ALCOHOL AND OTHER DRUGS IN TRANSPORTATION: RESEARCH NEEDS FOR THE NEXT DECADE

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This report is the culmination of ideas presented at a workshop held at Irvine, California, July 27-29, 1992.

Workshop Purpose

The purpose of the workshop was to identify 1) progress in reducing the prevalence of alcohol and other drugs in transportation accidents in all modes, 2) gaps in the knowledge base, 3) opportunities and needs for future research and 4) to establish research needs and priorities for the next decade. This proposed research agenda identified at the workshop is intended to provide guidance and data that can be used by the U.S. transportation industry, Federal, state and local government agencies, law enforcement, the judiciary, the rehabilitation community, safety advocates and others to further reduce the role of alcohol and other drugs in accidents.

This report presents highlights of the summary and synthesis of the issues and ideas put forth in the two and a half day workshop.

The information presented was broad and diverse. Numerous research needs were offered, ranging from large macrolevel research programs of the relative interplay of countermeasure systems to specific microlevel analyses of particular interventions such as checkstops. It was clear, however, that it would not be possible to address all the research ideas outlined in the Workshop. Not enough resources would be available to realize all the research ideas initiated by the workshop.
For these reasons it was important to set out some guiding principles for prioritizing the proposed research initiatives.

The **first principle** voiced by a number of participants is that the primary focus of the research should be on the reduction of morbidity and mortality of alcohol and drug related collisions.

The reality of limited resources available for research in the next decade will force researchers and funding agencies to look long and hard at what projects have the potential to provide the greatest cost-benefit and difficult decisions will have to be made regarding which projects get funded.

A second principle was that we should look at alcohol, drugs and transportation in a broader context. In particular, the criminal justice approach has strongly dominated the research in this area at the expense of other approaches, notably the public health approach. We need to make the alcohol, drugs and transportation issue part of the larger societal processes and goals.

A **third principle** that was also reiterated by a number of participants was to not "reinvent the wheel".

The **fourth principle** which relates to the second and third was to collaborate more effectively within disciplines, across disciplines, across funding agencies, across states and internationally.

A **fifth principle** which also relates to the previous two, is that we should look at what we can learn from a number of our long term programs such as tobacco use, diet, exercise and including drinking and driving which have seen reductions in harm producing behaviours.

A **sixth principle** is that we should find ways and means of advocating our research. We do not use a lot of the information that we already have. Therefore, it is important that research also be presented in a more user friendly format so that it can be used by a broader spectrum of constituents.

The research agenda as presented at the workshop encompasses the three research "E"s, epidemiology, experimentation and evaluation. Most specifically the research areas can be envisioned by the following diagram (see Figure 1). All the topics addressed in the Workshop fall within this broad general picture.
Epidemiologic Research agenda

The epidemiologic approach to alcohol, drugs and transportation necessitates an examination of trends and patterns in alcohol, drugs and transportation which includes attempts to determine causality.

Host

The research ideas centred on monitoring alcohol and drug use trends of the changing U.S. population, in particular, women, the aging population and immigrants, and investigating the causes of a person engaging in drug use and combining it with driving. In the transportation workplace, "real-world" drug and alcohol prevalence rates for transportation modes based on scientifically credible research designs which use multiple measures with representative employers was needed. This included assessing different occupational groups, and costs.

Agent

It will remain important to monitor through different means the trends of drug use, including new "fad" drugs.

Environment

Physical

We probably would not be seeing much new in vehicles and roadways. But computerized technologies are being used in the development of IVHS. Alcohol and drugs will need to be integrated into the research and development of IVHS.

Social

We have misdiagnosed drinking and driving as only being criminal behaviour as opposed to viewing it as a natural consequence of a driving and drinking society. More information was needed on availability, pricing, transportation planning for licensing of drinking premises, etc., to understand the interplay of these factors and drinking-driving behaviour.

We need a much more complex understanding of the interaction between public policy and
institutional policy. Information on how these specific policies are disseminated and diffused in society, research on the recent reductions in drinking driving behaviour to determine the reasons for the reduction, were all recommended for study.

Experimental Research Agenda

Detection

Various biochemical and non-biochemical research issues were presented which included the need 1) to identify analytic Markers or metabolite ratios in body fluids to support determinations of recency of use; 2) to determine efficacy and future of on-site testing for the workplace; 3) to develop routine screening test which detects presence of "in vitro" adulterants; 4) to look at long term degradation indicators as predictors. We need also to look at models such as the LAPD's Drug Recognition Expert (DRE) Program to add either to supervisor skills or to the consistency and capability of a fitness for duty determination by medical facility.

Impairment/Performance

The drugs of choice to be investigated were alcohol, marijuana, cocaine, and prescription drugs.

1. Alcohol

Information was still needed on: alcohol tolerance; low BAC's with inexperienced, infrequent drinkers and chronic, heavy drinkers; alcohol-drug combinations; hangover effects; alcohol-aging interaction; and alcohol effects in the young driver.

2. Marijuana

Some of the research questions presented were on: the effects of high THC content marijuana; the duration of marijuana effects; the effects on driving skills of high THC marijuana in combination with alcohol and other popular drug combinations; marijuana effects on young (adolescent) drivers; and the relationship of blood/urine levels to performance effects.
3. **Cocaine**

Little was known about cocaine and driving so clearly it was important to study the effects on performance, with the first priority to define what variables should be measured.

4. **Prescription drugs**

Prescription drugs were a problem, particularly with the aging population. Research ideas included the examination of the effects of a prescription on over-the-counter (OTC) medication systematically, including: acute dose studies with healthy volunteers to specify drug effects per se; acute and chronic dose studies with patients to clarify the net effect of drug-disorder interactions; and dosing regimens that represent typical therapeutic use.

More generally it was recommended that researchers determine the efficacy of developing a "per se" indication of impairment for drugs other than alcohol and establish an accepted format/design for measuring performance impairment and include single dose, multiple dose and multiple drug studies.

In the workplace there was a need to pursue performance impairment tests, such as, Critical Tracking Test (CTT) to determine if they; a) may have value as an independent performance impairment determination or, b) as a device to evaluate dose-related drug impairment levels; to link laboratory performance impairment results to field observational studies, and most importantly; to develop "fitness for duty" tests, which are valid, cheap, quick and transportable.

**Intervention Strategies**

**Education Research Agenda**

**Mass Communication**

It was noted that mass communications campaigns and alcohol advertising were not well assessed. Research was needed to evaluate mass communications campaigns on multiple variables including media coverage, penetration, message, drinking-driving behaviour. We also need to develop a better understanding of the effects of alcohol advertising, for example, effects on youth, counter-advertising, media advocacy, individual vs. collective messages, etc.
Legal Control Research Agenda

Legislation

It was recommended that researchers compare and evaluate selected legislative initiatives begun in the 1980’s and currently in place in several states.

Detection/Enforcement

Generally, more knowledge was needed on the best strategies and procedures to detect and arrest DUI’s. For example, detection cues for .05%, .08%, and youth, optimal DUI processing systems, use of new technologies were mentioned. In addition, general epidemiological information on arrest rates by state etc. reasons for variance were all suggested.

Sanctioning

It was recommended that various sanctions ranging from vehicle impoundment to treatment and severity of sanctions be studied to determine optimal specific deterrence.

Workplace

In the workplace, it was important to determine the optimum random testing rate to maximize deterrent effect.

Rehabilitation Research Agenda

DUI Remediation

A more in-depth evaluation was recommended for remediation, which included the expansion of options targeted toward specific sub-groups of offenders, improvement of methodology and reporting standards, and assessment tools. It was also suggested that DUIs may be frequently involved with a variety of systems, health care, criminal justice. This needs to be investigated and the inter-agency cooperation on research to design innovative and comprehensive approaches to intervention needs to be explored.
Workplace

It was recommended that researchers conduct scientifically credible, comprehensive studies of return to duty success.

Indirect Programs Research Agenda

Alcohol Policy/Program

Numerous research ideas were presented under alcohol control policies and programs ranging from studies of underage drinking, patterns of alcohol use and sale, methods of sale, efforts to control availability, price, policing of alcohol control laws, SIPs. In addition, more situational and contextual information was needed on alcohol use, drinking in public establishments, the development of control policies, the diffusion of control ideas to action, the process of introducing new regulations and so on.

Transportation Policy/Program

Various research ideas were also introduced to make transportation safe for "fools and drunks" to coin Haddon's phrase. Graduated licensing, raising the driving age, provision of alternative transportation subsidy at drinking establishments, designated driver evaluation, were all presented.

Technology

Various technologies have evolved, such as interlocks, field sobriety tests, but we have failed to develop methods to get the users to use the technology properly and safely. Thus, it was recommended that research examine training methods and systems for the technology.

In addition, little is known about how they are used, how effective they are, and so on; research is needed to answer these questions.

In summary, a broad and colourful palette of research ideas were generated at the NTB meeting. If these ideas can be realized in the next decade, we will have much ammunition for reducing the alcohol, drugs and transportation problem in the U.S.
ALCOHOL, DRUGS AND TRANSPORTATION RESEARCH AGENDA
MORBIDITY/MORTALITY PREVENTION

Epidemiology (Patterns and Trends)
- Individual (Host)
- Impairing Substances (Agents)
- Environment

Experimentation (Field and Laboratory)
- Detection
- Impairment/performance

Evaluation (Intervention Strategies)
- Education
  - mass communication
- Legal Control
  - legislation
  - detection/enforcement
  - sanctioning
  - workplace
- Rehabilitation
  - DUI remediation
  - workplace
- Indirect Programs
  - alcohol policy/programs
  - traffic safety policy/programs
- Technology