to TRB's designation of demonstration projects as tools of advocacy—a proper role for NHTSA as part of its knowledge transfer function.

Participants noted that, in the past, projects termed "demonstrations" have been conducted with inadequate prior evaluation. Preceding such efforts, state practitioners have often labored to convince legislatures of their value, only to encounter poor results after large expenditures of limited resources. One prominent example mentioned was the Alcohol Safety Action Project (ASAP) that in the minds of many was a field test on a grand scale that ultimately wasted millions of dollars. One panel member described the experience at the state level as being "switched from magic solution to magic solution" until fixation on one particular solution, cynicism about any solution, or massive disinterest resulted. One reason given was that demonstrations are simply not perceived as research,

TABLE 2-2

TRB CONFERENCE CATEGORIES OF NHTSA 403 ACTIVITY

1. **Fundamental Research and Discovery.** This area of activity, which includes **problem identification,** is "directed toward the front end of the discovery process in order to define the relevant issues better. In particular, basic studies on driver behavior and accident causation are needed; the funding for this basic research should be increased, even if lower-priority programs have to be sacrificed" (TRB 1979, p.110). "A prerequisite for long-range research programs is more and higher-quality data than are now available" (TRB 1979, p.112). "As part of its role as research coordinator, NHTSA should ensure that relevant findings from other fields are integrated into the 403 and 402 programs " (TRB 1979, p.112).

2. **Research and Development to Assist in Meeting 402 Goals.** Activity in this area includes the **development, test,** and **evaluation** of countermeasure programs. "Researchers are concerned . . . that approaches not be sold until they have been proven to work . . ." (TRB 1979, p.113). "Demonstration projects should not be used as substitutes for discovery, nor for field experiments or other stages of the research and development process. Developmental efforts, openly labeled as such, can be much more easily evaluated and a lack of success accepted than is the case if the same effort is presented as a demonstration" (TRB 1979, p.115).

3. **Knowledge Transfer.** Defined as the process of making research products available for use by both **practitioners** and **researchers,** "knowledge transfer" (1) includes the meaning of "technology transfer" (as used by NHTSA) with its connotation of instruments and hardware; (2) emphasizes the importance of less tangible products ("software"), for example, better communication systems among states for monitoring drivers; and (3) requires advocacy, as "proposed approaches must be presented in their best light" (TRB 1979, p.113). "Demonstrations are proper instruments of advocacy, designed to sell an approach . . ." (TRB 1979, 115).

but as programs thought to work and therefore advocated as such.

While the distinction between **demonstration** and **field test** can be considered a "semantic difference," the label demonstration often alters the perceptions of persons responsible for a program. These persons must take an advocate's position to generate enthusiasm for the implementation of a program; they depend on positive results for continued credibility. Terming field tests "demonstrations" heightens expectations of all concerned and lessens objectivity in evaluating the results. A more appropriate label is required. Demonstration projects should be used as a technique of advocacy and be restricted to those projects of proven effectiveness.

A NHTSA resource person argued that the TRB categories were "artificial," characterizing 403 activity as a "full flow process" in which no lines would be drawn between different stages of research, testing, and demonstration. In fact, research does not end when programs have been transferred to states. State agencies modify programs, adapting them according to their own ideas, changing them so much that NHTSA cannot regard their implementation as demonstrations. Hence the need for evaluation of state programs. Moreover, objectivity is lacking throughout this process, due in part to the absence of rigorously controlled studies—for example, experiments with random assignment--and to a lack of research evaluations. Also pointed out was the difficulty in getting states to collect data on their own efforts, so that ineffective programs could be "weeded out" over time.

Nevertheless, panel members stressed the critical need to know **at the practitioner level** what works and what does not, what NHTSA is testing and what NHTSA is promoting or advocating. A sharp line of demarcation between test/evaluation and demonstration would greatly assist. They also recommended that results from field tests from various studies in different states be integrated and a realistic evaluation of the **probability** of success be indicated to practitioners. In this way, advocates of demonstration projects can understand where a program stands with regard to effectiveness. With respect to **criteria** of effectiveness, they suggested that more reasonable goals might result if requirements for statistical

significance in controlled studies were lowered. Measures that were too stringent have led to failure in finding results, whereas relaxed standards will at least indicate "good odds" that a program will have a positive impact. Practitioners recognize uncertainty as a fact of life; they do not demand programs be proven 100% certain to work, but rather need to know the **realistic** possibility of producing desired results. This was characterized as a "probabilistic" idea—a requirement at the state level not for the highest standard of proof but some indication of the likelihood for success and some reasonable expectation that a program will work.

The role of evaluation in the 403 process also received detailed comment. One objection to NHTSA's "management process" and its categories of effort was that **evaluation** (IV, Table 2-1) is too narrowly defined. According to panel members, evaluation should occur throughout the research and development process and be an integral, explicit component of each stage. The role of evaluation prior to knowledge transfer, including demonstration projects, is to provide that "reasonable assurance" that practitioners require.

A resource person from NHTSA pointed out that category III in the "management process" scheme—Test and Demonstration—could be viewed as another form of definition for evaluation. In addition, NHTSA encourages 402-funded evaluations of state programs, requiring that at least one program be evaluated each year. Yet, the number of well-conceived, well-implemented evaluations remain limited for the most part to those states with unusual resources.

Participants recognized existing constraints on evaluation as done in many states. These include lack of knowledge for program evaluation and failure to implement experimental designs based on random assignment to treatment by the courts. In addition, the need for a good measurement tool was recognized by both participants and NHTSA resource persons. Current practice emphasizes the decrease in traffic crash fatalities as a measure of effectiveness. Little information exists to indicate what other factors are being affected by traffic safety programs. Other measures are needed to supplement this fatals data.

Finally, the **feedback** role of evaluation in the 403 process was discussed, both within the research and development stage and during field testing and demonstration. If evaluation components were included as integral parts of development, what was learned--either positive or negative--could be "cycled over" through research to focus the discovery process. Evaluation at the state level not only indicates program effectiveness but also can provide countermeasure development efforts with information useful in refining existing approaches or spurring the search for innovative programs.

Panel members questioned, however, whether a mechanism is in place to monitor and integrate perceived needs at state and local levels so that NHTSA 403 activities support 402-funded programs appropriately. One participant indicated that NHTSA is perceived to make value judgments in the absence of feedback about what is needed and wanted. Increased sensitivity to local factors that influence a program's effectiveness is needed. Input from minority populations and their representation in policymaking as well as in the "selling" of programs are essential.

2.3 Objectives of the Proposed 403 Alcohol and Drugs Program

Following the general review of and comment on the alcohol and drugs program and the 403 process, participants identified and discussed objectives of an alcohol and drugs program. The nature and overall thrust of the proposed program were examined to provide a framework for later comments on specific projects within the program.

2.3.1 Background.

NHTSA described the objectives of the proposed five-year alcohol and drugs program as follows:

> The basic objectives of this program are threefold: (1) to obtain necessary information on various subgroups of drinking drivers in order to allow for the development of countermeasures and to assist in determining which countermeasures should be most effective for different target groups; (2) to develop alcohol safety programs and assist the States in implementing them so that the deaths, injuries and property damage resulting from alcohol related crashes will be

> reduced; and (3) for drugs, to determine the nature and scope of the highway safety problem related to drugs, and based on the defined need to develop appropriate countermeasures to meet the stated needs. (U.S. Department of Transportation 1979, p.51)

The TRB workshop that reviewed the proposed alcohol and [other] drugs program first discussed NHTSA's project list and suggested additions. Workshop members then considered the relative importance of all these projects and recommended new priorities for them (Transportation Research Board 1979, pp.53-60).

> The general consensus among workshop members was that most of NHTSA's alcohol and drug projects will be useful, but long-range programs should be developed to balance the short-range approaches tried thus far. Some alcohol projects may be proceeding toward implementation without an adequate basis in research or evaluation; this is especially true with the proposed public information and education programs. Much knowledge and technology on alcohol already exist, however, and should be compiled and transferred. In fact, developing efficient mechanisms for technology transfer should be emphasized as a separate program area. The group strongly supported all but one of the drug projects. There was some concern that the alcohol and drugs program area includes too many projects—that the effort is spread too thin. The program should focus on a few important projects to achieve maximum impact and results . . . . (Transportation Research Board 1979, pp.59-60)

Additional, more specific recommendations were also developed; these have been incorporated into subsequent sections dealing with category-specific projects.

2.3.2. Discussion of Specific Program Objectives. Participants outlined specific aims that should be included as objectives in an alcohol and drugs program. Three general categories of objectives were discussed, including:

- problem identification,
- countermeasures, and
- knowledge transfer.

Problem identification. A better understanding of socialization in the

use of alcohol and of restraints against its excessive use is needed to deal more effectively with the alcohol and highway safety problem. The workshop noted that this objective requires a long-range research program and recognized that this luxury has not yet been afforded to NHTSA. Participants suggested, however, that NHTSA's approach to the alcohol and highway safety problem traditionally has focused on identifying ways to arrest the drinking driver, and again recommended that NHTSA should consider adopting a broader approach in this area.

Specific objectives identified for problem identification projects included:

- identify target groups for countermeasure research and development;
- monitor changes in target groups, their make-up, and their priority among programs; and
- identify reasons and causes for changes in the nature and magnitude of the problem so that countermeasures may be directed more closely to its source.

Each of these objectives has consequences for countermeasure development and knowledge transfer efforts. If the nature of the problem has changed, programs must be tuned to address the problem as it is at present. Otherwise, yesterday's programs may become inappropriate and, though once effective, unable to produce results.

Some participants reiterated that the alcohol-crash problem is one aspect of a complex social issue. Many of the "causes" of the alcohol-highway safety problem lie outside the purview of NHTSA's mission. Interagency efforts should, therefore, also include fundamental research on problem identification. This general objective of the 403 process--basic research and discovery--received less support than knowledge transfer and countermeasure research and development functions. Continued or renewed efforts to define the alcohol-crash problem were seen partially as studying the same old questions, an interesting but not very useful endeavor.

Countermeasures. In general, participants recognized the utility of a

general-deterrence approach to reducing the incidence of alcohol-impaired driving. Strict enforcement of alcohol-impaired driving laws combined with public information and education campaigns was seen as a potentially viable solution to a very difficult problem. The panel stressed that attention to the adjudication process was essential.

Workshop participants cautioned, however, against developing a countermeasure program that relies solely upon the general-deterrence approach. Doubts were expressed about the adequacy of the current knowledge base in that area to support that kind of program direction. The driver need be just one focal point in a countermeasure program. NHTSA should consider adapting other methods, modes, and approaches to the alcohol and highway safety problem. For example, other groups can be looked at as possible control mechanisms for the development of **preventive measures.** Conditions for controlling the availability of alcohol, such as hours sold, where sold, etc., could be more thoroughly explored as prevention measures.

The panel also recommended that evaluation measures be broadened beyond traditional measures, for example, number of fatal traffic crashes. Nontraditional measures might include the health status of individuals referred to treatment programs, improvement in the delivery of community services, and increased capacity of communities to deal with their problems. A specific objective of the alcohol program could be the identification of intermediate variables appropriate to the evaluation of countermeasure programs. Participants recognized that NHTSA's mission was narrow, in that programs focus on the reduction of traffic crashes and associated losses. Nevertheless, programs with value might be considered ineffective if only gross traffic safety measures were used in evaluations. To accomplish this objective, the panel again encouraged NHTSA to enter into interagency agreements, for example, with the National Institute on Alcohol Abuse and Alcoholism (NIAAA).

Knowledge transfer. Several panel members expressed the frustration at the practitioner level over NHTSA's inability to provide proven products

of research and development to those in the field. They pointed out that the problem is **not** that useful items such as training manuals have not been produced, but rather that potential users often have no knowledge of their existence. A presentence investigation training package developed by one participant under NHTSA sponsorship was offered as a case in point. They also cited as a problem the time lag between NHTSA's designation of priority concerns and the availability of tools to address them. During this period, local agencies move on their own. By the time a "cookbook" appears, the approach or technique advocated is harder to implement because something else is already in place.

In addition, a panel member stressed the need for a "translation" function in the knowledge transfer process. Reports and other technical work products should be translated into language within the grasp of an average person's understanding. Reduction to operational language would assist those who have responsibility for implementing practical programs and would obviate the requirement for practitioners to perform the entire task themselves.

The panel recommended the following as specific objectives:

- improve dissemination both of knowledge gained from research and of products for use by states in their traffic safety programs, in particular, evaluation techniques; and

- identify, develop, and evaluate mechanisms to support additional efforts to transfer knowledge.

2.4 Summary

The first working session examined general objectives of NHTSA's proposed five-year plan and the processes to accomplish them. Specific objectives in the alcohol and drugs area were identified.

One issue not completely resolved involved the scope of NHTSA's activities in this area. Broadening the purpose of its 403 mission received much support, but this recommendation was questioned because it led to NHTSA's involvement in areas beyond traffic safety per se. Interagency agreements was one alternative advanced to satisfy both viewpoints.

An examination of alternative schemes to classify NHTSA 403 activity led to general support of the categories defined at the TRB Conference. In particular, the ability of the TRB scheme to distinguish clearly between field test and demonstration projects and its broader admission of evaluation into countermeasure research and development received favorable comment. The role of demonstration was seen as a technique of knowledge transfer and as a tool of advocacy; the role of evaluation was seen as a means to assess the value and effectiveness of programs as well as to provide feedback to earlier stages of the 403 process.

General objectives of the alcohol and drugs program were reviewed and specific aims that should be addressed by 403 projects were suggested. Among the specific objectives identified were the following:

- monitoring of the nature and magnitude of the alcohol-crash problem and identifying possible changes in the nature of target groups that should be the focus of countermeasure programs;

- broadening the scope of the countermeasure program beyond the use of stepped-up enforcement paired with public information to include other general deterrence and preventive approaches to the alcohol-highway problem; and

- improvement in the dissemination process, including an examination of better methods for making available products of proven worth.

3.0 PROBLEM IDENTIFICATION

The second working session dealt with projects in the **alcohol** program area that have as their intent problem definition, including identification of target groups for countermeasures. These projects continue the study of the alcohol-crash problem begun over forty years ago.

3.1 Background

NHTSA has defined **problem identification and analysis** as the first step in a rational developmental process for highway safety management. This step includes:

- identification of problem areas requiring attention;
- analysis of identified problems describing their scope, nature, and magnitude;
- review and analysis of existing information on a problem area and the state of the art with respect to solutions; and
- determine needs, as perceived by States, communities and others that, if met, would improve the overall effectiveness of highway safety programs. (U.S. Department of Transportation 1979, p.9)

Roughly corresponding to "problem identification" is the TRB category of NHTSA activity termed **fundamental research and discovery.** This category emphasizes long-range information needs in the context of basic research to define problems and to examine the validity of short-range solutions or countermeasures--both implemented and proposed.

This is the first of nine program areas in the alcohol program. It was described in NHTSA's five-year plan as follows:

> The first program area involves efforts directed at clearly defining the relationship between those individuals who are driving at various levels of alcohol intoxication, those arrested for DWI, and those who are involved in alcohol-related

> accidents. This information is needed in order to determine if the same, or different countermeasure approaches are likely to be effective with these different groups. (U.S. Department of Transportation 1979, p.52)

According to NHTSA, "an analysis of 403 program funds by category . . . and fiscal year show the proposed program to be well balanced" (U.S. Department of Transportation 1979, p.11). As summarized in the TRB review of the proposed five-year 403 Program, conference participants found that, "in contrast to other health problems and related research, the funding for investigation and discovery in the field of highway traffic safety is miniscule" (Transportation Research Board 1979, p. 110). Specific recommendations by the workshop reviewing the Alcohol and Drugs Program reflect this conclusion (Transportation Research Board 1979, p.59-60):

- NHTSA should expand its driver-background survey to (a) investigate driver characteristics as a function of BAC and (b) include seriously injured drivers.
- In addition to its specific projects, NHTSA should examine broad, long-range variables that affect high-risk groups of drinking drivers.
- NHTSA's project to encourage intermediaries to discourage drinking drivers is premature; more motivation research is needed first.
- The NHTSA-FHWA project to develop ways to reduce roadway impairment of drinking drivers should be given high priority; additional studies are needed of the information-processing capacities of drinking drivers.

Four NHTSA projects--one ongoing and three FY 1980 proposals—are closely interrelated and were presented at the workshop as a four-study, problem definition set:

- The Incidence of Drugs Among Fatally Injured Drivers (DOT-HS-8-02024);
- Roadside Companion to Drug Fatal Study (FY 1980, with NIDA);

- Background Survey of Fatally Injured Drivers (FY 1980, with NIAAA); and

- Survey of Drinking Drivers (FY 1980 with NIAAA).

The four projects originated in the alcohol/drugs research area and have as their purpose the identification of specific subgroups of drivers who have unusually high probability of dying in traffic crashes, either because of their use of drugs, including alcohol, or because of personal or behavioral characteristics that may or may not be related to their use of impairing substances.

The four studies depend on each other in several ways. Large, nationally representative driver samples will be obtained in the first two projects listed above and will provide subjects for the latter two projects. In addition, because similar data will be obtained for the different groups of drivers, important safety questions can be addressed by comparing, for example, crash-involved and at-risk drivers to identify similarities and differences.

The proposed NHTSA/NIAAA interagency efforts focus on subgroups of persons who are identified as drinking drivers. The proposed project entitled "Background Survey of Fatally Injured Drivers" would develop detailed behavioral histories of persons whose blood alcohol concentration (BAC) was 0.05% w/v or greater at the time of the fatal crash. The "Survey of Drinking Drivers" would develop similar data sets for on-the-road drivers and for persons arrested for impaired driving.

The NHTSA/NIAAA projects would make use of driver samples obtained in the surveys of drug use among fatally injured, on-the-road, and other drivers and attempt to answer such general questions as the following:

- Are drivers detected and arrested for impaired driving those most likely to be fatally injured in traffic crashes?

- Are drinking drivers killed in traffic crashes typical of drinking drivers on-the-road, or can they be distinguished in ways that could lead to the development of specific preventive measures?

- Are drivers currently arrested for impaired driving typical

of on-the-road drinking drivers at comparable BACs?

The two studies to develop background information on drinking drivers were the primary focus of the second working session. Comments on the projects to obtain the samples of different driving populations (i.e., "The Incidence of Drugs" and the "Roadside Companion" studies) are summarized in Section 6.0.

3.2 Discussion

The two projects designed to develop background information on drinking drivers were addressed by participants in Session Two. Some panel members wondered what—beyond age, gender, etc.—would be learned from the in-depth background surveys as proposed. In response, NHTSA representatives described basic questions still unanswered in the area of alcohol countermeasures. For example, it is not clear that present emphasis on problem drinkers in enforcement and treatment is totally correct. Partial evidence from crash and court data appears to corroborate that about two-thirds of persons arrested for impaired driving are problem drinkers. Nevertheless, these data, developed from biased, nonrandom samples, may not accurately represent the actual situation on the road. One purpose of these studies, therefore, is to verify current beliefs about the impaired driver population. In addition, the at-risk driving population has never been adequately characterized. The vast majority of drinking drivers on the road may be social drinkers; selective arrest procedures may capture mostly problem drinkers. These studies can serve to answer the question of whether people at risk who have a BAC over 0.10% w/v are problem drinkers.

Moreover, past research has shown that the fatal crash population of "responsible" and "not responsible" drivers differs in the frequency and quantity of alcohol-involvement. Personal, demographic, and other variables besides alcohol use may assist in identifying high-risk subgroups of drinking drivers. For example, although younger drivers are overrepresented in the crash population, the older drinking driver tends to have a higher BAC and is arrested more frequently. Information from

these studies may support the hypothesis that the young driver with a lower BAC is equally impaired and that enforcement and other efforts should be redirected to find younger drivers who use alcohol inappropriately.

On a more general level, panel members cautioned NHTSA in using terms such as "verify" to describe projects and project goals. Research is the testing of an hypothesis rather than the verification of a belief. It was noted that the latter approach has caused NHTSA problems in the past: that is, a project is conducted, and evaluation is expected to prove that it worked, not whether it worked. Better experimental design was viewed as necessary.

Other panel members restated the view that these studies represent the asking of the "same old questions, over and over." They questioned whether sufficient time was available to justify research on interesting--though not highly useful--questions. Rather than to return to "ground zero" in an area where research was offering diminishing returns, they suggested that basic questions had been answered sufficiently to guide present countermeasures. They recommended that the severity of current sanctions be a primary concern and that action programs be the focus of NHTSA alcohol activity. The investigation of root causes of alcohol-related problems is best left to agencies such as NIAAA, and NHTSA should adhere to its mission aimed at alcohol-highway safety.

A number of other panel members, however, emphasized the necessity of focusing upon the social influences on drinking behavior beyond the highway safety area. A better understanding of the socialization of the use of alcohol and the restraints against its use is seen as needed to more effectively deal with the alcohol and highway safety problem. Such an approach focuses upon factors influencing the development and the maintenance of alcohol use. The group noted that this approach requires a long-range research program and recognized that this was a luxury that has not yet been afforded NHTSA. In this regard, participants noted, however, that NHTSA's approach to this problem traditionally has focused upon ways to arrest the drinking driver. A broader rationale--or at least an

alternative rationale--is needed to better approach this problem. A program geared toward prevention was one suggestion. Deemphasizing the "problem drinker" category was another.

3.2.1 Survey of Drinking Drivers. Following is the project description for the "Survey of Drinking Drivers" study:

> This study is designed to collect interview data from two groups of drivers, i.e., "At Risk" and DWI Arrests. This data when combined with similar data obtained in another study on Fatally Injured Drivers, will permit three significant questions to be answered: (1) Are persons killed on the highway in alcohol-related crashes a random sample of a larger "At-Risk" group (BAC exceeding .05%)?, (2) Are persons arrested for DWI a random sample of the same "At Risk" group, and (3) In what ways, if any, are persons killed and persons arrested for DWI similar?
>
> The types of data to be collected in this study will provide the basis for determining if the police are presently arresting those DWIs who are likely to be involved in an alcohol-related crash, and if not, is it feasible to develop countermeasures which would aid in the detection of this type of DWI.
>
> Drivers who participated in a concurrent Roadside Companion to Drug Fatal Study, and who had a BAC exceeding .05%, will form the "At-Risk" comparison group. Drivers arrested for DWI from the same geographical area as Fatals and "At-Risk" groups will form the Arrested Driver comparison group. (NHTSA Project Summaries, FY80)

Workshop participants generally agreed with the approach taken in the "Survey of Drinking Drivers" study for identifying the characteristics of the population on the road driving under the influence of alcohol. The focus upon the DWI Arrest group (as opposed to earlier studies of DWI Convictions) was supported. Along this line, participants cautioned NHTSA to be aware that a wide variety of social factors operate in selecting a DWI driver group. These include factors such as the areas selected for DWI enforcement, and the drivers who are stopped for DWI, those who subsequently are arrested, those who go to trial, and those who are eventually convicted of DWI. Participants pointed out that the distribution

of the DWI drivers and the At-Risk drivers is probably already different at the time of arrest, and the sequence of events leading to conviction for DWI is only likely to further select out certain drivers. The group emphasized that NHTSA be sure it is the DWI Arrest group that is studied rather than a DWI Conviction group.

The workshop group also emphasized that information be developed in the study regarding pre-driving drinking practices. Data collection and analyses should be designed so that the various social factors surrounding drinking and driving behavior can be identified. Suggested factors for inclusion in the study are: the source of the substance, the legality of the substance, the place where the substance was consumed (e.g., party, bar, home), and the form in which the alcohol was consumed (e.g., beer, wine, mixed-drinks, hard liquor).

An additional research topic that was suggested by this study was the cues that police use to identify DWI offenders. One participant related the experience of the city of Santa Barbara where an increase in DWI arrests was accompanied by a reduction in personal injury accidents. The relevant research question here is how do police identify DWI offenders in such a way to arrest the right people and have a deterrent effect on personal injury accidents: would it be possible to investigate detectable differences in driving behaviors prior to an accident for the different drinking driver groups; are police getting the same signals from these two groups of people or different ones. Such information could be developed as a diagnostic tool for use in a countermeasure or driver treatment program.

Participants generally expressed concern that the level of funding for this project was too low to adequately address the activities outlined in the project summary.

3.2.2 Background Survey of Fatally Injured Drivers. The "Background Survey of Fatally Injured Drivers" was the second project discussed by participants in Working Session Two. Its project description follows:

This study addresses the question of whether drivers most at

> risk of dying in an alcohol-related accident are the drivers most likely to be arrested by police for DWI. The study will attempt to develop countermeasures, e.g., behavioral cues, which could be used by friends, relatives, bartenders, hosts, police and others to detect drivers with high probability of being involved in alcohol-related vehicle fatalities. Behavioral characteristics of high-fatality-risk drivers will be identified in psychological and behavioral profiles of those fatally injured drivers who had a high BAC at the time of their accidents. The profiles will be developed through interviews with friends, relatives, and other associates who can provide information on the drinking and driving habits of the deceased driver, as well as on other behaviors which might be used to detect these high-risk drivers either before they get behind the wheel, or while they are driving, but before a crash. The data collected will be analyzed in conjunction with similar data collected on arrested drivers, and on at-risk drivers, in other NHTSA projects. This study will be accomplished by an interagency transfer of funds to the National Institute on Alcohol Abuse and Alcoholism (NIAAA). (NHTSA Project Summaries 1980)

The workshop participants generally agreed with the 1979 Transportation Research Board recommendations to expand the scope of this study to include other accident types. First, they recommended expanding both background surveys to include all drivers, not just those with BACs greater than 0.05% w/v. Second, the inclusion of both personal injury and property damage accidents was suggested. The aim would be to compare drinking **and** nondrinking crash and noncrash drivers to identify factors other than substance use that may contribute to the likelihood of crash-involvement. Third, the broadening of scope would also lead to the development of a valuable data base on drivers who use drugs other than alcohol alone--information that is not presently available. These studies provide a rare opportunity to collect data on nationally representative samples of drivers and as much information should be collected as possible, considering the expense and effort involved. It was also suggested that NHTSA consider interviewing those drivers who survived a traffic crash in which a fatality did occur.

The group cautioned NHTSA not to limit itself to a narrow focus of study by addressing only the fatally injured driver group. The hypothesis was made that the fatally injured drivers represent a more narrow

distribution of drivers than the general population on the road driving under the influence of alcohol; that is, fatally injured drivers do not represent a cross-section of drinking drivers. One participant argued that this approach was reminiscent of the accident proneness search, for which there is little evidence. The group did agree that the identification of traits, personality profiles, or other such factors peculiar to the fatally injured driver is an empirical question that should be addressed within the framework of the above study. Expansion of the study in this direction would provide useful information for the development of prevention and countermeasure strategies directed toward drinking drivers.

One participant did have reservations regarding the feasibility of obtaining adequate data about those drivers who were fatally injured. This participant noted that the data outcomes from past "psychological autopsy" studies have been flawed. The seriously injured driver was suggested as a more useful category for obtaining more information from drivers. The constraints in obtaining adequate data from the seriously injured driver population were also noted by workshop participants. Both legal and practical constraints exist in obtaining BAC levels from this group of drivers. To obtain a BAC from a seriously injured driver requires obtaining the informed consent of the driver to the purposes for which the sample is to be used (other than treatment), i.e., research. The implications of finding a high BAC with regard to licensing, insurance rates, etc., may preclude obtaining driver cooperation. In addition, the treatment given to a seriously injured driver often requires the administration of an intervening substance. From a practical standpoint, this presents problems for obtaining BAC information with any accuracy from this driver group. (This is an even greater problem in trying to determine the presence of drugs other than alcohol.)

The group reiterated the importance of factoring out the social factors involved in the fatally injured drivers' drinking practices. As with the "Survey of Drinking Drivers" study, participants suggested that the data collection and analysis methods be designed to answer such questions as: where did the drinking take place; what kind of alcoholic beverages were

consumed, and what were the characteristics of the drinking situation.

Concern was generally expressed that the level of funding would not be adequate for the study's goals. Although the project is to be a joint effort with the National Institute on Alcohol Abuse and Alcoholism (NIAAA), the NIAAA funding estimates were not readily available for the group's use.

3.3 Additional Research Topics for Problem Identification

A number of problem identification research questions for NHTSA were identified by the workshop participants. The group suggested that these issues need to be addressed if NHTSA is to develop a more effective approach to the alcohol and highway safety problem.

Proximate behavior prior to traffic crash involvement should be investigated as a function of BAC. Findings may be of value in countermeasure development related to highway design. Participants noted that information is still needed regarding the effects of alcohol on drivers. Information about the physiological effects of alcohol in the driving context is still needed. For example, what is known about the ways drivers use their eyes; how does this differ for sober and for drinking drivers. Additional efforts should be spent in studying the effects of alcohol on driving behavior: (a) as a function of low BAC levels; and (b) as a function of the individual determinants of variability. This latter notion includes the study of both within and between subject variability as well as situational influences.

Information is also needed regarding the decision-making processes of drinking drivers; participants noted that the individual's decision-making process with regard to drinking and driving behavior as well as the drinking driver's decision-making processes on the roadway are still to be delineated. In a more general context, this requires that the process of risk-taking and drivers' decisions to take risks must be understood. More must also be learned about the recognition processes of drinking drivers and how to communicate with them in terms of road signs and roadway design.

The workshop group also noted a better understanding of the differences and similarities between the novice and the chronic drinker is needed. It is likely that the experienced drinker is better able to cope with the behavioral effects of alcohol, both physiological and psychological, than is the novice drinker. Little information, however, is available for assessing the differential effects of alcohol among different driver groups. Somewhat analogous to this, one participant suggested more study of the novice and the experienced driver. One would expect the experienced driver to cope with hazards on the roadway better than the novice driver. In addition, the age of the novice driver is frequently very close to the age of the novice drinker. Thus, this driver may pose a special problem for highway safety in trying to perform under two relatively unfamiliar conditions at the same time.

The workshop group also recommended that more effort be directed toward defining and understanding the driving task. Participants noted that very little is really known about the behavioral demands placed upon drivers on the roadway. Measures of the overall performance of driving behavior are also needed. These responses, tasks, behaviors, and skills involved in driving underlie the whole area of highway safety--from driver training to vehicle and roadway design. It may be possible to remove some of the hazards in driving for most impaired drivers (not just the drinking driver) if this kind of information were available. The problem of defining impaired driving without a "good" driving standard was pointed out.

Participants reiterated their concern about broadening the scope of the problem identification studies. Projects concerning fatally injured and on-the-road drivers as well as persons arrested for impaired driving should be supplemented by the study of drivers injured in traffic crashes. This driving population, that is substantially larger than the fatality group, has not been adequately studied and may differ substantially from other groups.

The workshop group noted the importance of monitoring the National Alcohol-Crash Experience. Noting that BACs are reported for less than twenty-five percent of driver fatalities nationwide, the panel recommended

that NHTSA encourage states to determine BAC of all driver fatalities possible and to enhance the quality of BAC data in the FARS, NASS, and NCSS.

The examination of secondary data sources was recommended to NHTSA. Available statistics, information, and reports should be examined to answer fundamental questions related to alcohol and highway safety. The collation of coroner reports, police accident reports, and driving history records was mentioned as one approach that could be combined with questionnaire-based interviews. This approach could be more cost-effective than large-scale surveys and could address such questions as:

- Are persons with one or more alcohol-impaired driving arrests or convictions also involved in traffic crashes?
- How do persons receive several such convictions and still retain a license to drive?
- To what extent do persons whose license to drive has been revoked for such convictions continue to drive?

Participants suggested that NHTSA put effort into better disaggregating the data collected in its driver studies. Possible variables for disaggregation include: age, sex, driving experience, and driving exposure. Answers to some of the research questions posed may be found in already existing data.

3.4 Summary

A better understanding of socialization in the use of alcohol and of restraints against its excessive use is needed to deal more effectively with the alcohol and highway safety problem. The workshop noted that this objective requires a long-range research program and recognized that this luxury has not yet been afforded to NHTSA. Participants noted, however, that NHTSA's approach to the alcohol and highway safety problem traditionally has focused on identifying ways to arrest the drinking driver. NHTSA should consider adopting a broader approach in this area.

Two specific NHTSA projects were identified and discussed in this area:

"Survey of Drinking Drivers," and "Background Survey of Fatally Injured Drivers." The workshop generally agreed with the approach taken in the "Survey of Drinking Drivers" study for identifying the characteristics of the population on the road driving under the influence of alcohol. The focus upon the DWI arrest group (as opposed to earlier studies of DWI Convictions) was supported.

It was recommended that the scope of the "Background Survey of Fatally Injured Drivers" study be expanded to include other accident types. Both personal injury and property damage accidents were suggested. NHTSA should also consider interviewing drivers who survived a crash in which a fatality did occur. Drivers who have low (less than 0.05% w/v) or zero BAC should be included in both surveys for the purpose of comparison.

A number of additional research questions in this area were identified. These involve the psychopysiological effects of alcohol. The workshop indicated that these issues need to be addressed if NHTSA is to develop a more effective approach to the alcohol and highway safety problem. These issues are:

- the physiological effects of alcohol in the driving context and subsequent response differences between sober and drinking drivers;
- the risk-taking and decision-making processes of drinking drivers; and
- the differences and similarities between the novice and the chronic drinker.

Finally, the workshop group recommended that effort be directed at defining the driving task. The problem of defining "impaired driving" without a "good driving" standard was pointed out. The workshop noted that very little is really known about the behavioral demands placed upon drivers on the roadway. Measures of the overall performance of driving behavior are needed.

4.0 COUNTERMEASURE DEVELOPMENT, TEST, AND EVALUATION

This working session considered projects corresponding to the second Transportation Research Board (TRB) category of 403 activity, Research and Development to Assist in Meeting 402 Goals (see Table 2-2). Projects for review in this session were drawn from the following NHTSA categories:

- Program/Countermeasure Development (II);
- Test and Demonstration (III);
- Evaluation (IV); and, where judged appropriate,
- Technology Transfer (V).

Although the National Highway Traffic Safety Administration (NHTSA) categories do not correspond exactly to those described in the TRB Conference as basic areas of NHTSA 403 activity, the TRB categories were used to group projects for consideration in working group sessions. The reasons for this grouping have been outlined in Section 2.2.

4.1 Background

The projects discussed in this session belong to eight alcohol program areas proposed in NHTSA's five-year plan. These program areas, according to NHTSA, "support one of three proposed approaches to solving the alcohol problem." The three approaches are:

(1) limiting the opportunity for high risk groups to drink and drive,

(2) influencing the motorists' decision to drink and drive, and

(3) reducing the consequences of drinking and driving (U.S. Department of Transportation 1979, p.52).

According to NHTSA's 403 Plan, project development (i.e., countermeasure development) will remain strongly funded across all five

years of the program plan; tests and demonstrations are de-emphasized in the later years. The 403 Plan further states: "Emphasis will be on early delivery of products to the states. Evaluation work increases after FY 1980 and 1981, to accommodate the expected increase in the implementation of new projects in future years" (U.S. Department of Transportation 1979, p.11). The TRB conference participants generally supported efforts to deliver products to the states and evaluation efforts. However, strong concern was expressed that products not be advocated until they have been discovered and evaluated: "Practioners are concerned that approaches not be sold until they have been proven to work . . ." (Transportation Research Board 1979, p.113) The TRB conference report further states:

> Discovery efforts must be free from pressures to "discover" what will support the advocacy program of the moment. This does not suggest that research should not support short-term NHTSA goals. What it does suggest is that research efforts should be conducted in an organizational milieu that facilitates and rewards objectivity. A separation of discovery and advocacy is necessary to obtain objectivity, to develop needed long-term programs, and to enhance the credibility of the NHTSA advocacy role. Conference participants recommended that the discovery function, including evaluation as a component of discovery, be administratively separated from the advocacy function. (Transportation Research Board 1979, p.114)

The specific recommendations by the Transportation Research Board workshop reviewing the Alcohol and Drugs Program also reflect the above concerns. (Transportation Research Board 1979, pp.59-60):

- NHTSA should include in its development projects some provision for evaluating the end products that are developed.
- A better technology base should be developed before proceeding with public information to support enforcement.
- New approaches are needed to the treatment of social and problem drinkers who drive.

As previously noted, the projects discussed in this working session

reflect NHTSA's three approaches to the alcohol and highway safety problem. Projects within the first approach are geared to **reducing the opportunities** to drink and drive for high-risk groups. Projects within the second approach are aimed at **influencing the decision** to drink and drive; better enforcement of DWI laws as well as public information and education programs are included. **Reducing the consequences** of drinking and driving constitutes NHTSA's third approach; the environment, the vehicle, and the driver are all potential targets for countermeasure development. This category of effort represented the largest number of projects discussed in the workshop.

4.2 Discussion

Several themes emerged in this workshop session regarding the general thrust of NHTSA's program. The issues that NHTSA should be giving careful consideration to according to the workshop participants include:

- prevention,
- long-term research, and
- evaluation.

The workshop participants noted that the driver has for the most part been the primary focus for the countermeasure approach to the alcohol and highway safety problem. They suggested that other groups be looked at as possible control mechanisms for the development of **preventive measures.** For example, one could study the parameters of supply (as well as demand). Conditions for controlling the availability of alcohol, such as hours sold, where sold, etc., could be more thoroughly explored as prevention measures.

Related to the need for a more prevention-oriented program, participants observed that in general the NHTSA research programs have lacked continuity; projects are scheduled for one year, and a new one begun in the next year. The workshop emphasized the necessity of including **long-term research** in the NHTSA research program. The workshop recognized that NHTSA operates within certain constraints, one being a limited amount of funding. Nevertheless such constraints do not

obviate the need for long-term research.

Finally, the importance of **evaluation** was a recurring theme throughout the workshop session for any countermeasure or prevention programs that are undertaken. Participants recommended that independent contractors be used for this task rather than either those who have developed the project or persons from the NHTSA central office. This issue was exemplified in the workshop discussions on the "Develop NHTSA/NIAAA Treatment Programs for PDs" projects. Participants suggested that not enough data are now available to support the development of national guidelines for referral and questioned the wisdom of advocating such programs when treatment outcomes remain unknown. The workshop noted that what is needed is evaluation of existing programs rather than the development of new ones.

Project specific comments follow.

4.2.1 Evaluate Benefits of Raising the Drinking Age. Following is the NHTSA project description:

> In the last several years a number of states have lowered the age at which liquor may be purchased. Several studies have shown that nighttime crashes involving teenagers have increased as a result. This has led to legislative action to raise the age back to a higher level. NHTSA will undertake a study to determine whether this return to the previous level results in a reduction in nighttime alcohol-related crashes involving young drivers. As data become available from project areas 1.1 and 1.2, additional high risk groups may be identified, in which case a determination will have to be made as to whether these groups would be amenable to countermeasures of this type. (U.S. Department of Transportation 1979, p.56)

NHTSA resource persons pointed out that this project is currently underway. Furthermore this project has been removed from the 403 Plan and has been designated as an "in-house" study. No compilation of data for dissemination is planned. Thus, participants indicated that little workshop time should be spent discussing it.

Generally, the project received little support from the panel. Reasons included: the belief that the measure had already been adequately

evaluated; drinking age would have to be raised to twenty-five to thirty years to make a difference, and this could not be sold; and reanalysis of information from the states is not worth the intended result.

Participants did note, however, the necessity of long-term study in assessing the effects of a measure such as raising the drinking age. One participant suggested that a one-year study of effects would provide inconclusive data; effects must be shown to persist for at least three to five years before conclusions regarding such a measure can be drawn.

4.2.2 Explore the Feasibility of Developing Driving Restrictions for Novice Drivers. The NHTSA description of this study reads:

> Most states permit the licensing of individuals under 18 only under special conditions such as completion of a driver education course. The effectiveness of restrictions on nighttime driving, more stringent requirements for remedial driver improvement courses in the event of an accident or a violation, and lowering the BAC level required for a DWI arrest of the young driver will be investigated. (U.S. Department of Transportation 1979, p.56)

Evidence exists to indicate inexperience with driving and drinking combine to greatly increase the risk of traffic crash for young novice drivers. Driver education courses are assumed to have value, yet result in larger numbers of drivers aged sixteen to eighteen on the road. Measures to reduce exposure and to restrict driving privileges of young drivers are thought to be necessary to remedy this problem.

A number of recommendations regarding this project were raised by the workshop participants. First, the workshop group simply noted that evidence identifying a particular class of drivers as a highway safety problem will be necessary to develop these kinds of legal restrictions. Second, the group recommended that such driving restrictions be developed within the driver licensing system and not as criminal actions.

The majority of the workshop group recommended modifying the driver licensing system to accomplish driving restrictions rather than modifying the point system for the novice driver. As one participant pointed out,

the problem of the novice driver is inexperience; such experience will not be provided by introducing more serious consequences for certain offenses in this group of drivers. A provisional licensing law whereby licenses are reissued annually or an extension of the probationary period would provide the young drivers with the necessary experience by not totally restricting them from the road. The young driver is still learning and needs this kind of exposure to a wide variety of hazards on the road, including those associated with drinking and driving. Several years of exposure must pass to gain this kind of experience.

Panel members pointed out an Illinois study that indicates that the problem is not simply with newly licensed young drivers but with those who have been driving one to two years. Furthermore, epidemiological data indicate an increased risk of alcohol-related accidents until the age of twenty-five. Given this information, an additional area for NHTSA to explore might be the feasibility of issuing an "adult" driver's license only after several years of driving experience. Within this licensing scheme, renewals could be made at one-year intervals up to age twenty-five with declining provisions for being called in with increasingly safer records. Recognition already exists for this driver age limit (i.e., 25) with regard to the insurance community.

The project received a very low priority ranking from Group B. The participants believed the study would not address the current issues in the alcohol and highway safety area.

4.2.3 Enforcement and Public Information Strategies for the General Deterrence of DWI. This study was described in the NHTSA FY 80 Project summaries:

> Description:
>
> This project will develop and field test a "General Deterrence" program directed at DWI. The objective will be to develop a public information progam focused on one or more specific enforcement procedures and designed to increase driver awareness of apprehension risk. The underlying premise is that this increased perception of detection will influence the driver

not to drink and drive. The selection of enforcement procedures for inclusion in the project will be based on available data indicating potential influence on the DWI problem. The combined public information/enforcement programs will be implemented in one or more field locations and the incidence of DWI and alcohol associated accidents will be recorded before and after implementation.

Application:

Results will be used as a basis for determining whether any of the countermeasure approaches tested require additional testing on a more widespread (e.g., national) basis to assess the full extent of their impact. A report written as a local procedures manual will be provided to the States to assist in the implementation of the various strategies as appropriate for their highway safety programs. The manual will detail each of the enforcement/public information strategies, their characteristics, means of implementation, costs, limitations, potential problems and expected payoff. (National Highway Traffic Safety Administration Project Summaries, FY 80)

Resource persons from NHTSA pointed out that efforts to get this study underway are already in progress. Therefore little workshop time was spent commenting upon it. The panel in Group B strongly supported the project because it supported the general-deterrence approach (strict enforcement combined with PI&E campaigns). Many participants in this group believed that approach represents the only viable solution to the drinking driver problem presently known.

4.2.4 Nystagmus Test Field Evaluation. This project was described in NHTSA's 403 Plan:

For roadside investigation of suspected drunk drivers, police in this country employ a variety of techniques from portable breath-alcohol instruments to a variety of psychomotor tests. In recent years, however, the psychomotor tests--walking the line, body sway, coin pick up, etc.—have been shown to be highly unreliable indicators of alcohol impairment.

A research program was initiated in 1977 by NHTSA to develop a more accurate behavioral test of impairment for police use. Present results indicate the positional nystagmus of the eyes is an accurate indicator of alcohol impairment and may be suitable for roadside testing. (Briefly, positional nystagmus

> refers to the gross tremor of the eyes when fixed on a single point. As alcohol intoxication increases so does the degree of tremor.) (U.S. Department of Transportation 1979, p.58)

This project follows up earlier studies to identify and develop behavioral tests for use by officers in the field to detect more reliably the alcohol-impaired driver. The nystagmus test showed the most promise among several examined. Effort is presently underway.

One participant pointed out that the use of the term "positional nystagmus" in this context is not accurate. The correct term is "alcohol-gaze nystagmus." It was recommended that NHTSA modify the project description accordingly.

Panel members questioned whether the legislatures and general public will accept this kind of roadside test. They pointed out requirements for training police officers in the use of any equipment needed and for standard criteria for judging impairment. Evaluation of training manuals and video demonstrations should include tests of officers ability to judge alcohol impairment accurately. The group recommended that projects be undertaken to contribute to the operational testing and development of materials for the technological transfer to enforcement and adjudication programs and to the general public's understanding of the sobriety tests.

Questions raised about this technique include whether the results of the nystagmus test can be used as evidence and whether other drugs or driver conditions (e.g., fatigue) will interfere with the test.

4.2.5 Chemical Test Technology. Four projects were considered as a set by the workshop. The first project is "Assessment of the Potential Utility of New Devices;" its project description in NHTSA's 403 Plan reads:

> The objective of this project will be to evaluate the potential utility of new breath test devices. The results of this program will provide the States with confidence in the results of the tests which are used to determine BAC when used as evidence in court. (U.S. Department of Transportation 1979, p.60)

The second project in this group considered by the workshop was "Breath Measurement Standards Interagency Agreement" with the National

Bureau of Standards.

> This project is a continuation of a long-standing arrangement with the National Bureau of Standards (NBS) to develop standards for alcohol breath-testers, both screening and evidential. In this phase, NBS will develop performance and maintenance standards which breath-testing devices must meet once they are in operational use. The standards will address such issues as the minimum number of tests which the device must run accurately without requiring maintenance, the storage conditions which the device must tolerate, minimum battery life, etc. Similar standards will be developed for the calibrating equipment to be used with the testers. The specific issues addressed in the standards will be determined through information exchange between NBS and users of the devices. (National Highway Traffic Safety Administration Project Summaries, FY 80)

"Alcohol Breath Test Standards" is the third project in this set; its project description is as follows:

> This project is a continuation of a long-standing arrangement with the National Bureau of Standards (NBS) to develop standards for alcohol breath-testers, both screening and evidential. In FY 1980 and 1981, NBS will develop performance and maintenance standards which breath-testing devices must meet once they are in operational use. The Standards will address such issues as the minimum battery life, etc. Similar standards will be developed for the calibrating equipment to be used with the testers. The specific issues addressed in the standards will be determined through exchange between NBS and users of the devices.
>
> NBS will also make any modification in existing breath test device standards, that are specified by NHTSA as necessary.
>
> Qualified Products Lists of breath test devices that meet the standards will be provided to the States for their use when purchasing these devices. Any devices purchased with Federal funds are required to meet these standards. (National Highway Traffic Safety Administration Project Summaries, FY 81)

The title of the fourth and final project in this set considered by the workshop is "Develop New Standards: Passive, Remote Collection and Transfer Breath and Blood Standards Program." Its project description is found in NHTSA's 403 Plan.

> Current alcohol safety enforcement is based upon the use of chemical tests for alcohol. The NHTSA has been supporting these efforts by maintaining a Qualified Products list and an associated standards program for breath testing devices to assist the States in insuring the quality of the equipment they purchase. This effort will be continued, together with an effort to persuade the States to adopt roadside breath test laws, and to adopt laws making it illegal **per se** for persons to drive with a blood alcohol level of .10%. In addition, NHTSA has been and will continue to conduct a limited effort to evaluate new breath testing devices.
>
> Development of performance standards for new forensic breath alcohol measurement instrumentation is provided for in this project area. Standards for such new devices as the roadside preliminary breath tester have recently been developed and an additional standard for remote breath sample collection units is planned.
>
> NHTSA presently operates a voluntary blood alcohol proficiency testing service to the states. Participated in by over 100 laboratories across the U.S., this program is intended to upgrade the quality of blood alcohol analysis for drunk driving cases in the States. Long range plans call for the transfer of this program to the Center for Disease Control, HEW. This task provides for interim program operation until transfer occurs. (U.S. Department of Transportation 1979, p.60)

These projects were considered as a set by Working Group B. It gave strong support to the continuation of such efforts by NHTSA. Participants recommended deleting the word "Passive" from the fourth project because of possible legal constraints and the lack of present evaluation techniques. DOT will not become involved in the development, marketing, or sales of equipment, but through these projects will stimulate and assist the development of new technology.

Participants noted the confusion evident in courts over different equipment used to measure breath alcohol concentration. Most saw NHTSA participation in the development of standards, guidelines, and lists of approved equipment as valuable. One panel member asked that NHTSA differentiate between the development of new technology and continued standardization, believing that dependence on the least technology possible was the best approach. In general, police do not appear to want remote

collection devices--their need proceeds from the court (e.g., Colorado, Arizona) in decisions about breath specimen preservation. As demand grows, however, technology (that is already available) can support enforcement equipment requirements.

Because most of these projects are currently underway, Group A chose not to spend workshop time in commenting on them.

4.2.6 Public Information for Intermediaries to Deter Alcohol-Impaired Trips. This project is from NHTSA's FY 81 project summaries: it is described as follows:

> This research will be initiated by NHTSA RD in FY 1981. The project responds, in part, to TRB's recommendation: "better technology base research (motivated research) should be developed before proceeding with public information and education programs." The project will be aimed at determining what kinds of information are needed by, and useful to, various groups of significant others, e.g., bartenders, hosts, supervisors, media executives, what media or mechanisms should be used to effectively transmit the information to the various target groups, and what the possible effects of the availability of the information would be on drinking-driving behavior.
>
> Technology base information developed during this project will be made available in subsequent research studies to develop prototype public information and education programs to be field tested. (National Highway Traffic Safety Administration Project Summaries, FY 81)

The panel indicated the project should be low in priority. The workshop noted that the revised project description still does not address the issues raised at the Spring 1979 TRB Conference (Transportation Research Board 1979, p.56). Although the effort as proposed is ostensibly a "feasibility study" or incorporates a feasibility study, the approach (intervention by intermediaries) does not appear to have utility. Participants questioned the evidence for intermediaries' ability to intervene. The group noted that the intermediaries and their possible motivations, if any, to act must still be identified. Participants cautioned NHTSA against assuming that this approach will work; the mechanisms for the possible

intervention must first be identified. It was noted that this project appears to be based on the European experience. Europeans have different psychosocial factors, i.e., they tend to be more law-abiding, respectful, fearful of law enforcement; penalties are more severe and the levying of sanctions more certain. The approach does not appear promising because of what is already known--people with serious alcohol problems are already beyond the control of intermediaries.

Participants who supported the project emphasized that drinking drivers include not only problem drinkers but social drinkers as well. The project addresses information needs that include:

- the kind of information that can be provided to bartenders (e.g., dram shop laws and their application);
- the kind of information that can change knowledge and behavior related to alcohol-impaired trips; and
- the kind of information needed for intermediaries to pass on to potential drinking drivers, for instance, to be presented in bartender schools.

4.2.7 Continue Judicial Training Efforts in the Presentence Investigation.

> As a result of several years of experience with ASAP diagnostic and evaluation efforts, a pre-sentence investigation training program has been developed which shows judicial personnel how to most efficiently conduct pre-sentence investigations which have good discriminability. this training program has been used in a number of localities (upon request) and the service of providing such training will be continued for another year. (National Highway Traffic Safety Administration Project Summaries, FY 81)

There were no comments on this project.

4.2.8 Development of Treatment Guidelines and Treatment Programs. Two NHTSA special-deterrence projects (Project Area 7) were discussed together in the workshop session. These were: "Develop NHTSA/NIAAA Guidelines Using Health Legal Approach: Diagnostic Tools and Guidelines

for Matching of DWIs and Treatments" and "Develop New NHTSA/NIAAA Treatment Programs for PDs." The "Guideline" project is described as follows:

> Develop NHTSA/NIAAA Treatment Guidelines Using Health Legal Approach: Diagnostic Tools and Guidelines for Matching of DWIs and Treatments
>
> This research will be initiated during FY 1981 through an Inter-Agency Agreement with NIAAA. The project will be aimed at the development of diagnostic and other tools, e.g., psychomotor tests, interview guides, etc., for use by judges and other local officials in making individual case decisions regarding referral and treatment for problem drinker DWI offenders. The project will also investigate the feasibility of enhancing existing diagnostic instruments, e.g., paper and pencil tests, background surveys, etc., and the analysis and assessment of various treatment approaches, e.g., DWI schools, counseling, etc., and sanction approaches, e.g., license suspension, jail, ASAP programs, etc., in order to develop treatment referral guidelines.
>
> A manual and supporting materials will be prepared which describes the diagnostic, referral, and other tools developed from this project, suitable for use by judges and other local officials for making decisions regarding referral and treatment for problem drinker DWI offenders. (National Highway Traffic Safety Administration Project Summaries, FY 81)

The above description has replaced the "Using Health-Legal Approach to Develop NHTSA/NIAAA Treatment Guidelines" project description in NHTSA's 403 Plan (U.S. Department of Transportation 1979, pp.61-62).

The "Program" project description as from NHTSA's 403 Plan:

> Develop New NHTSA/NIAAA Treatment Programs for PDs
>
> Upon completion of the new guidelines, development of treatment programs meeting these criteria would be undertaken and then pilot tested. Several different treatment programs are envisioned. NIAAA would be the lead agency in the development and NHTSA would be the lead agency in the pilot testing. (U.S. Department of Transportation 1979, p.62)

Three main issues were raised by the workshop participants regarding the above two projects. Each will be discussed in turn.

The first issue regarded the known efficacy of the treatment programs. The participants suggested that not enough data are now available to support the development of national guidelines for referral and questioned the wisdom of advocating such programs when treatment outcomes remain unknown. The group noted that what is needed is evaluation of existing programs rather than the development of new ones. Furthermore, the group pointed out that the sequence of the two projects appears to be backward; that is, if the efficacy of treatment is not known, what decision base exists for developing the guidelines for referral? The participants recommended first finding a treatment that works and then developing the guidelines for referring the DWIs into that system. The development of guidelines now is premature.

Second, the workshop group recommended that NHTSA concentrate on measures that fall within the purview of the traffic safety system. There was a consensus that NHTSA should not focus its efforts on developing health-based treatment and rehabilitation programs. Such activity was considered a duplication of NIAAA's larger efforts in this area. NHTSA's efforts are more appropriately focused on elements of the traffic safety system such as the courts or state departments of motor vehicles and what they can do to reduce the incidence of drinking and driving. Along these lines, it was suggested that NHTSA be precise in its use of the term "treatment." The group agreed that it was appropriate for NHTSA to study the referral of drivers to alcohol treatment programs but the development of those programs should be left to other agencies.

Third, the workshop group agreed that interagency cooperation needs to be maintained. NHTSA's efforts here should be spent in trying to stimulate other agencies (i.e., NIAAA) to evaluate existing treatment programs with regard to the population of interest to NHTSA. It is the driver who drinks that is NHTSA's concern. However in the view of the workshop participants, the development of a treatment program for the population falls within the domain of NIAAA; the application of that program to the driver referral system is NHTSA's responsibility.

The group also supported the TRB recommendation to drop the use of

the term "problem drinker" (Transportation Research Board 1979) from both these projects. The group again pointed out that the term lacks precise definition. The "DWI driver group" was suggested as an alternative term for the population of concern.

4.2.9 Complete Comprehensive Treatment Demonstration. The project description for this project is from NHTSA's 403 Plan.

> A demonstration to assess the effectiveness of a comprehensive rehabilitation program for persons convicted of Driving Under the Influence (DUI) is presently being conducted in Sacramento, California by the NHTSA. Methodology includes random assignment of a no-treatment control group to one of a variety of treatment alternatives in addition to monitoring of driver records for a two year follow-up period. Additionally a proportion of drivers will receive periodic interviews to detect subtle changes in life styles as a result of attending the comprehensive treatment. This project is incrementally funded through FY 1981. (U.S. Department of Transportation 1979, p.62)

The NHTSA resource people noted that project is in its last year. Neither workshop group commented upon it.

4.2.10 Study of Alternative Sanctions Such as Community Service Programs for DWIs. This project stems from the perception that treatment programs are not effective and that jail sentences are simply not assigned. The need for alternative sanctions for DWIs and PDs is its focus. Its description is from the National Highway Traffic Safety Administration FY 81 Project summaries.

> Several promising misdemeanor sanction alternatives have recently been identified. These sanctions include restitution community service, the "day-fine" system, partial confinement and award of punitive damages for injuries caused by drinking drivers. There is an effort underway by LEAA to evaluate the utility of community service and restitution. This evaluation is directed at all types of misdemeanor offenses not strictly traffic related violations.
>
> Efforts need to be initiated to document and ascertain utility of these alternatives in regard to traffic offenses and highway

> safety. Areas such as offender response and recidivism and value of community service should be reviewed. ASAP experience has shown that the courts are eager to accept alternative sanctions for traffic offenses which help them individualize sentences and aid the offender and the community.
>
> The Adjudication Branch of TSP has described an approach to this area in an overview of a proposed paper on alternatives to traditional sanctions. This study would implement the ideas in this paper by reviewing the efficacy of existing alternative sanction programs in regard to traffic offenses and highway safety (NHTSA Project Summaries, FY 81).

The project did not receive overwhelming support in the workshop. In Group B it was strongly supported by two; low priority was given by two. The rest abstained. No comments were made in Group A. Supporters cited the need for such "arm-chair" studies of identified alternatives. They recommended that such alternatives be documented in a useful form and be provided to communities for trying them out. They also supported this project as another example of interagency collaboration (with LEAA) that NHTSA, they believe, should attempt with greater frequency.

Those not supporting the inclusion of this project in the 403 Plan pointed out that the failure of the adjudication system was due to severe sanctions called for in state statutes. Such sanctions are avoided by the courts, and records of impaired driving arrests are not developed. Diversion programs only exacerbate the situation. They suggested one (apparently not so obvious) alternative—**change** the existing statutes. Stiff jail sentences do not work. NHTSA should encourage states to adopt changes in statutes more in line with the times.

4.2.11 Revision and Pilot Test of DWI Enforcement Training Materials. This project replaces the "Develop Model Offenders Act with NIAAA and Department of Justice" in NHTSA's 403 Plan (U.S. Department of Transportation 1979, p.63). Its purpose is to update the material already in existence.

> Enforcement is a key measure in the deterrence of drinking and driving behavior. It has been shown through experience in

> the ASAPs that a key element in increasing DWI arrests is an effective training program. The objectives of this project are threefold: (1) to revise and update the multitude of existing materials which deal with the detection, apprehension and processing phases of DWI enforcement; (2) explore various methods for disseminating and presenting such information in a cohesive package; and (3) pilot test such a dissemination and presentation process in a State enforcement system (NHTSA Project Summaries, FY 81).

A number of high-priority marks were given to this project as written. The major comment was that funds allocated appeared too low for the scope and intention of the project. An increased funding level was recommended to ensure its adequate conduct and completion. No other comments were made.

4.2.12 Study of Existing Means for Gaining Increased Financial Self-Sufficiency for Alcohol Countermeasure Programs. This project has replaced the "Evaluate State Implementation of Traffic Violations Aggravated by Alcohol (TVAA)" (U.S. Department of Transportation 1979, p.63).

> As long as reasonably comprehensive alcohol programs must depend on State of Federal Funds to operate, such programs will be few in number and too short-lived to take a significant reduction in the problem. Several programs have found ways for supporting diagnostic and treatment efforts, but few have found means for supporting the management, enforcement and media efforts which must be incorporated into any meaningful program. At the same time, considerable funds are generated by enforcement and adjudication efforts which are generally not redistributed equitably relative to where the costs are incurred. A study of existing self-sufficiency programs including fines, fees and taxes is to be accomplished and a review of the legislative and political obstacles to a more equitable redistribution of funds generated in such programs is to be conducted. (National Highway Traffic Safety Administration Project Summaries, FY 81).

The group concurred on the utility of assembling information about the ways that countermeasure programs can pay for themselves. Several participants characterized this project as what was needed and wanted at state and local levels. Information about programs funded in part by

client fees and other means besides Federal and State dollars is hard to obtain; self-sufficiency is a concept that is pushed, and Federal assistance would greatly assist in developing program designs that lead to self-sufficiency.

Supporters of the project noted that the project belonged in the 403 Plan category dealing with support and technical assistance to states and indicated that program people, especially local agencies unable to monitor other states' programs, would welcome this information.

The participants added a strong caution that the self-sufficiency of a program is not confused with the effectiveness of the program and emphasized that the results of this study be applied only to programs of proven worth.

Other panelists pointed out that this project did not represent research or development efforts appropriate to 403 Plan activity. In addition, the great variance among programs and approaches would reduce the utility of project findings. Although they found the idea meritorious, they thought the project should not be done with 403 Plan funds. It was further pointed out that the "TVAA" project, which was replaced by the present one, had been given high priority by the earlier TRB workshop panel.

4.2.13 Develop Roadway Countermeasures with FHWA to Reduce Alcohol Impaired Effects. This project follows on earlier research to identify alcohol-accident types (time of day, type of roadway, crash characteristics). It will focus on further definition of impaired driving accident types and the identification of countermeasures that may be effective.

> This research will be initiated by NHTSA RD in FY 81 to develop countermeasures which either reduce the consequence of alcohol impaired driving, or help to overcome the impairing effects caused by alcohol. Included are: (1) developing and testing countermeasures for specific alcohol accident types and target groups, e.g., wrong way driving, moth effect truck drivers, and (2) identifying countermeasures which overcome the impairing effects of alcohol and fatigue. The project will develop potential countermeasures directed at the environment, e.g., rumble strips, barriers, signs; the vehicle, e.g., continuous

monitoring devices; and the driver, e.g., additional training prior to initial licensing. The project will also assess countermeasures feasibility, e.g., cost, legal, technical, and based on these evaluations subject the most promising to laboratory testing or to limited field testing.

Based on project results, promising environmental, vehicle, and driver countermeasures will be subjected to full scale testing, or, in certain cases, may be recommended for public implementation. (National Highway Traffic Safety Administration Project Summaries, FY 81).

One recommendation made by the workshop was to strike the word "alcohol" from the project and deal with the effects of impaired driving. It was suggested that focusing upon a reduction in roadway hazards for the impaired driver might be more publicly acceptable than making the driving task easier for the drinking driver.

The group also questioned whether the level of funding was adequate for the task described.

4.2.14 Program Evaluation Support. This project represents services, hardware, and in-house support to state and local agencies and programs.

To support the continuing efforts involving the design and implementation of evaluation plans associated with demonstration programs as well as national traffic safety programs. The support costs can be broken down into the development and acquisition of data systems and data bases, computer support costs to perform time series analysis, and statistical evaluations of demonstration projects and computer costs for accessing national data files (FARS, NASS) to identify high crash groups. Also, to obtain scientific impact data on State funded projects of special interest in order to facilitate adoption by other states. (National Highway Traffic Safety Administration Project Summaries, FY 81)

The practitioners in the workshop strongly supported the project. They strongly recommended that manuals be developed to outline how to evaluate (i.e., the techniques and designs) programs. This would be helpful for use in fulfilling the NHTSA requirement to assess program effectiveness. This was suggested as a specific addition to the language of the project description.

A number of participants did question how this project fit into the alcohol program area; it was noted that no mention of alcohol is made in the summary.

4.2.15 Develop Alcohol Pedestrian Countermeasures. This project is found within the NHTSA Pedestrian/Bicyclist/Pupil Transportation Program Area. It follows on research to define the alcohol-pedestrian safety problem. Alcohol has been found highly overrepresented, especially at high BACs.

> This project will develop and test feasible countermeasures to aid in the reduction of alcohol related adult pedestrian accident types. New technological information will be provided to the states. (U.S. Department of Transportation 1979, p.73)

A number of workshop participants judged the available project information inadequate for comments to be made on the project. Other participants thought that countermeasure ideas for pedestrians were not sufficiently advanced to support a development and testing project. They recommended, if the project were funded, that it focus on the identification and assessment of feasibility of alternative countermeasures. They cited possible legal and public acceptance problems to some ideas mentioned by NHTSA (e.g., sloping sidewalks to prevent staggering into a roadway, barriers at nonintersections). They also pointed out that errors by alcohol-impaired pedestrians are similar to those committed by other nonalcohol-impaired pedestrians.

4.3 Identification of Additional Countermeasure Program Research Topics

Both short-term and long-term research projects were identified by the workshop group.

A number of suggestions focused upon public information and education. One project that could be started soon is the development of a brief package for courtroom use in lieu of expert testimony to explain the meaning of BAC. This could have significant cost and effectiveness implications for DWI prosecutions. Moreover, there could be spinoff

potential in this project in terms of knowledge transfer to counselors, judges, and juries. Other participants questioned whether such a package could realistically replace expert testimony. While it might help the judge to better understand the concept of BAC, it was noted that the laws on DWI make the use of expert witnesses unnecessary for the most part. In vigorously contested cases, such a package could not replace expert testimony if technical questions are to be answered, especially before a jury. Informing judges was seen as useful but as not accomplishing the other suggested goals of the courtroom package concept.

A second suggestion within the PI&E area focused upon the method of communication. The workshop group noted that much PI&E has not been shown to be effective. Preliminary work on the channels of communication is necessary; these channels of communication need to be evaluated as such before selecting which should be used. NHTSA must consider the appropriateness of the mechanisms for communicating the message as well as the content of the message.

Other suggestions focused upon the sanctions administered to drinking drivers. One suggestion was that NHTSA re-initiate research on the feasibility of requiring display of driving licenses during the operation of motor vehicles. Licenses could be "color-coded" to indicate prior DWI conviction. Eight of ten panelists present in Group B gave this project recommendation a high priority rating. One participant suggested exploring the cost-effectiveness of fines and penalties; that is, to learn what the response of people is to such sanctions and if they work as intended. Another participant suggested investigating the feasibility of adopting the halfway house concept to DWI offenders. These offenders could be required to check in and spend each night at a designated building for a specified period of time. A limited driving permit would be extended to the individual. Thus, the person could continue to work, would avoid jail, and avoid negative consequences to the welfare of other family members.

It was also suggested that NHTSA look to other areas for new approaches to the control of drinking and driving. One participant suggested that the technology of behavioral contracting be explored.

Behaviorial contracts refer to voluntary agreements made between a subject and a sponsor; such agreements have been used in the medical area between patients and physicians, for example, to control blood pressure problems. It may be possible to apply this to drivers also. Drivers and the court could enter into behavioral agreements that would allow the drivers to make predictions about and control their own behavior. For example, the driver may agree that he can drink as often as he wants but cannot drive afterward; or because drinking and driving increases accident risk, the driver will agree that he and all occupants will use their safety belts to reduce the consequences of a potential accident. A number of small-scale experiments would need to be done to see if individuals who commit themselves to staying with certain limits over a certain period of time (provided rewards are attached) do so and to see the effects on their behavior.

One long-term research program was suggested. It dealt with the study of social change. Specifically, it was suggested that NHTSA might consider exploring the willingness of local juries to convict on DWI charges. This would be a retrospective-type study in which a nationwide survey of the percentage of DWI convictions by juries was conducted. One would then look at the communities with a steady increase in DWI convictions and retrospectively try to identify what happened in the community that might be responsible for the greater willingness to convict. This would be a kind of countermeasure discovery study.

4.4 Summary

Three themes emerged in the workshop regarding this area of NHTSA's program. The issues that NHTSA should carefully consider include:

- prevention;
- long-term research; and
- evaluation.

The workshop noted that the driver has for the most part been the focus for the countermeasure approach to the alcohol and highway safety problem. It suggested that other groups be looked at as possible control

mechanisms for the development of **preventive measures.** Conditions for controlling the availability of alcohol, such as hours sold, where sold, etc., could be more thoroughly explored as prevention measures.

Participants observed that in general the NHTSA research programs have lacked continuity; projects are scheduled for one year, and a new one begun in the next year. The workshop emphasized the necessity of including **long-term research** in the NHTSA research program. The workshop recognized that NHTSA operates within certain constraints, one being a limited amount of funding. Nevertheless such constraints do not obviate the need for long-term research.

Finally, the importance of **evaluation** was a recurring theme throughout the workshop session for any countermeasure or prevention programs that are undertaken. Participants suggested that independent contractors be used for this task rather than either those who have developed the project or persons from the NHTSA central office. This issue was exemplified in the workshop discussions on the "Develop NHTSA/NIAAA Treatment Programs for PDs" projects. Participants suggested that not enough data are now available to support the development of national guidelines for referral and questioned the wisdom of advocating such programs when treatment outcomes remain unknown. The workshop noted that what is needed is evaluation of existing programs rather than the development of new ones.

5.0 KNOWLEDGE TRANSFER

This working session reviewed projects that fall into the category of 403 activity termed **knowledge transfer** by the TRB Conference (see Table 2-2). This category, for the most part, corresponds to the fifth step in NHTSA's "management process" approach to program planning, **Technology Transfer** (V) (see Table 2-1).

5.1 Background

NHTSA has outlined its technology development, transfer, and implementation program in the proposed five-year 403 program plan (U.S. Department of Transportation 1979, pp.20-28).

> The information acquired during technology development is presented to the States in a variety of forms and ways as it becomes available. Information to be made available to the States includes problem and project descriptions, program effectiveness data, and technical assistance to the States for program implementation and evaluation. Advice will be offered on program implementation, management, organizational and material requirements, and availability of supporting resources and materials available from the NHTSA. Research, development, and demonstration products, having been suitably evaluated to determine their effectiveness, are recommended to the States by means of reports, program guidance manuals, the conduct of seminars, conferences, and workshops, on-site technical assistance, and in some cases through national legislation. (U.S. Department of Transportation 1979, p.26)

In the TRB review of NHTSA's proposed 403 Program, the importance of **knowledge transfer** was acknowledged (Transportation Research Board 1979, p.114). At the same time, deficiencies were noted:

> There are many problems associated with NHTSA's present knowledge transfer effort. Basically, the system does not effectively disseminate results or products of research effort. A major part of the problem is that the knowledge base in highway safety is not well defined and the information that is

> available has not been compiled, analyzed, and catalogued properly. In addition, minimal assistance is provided to states in adopting or adapting new technologies. The principal vehicles for transferring knowledge--demonstration programs and research reports--have not been used very effectively.

In addition, fundamental differences between NHTSA's view of the role of demonstration projects and those of TRB reviewers were evident. For example, NHTSA considers demonstration projects as a means to test the effectiveness of a proposed countermeasure program (U.S. Department of Transportation 1979, p. 26). Both the TRB review and a 1978 report by the Office of Technology Assessment conclude that demonstrations should not be undertaken "until the technology to be demonstrated is, in the language of the OTA report, 'well in hand'" (Transportation Research Board 1979, p.115). Thus, a "demonstration project," in the language of NHTSA, may actually represent an effort to test a countermeasure program. From the TRB perspective, a "demonstration project" is an instrument of advocacy, one that transfers--and sells--a program proven to be effective in the setting for which it is intended (Transportation Research Board 1979, p.115).

5.2 Discussion

A concern of the workshop was the narrow range of projects within the knowledge transfer project area. This area for the most part appears to be limited to product development with only limited dissemination of these products. The plan does not appear to encompass identification and analysis of user groups; no effort in developing a distribution system or a system of information transfer could be readily identified. The group noted that this was one of the major TRB recommendations with regard to this program area:

> An investigation of methods of technology transfer should be a separate program area, and projects dealing with this area should be considered under this program. (Transportation Research Board 1979 p. 60)

Members of the workshop again recommended that NHTSA improve its

dissemination process.

The panel identified two types of technology transfer:

- dissemination of products developed, tested, and evaluated with 403 funds to users in the field sense; and
- dissemination of technical research products to the research community.

The first type appeared to be of greatest concern. Participants emphasized NHTSA's critical role in putting materials and tools that help into the hands of people in the field. In the past, products of 403 activity have been found useful; for example, high quality materials such as "television spots" have been excellent. Nevertheless, unless the process by which such materials are transferred to user groups is improved, their potential impact will never be realized.

In addition, NHTSA should be responsible for follow-up efforts to assess user acceptance. Participants noted that very few projects in the knowledge transfer category contained explicit evaluation components. They questioned whether NHTSA funding levels for these projects allowed for dissemination and follow-up to assess the acceptance, use, and effectiveness of materials to agencies.

The workshop group recommended that NHTSA reallocate its efforts in this area to focus upon the design of an information distribution system. These efforts should include:

- identifying the users;
- determining the appropriate forms to present the materials to the various user groups;
- developing the appropriate mechanisms for informing the user groups and for updating their information; and
- developing a feedback mechanism within the information transfer system by which the user can question, respond to, or seek materials from NHTSA.

Recommendations for projects focusing on these efforts are discussed in Section 5.3.

Project specific comments follow below.

5.2.1 Manual and Materials Development. The workshop comments in this project area were applicable to three of the five knowledge transfer projects. All three projects are similar to what NHTSA has done in the past regarding knowledge transfer. Material is captured for transfer to operating agencies; the manual format for presentation of materials is generally accepted. The first of these projects is entitled "Manual and Instructor Training: Advanced Arrest Procedures":

> This project will be concerned with the preparation of manuals and training materials to support the transfer of advanced arrest techniques developed above to State enforcement agencies. Instructors will be trained to conduct advanced arrest technique courses in the field. This project will serve as the main technology transfer function for the Enforcement Procedure category of work. (U.S. Department of Transportation 1979, p. 58)

The project involves transfer of improved procedures and techniques and is planned to follow-up an expected successful evaluation of ongoing research and development efforts.

The second related project is "Manuals and Workshops for Enforcement Agencies"; it is described as follows:

> There are approximately ten thousand individual enforcement agencies across the Nation which must be provided with the improved techniques developed by NHTSA (see project area 3.1). In order to reach the large user population it is necessary to develop manuals and training programs which can be used by local police agencies.
>
> It is also frequently desirable to hold workshops at the State or Regional Office level to inform the officers who are responsible for training for their departments. Without such technology transfer efforts much of the results of NHTSA's research would go unused. (U.S. Department of Transportation 1979, p. 59)

This project is intended as the "delivery system" for products developed as part of General Deterrence enforcement and PI&E projects.

"Materials Development for State Support" was the third project included for discussion; its project summary follows:

> NHTSA supplies materials for use by States in their continuing DWI countermeasure programs. These materials, which include television and radio announcements, posters and pamphlets, can be identified with the name of State agencies before they are distributed to the public. Technical manuals and procedural guides for conducting systematic public communications programs in support of DWI programs are also provided to State and local agencies. In this regard, note that the public information programs developed in project area 4.1 that will be designed to increase public awareness of apprehension risk will be distributed to the States for their use. It is expected that these programs will begin to be available in FY 81 or 82. (U.S. Department of Transportation 1979, p. 59)

This project is another "delivery system" project for the General Deterrence program. These projects were given high priority by the practitioners in the group. This priority, however, depends on the quality of materials produced under R&D efforts. This approach received support, in that certain kinds of materials can be produced relatively inexpensively, with higher quality, and they stimulate a greater uniformity in a national attack on the problem. NHTSA TV spots are one example; these compete for time allocated for public service announcements and have been well received. Their quality is beyond the ability of most state and local agencies. Some panelists emphasized that these PI&E materials should be used in conjunction with enforcement programs to realize the maximum impact on the problem. They cited the inherent danger of being caught "crying wolf" all the time.

The workshop group noted that the packaging of materials for users was a sound notion but cautioned NHTSA that a manual prepared by a central agency often is not particularly helpful to the user group. Some manuals, such as the emergency medical services material, have been successful. However, the user usually needs to tailor working programs to be locally useful and usable. Legal manuals are a case in point here. This caution supported the issues raised at the TRB Conference (Transportation Research Board 1979); at that conference the operations people expressed

the complaint that centrally developed materials were not easily adaptable to their needs; in their view NHTSA was not keeping up with local activity. Moreover, these persons saw no effort on NHTSA's part to identify the activities of the more advanced jurisdictions (state or local) in attempting to identify more effective procedures. Participants also recommended that enforcement manuals be brought up to date by incorporating sections on preliminary breath testing and illegal per se laws.

This workshop group had several recommendations to counter the above criticisms. First, participants noted that it is often more useful to transfer the working concepts or procedures rather than a complete centrally produced package. These materials could be tailored as necessary by the local agency. Second, the group supported the notion of a close working relationship between the developer of the subject materials and representatives from local jurisdictions who are faced with the realities of the operational situation. In this way, a product that is oriented toward the final user is more likely to be designed. Finally, participants noted that manuals are useless unless they are incorporated at the working level. As noted, there is not usually time to read and digest the manuals that are sent; often relevant information is not adequately identified, indexed, or referenced for ready accessibility and thus is lost in the material that is received. One practitioner suggested introducing various manuals into the field via a workshop-type training session on a regional or state level.

5.2.2 Technology Transfer: Legislative Information System This project summary states:

> This project will continue work started in 1975. The purpose is to enable legislative staff specialists to be informed on a weekly basis of all major pending and recently enacted State legislation on alcohol, drugs, and other highway safety subjects (e.g., habitual offender laws, restricted driver licensing laws and 55 mph laws). Also, in 1980, the project shall include an analysis of a selected number of these laws to determine significant legislative and case-law developments and their impact on NHTSA's programs. (U.S. Department of Transportation 1979, p. 63)

Participants considered this project duplicative of what is already available. The funds allocated to bring such an information service to a weekly basis would appear wasted. The Highway Users Federation, the Council of State Governments and the National Committee on Uniform Traffic Laws already provide similar services. The National Traffic Law News also shows trends. This project, given low priority, would probably result in giving people more material to read than is needed or wanted. Further, the project does not reflect "knowledge transfer" as commonly used.

5.2.3 Program Review Workshops The summary for this project is for FY 81; it reads:

> To provide for a forum where the research community and operational personnel can come together and review in detail our plans for the coming year. This should assist us in making our undertakings more responsive to identified problems. These funds would be used to conduct another 403 Conference similar to the one recently held. (Project Summaries, FY 81)

No specific comments were received on this project. Again the workshop noted that the project does not reflect "knowledge transfer" as commonly used, although such gatherings were favored. Recommendations offered for workshops dealing with program review include:

- projects should be more accurately entitled;
- project descriptions should include a brief summary of background knowledge, and reference to projects (both past and ongoing) that are functionally related; and
- categorizations of each project should be made clearer.

In reference to the present workshop, participants expressed frustration at its large size. It was suggested the future workshops may be more constructive if they are limited in size to one small working group.

5.3 Additional Knowledge Transfer Topics

Recommendations for new projects focused primarily upon methods of distribution. Concern over the lack of visibility and availability of NHTSA materials rather than content recurred throughout these discussions.

First, participants recommended that NHTSA develop its own clearinghouse of information, a recommendation also made by the TRB Conference (Transportation Research Board 1979). The group noted that currently NHTSA relies too heavily upon the National Technical Information Service; this service is unlikely to be referenced by an operational agency. This clearinghouse should also serve as a linking mechanism to which the user could respond. One of the primary functions within this clearinghouse would be to identify how to get the information to the right user groups. To illustrate this current gap in the system, participants were asked if they were aware of the HSRI library as a designated federal repository (under NHTSA contract) for all PI&E materials developed under federal contract for alcohol, 55 mph, occupant restraints, and motorcycle helmets; no participants were aware that such a repository existed.

Participants suggested several strategies for remedying this problem. First, NHTSA needs to analyze its user groups and capitalize on the existing networks to provide information. For example, letters from the American Bar Association might be a mechanism for disseminating information to traffic court judges. Professional journals are another alternative existing mechanism for the transfer of information. Continuing education efforts could be directed at identifiable professional groups or societies. One participant pointed out, for example, that judicial institutes exist in most states for the continuing education of judges. One of their regular training sessions could be used to update judges on highway safety research. Other strategies suggested include the notification of regional NHTSA offices of the availability of research and development products and the surveying of users to assess how products have been accepted.

A second point emphasized by the workshop group was that for the material to be adequately transferred, NHTSA must present it in a readily digestible form; technical reports are too time-consuming to sort through

for the needed information. Suggestions here included the publication and dissemination of a monthly newsletter which would inform people in the field with short notices about a variety of programs. A second suggestion was the publication of a quarterly magazine in which researchers would prepare a seven- to eight-page nontechnical article on their research. Participants also recommended the training session approach for the introduction of the technical reports or manuals that are to be used in the field; such an approach was seen to speed their adoption and adaptation on the working level.

A number of specific knowledge transfer projects were suggested in the workshop. These include:

- Update and Revise Defensive Driver Course (DDC)

  Originally designed for the "average" driver, higher percentages of court-assigned persons convicted of DWI are now taking the course. The portion devoted to alcohol and drugs is only one hour; this section in particular should be revised, updated, and better targeted. When the standard course is used for every set of drivers, the return from the course is lessened. Supplementary material to assist instructors in gearing the course to the needs of different driving populations should be developed.

- Develop Specific Programs to Enlist Support at Community Level

  Participants pointed to the great numbers of local safety chapters, private agencies with a base of volunteer workers, and other organizations that could support, at the community level, safety programs. They called on NHTSA to develop programs to tap this human resource, get these people involved, generate citizen activists, and provide the opportunity for their contribution.

- Develop Program Addressed to the Youthful Offender

  Some participants questioned the effectiveness of current juvenile adjudication processes. It was suggested that NHTSA consider a study to determine how juvenile traffic cases are handled. Questions to be addressed by such a study include when juvenile cases are assigned to juvenile courts and how they are assigned to the same courts as adult traffic cases. The advantages and disadvantages of trying these cases in adult or juvenile courts should also be investigated.

  It was noted that for many years, the American Bar Association Traffic Court Program has recommended that traffic offenses involving licensed juvenile drivers be tried in the same courts as adult traffic offenses. Where state law requires these drivers to be tried in juvenile court, it has been recommended that they be assigned to the regular traffic judge, sitting as a juvenile court reference. Thus, the same procedures should apply to both adult and juvenile traffic cases.

5.4 Summary

A concern of the workshop was the narrow range of projects within the knowledge-transfer project area. This area for the most part appears to be limited to product development with only limited dissemination of these products. The plan does not appear to encompass identification and analysis of user groups; no effort in developing a distribution system or a system of information transfer could be readily identified. The group noted that this was one of the major TRB recommendations with regard to this program area.

The workshop group recommended that NHTSA reallocate its efforts in this area to focus upon the design of an information distribution system. These efforts should include:

- identifying the users;

- determining the appropriate forms to present the materials to the various user groups;
- developing the appropriate mechanisms for informing the user groups and for updating their information; and
- developing a feedback mechanism within the information transfer system by which the user can question, respond to, or seek materials from NHTSA.

6.0 OTHER DRUGS AND OTHER TOPICS

This working session covered proposed projects concerning drugs other than alcohol alone as well as other topics raised for discussion and not considered previously. The projects in this program area alone represent several stages of 403 activity. Two projects, including one already intiated, are directed toward problem identification, efforts that will indicate the nature and magnitude of a suspected--but undefined--drug and driving problem. Two additional projects will examine possible approaches to the detection and apprehension of drug-impaired drivers. Alternatives under consideration include the development of BAC-equivalents for other drugs, development of behavioral tests of drug (or general driving) impairment, or some combination of chemical- and behavioral-based methods. Finally, depending on the findings of these projects and the direction suggested by prior research, a proposed project would focus on developing techniques for determining driver impairment due to use of drugs.

6.1 Background

The program area dealing with drugs other than alcohol is one of ten in the Alcohol and Drugs Program proposed by NHTSA (U.S. Department of Transportation 1979, pp.64-65).

> The major effort in the drug program is directed at determining which drugs are currently highway safety hazards. An attempt will be made to determine which drugs, if any, are over represented [sic] in fatally injured drivers, and to determine what the basic characteristics of this population are. (U.S. Department of Transportation 1979, p.52)
>
> This effort will involve determining what drugs are found in drivers who have been fatally injured in a highway accident, and what the basic demographic and driving characteristics of this population are. NIDA will collect the necessary data to answer the companion issue of what drugs are present in a

> random sample of drivers on the road. NHTSA will take the data from these two studies and analyze it to determine which drugs, if any, are over represented in the population of fatally injured drivers. This will allow a determination to be made regarding which drugs are potential highway safety hazards. (U.S. Department of Transportation 1979, p.54)

In general, participants in the TRB workshop that reviewed the program area on drugs other than alcohol strongly supported NHTSA's proposed projects (Transportation Research Board 1979, pp.57-60). In fact, the project involving an interagency effort with the National Institute on Drug Abuse--a roadside companion survey to the national study of drug use among fatally injured drivers--was highest ranked of all projects in the Alcohol and Drugs Program.

Subsequent to the TRB Conference, a study was completed that supported the development of a report to Congress by the Department of Transportation concerning efforts to detect and prevent marijuana and other drug use by motor vehicle operators. This report, entitled "Marijuana, Other Drugs and Their Relation to Highway Safety" (DOT-HS-805-229), was also provided to participants prior to this workshop. The report described programmatic actions by the Department of Transportation (pp.37-39), many of which address issues and recommendations outlined in the TRB Conference Proceedings.

6.2 Discussion

The workshop generally supported NHTSA's proposed projects dealing with drugs other than alcohol, especially their emphasis on problem identification. The working groups as a whole agreed that epidemiologic research is now required to determine the nature and magnitude of the drug and driving problem. Participants noted that the proposed epidemiologic studies will complement experimental research. They also recommended that behavioral research methods be further developed and applied to measure the effects of priority drugs (i.e., drugs that have the potential to increase the likelihood of traffic crashes) on driving skills and to estimate their potential risk to drivers who use them.

Participants cautioned that traditional approaches to dealing with the alcohol-crash problem may not be appropriate for other drugs. The workshop group noted that NHTSA's present countermeasure approach has its foundation in the concepts of special and general deterrence. This particular approach may have limited usefulness in dealing with the driver impairments due to drugs other than alcohol. For example, BAC-equivalents have not been established for any drug besides alcohol and may never be established for some drugs of interest in highway safety. The workshop supported NHTSA's intention to sponsor an examination of this and related issues, in particular, the feasibility of developing behavioral tests for driving impairment.

A second issue noted by participants regarding the use of a deterrence approach with drugs other than alcohol is that a broad spectrum of substances is involved, not all of which are ingested for recreational purposes. The therapeutic use of drugs (both over-the-counter and prescription) must also be dealt with.

The workshop group was critical of the lack of provision for knowledge transfer activity in this particular program area. The group also pointed out that this issue had been raised repeatedly at the TRB Conference (Transportation Research Board, 1979). The group observed that knowledge about the effects on human performance does currently exist for many drugs, including therapeutic drugs, but is not being used. Participants noted that the effect of drugs on driving is not a unique human performance relationship. It was pointed out that the same drug that will impair a person's ability to operate a motor vehicle will very likely impair performance on heavy machinery in an industrial setting, on household appliances, or on recreational equipment. The group suggested that NHTSA make use of the information that exists in these areas to disseminate it to the appropriate user groups.

Project specific comments follow.

6.2.1 Roadside Companion to Drug Fatal Study. The description for this project is from NHTSA's FY 80 project summaries; it reads:

> This project will be accomplished by an interagency transfer of funds from NHTSA to the National Institute on Drug Abuse (NIDA) to support NIDA research on the nature and extent of the use of drugs, drug combinations, and drug-alcohol combinations, in the general driving population, on a nationwide basis. Drivers on the road will be asked to volunteer blood and breath samples. The sampling points will be the same as those used in another NHTSA project, the Drug Fatal Study (DFS). Comparison of data from the two studies will permit, for the first time, an accurate estimate of the magnitude and scope of the highway safety problem occasioned by driver use of drugs, licit and illicit.
>
> In addition, the breath samples will provide an immediate BAC, which will enable a subpopulation to be drawn which will be used as a comparison group for other NHTSA studies. (NHTSA Project Summaries, FY80)

Participants discussed the purpose, design, and feasibility of a roadside survey to complement the ongoing, national survey of drug use among fatally injured drivers.

The aim of a roadside survey can be to determine **exposure** or **risk.** If the intent is to measure exposure, two surveys would be required: the survey at roadside and a follow-up household survey to determine the proportion of the at-risk driving population on the road. If NHTSA wants to compare the prevalence of drug use in samples for fatally injured and at-risk drivers for the purpose of measuring relative risk, then only the roadside survey would be required.

The design of a roadside survey is a function of purpose of this research. Past studies have indicated that **where** the at-risk population is sampled makes a difference in the percentage of drivers who use, for example, alcohol. Random surveys of on-the-road drivers are probably more appropriate to studies of exposure. Sampling at the time and place of prior fatal crashes (case-control approach) is more meaningful for studies of relative risk. Panel members recommended that these issues be examined carefully in conjunction with the conduct of this research.

Questions of feasibility of successfully conducting roadside surveys were raised. For example, many participants doubted whether an adequate rate of cooperation of subject-drivers could be obtained. They stressed the requirement for methodological studies to demonstrate whether this apparent constraint could be overcome.

In addition to the surveys of fatally injured and at-risk drivers (including persons arrested for impaired driving), participants generally perceived a need to expand problem identification studies to include injured drivers, for example, drivers injured in traffic crashes requiring emergency medical treatment. This driving population may be the key population with respect to a drug and driving problem. They recommended that should additional funds be required to study drug use among injured drivers, that funds be shifted from lower priority projects. Policy-making decisions should not be based solely on findings from studies of fatally injured drivers. If a low frequency of drug use is found in the fatality study, a survey of drug use among injured drivers should be undertaken, despite the inherent difficulties. Especially valuable would be a valid comparison between samples of injured and fatally injured drivers.

Finally, participants suggested that driver's reasons for taking the drug be included as part of this survey. It was pointed out that the reasons for taking the drugs may also be the reasons for overinvolvement in traffic crashes. This survey could be a way to begin to get a handle on that question.

6.2.2 National Academy of Sciences Study Panel. This project summary reads:

> The report to Congress entitled "Marijuana, Other Drugs and Their Relation to Highway Safety" recommends that the DOT request the National Academy of Sciences to convene a study panel "to examine the extent to which the designation of a legal limit of impairment (i.e., for drugs, the equivalent of 0.1 BAC for Alcohol) should be relied upon to plan research and operational approaches to deal with other drugs. Using the 'BAC Equivalent' means using the approach of establishing a quantitative measurement of a drug or drug component in the body as a basis for legal action with regard to drugs and

driving." Either the "BAC equivalent" approach or the alternative approach of developing a set of behavioral measures to be used to test for impairment will require a substantial commitment of significant resources. Before NHTSA commits solely to either approach it would be desirable to have the National Academy of Sciences (NAS) review each of the alternatives and recommended to NHTSA the approach which it considers to have the highest potential for a positive payoff. This project would receive sole source funding in order to secure the services of the most respected scientific body in the nation. (NHTSA Project Summaries, FY80)

There were no objections raised regarding this project by the workshop group.

6.2.3 Behavioral Tests of Impairment. The description for this project is from NHTSA's FY 80 project summaries.

> There is need for reliable, objective performance tests of driver impairment to support law enforcement efforts to reduce highway accidents. Drivers unable to operate their vehicles safely should not drive, whether the reason for their impairment is alcohol, fatique, emotional upset, or drugs—licit or illicit. A officer must make an immediate decision about whether a stopped driver should continue to drive or should be removed from the road. These decisions, except for the quantification of breath alcohol at the roadside, depend entirely upon the officer's judgment. The officers themselves are the first to ask for more objective criteria on which to base these difficult decisions.
>
> This project will asssess the feasibility of developing practical behavioral tests of impairment which could be used by the officers at the roadside and which would be admissible as evidence in court. Further, the study will develop information on the legal implications which could arise from the use of such tests, e.g., how should a behaviorally impaired driver who is taking a prescribed drug be treated differently from a driver who is not, once both have been taken off the road? (NHTSA Project Summaries, FY80)

The behavioral tests to be developed under this project are to be used to detect drivers who are incapable of driving. This general impairment test approach was supported by the workshop group. However, participants criticized the study as premature. Objective tests of drug impairment are

needed to assess the risks to highway safety before developing tests of driver impairment to support law enforcement efforts. Participants also questioned what would be the "anchor" for a behavioral test of impairment. A definition and test of good driving is needed to determine what constitutes impaired driving.

Participants also observed that driver impairment could be due to a number of reasons other than alcohol or drugs; examples of such reasons include fatigue, anxiety, or distraction. Participants noted that research on such variables is likely being done already in nonalcohol program areas within the NHTSA R&D Office. Participants recommended that program areas coordinate their efforts at developing a test for general driver impairment.

6.2.4 Develop Techniques for Determining Driver Impairment Resulting from Drugs. The project description follows:

> Description:
>
> This project is designed to develop reliable, objective tests which can be used by the police to infer impairment caused by drugs(s) which a driver may have recently taken. At present there are two alternative types of tests which could be developed, i.e., chemical tests of breath and/or saliva for specific drugs, or behavioral tests of overall impairment level, which could be administered by an officer at the roadside, and which would be accepted as evidence in court. Based on the results of two FY 1980 projects, a decision will be made regarding which of these two alternative methods for determining drug impairment should be pursued. If it is determined that breath or saliva assay techniques should be developed for determining specific drug impairment, then the money allocated to this project will be transferred to the National Institute on Drug Abuse under an interagency agreement, because they have the technical expertise to manage this type of project.
>
> Application:
>
> Tests which can be used at the roadside by police to determine if a driver is drug impaired. (NHTSA Project Summaries, FY81)

Participants expressed reservations about the feasibility of developing a single test to assess impairment for a broad spectrum of drugs. It was noted that because different drugs have different patterns of impairment, it is unlikely that a test could be developed to encompass all the forms in which impairment may occur. In addition, participants cautioned that there may be no equivalent for other drugs to the 0.1% w/v BAC used for alcohol. Levels of impairment are likely to vary among the various drugs and drug combinations used. Current drug analysis techniques are costly. Different techniques must be used to detect the presence of different drugs. For reasons such as these participants thought it highly unlikely that a chemical test to detect drug presence or drug concentration could be developed for use at roadside by police.

Participants again expressed the viewpoint that impairment per se was at issue here. Drivers may be impaired for a number of reasons. These include factors such as aging, fatigue, use of therapeutic drugs, or use of alcohol. The participants recognized that the cause of the impairment is important for law enforcement purposes. However, impairment, independent of its cause, was put forth as the highway safety problem. A project focusing on making the driving task safer for the impaired driver was recommended. By extending the concept of impairment to such drivers as those who are using therapeutic drugs, or to the increasing numbers of aged drivers on the roadway as well as those using alcohol and other drugs, NHTSA would have a better basis for justifying a more fundamental research program.

6.2.5 Identify Risk Levels of Elderly/Medically Impaired Drivers. This project is part of the NHTSA Driver Licensing Program Area.

> Because of the complexity of the problem, considerable study will be required before adequate guidelines can be developed for the States. For example, certain data is available on those impaired drivers who are recognized as such by the licensing agencies, but it seems likely that there are many drivers just as badly impaired that have not yet come to the licensing agencies' attention. Means must be found to more easily and quickly detect impaired drivers and to relate impairments to

driving tasks and crash factors. (U.S. Department of Transportation 1978, p. 83)

No objections to this study were expressed.

6.3 Additional Topics Regarding Drugs Other Than Alcohol

Participants stressed that problem identification projects must precede countermeasure design and development efforts. Political and social problems may result if tests for drug presence and amount in driver body fluids are rushed into place before an adequate groundwork has been laid and target drugs and driver groups have been identified. In addition to projects proposed by NHTSA, Working Group B developed a specific project description involving the collection, collation, and analysis of data produced by ongoing state and local studies, including enforcement efforts. No present roadside surveys were identified. Current knowledge of drug use in different driving populations is extremely limited; the gradual accumulation of data indicating the broad outlines of a drug and driving problem is one approach that would be of value in the nearterm. Secondary data sources such as police and state toxicology laboratories, offices of medical examiners and coroners, and state and local studies should be tapped to gather available information about drugs and driving. This cost-effective approach would greatly supplement proposed large-scale surveys sponsored by NHTSA, NIDA, and NIAAA. The secondary data collection project received high priority ratings from all but one panel member in this group.

NHTSA should consider alternative approaches to drug and driving countermeasures, avoiding the punitive, rehabilitative model used for alcohol. For therapeutic drugs, those who prescribe and those who take them can be informed about their effects related to driving. It is simply not feasible to ask older persons, for example, who comprise ten percent of the population and use twenty-five percent of prescription drugs, to cease driving because the drugs have adverse effects on some driving skills. Information and education campaigns may be more effective in this area than in influencing drinking-driving behavior.

Along this line, additional efforts in the area of **knowledge transfer**

were highly recommended. Participants noted that a large literature does exist for many drugs of interest. NHTSA should take advantage of this information that exists in areas other than highway safety. Studies of industrial, household, and recreational settings provide information regarding the impairing effects of drugs, including legitimate prescription drugs, on human performance. This information, particularly as it relates to licit drugs, needs to be disseminated. Networks for disseminating information regarding drugs and driving already exist. These include physician and pharmacist groups in addition to the individual patients and their family and peer group. The role of these groups on the knowledge transfer function has been recognized by other disciplines. For example, one participant noted that the major thematic topic at the upcoming American Association of Colleges of Pharmacy meeting will address the issue of the role of the pharmacist as an information dispenser as well as a prescription drug dispenser. The group consensus was that knowledge about many prescription and over-the-counter drugs does exist but is not being transferred.

Other recommended actions include:

- encourage states to change drug-impaired driving laws to allow the obtaining of blood specimens for drug analysis;
- target ongoing drug-impaired driving programs to those drivers with less than the presumptive limit for alcohol-impaired driving (e.g., less than 0.10%), in order not to overload existing laboratory capability; and
- emphasize driving infractions themselves, especially in jurisdictions lacking the funding, facilities, or personnel to analyze driver body fluids for drugs.

One specific project recommendation was made. That recommendation was to develop a behavioral test methodology for the evaluation of new drug products to assess potential driver impairment. Results from a recent survey of past, ongoing, and planned activity in drugs and highway safety indicate a growing interest in testing new drug products for their potential to impair driving skills. Pharmaceutical companies have occasionally

studied the effects of new drugs in laboratory settings, but cite the need for reliable methods, designs, and techniques for measuring driving performance skills. This project would identify a set of critical behavioral measures and develop behavioral test methods for evluating new drugs prior to FDA approval and marketing. It was noted that the Kuratorium fur Verkerssicherheit in Vienna has such a battery and has been testing numerous drugs for manufacturers, among them anti-hypertensives. The battery of tests is now being developed into a single "testing maching" by a commercial organizations. Participants in Group B unanimously gave this project recommendation high priority ratings.

6.4 Summary

The workshop generally supported NHTSA's proposed projects dealing with drugs other than alcohol, especially their emphasis on problem identification. The working groups as a whole agreed that epidemiologic research is now required to determine the nature and magnitude of the drug and driving problem. Participants noted that the proposed epidemiologic studies will complement experimental research. They also recommended that behavioral research methods be further developed and applied to measure the effects of priority drugs on driving skills and to estimate their potential risk to drivers who use them.

Participants cautioned that traditional approaches to dealing with the alcohol-crash problem may not be appropriate for other drugs. For example, BAC-equivalents have not been established for any drug besides alcohol and may never be established for some drugs of interest in highway safety. The workshop supported NHTSA's intention to sponsor an examination of this and related issues, in particular, the feasibility of developing behavioral tests for driving impairment.

The workshop was critical of the lack of provision for knowledge transfer activity in this particular program area. Participants noted that knowledge about the effects on human performance does currently exist for many drugs, including therapeutic drugs, but is not being used. The workshop suggested that NHTSA make use of the information that exists in

other areas (e.g., industrial settings; recreational settings) and disseminate it to the appropriate user groups.

7.0 CONCLUSIONS AND RECOMMENDATIONS

The Problem-Behavior Workshop represents part of NHTSA's efforts to conduct periodic conferences to review technical developments, new information, and changing state and local needs in terms of traffic safety priorities. The purpose of this workshop was to develop specific recommendations for the planning and implementation of NHTSA research, development, and demonstration projects in the program area of Alcohol and Drugs.

Workshop participants represented both the practitioner and researcher communities. They were provided an opportunity to discuss general issues related to the program area of alcohol and other drugs and to review in-depth specific program elements. Two working groups participated in a series which dealt with the following topics:

- General Objectives of the Alcohol and Drugs Program;
- Problem Identification;
- Countermeasure Development, Test, and Evaluation;
- Knowledge Transfer: Demonstration and Other Techniques; and
- Other Drugs and Other Topics.

7.1 General Objectives of the Alcohol and Drugs Program

The initial working session dealt with general objectives of an alcohol and drugs program. The nature and overall thrust of the proposed program were also examined to provide a framework for comments on specific projects within the program.

General objectives of a NHSTA program on alcohol and drugs should include the following:

- Problem Identification

  - monitor the nature and extent of the alcohol-crash problem to measure changes over time, for example, changes in its magnitude and in the nature of target groups for countermeasures;

  - discover the "root causes" of drinking-driving behavior;

  - determine the nature and magnitude of a possible "other drugs and driving" problem.

- Countermeasures

  - continue emphasis on general deterrence with programs focused on increased enforcement in conjunction with public information and education;

  - improve and incorporate (explicitly) evaluation components in projects designed to test countermeasure approaches.

- Knowledge Transfer (including demonstration projects)

  - improve dissemination both of knowledge gained from research and of products for use by states in their traffic safety programs, in particular, evaluation techniques;

  - identify, develop, and evaluate mechanisms to support additional efforts to transfer knowledge.

General comments on the alcohol and drugs program included the following:

- Research on the nature and magnitude of the alcohol-crash problem requires focus. Study of the "same old questions" is interesting but not useful. In examining the root causes of the problem, which to some extent lie beyond highway safety per se, collaboration with other agencies, such as NIAAA, is encouraged.

- Terming field tests "demonstrations" heightens expectations of all concerned and lessens objectivity in evaluating the results. Demonstration projects should be used as a technique of advocacy and be restricted to those projects of proven effectiveness.

- In transferring knowledge, increased sensitivity to local

factors that influence a program's effectiveness is needed. Input from minority populations and their representation in policymaking as well as in the "selling" of programs are essential.

- Along with increased enforcement and public information and education efforts, attention must be given to the adjudication and sanctioning elements, which can be a limiting factor in alcohol-related programs.

Some participants questioned (1) what knowledge base exists to support the current emphasis on the general deterrence approach within the alcohol program area, and (2) whether the reliance on this approach represents too narrow a program direction to successfully affect the impaired driver problem. The group noted that an approach with an emphasis on detection and arrest has a very small target group of drivers who drink (i.e., those drivers with a BAC of 0.10% w/v or greater). Furthermore, it does not address the general issue of driver impairment, which involves a much broader class of drivers (e.g., the aged; users of legitimate drugs; fatigued drivers).

The workshop recommended that NHTSA consider broadening its approach in this program area. For example, NHTSA should consider using a systems approach to identify other ways of intervening (e.g., reducing substance availability; providing alternate transportation; changing social attitudes) in the impaired driver problem.

7.2 Problem Identification

A better understanding of socialization in the use of alcohol and of restraints against its excessive use is needed to deal more effectively with the alcohol and highway safety problem. The workshop noted that this objective requires a long-range research program and recognized that this luxury has not yet been afforded to NHTSA. Participants noted, however, that NHTSA's approach to the alcohol and highway safety problem traditionally has focused on identifying ways to arrest the drinking driver. NHTSA should consider adopting a broader approach in this area.

Two specific NHTSA projects were identified and discussed in this area:

"Survey of Drinking Drivers," and "Background Survey of Fatally Injured Drivers." The workshop generally agreed with the approach taken in the "Survey of Drinking Drivers" study for identifying the characteristics of the population on the road driving under the influence of alcohol. The focus upon the DWI arrest group (as opposed to earlier studies of DWI Convictions) was supported.

It was recommended that the scope of the "Background Survey of Fatally Injured Drivers" study be expanded to include other accident types. Both personal injury and property damage accidents were suggested. NHTSA should also consider interviewing drivers who survived a crash in which a fatality did occur. Drivers who have low (less than 0.05% w/v) or zero BAC should be included in both surveys for the purpose of comparison.

A number of additional research questions in this area were identified. The workshop indicated that these issues need to be addressed if NHTSA is to develop a more effective approach to the alcohol and highway safety problem. These issues are:

- the physiological effects of alcohol in the driving context and subsequent response differences between sober and drinking drivers;
- the decision-making processes of drinking drivers; and
- the differences and similarities between the novice and the chronic drinker.

Finally, the workshop group recommended that effort be directed at defining the driving task. The problem of defining "impaired driving" without a "good driving" standard was pointed out. The workshop noted that very little is really known about the behavioral demands placed upon drivers on the roadway. Measures of the overall performance of driving behavior are needed.

7.3 Countermeasure Development, Test, and Evaluation

Three themes emerged in the workshop regarding this area of NHTSA's program. The issues that NHTSA should carefully consider include:

- prevention;
- long-term research; and
- evaluation.

The workshop noted that the driver has for the most part been the focus for the countermeasure approach to the alcohol and highway safety problem. It suggested that other groups be looked at as possible control mechanisms for the development of **preventive measures.** Conditions for controlling the availability of alcohol, such as hours sold, where sold, etc., could be more thoroughly explored as prevention measures.

Participants observed that in general the NHTSA research programs have lacked continuity; projects are scheduled for one year, and a new one begun in the next year. The workshop emphasized the necessity of including **long-term research** in the NHTSA research program. The workshop recognized that NHTSA operates within certain constraints, one being a limited amount of funding. Nevertheless such constraints do not obviate the need for long-term research.

Finally, the importance of **evaluation** was a recurring theme throughout the workshop session for any countermeasure or prevention programs that are undertaken. Participants suggested that independent contractors be used for this task rather than either those who have developed the project or persons from the NHTSA central office. This issue was exemplified in the workshop discussions on the "Develop NHTSA/NIAAA Treatment Programs for PDs" projects. Participants suggested that not enough data are now available to support the development of national guidelines for referral and questioned the wisdom of advocating such programs when treatment outcomes remain unknown. The workshop noted that what is needed is evaluation of existing programs rather than the development of new ones.

7.4 Knowledge Transfer: Demonstration and Other Techniques

A concern of the workshop was the narrow range of projects within the knowledge transfer project area. This area for the most part appears to be limited to product development with only limited dissemination of these products. The plan does not appear to encompass identification and analysis of user groups; no effort in developing a distribution system or a system of information transfer could be readily identified. The group noted that this was one of the major TRB recommendations with regard to this program area.

The workshop group recommended that NHTSA reallocate its efforts in this area to focus upon the design of an information distribution system. These efforts should include:

- identifying the users;
- determining the appropriate forms to present the materials to the various user groups;
- developing the appropriate mechanisms for informing the user groups and for updating their information; and
- developing a feedback mechanism within the information transfer system by which the user can question, respond to, or seek materials from NHTSA.

7.5 Drugs Other Than Alcohol

The workshop generally supported NHTSA's proposed projects dealing with drugs other than alcohol, especially their emphasis on problem identification. The working groups as a whole agreed that epidemiologic research is now required to determine the nature and magnitude of the drug and driving problem. Participants noted that the proposed epidemiologic studies will complement experimental research. They also recommended that behavioral research methods be further developed and applied to measure the effects of priority drugs on driving skills and to estimate their potential risk to drivers who use them.

Participants cautioned that traditional approaches to dealing with the alcohol-crash problem may not be appropriate for other drugs. For

example, BAC-equivalents have not been established for any drug besides alcohol and may never be established for some drugs of interest in highway safety. The workshop supported NHTSA's intention to sponsor an examination of this and related issues, in particular, the feasibility of developing behavioral tests for driving impairment.

The workshop was critical of the lack of provision for knowledge transfer activity in this particular program area. Participants noted that knowledge about the effects on human performance does currently exist for many drugs, including therapeutic drugs, but is not being used. The workshop suggested that NHTSA make use of the information that exists in other areas (e.g., industrial settings; recreational settings) and disseminate it to the appropriate user groups.

APPENDIX A
TRAFFIC SAFETY PROGRAMS
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

This appendix contains the text of an address to workshop participants given by Dr. Robert Voas at the Conference Opening. Dr. Voas is the director of the National Highway Traffic Safety Administration Office of Program and Demonstration Evaluation.

While I am no longer directly involved with the alcohol program, there is no area that interests me more. When I first came to this agency, I was assigned to the research program on alcohol. That was before we were doing a live operation at NHTSA on alcohol. As you know, I am now part of Traffic Safety Programs, which is basically the operations arm of NHTSA, and is distinct from the Research and Development (R&D) Office, which is responsible for developing new countermeasures.

Traffic Safety Programs is responsible for assisting the States to implement the countermeasures developed by R&D. Part of this technology transfer effort is converting scientific reports into manuals, public information releases, and so on for operational use. Part of that activity is demonstration and proof of effectiveness, which is done through demonstration projects funded by the Federal 403 Funds. Finally, this program is the administration of the state and community highway safety program. This is a program of funds distributed to the states by formula, which runs on the order of $175 million a year. By administrating those funds to stimulate and develop new safety programs, the Traffic Safety Programs operation has an opportunity to get those countermeasures that have been developed by the federal government into practice in the states. In addition, Traffic Safety Programs tries to be aware of programs developed at the state level which are useful and effective, and then

publicize these to other states, and have the 402 funds used to implement new programs that have been developed at the state level as well as the federal level.

That is basically our portion of this job. In a moment, Dr. Monroe Synder is going to talk to you about the research program at the federal level, which will be the primary area of interest at this conference.

But let me go back just a bit and describe some of the things that have been done on the operational side of the house in that area of alcohol, by way of background for your deliberations today. I think that you are all aware that our agency is about twelve years old. We were launched with both feet in the alcohol area because Congress put in the original Highway Safety bill a requirement on the Secretary to present to Congress a report on alcohol and highway safety. That report was prepared by Dr. Bill Hadden, our first administrator, and became a benchmark on the basis of which we built our programs for the first decade. Many of you were around and, I think, contributed to that report when it was prepared.

The report pointed to alcohol safety as a problem of individuals who are drinking very heavily; not a matter of a couple of beers. It suggested a trend away from the past programs which had the theme "if you drink, don't drive." In an attempt to look more closely at a target group, it highlighted the so-called "problem drinker." Based on that initial effort, a program was begun, and Dr. Bob Brenner, the second administrator of NHTSA, was principally responsible for getting that underway by going to Congress for funds to get the states started in the alcohol area. Congress responded by appropriating monies for what came to be known as the "Alcohol Safety Action Projects" (ASAPs).

The ASAP program has been controversial since its beginning. It was disappointing, I think, to some researchers because it focused on moving ahead in operations before many of the researchers felt confident about having the solutions to the alcohol problem. On the other hand, I think it is fair to say of ASAP (at a cost of $88 million over some seven years)

that its presence generated a good deal more for research than probably would have existed had that program not been part of the national effort. The funds for alcohol research went up and there were a number of side benefits. One example is the Fatal Accident Reporting System (FARS), which is a census of all fatal accidents in the United States. It was finally begun in 1975 and now is an established record of all fatal accidents. The FARS was an attempt to measure fatal accidents, and particularly alcohol involvement in fatal accidents, as part of measuring the effect of ASAP. The measuring of alcohol involvement has not been entirely successful, but the census of fatal accidents has made a major contribution to safety research.

There was also a great deal of support for multidisciplinary accident investigation teams that came to NHTSA during the early 1969, 1970, and 1971 period. At one point Congress was on the verge of requiring that everywhere there was an ASAP there would also be a multidisciplinary accident investigation team. That never occurred. But again, funds for those teams did flow, and certain of the studies, particularly those directed at driver behavior, such as the study in Indiana, were able to be funded as a result of the stimulus that the ASAP program provided.

Meanwhile, on the operational front, the ASAP's, thirty-five of them around the country, did successfully stimulate a great deal of safety activity at the state level. We can trace activities in both state 402 programs and in totally state-funded programs to efforts that got underway in states with ASAPs and in states that copied from the general ASAP approach. Now the ASAP approach, I think, as you are more than aware, because many of you contributed to the thinking that went into it, was a systematic approach at the community level to dealing with the alcohol program. It saw in its initial study of the problem that the communities were not well organized with regard to alcohol programs, that what the police did often came into conflict with the courts and vice versa, that there was little or no public information support, and that generally we were not well set up to take care of the alcohol safety problem, and this problem could not be easily attacked on a piecemeal basis. Alcohol was

such an important feature of our lifestyle, as was driving, that a single effort in one area such as public information was not likely to be effective. It appeared that our best chance for success would be to try to get organized so that communities could bring to bear our enforcement programs, coordinate the activities of the police, the courts, the treatment, rehabilitation, and reeducation agencies, as well as public information programs.

Secondly, since ASAP grew out of the alcohol and highway safety report, which suggested that the major problem group was one which might be characterized as having a drinking problem. It attempted to deal very specifically with this problem through treatment options ordered by the courts. Now, I think most of you have seen the reports we have issued on these treatment programs. It became, I think, clear in terms of looking at the overall effect of them, that they were, at best, a partial success, and a partial success in one area. That was the area of deterring individuals whose drinking could be characterized as social drinking. It appeared that in those programs, which had been successful in greatly increasing enforcement and in backing some of that enforcement with good public information, there had been some reduction in nighttime fatal crashes. And as you know we were able to find about twelve of the thirty-five projects which had a significant reduction in nighttime fatal crashes.

In the area of treatment and reeducation, we were generally less successful. The data for the social drinker suggested that just about any intervention in the way of education was better than simple fines. However, with the problem drinker we found no effect at all. In fact, there have been a few disconcerting findings that perhaps the problem drinkers who were sent to treatment were, if anything, worse or certainly no better than those who were simply fined. These data are generally corroborated by some other programs. There have been some program results which suggest that the social drinkers were not effectively treated; there are others that give the contrary view. But I think that there's practically no example of a program which successfully treated the

problem drinker when we measure that in terms--not of social benefits generally but very specifically in terms of highway safety benefits, that is, the reduction in the number of accidents, the number of rearrests for drunk driving.

Aside from the ASAPs, there appears to be some support for the belief that social drinkers can be deterred outside the United States such as in the British Road Safety Act or perhaps the Scandinavian programs. On the other hand, it seems that no one has been very successful in dealing with the heavy drinker, who appears to be a good part of this problem--perhaps as much as one-half to two-thirds--aside from simply taking away the license and not allowing them to drive. That does appear to have some effect. The possibility of a permanent change is doubtful.

On a more detailed basis, I think we learned a good deal from ASAP in terms of specific enforcement procedures and how they work. I think we learned that one can get a police department to greatly increase the number of alcohol-related arrests. We know that arrests can be doubled or tripled. We suspect that these arrests could be raised further, because our roadside surveys of drinking drivers at night show that there are far more drivers who are impaired than the number arrested. I think we found ways for our courts to be more efficient in handling large numbers of drunk driving charges, to dispose of these cases more effectively, and to make sure that there were some punitive consequences of being convicted of drunk driving.

Unfortunately, in ASAPs much of the time we had to trade off the license revocation or restriction for assignment to treatment. That is not a good tradeoff, at least for the problem drinker. We have to develop a program in which there is no such tradeoff, but in which the problem drinker both loses the license and gets help with treatment.

As we looked at this problem of treatment, particularly with the problem drinker, we have tried to broaden our information and to look at possible treatment benefits beyond highway safety (for example, family income and health benefits). We have yet to demonstrate any of those advantages. There is some preliminary evidence that total alcohol

consumption may be reduced through treatment programs associated with the courts, but again this probably stresses what we have known from the beginning: that is, the federal government is going to have to get its house in order, get organized across agencies, so that we in traffic safety can work closely with those in treatment areas to work out effective programs.

I think in the area of public information we learned a good deal. For example, when we began we felt that "if you drink, don't drive" was not an effective approach, because it essentially tended to make everyone feel that they were part of the problem. Yet the research suggested that it was primarily the very heavy social drinkers and problem drinkers who were causing the problem. From the beginning we did not feel that we could appeal directly to the heavy drinker to curtail his activity and do so effectively. We always felt that one had to appeal to those who surround the problem drinker. Initially, in ASAP our public information funds were spent on building political support for organizing the community to combat the problem. Later we attempted to change the social atmosphere so that it would permit those surrounding the drinking drivers to intervene. Thus we started a program in which our slogan was, and is today, "friends don't let friends drive drunk." This was an effort to see whether we could create in this country the attitude that appears to exist in Scandinavia; that it is socially acceptable for a sober person to intervene when someone who has obviously been drinking too much attempts to drive. Our public polls suggest that this effort has produced some knowledge and some attitude change.

We have not been able to really pin down behavioral change in terms of a reduction in accidents on the highway. But in each one of these areas we gained some information that allows us to say how a community can make the elements (enforcement, the courts, treatment, and public information) more likely to be effective. In all of this, I don't think there have been breakthroughs in terms of a real, new, deep understanding of the problem of drunk driving, nor have there been any programs that could be classified as "silver bullets." However, during the first dozen years of

NHTSA, the research department (the R&D) has been carrying on more fundamental research on the problems of unsafe driving actions, the problems of drugs, and on the problems of alcohol. I think that as that work progresses we will see more well developed products, which we can apply at the state level.

In the meantime, aside from trying to make sure that the states do use the best knowledge we have in the alcohol area (which is limited), TSP is also trying to make sure that whatever is done is submitted to evaluation. For example, the courts have embraced the idea of reeducation and treatment, because it gives them a more positive approach. It is a very popular idea; it is spreading widely, and many courts use it. It is relatively easy to get the courts to offer treatment than to require more draconian measures. But because it is easy, it is likely to be particularly risky, particularly in view of the fact that we have not been able to show any impact for treating problem drinkers. We believe that communities and courts must take the responsibility to evaluate such programs when undertaken. Then they can demonstrate either that they are or are not having an effect. In the latter case, hopefully they will be open to modification of their program until it can be made effective. Now this is an area which could offer a great deal of research opportunity to the national scientific community. Most of these localities do not have the staff who can do research, so they will need to come to universities. We are encouraging the use of 402 funds for this purpose and in fact requiring as a minimum that each state evaluate at least one project each year. In many states we have a half-dozen or more evaluations underway. These are, of course, highly variable in quality. But if we can continue this effort, I think we will see two things: (1) we will see the states doing more evaluations of projects; and (2) we may see the states developing effective countermeasures of their own.

Thank you.

APPENDIX B
RESEARCH AND DEVELOPMENT
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

This appendix contains the text of remarks to workshop participants made by Dr. Monroe Snyder at the Conference Opening. Dr. Snyder is chief of the Problem Behavior Research Division of the Office of Driver and Pedestrian Research at the National Highway Traffic Safety Administration.

Although there has been a lot of work done by very capable people in developing various ways to look at aspects of the alcohol and highway safety problem and in looking at the research and development related to that, there is still, I feel, a need for an integrating framework that will help our communications in this area. I think there are two main aspects to that. I think that we need a framework for observing and communicating what the total R&D program is working on; not just one aspect of it or a segment, but the total program. We also need to be able to look at many other possibilities for what might also be done as a basis for decision-making about where we ought to go in the future.

Today we are going to be dealing with specific projects and a number of plans that have resulted from a lot of thinking at NHTSA and have been reviewed by people on the outside. Some of you were involved in the Dulles Conference. I think it is fair to say that we have a program here that has a lot of the best ideas that people can come up with now as to what ought to be done. I seriously doubt there are very many people here that would be willing to say that when we get through doing the research that is in the plan, we can all close up shop and go back and tell the American public and Congress that we have solved the alcohol and highway safety problem, and we can move on to other things like solving

cancer.

We ought to be in business for a while. The problem is that it is difficult to communicate where we are going. We have to communicate not only to ourselves but to people who make decisions about the nature, kind, and amount of R&D that ought to be going on, particularly in these times when there are strong pressures within the federal government to reduce all kinds of expenditures. So, my first point is that there is a need for an integrated framework.

I have said a few things about what I think the key points are with respect to that need. I have a few other comments on it. But, I will work in one old, old story. When I was thinking about this, I was reminded of the story of the blind men who set out to find out what an elephant was. As I recall the story, one of them went to the tail, felt the tail, and said an elephant is like a rope. Another went to the front, felt the trunk, and said an elephant was like a snake. The third fellow came to the middle; he got hold of a leg and said the elephant is like a tree trunk. All those people were right. And perhaps they are analogous to some of us who are specialists in trunks or elephant legs or what have you.

The alcohol problem is complex, and probably even more complex than an elephant. We have to communicate not only to each other but to other people who are often asking how the pieces fit together. I think that we need to do some more work on how the trunk, legs, and tail are connected, how they work together, and how working out one may help us understand the whole problem. There are many views and many perspectives on the alcohol and highway safety problem. I think it is reasonable to say that many of them are good when you are working in one particular area. But when we are getting into the realities of planning an overall program and coming up with a budget and a plan that has to be reviewed by people on the outside and by Congress, we need to be able to better put the pieces together to explain to ourselves and to others how they fit. This has to be done so it can be communicated to people who are not experts in all or any of the areas.

I have said we "have to" a number of times, and I am not really sure that that is a legitimate requirement. The question that I would raise is can we come up with some kind of integrating framework that is understandable to Congressmen, to police officers, to researchers, to researchers in different aspects of the problem, to highway safety specialists. Can we come up with something that is understandable to all these kinds of people, that covers the universe of the highway safety problem in a way that everybody can at least understand how their piece fits into it and understand where we are going, and to help us develop the strategies for R&D in the future? Maybe that is not possible, but at least we are going to give it a try. We have been doing some work within NHTSA; that in itself says that we feel it is important, because we normally do not have time to think about things like this. We try to do some work and discuss it with different people as we are going along. This is the first opportunity that we have had to discuss it with a group of people together.

What I would like to do today as point three is to issue an invitation, or more accurately, a request for help. If you are interested in this kind of problem, if you (from the brief comments I have made here) have some idea of the kind of problem I am talking about and feel that it is worthwhile, we would like to have your help in working on it. I am not going into any kind of formal presentation now or at any time during the next two days.

In the back of the room I have four pieces of paper without any explanation on them. They are some diagrams that we have come up with as we have been discussing this. If you are interested, there are three things I would invite you to do. One is to take one of each of those pieces of paper and take a look at them. Two, during the course of the next two days, there will be some opportunities for informal discussion; if you have some interest in this area I would appreciate it if we could chat during coffee breaks, or whatever Kent has arranged. Kent always makes sure that there are informal communications scheduled in any kind of workshop, and those things have been very productive.

Finally, in addition to what goes on in this meeting, you may have some great thoughts or ideas after you leave Silver Spring. Feel free (do more than feel free) to get in touch with us. I would be interested in knowing whether you feel there is this kind of need that I have described, if you have some ideas about what needs to be included in this kind of framework or presentation. Finally, if you are not predisposed to get into the framework kind of thing (I know a lot of people are not), you may still have some thoughts and ideas about the directions in which R&D ought to go without having worked it into some kind of schematic or formal idea. Let us know if you have thoughts about the strategy for the future, and I am talking now beyond what we are covering here today. (I do not want to say beyond the 1980s because researchers already have a reputation for wanting to do everything long range. I have to be very careful about not reinforcing that reputation too much.) If you have thoughts about general strategies, beyond the short-term or near-term, if you have thoughts about how we ought to view the whole problem and directions that we might at least consider going in that have not been considered before, let us talk about them during the breaks and at other times.

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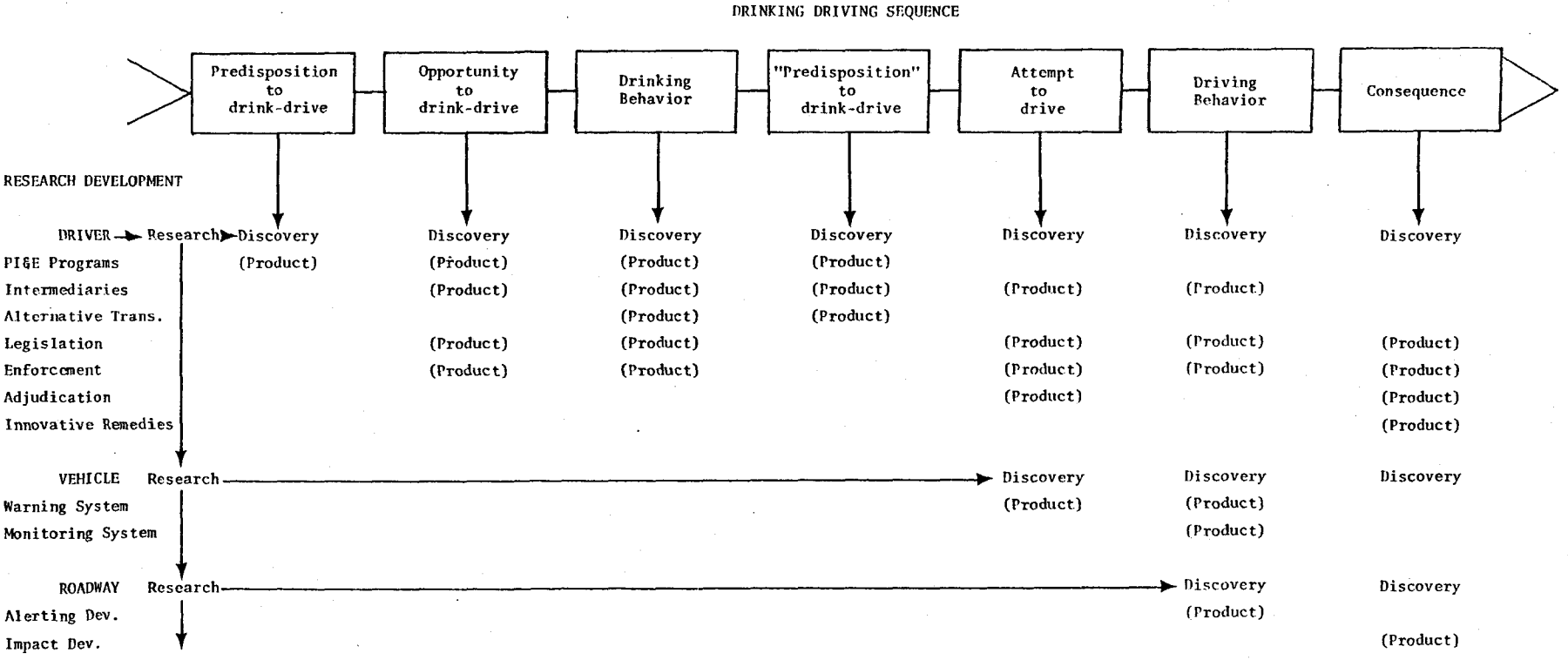

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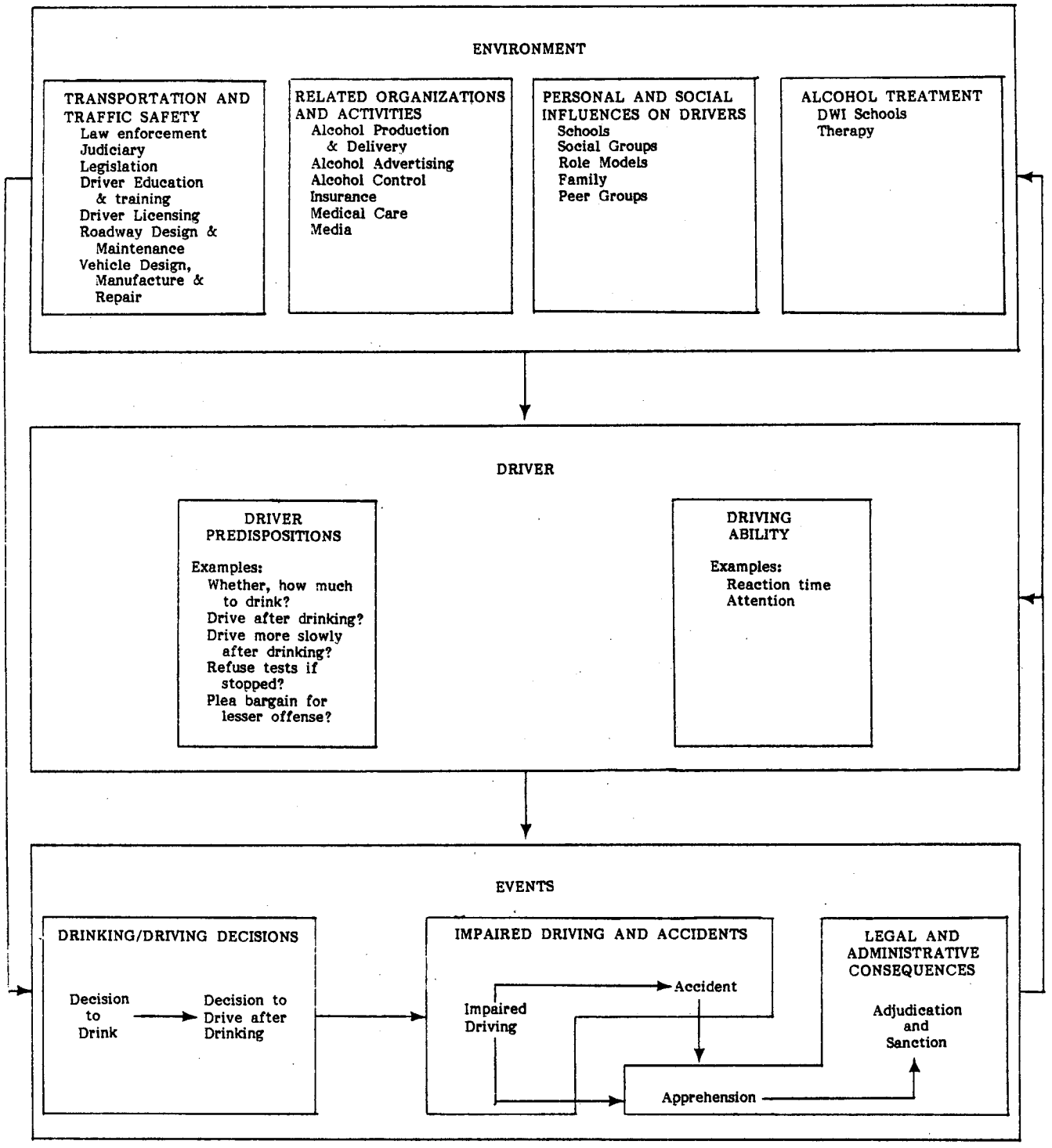

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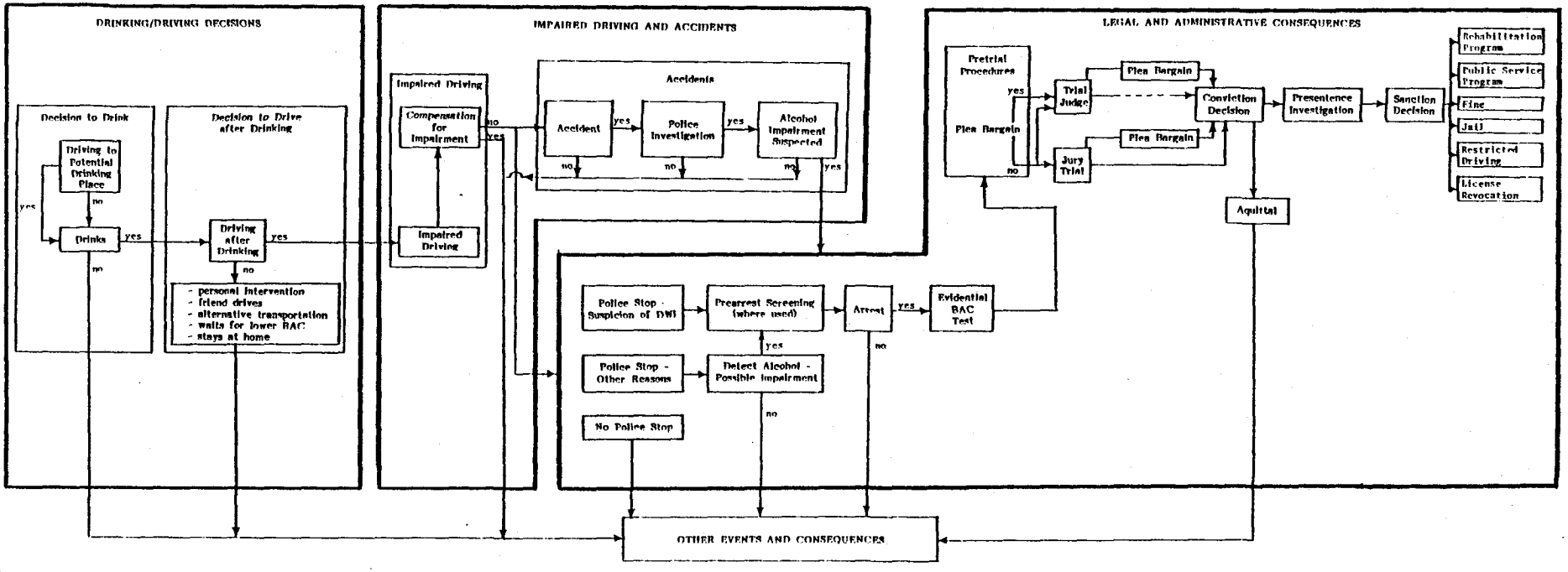

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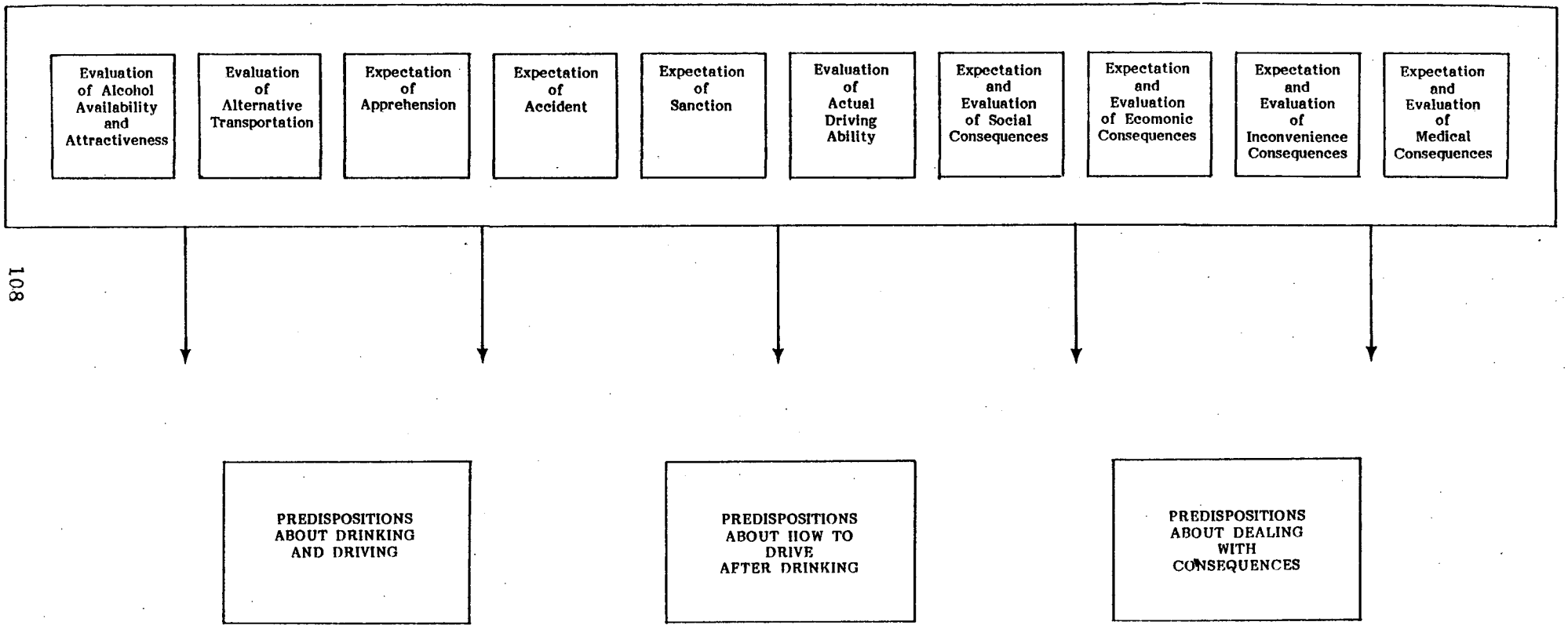

APPENDIX C
ALCOHOL, DRUGS, AND HIGHWAY SAFETY WORKSHOP

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