

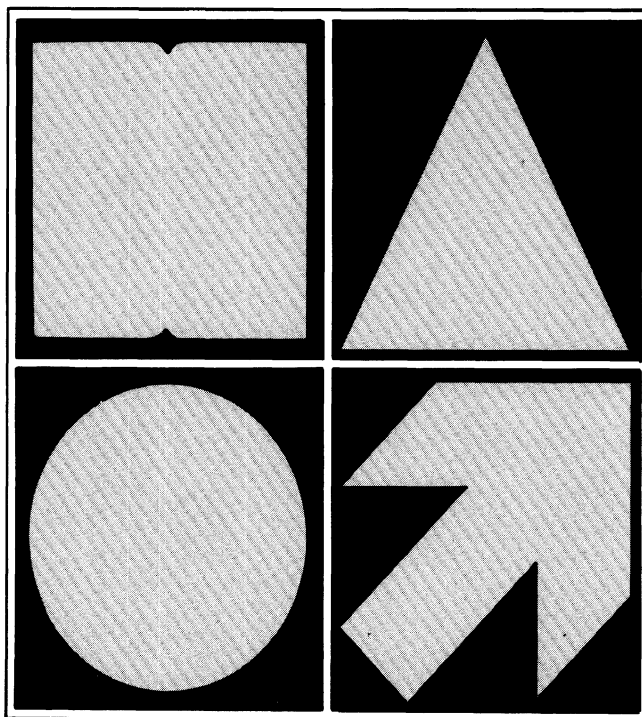
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# **IMPROVING DRIVER PERFORMANCE**

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*Synopsis of a Research Colloquium*

Ann Arbor, Michigan  
June 4-5, 1975



Conducted by  
Highway Safety Research Institute  
The University of Michigan

Sponsored by  
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William T. Pollock, Colloquium Chairman  
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Chronic deviant and accident prone drivers are *not* responsible for most of our traffic accidents. Studies of massive numbers of driver records collected over many years show that most of the accidents in a given year involve drivers who have not had an accident before—and probably will not have an accident again. It's the good guy group, not the bad guy group, to which most accidents are attributable.

That assertion is not meant to suggest abandoning our efforts to search out and correct the bad guys—the persistent violators and the accident repeaters. For several reasons. For one, they are identifiable. All states have driver records systems where tabs are kept on each registered driver. With those systems, good mechanisms exist for identifying deviant drivers. And all states have follow-up procedures for attempting correction of such problem drivers through punishment or rehabilitation. Continuing those efforts with the “bad” drivers is necessary, because those drivers are responsible for a small but significant part of our traffic problem.

But the fact remains that we will not get *large* gains in accident reduction by correcting only those drivers who are accident and violation prone and who come to the attention of licensing and enforcement agencies. Most accidents involve the mass of anonymous and normally safe, efficient drivers. Police reports and scientific investigation of driver-fault accidents overwhelmingly conclude that most accidents could have been avoided if the accident driver had applied just rudimentary driving skill, knowledge, and judgment. Paraphrased, most accidents, or more properly, preventable crashes, occur due to a transient failure of a driver to exercise his capabilities for safe, efficient driving.

Therefore, very large gains in accident reduction are possible, *if* the “average” driver performs in accordance with his potential for safe, efficient, legal vehicle operation. No capability improvement is required—only consistent, attentive application of already-held capabilities of the “average” driver.

But how do we get that mass of “average” drivers to consistently perform to their safe driving potential? What inducements, threats, rewards, or punishments can be used to put drivers on their best behavior? These are not new questions—they have persisted since the beginning of our highway transportation system. And massive efforts in education and enforcement have for decades attempted to induce that safe driving performance.

Those questions, and recognition that they remain unanswered, are what ultimately stimulated the research conference that this report is about.

During most of late 1974, various staff members of the Highway Safety Research Institute (HSRI) and of the Motor Vehicle Manufacturers Association (MVMA) met sporadically in a seminar-like fashion to consider where we stand and what research is required in this matter of driver performance improvement. Driver performance improvement could, of course, be approached from many directions, including for example better vehicle design, improved highway and environment design, refined institutional management of the traffic system, increased driver capabilities, or enhanced application of existing driver capabilities.

Our discussion group chose to focus on the last named approach—enhanced application of existing driver capabilities—for several reasons. Attempts to improve vehicle and highway design, as well as traffic management and driver education, have been vigorously pushed by the National Highway Traffic Safety Administration (NHTSA) and the Federal Highway Administration (FHWA), particularly since passage of the Federal Highway Safety Act of 1966. Conversely, not much attention has been paid to inducing better use of existing driver skills, except possibly in traffic law enforcement activities. And even there, enforcement focus has been mainly on control of “problem” drivers. Finally, as asserted above, the anonymous average driver is increasingly indicated as the accident culprit while engaging in capability lapses.

In considering this elusive average driver, our HSRI/MVMA discussion group came to few conclusions, the most significant of which was that we needed considerably more viewpoints on where driver performance improvement research and application could and should go. And that was the birth of the colloquium on research and operations in driver performance improvement.

We opted for a working meeting as opposed to a series of paper-presentation sessions. That preference dictated a limited number of colloquium participants, a number large enough to assure reasonable representativeness of viewpoints and small enough to permit interactive discussion. To provide discussion focus, we identified four approaches to driver performance improvement which we felt were reasonably separable as discussion areas, but collectively were reasonably inclusive of possible approaches.

Two of these approaches to influencing and encouraging better driver performance are traditional; the other two are relatively unexplored.

One of the traditional approaches to facilitating

adequate driver performance is through educational programs of various sorts. Thus, we planned for an "Educational Influences Group" as one of the four working groups of our colloquium. We envisioned this group as one concerned with where we stand and where research and operations should go in areas including the variety of indoctrination and training activities feasible in elementary and secondary school curricula, as well as the many re-education and refresher activities involving in-service drivers, whether operated as a license-continuation program, i.e., "driver improvement," or as an enrichment program.

Recognizing the dominant influence of law in determining driver behavior, we planned a "Legal System Influences Group." Here we expected the colloquium participants to review and extend the variety of codes, laws, regulations, ordinances, etc., designed to control driver status and operation, as well as the activities of the formal agencies, i.e., legislatures, motor vehicle departments, police, courts, etc., in developing and implementing formal driver control provisions.

In addition to those traditional driver influence areas, we planned for a group to focus on "Social Influences." This relatively unexplored area was viewed as that involving driver behavior modification involving interpersonal approaches, i.e., viewing driving behavior as a social process involving interaction with other highway users. We expected this group to look at the ways in which such social interaction influences the variable quality of our driving behavior and how good influences could be exploited and bad ones suppressed.

Finally, we identified an "Economic Influences Group" to see how we might improve driving behavior via the driver's pocketbook. Here, with this relatively unexplored area, we were interested in the variety of financial costs and rewards attendant to safe and unsafe driving, and how these economic considerations might be used for inducing improved driver performance.

With those four working group themes as the nucleus of the colloquium, we were fortunate in getting four eminent highway safety researchers to agree to lead the four working groups and to assist in further planning for the colloquium. Dr. B. J. Campbell, University of North Carolina, agreed to lead the Educational Influences Working Group. Leadership of the Legal System Influences Group was accepted by Professor Kent B. Joscelyn, Indiana University (now with HSRI, The University of Michigan). To lead explorations with the Social Influences Group, Dr. Robert B. Voas, National Highway Traffic Safety Administration, volunteered. And finally, Mr. James O'Day, HSRI, accepted leadership of the Economic Influences Group.

Working with these Group Leaders, HSRI staff generated a list of desired participants for each of the

four working groups. In composing those candidate lists, we aimed for a working group size of about twelve persons. We elected to have about half of each group composed of senior highway safety researchers noted for their achievements in areas related to the working group to which they were candidate. Some of the remaining candidates of each group were selected for their disciplinary excellence in education, law, sociology, or economics, but with little if any association with highway safety endeavors. And the remainder we selected as recognized operational experts in the variety of real-world highway safety operations. With those candidate lists, our colloquium recruitment effort resulted in the groups of participants listed with each of the Working Group Synopses that follow.

To facilitate the unconstrained discussions we wanted in each of the working groups, the Colloquium agenda were deliberately kept minimal. For the two-day meeting, two plenary sessions of one hour each were planned, one for introduction and one for general summary. The remaining time was devoted to individual group discussions.

Still consistent with the aim of minimum constraint on the group, only two general "instructions" were provided. Each of the groups was encouraged to consider the following questions in the context of its influence area assignment.

1. Can better education (or legal, or social, or economic) models for better driving be developed? What directions should the development take?
2. Can we predict effects from our existing data or state of knowledge?
3. What further data collection is required and what experimental research is desired to improve our ability to predict?
4. Are there any immediate actions which we would recommend?

In addition to those common questions to each working group, special papers for each group were prepared for pre-colloquium distribution to each participant. Each of these papers, intended as area-definers and brief summaries of significant status and problems in each influence area as discussion ticklers, was prepared by a highway safety researcher knowledgeable in a particular influence areas. Dr. Patricia F. Waller, University of North Carolina, prepared the "Educational Influences" paper. The "Legal System" paper was prepared by Professor Joscelyn, and Professor G. J. S. Wilde, Queen's University, authored the "Social Influences" review. Finally, Mr. O'Day and Professor Jay S. Creswell, University of British Columbia, collaborated on the "Economic Influences" paper.

With convening of the Colloquium in Ann Arbor on June 4 and 5, 1975, full tape recordings of each of

the working group discussions were made. No other record of the group deliberations was requested, other than a brief summary by each group leader at the closing plenary session.

The remainder of this report provides synopses of the discussions from each of the four working groups. The synopses are terse, not reflecting at all the frequently extended, freewheeling discussions that frequently occurred with various ideas. Attempt has been made here by HSRI staff to extract out of the tape recordings only those significant ideas, thoughts, comments, questions, recommendations, and conclusions from each group record. In that regard, while each participant has had the opportunity to review these synopses, the responsibility for discussion interpretation lies solely with HSRI. Individual participants held a wide variety of views. No part of any discussion can necessarily be attributed to any particular participant. Conversely, no part can be attributed to *all* participants.

With those explanations and that disclaimer, the synopses that follow are offered as thought provokers to those individuals charged with planning for and generating the data and information required for successful operational programs focused on driver preparation and performance improvement. While the synopses only sample ideas and thoughts from a small but select group of scholars and professionals, we hope that the thoughts provide increased insight and enthusiasm in pursuit of effective innovative programs for improved driver performance. We insist that this form of unconstrained, deliberated input to highway safety research and operational program planners from operational and research professionals is necessary for effective planning and operation of programs intended to improve safety on our nation's highways.

William T. Pollock, Ph.D.  
HSRI Colloquium Chairman



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**RE**

**EDUCATION**

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# Synopsis of Educational Influences Group Discussions

## Focus

The Education Group was asked to consider the variety of indoctrination and training activities practiced or possible in elementary and secondary school curricula, as typified, for example, by Driver Education, K-12, etc. In addition, the Group charter included the many re-education and refresher activities involving in-service drivers, whether operated as licensing, license-continuation, or enrichment programs, i.e., activities generally covered now by the terms "driver licensing" and "driver improvement."

## Discussion Emphases

Not surprisingly, the Group spent the bulk of its time discussing *Driver Education* as currently taught in most of the nation's high schools. Supplementing those discussions of basic driver training were expressed thoughts of what might, and might not, be done to make good drivers even better through implementation of *Advanced Driver Training* programs. Recognizing the increasingly educational flavor of *Driver Licensing*, the Group looked aggressively at ways in which this periodic contact between state officialdom and individual drivers could be used to bolster and improve driver performance. Finally, the burgeoning role of *Driver Improvement* in attempting to correct driver misbehavior through various re-education procedures was examined.

Given those major ongoing endeavors in the name of highway safety for review, what were the salient points of the Education Group deliberations?

## Salient Points

*Driver Education:* Despite the multitude of evaluation attempts, no convincing evidence of *accident reduction* through High School Driver Education (HSDE) has been produced.

But the discussants hastened to add that accident reduction is perhaps not yet the only correct success criterion to use with HSDE. As a curriculum item, driver education was quietly evolved over several decades as an optional course for students, with concentration on the manipulative aspects of driving. While safety was certainly implicit in those courses, not until the advent of the Federal Highway Safety Act of 1966 did safety, measured by accident reduc-

tion, become *the mandated criterion* of HSDE success.

Several problems immediately intrude. On the one hand, HSDE proponents, mainly driver educators and administrators, rightfully complain of being evaluated, at least for the present, with an inappropriate measure, i.e., accident reduction. However, recognizing that HSDE is now almost completely funded from highway safety coffers, the proponents are willing to modify curricula to emphasize safety, *if* they are provided with valid behavioral details on what is required for safe driving. And therein lies the problem on the other hand.

We do not know in other than fragments—despite much prevailing folklore—what the elements of safe driving behavior are, or, conversely, what behaviors result in accidents. The NHTSA-sponsored work by Human Resources Research Office (HumRRO) and others, involving an initial driver education task analysis and associated education objectives, remains relatively unevaluated.

So until research and development provides an evaluated curriculum, we have no basis for expecting driver education to produce graduates with subsequent measurable experience in accident avoidance.

General Group endorsement was given the NHTSA development plan for driver education. That plan involves the eclectic combination of the HumRRO developments and other appropriate material into a Safe Performance Curriculum, with experimental field evaluation of its accident reduction potential. Endorsement was given though recognizing fully that several years of this development process would be necessary, *plus* perhaps as much as ten or more years before implementation impact would show in accident statistics.

One of the problems in focusing HSDE on accident prevention is that of training for the relatively low probability of accident events. Such training is demonstrably successful in such highly specialized tasks as aircraft pilotage where periodic reinforcement training is feasible for professionals, but applications in non-professional driver training require study.

While HSDE should concentrate on risk perception and risk avoidance, techniques for subsequent reward of successful risk avoidance behavior need study and development. Unfortunately, as drivers, we know that rewards come from risky behavior, e.g., speeding is risky, but, in the vast majority of cases, rewarding in that we get there quicker without accident.

Another contention is that training for risk avoidance may be in conflict with our general life style, that if we drive as we live, risk avoidance training is useless. That sequence of contentions needs study.

In addition to training in principles of safe driving, once developed, HSDE should also instruct in emotional control and frustration tolerance.

We know from other sources that the wide spread of differences between individuals in sensory-motor, perceptual, and judgment capabilities frequently requires job tailoring for performance success. Thus, driver education of the future must recognize these individual differences and provide training options to get differing individuals to common safe performance levels. The emphasis is therefore not on education but on insuring minimum achievement levels among drivers.

In the development of a Safe Performance Curriculum, determination of priority areas must consider what students already know from their experience as pedestrians and passengers in order to economize HSDE course time. Further, content of the curriculum should be reviewed to tease out that subject material that might better be injected earlier in student life, as, for example, in augmentation of current K-12 (Kindergarten through 12th grade) programs for safety education.

As an extension of that thought, the discussants mused over the concept of replacing HSDE with an expanded K-12 program. They envisioned general cautionary, or risk-perception, education as probably having more effectiveness in generalizing to driving behavior than the specific instruction of HSDE. They argued that, particularly in the absence of definitive, valid safe driving principles, inculcation of a general risk reduction attitude could have high potential, especially where the risk is shown to extend beyond oneself to involve others. The Group recommended further study of this approach.

Still on the HSDE curriculum subject, the Group speculated on a curriculum composed of material on "standardizeable" behavior, i.e., things that a driver should do the same way each time, for example, trip initiation procedures each time a vehicle is entered, preparing for a left turn, etc. Here the concern seemed both on identification of desirable, teachable behavior sequences *and* on more uniform, hence more predictable, behavior of driver groups. But the post-training reinforcement problem remains—how do you provide positive, rewarding feedback for successful performance of routine tasks? Again the reward enigma of today's driving was recognized—bad driving is rarely punished and good driving is rewarded only implicitly by the avoidance of low-probability violation citations and accidents.

Continuing on the curriculum issue, the discussants reflected on a split curriculum concept, with classroom activities spread through the student's development, and in-car training reserved as a condensed, safety-oriented unit. The argument that

classroom activities should retain a citizenship-responsibility, public service flavor was advanced. Note, however, some potential pitfalls in this split-curriculum approach. Student incentive to learn safe driving is probably highest as he nears licensing age—spreading instruction earlier might be associated with low student motivation. And driver educators seem convinced that classroom content is best learned when closely integrated in time with in-car instruction.

That curriculum-splitting discussion was embedded in the occasionally heated argument of who should teach driver education, particularly the safety-concentration aspects. Some opted for continued complete control by the school system, while others suggested in-car training be made a responsibility of driver licensing agencies, or, perhaps, of commercial enterprises.

Arguments against shifting the in-car training included recognition that licensing personnel are not educators and that rather massive funding would be needed for providing licensing agencies with appropriate training facilities. Arguments for licensing agency involvement included the assertion that such agencies would clearly concentrate on safe driving requirements with accident reduction accountability.

Nonetheless, the discussants concluded that study and research are required before the present institutional arrangements for driver education and licensing are revised.

On personnel matters, the Group was generally concerned with allegations of low professional competence of HSDE instructors. In commenting on the very minimal certification requirements to teach driving, the Group endorsed the movement in some states to require a college major in Safety Education as a certification requirement. This implies more costly certified personnel, but might include greater use of non-certified instructors under the direct supervision of one certified person to control costs. The certification movement was felt to be too long in coming, and if uniformly instituted now would have a long lag in academic competence improvement by driver educators.

With the current system of state reimbursement to school districts for HSDE expenses, no incentive to program excellence exists. Schools are paid simply for volume of students. Indeed, it can be documented that schools which attempt tougher, more comprehensive HSDE programs are financially penalized. Their per-student reimbursement is generally the same as that for schools meeting only the minimum training requirements. Study of alternative reimbursement schemes was recommended.

*Driver Licensing:* Much discussion and information sharing took place with the subject of "driver licensing," i.e., the examination and re-examination of driver aspirants and drivers for the intended pur-

pose of causing individuals to demonstrate competence for safe, efficient, legal vehicle operation.

The group rejected licensing as currently practiced as being a “good-driver” selection process. At best, licensing is a forcing function to get people to read a driver manual or otherwise prepare for a minimum requirement test. Anyone with persistence, and even minimal skills and knowledge, can get a driver license. States are reticent in denying licenses because (1) driving is a socio-economic necessity, and (2) detection of those who choose to drive unlicensed is of low probability.

What then should the driver licensing process be? The discussants opted for a diagnostic/educational process, with examinations beefed up and failure used only as an incentive to re-prepare and try again.

Government responsibility for providing study material to be used by applicants in preparing for licensing tests was recognized. And the NHTSA-sponsored “model” driver manual work by National Public Service Research Institute was applauded.

With considerable discussion on license testing operations, the discussants generally agreed that no particular research is needed in providing adequate knowledge tests for driver license applicants—only the application of better test construction technology.

While accident reduction was recognized as an attractive criterion of licensing test success, the Group was dubious about achieving that precision in testing in the foreseeable future. In its recent driver license knowledge test re-design, North Carolina achieved modest success in correlating test scores with subsequent accident and violation experience. But that success was small and of doubtful practical significance. Rather, the discussants believed that licensing tests should be judged by psychometric adequacy and their face validity, i.e., containing material reflecting our best current understanding of safe driving principles.

Relative to actual testing operations, some discussion of the potential use of driving simulators as testing tools ensued. While the Group was aware of the several researches in the area, it felt that such application was still an open subject, and that further study is needed.

More extended use of the probationary driver license concept was endorsed. Given the accident overinvolvement of new, young drivers, many states observe first-licensed-year probation provisions, with stiff penalty including suspension for excessive accidents and convictions during that period. Our Group opted for considerably more monitoring and control during new-driver formative years. Based on what we know, statistically, about relative risk situations for young drivers, the discussants mulled over a licensing concept that controlled new driver experience with increasing risk situations. For example, the driver might be constrained in his first driving year to daylight only with an adult driver passenger,

during some subsequent period to daylight solo, then nighttime with passenger, etc. Definitive study of this phased-introduction licensing concept was heartily recommended.

Bits and pieces of licensing research were presented by various researchers. The New York procedure for a three-hour indoctrination course for new license applicants not having had Driver Education was discussed. The North Carolina, the Virginia, and other programs trying out license renewal test waivers under various circumstances were mentioned. Such mentions triggered recognition of the apparently poor communications that exist between researchers and operational experimenters. For general enlightenment and to minimize redundancy, the Group suggested that some central agency, probably NHTSA, produce periodic, brief summaries of ongoing state experiments in the licensing process.

In a mood of speculation, the discussants pondered in a general way the assumed low benefit-to-cost returns of the various state driver licensing systems. What increased returns to highway safety would accrue, for example, if funds used for driver licensing were diverted to removal of roadside obstacles? However, even given that such resource allocation questions are real, Group consensus developed that driver licensing systems should continue and be improved as educational tools.

*Driver Improvement:* Most of the discussion of driver improvement (DI) was interlaced with the driver education and licensing discussions. Several points specific to DI, however, are reported here.

As currently practiced by states, DI generally involves attempts to re-educate and control, generally in a punitive atmosphere, drivers who show bad records of, mainly, violation convictions. Ranging from lectures to license suspension, DI actions have generally been associated in evaluation with moderate but temporary success, as measured by before-versus-after records. Reasons for these small successes in wildly varying programs are moot—perhaps because older age groups are involved.

License suspension and revocation are frequently used DI sanctions with flagrant violators. But studies show that many drivers so treated continue driving without benefit of license. Follow-up enforcement systems are badly needed, if such sanctions are to work with uncooperative culprits. One type of study suggested, mainly for suspension enforcement but also for general traffic violation suppression purposes, is the comparison of low detection probability coupled with very severe penalty *versus* high detection probability and mild penalty. Educational deterrent effects of those combinations have been long on speculation but short on study. The visible-license concept, in which each driver is required to display a license symbol while driving, is feasible, but not easily accepted by the public.

Other less extreme DI measures were reviewed.

Warning and advisory letters are becoming popular and relatively cheap means for reminding large numbers of drivers of increasingly bad records, and of consequences if the records worsen. Attempts to evaluate these education-by-mail programs have produced equivocal results. The concept merits more definitive study.

*Advanced Driver Training:* As the phrase suggests, Advanced Driver Training (ADT) is the relatively un-implemented concept of instructing experienced drivers in techniques for improving their vehicle handling skills, and possible general judgment and decision capabilities.

While NHTSA issued some feelers several years back about public interest in the area, our discussants are not aware of other than isolated fragments of ADT activity. Several commercial schools teach high-speed driving and emergency-recovery subjects. Isolated police department activities do the same for their patrol personnel.

Such courses are apparently formed from folklore and cursory review of accident causative and avoidance behavior. Our Group recommended collation of what exists relative to the characteristics and apparent results of such courses as a prelude to systematic study and evaluation of the ADT concept.

One danger of ADT was felt to be possible elevation of risk-acceptance thresholds of drivers given such training, comparable to the alleged increase in risky behavior of newer car owners. They have been told their cars are safer, and they "spend" that safety increment on greater risk behavior. Findings of excess violation rates of race drivers was offered as another bolster to the risk-increase argument against ADT, except that race drivers are exceptional people, and further training of "average" drivers need not produce similar results.

A companion concept to ADT is the Master Driver License idea, reportedly practiced in New Zealand. Here the plan is to give recognition to drivers, who, with or without special training, show superior driving records. Study is required to flesh-out an equitable Master Driver License plan, along with possible driver incentives, e.g., lower insurance rates, special vehicle plates, etc.

Finally, the relative accident-avoidance success of high-mileage-exposure truck and bus fleets should be studied for possible exploitation with passenger car drivers. While fleet safety programs may be responsible, the discussants felt that the driver selection/rejection control exercised by fleet directors, control not feasible with the motoring public, might be a success factor, as is the extensive experience these drivers have in meeting varied conditions and emergencies.

*General:* Constraints on research in operational settings were much discussed. The Group felt that operational agencies still do not have a research attitude, i.e., a posture conducive to systematic try-out

of new procedures for betterment of their intended operations. More often than not, research consists of comparing two or more alternative operations, with no certainty that any one of the alternatives meets a real agency need.

In that respect, DOT Highway Safety Program Standards hinder study and innovation—they dictate mechanisms rather than functional goals.

Operationalists are frequently naive in interpreting statistical results, particularly those involved in evaluation programs. Caution must be exercised in rejecting valuable programs because one-shot statistical results fail to show significance, i.e., committing the Type II experimental error. Two thrusts are recommended: (1) before experimental evaluation, determine what program effect is minimally, operationally acceptable and prepare an experimental design sensitive to that effect magnitude, and (2) educate administrative and operational people in the fallacy of blindly assuming that no effect exists unless statistically demonstrated.

## *Recommendations*

Suggestions for research and other recommendations that fell out of the Education Group deliberations are as follows:

### *On Driver Education*

—Detailed, quantified analysis of driver behavior, carrying forward from the HumRRO Driver Education Task Analysis, is required for many purposes, including needed improvement of Driver Education and Driver Licensing programs.

—Research community support to the NHTSA development and evaluation of its Safe Performance Curriculum for Driver Education is urged and solicited.

—Study is required to consolidate on a periodic basis what is known relative to driver risk perception and risk avoidance, particularly for injection into driver education, licensing, and improvement programs.

—Techniques for reward of good risk-avoidance behavior must be developed.

—HSDE curricula should include segments on the need for and techniques for achieving emotional control and frustration tolerance.

—In recognition of individual differences, future driver education curriculum planning must consider alternate training programs required to get individuals of differing capabilities to comparable levels of driving skill.

—Study is required to determine what elements of current HSDE might better be presented earlier in an individual's schooling.

—Consideration should be given to general risk reduction education in various grades as a partial replacement for much of current HSDE curricula.

—Study is required to develop a more optimum balance between education and licensing agencies with respect to entry-level education and tests of neophyte drivers.

—Study is required to document or refute allegations of low professional competence of HSDE instructors; if documented, development of a model teacher certification standard should be initiated and promulgated.

—Exploration of reimbursement schemes other than the current system for HSDE is required to provide a system which provides incentives to school excellence.

#### *On Driver Licensing*

—Acceleration of the trend in driver licensing away from “screening” to a more diagnostic/educational process should be encouraged.

—To facilitate that change in driver licensing approaches, research community support of the NHTSA model driver manuals project is encouraged.

—Given the example of a few states, all states are urged to use available data and formal test development procedures for developing licensing knowledge tests that perform a broad educational and testing function.

—Continued research on the applicability of driving simulators to licensing operations is encouraged.

—Study of systems for more gradual introduction of entry level drivers, beyond the current probationary practices, is strongly recommended.

—Better communication between researchers and operational agencies engaged in various trial manipulations of the licensing process is required.

#### *On Driver Improvement*

—Study is required of the relative effectiveness of low-probability-of-detection, high-penalty *versus* high-probability-of-detection, low-penalty systems for enforcement of driver license sanctions.

—Attempts to develop and evaluate warning and advisory letter systems for deterrence of poor driving performance should continue.

#### *On Advanced Driver Training*

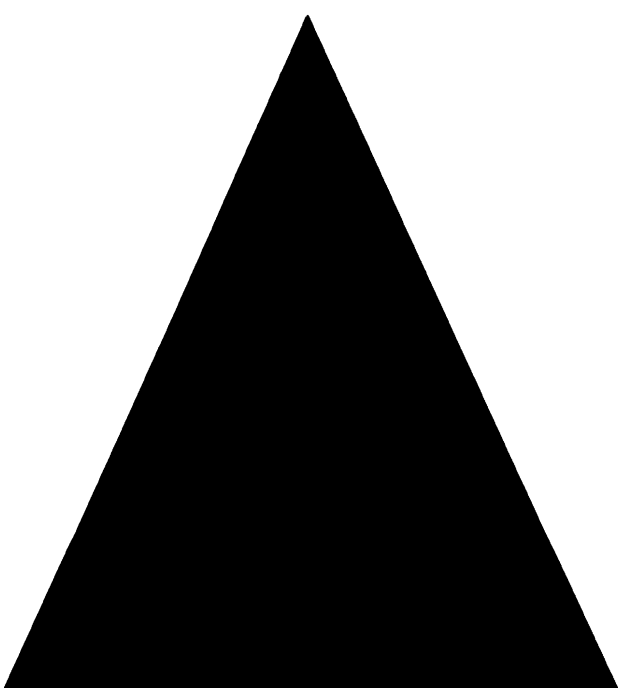
—Collation of the results of various advanced driver training attempts should be attempted, with that review used to explore feasibility of a general program for in-service driver instruction.

—Study of the Master Driver License concept is required to determine if a practical system for improved driver performance using this incentive is feasible.

—Study of successful fleet safety programs is necessary to determine if elements other than favorable selection control are available for general use with the motoring public.



**LEGAL**



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# Synopsis of Legal System Influences

## Group Discussions

### *Focus*

Given our complex *Traffic Law System*, evolved purportedly to help reduce traffic risk through control and modification of driver behavior, this Group took on the rather large task of reviewing that system in search of the answers to two questions: Is the system really focused on those behaviors not conducive to safe traffic system operation? And, if not, what refocusing, with what attendant research, is required?

The Group charter for discussion included operations of the Criminal Justice System that deal with law violations by drivers, as well as operations of administrative agencies responsible for driver licensing and control.

### *Discussion Emphases*

Included under that large umbrella of criminal and administrative law are *Law Generation, Enforcement, Adjudication, and Sanctioning* operations. Each of those subjects was touched on at one time or another during the Group discussions. By far the bulk of discussants' attention involved, however, the more fundamental issues of *traffic risk identification* and of system characteristics in-being or required for *traffic risk management*. The discussions were frequently heated, and seldom concluded with consensus—testimony to the uncertain pertinence and success of the Traffic Law System in effecting improved driver performance of the general population.

### *Salient Points*

*General:* A complex legal system, ostensibly for assuring safe driving performance by law, exists and continues to expand with specific, fragmented legislation. Increasingly the rational foundation of that system and its operations are being challenged.

Not only the motoring public, but also principals in the legal system itself have become critical of the legitimacy of intent of traffic law. Is speeding per se really bad? Does removing the driving license of a traffic law violator really improve traffic safety? Such questions, growing in volume, show mounting resistance to what used to be routinely accepted as a necessary exercise of the public safety function of the state.

In that connection, our panelists observed that much use of the criminal justice system is related to traffic *flow* infractions with no demonstrated connection with *safety*. The motoring public does not take seriously threats of sanctions in such cases. Perhaps what is needed is some separation of system functions, such, for example, that an administrative system handles traffic-flow-related adjudication, and the criminal law system continues treating violations associated with public safety, consistent with the historical mission of criminal law.

Counter-argument to such a flow-versus-safety split in adjudication functions stressed that separation of violations into flow- or safety-related is no small task. The same driving maneuver considered a traffic impediment in one case might be in a different time or place judged a hazard.

On a different tack, the Group hashed over the pros and cons of national uniformity of traffic law. Study is needed to identify local situational circumstances that might dictate unique local laws to optimize traffic safety.

The discussants observed that *reasonable* laws, for example, most speed limits, probably require no massive application of criminal sanctions. By and large, many traffic laws simply codify normative behavior of the driving population. By definition, then, most drivers voluntarily observe those laws. But ample evidence exists that some drivers persistently exceed the norms, i.e., break the laws. Clearly, enforcement and sanctions are required for the persistent violator, but should that same system be used for the occasional inadvertent violator? Study is required on that question.

While the relationship that law is the codification of normative behavior is generally true, law can also influence driver normative behavior. Witness the between-state variations in enforcement of the national 55 mph speed limit and associated variation in average speeds. What we do not know with adequate precision is the range of circumstances in which enforcement and sanctions can exercise that beneficial influence on normative behavior. That needs study.

The Group re-recognized the fact that many bad or archaic traffic laws exist. Laws with uncertain objectives, no matter how well enforced, are of questionable value. Mechanisms must be developed for periodic review of driver and vehicle codes for emphasis of good laws and purging of bad.

That review responsibility must be accepted by the legal system, with the concomitant responsibility for detailing and clarifying traffic safety problems and

law inadequacies for legislative and public action. Law generation must be based on such *derived* needs clearly related to risk, not on capriciousness or pressure group influence.

Given that we all occasionally, willfully violate traffic law, the discussants could recall no studies in which drivers are asked what makes them accept unlawful risks, what situations cause them to behave unsafely. One participant noted that the study of general criminal law violation and of the etiology of crime relies strongly on information from public surveys. Such information describes motivation and behavior precipitous to crime. Such studies often show that actual criminal activity is at variance with statistics derived from reported crimes and convicted criminals. In highway safety work, similar survey techniques identifying personal experiences with dangerous or illegal driving might be more enlightening than relying solely on information from accident-involved or arrested drivers. Information of how an accident was avoided may be of more value than how an accident occurred. Study is needed here.

While its ethical acceptability would need study, the use of deliberate bluffs, or "spoofer stories," on increased enforcement and vicious sanctions, simply as do-good-or-else influences on motorist behavior, should be investigated.

Arguing that not knowing how well the legal system works should not be the basis for assuming that it does not work, some discussants opted for a no-change posture, a period of "benign neglect" during a period of review and reevaluation of the traffic law system.

*Risk Identification:* Much discussion centered on the relatively unknown relationship between traffic law and traffic risk. Are violations unsafe? Do they cause accidents?

The Group agreed that we have an impasse. We do not know with any precision what kinds of behavior create risk, and hence we do not know what effects current actions of the legal system have in changing driver behavior to minimize risk.

This is, of course, a general problem—not one restricted to legal system operations. Desperately needed for improvement of *all* traffic safety operations is better definition of what driver improvements are desired and what options are available for effecting that improvement. The Group suspected that *criminal* law is one of the least desirable of those effecting options.

Until better definition of undesirable, risky driver behavior is developed, law generation and associated enforcement will continue being considered unreasonable and unacceptable to the motoring public and to the legal system itself.

Our discussants asserted that the identification of risky behavior for more valid operation of the Traffic Law System must come from behavioral and social

science studies. That risk-identification research is highly recommended.

Note that driver behavior perhaps most in need of change for risk reduction might be normative behavior, for example, low utilization of restraint systems. How to combat popular, but risky, behavior must also be studied.

And that is no small task. We know that the public will reject safety improvements unless the safety risk is clearly perceived and the benefits of the improvements are evident. Witness the public, and then official, rejection of the seat belt-ignition interlock system. However, some discussants argued that the public will to some extent accept mandated "improvements," even if the reasons for the mandates are not clearly understood. Extending that argument, proponents asserted that authority must act alone in some cases before public understanding and acceptance is achieved, simply as a matter of public welfare protection. In such instances, the legal system, acting as an early receiver of technical information, must exercise its authority unilaterally.

Back to risk identification per se, the Group agreed that the current processes of working only with individuals who persistently show extreme behavior will never solve the traffic safety problem. The low correlation between violation convictions and accidents suggests that the legal system is not working to weed out the really unsafe drivers. By extension, enforcement is not really related to risk—which cycles us back to the extreme need for risk-identification research.

In that same vein, we have increasing recognition that most accidents are probably caused by occasional lapses into deviant, unsafe behavior. The Group seriously questioned the pertinence and effectiveness of the criminal law process in dealing with such occasional deviant behavior. Other adjudication and sanctioning processes are required.

*Enforcement:* Despite numerous studies, the effects of law enforcement, i.e., policing, on driver behavior and traffic risk are not known.

Several fundamental questions were debated to no conclusion. For example, do laws achieve their maximum effect mainly through their existence, or is enforcement required? Study is needed to determine what circumstances are associated with voluntary compliance, obviating the need for enforcement.

Police are trained in criminal law enforcement, with traffic law subsumed, with the result that violations are not differentiated. Emphasis is on enforcement per se, not on management of traffic risk. But can police be expected to recognize and decide the risk potential of specific driver actions? Consensus seemed to develop that that discrimination had best remain in the adjudication process.

Evidence that enforcement is not focused on serious offenses comes from several quarters. Given

that driving while intoxicated is high-risk behavior, roadside surveys suggest that the incidence of such behavior greatly exceeds arrests. Selective enforcement is a much discussed operational technique, but in operation reduces to "paper hanging," that is, the indiscriminate issuing of traffic citations without consideration of the risk inherent in various driver behaviors.

The low detection of serious offenses is frequently attributed to not enough police concentrating on traffic. But going the Traffic Bureau route is a problem, because the quality of officers willing to concentrate on traffic law, given the call of *real* crime fighting, is low. Study is needed on how to improve serious violation detection by making traffic law enforcement duties more attractive and rewarding.

A variety of police effectiveness improvers was suggested for further study.

- Enforcement agencies need goal, rather than activity, objectives.
- Agencies, tradition bound, are too slow to adopt new, improved procedures.
- Better deployment practices and guidelines on optimum enforcement levels are required.
- Study is needed to determine what enforcement tactics work best on what deviant driver behaviors.
- Physical improvements to extend police power are required, for example, ORBIS III for automatic detection of speeders.
- More specific training programs are needed, to include training in relevance of traffic duties to societal benefit.
- As a detection facilitator, profiles of risky driver types and behavior clues could probably be devised.
- Better guidance on what to report for record systems, particularly in accident investigation, is needed to avoid continued amassing of files of useless data.

Finally, while police have the responsibility for on-line, real-time detection of risky behavior, administrative agencies, i.e., licensing and records agencies, must work in tandem to perform the cumulative behavior enforcement function.

*Adjudication:* Most of the discussion unique to adjudication related to the current issue of administrative adjudication versus criminal court processing of traffic law cases.

The Group recognized that use of the criminal justice system for traffic law adjudication has been traditionally justified as necessary to the use of our existing police enforcement system. The discussants were divided on whether an administrative adjudication system could effectively interact with existing

police operations. That needs study.

The much-expressed contention that removal of traffic law from criminal courts would destroy deterrent benefits was repeated. Some semblance of consensus suggested that the problem with decriminalizing violations, except for serious violations and repeat offenders, is that traffic risk, as contributed by the majority of drivers, would be de-emphasized.

On the other hand, administrative adjudication might lend more effective coordination to what is now believed to be a disorganized collection of courts. While higher courts may be coordinated, activities at local court levels are demonstrably disjointed, generally with each case uniquely determined, with attendant questions of risk reduction effectiveness.

Concern was expressed with the generally negative, punitive nature of legal system operations. Study was recommended of possibly feasible positive actions, for example, congratulatory letters to "clean" drivers, reminders of age-connected problems, etc.

Note that research shows that mandatory appearance to answer a citation has no measurable deterrent effect. What acceptable alternatives might be developed?

*Sanctioning:* Some question exists of whether legal sanctions to deviant behavior really work. One recognized problem is that the wide variations in sanction application result in dilution of sanction deterrence effects. The contention, for example, that the affluent suffer less from sanction effects is true.

Definitive study of sanction effectiveness is much needed. As an adjunct, research on exploitation of indirect sanction effects should be pushed. Some limited-scope studies suggest that individuals are more influenced by the social ostracism, family displeasure, etc., that result from traffic law conviction than by the legal sanction, e.g., fine, itself.

The Group believed that sanctions should be of greater range than at present, and tailored somehow to the behavior associated with the violation. This needs study.

Noted was the suggestion that criminal justice sanctions just do not work against the numerous, but occasional and unintentional, violations. Some mechanism of citizen or quasi-administrative system of sanction influences must be developed. In such cases, the legal system can probably best exercise indirect deterrence by a good display in handling repeat offenders.

With occasional violators, sanctions should perhaps be more diagnostic in nature. More use of re-testing of such violators on physical condition and on skill and knowledge of driving should be explored.

*Records:* Nearly every state maintains a central record of individual driver deviance in accidents and traffic law convictions. Our Group felt that the typi-

cal practice of using only the last two years of a driver's record does not permit adequate identification of a potential dangerous driver. Study is required on the bad-driver predictability of longer record periods. Note, however, that the Group was quite sensitive to the need for protecting individual privacy rights in such record-expansion activities.

Several current restrictions on record keeping constrain their potential usefulness. Records inadequately help risk identification since they simply reflect imperfect police and court operations. Constraints on police operations are reflected. The need to observe violations as a requirement for issuing citations biases records of hazardous behavior, and creates inequity. An accident-involved drunk is less penalized than a drunk observed driving by the police. Non-uniformity in adjudication clouds record systems. Instances are replete of different convictions and recorded sanctions for the same offenses. Study is needed to determine feasible improvements to record systems to make them more reflective of traffic risk, but not, as mentioned before, to the point of individual harassment or privacy invasion.

## Recommendations

Suggestions for research and other recommendations that fell out of the Legal System Influences Group deliberations are as follows:

### On Traffic Law

—Determine which traffic laws are predominantly *safety* related and which are *flow* related, and explore different adjudication and sanctioning processes for each.

—With respect to traffic law uniformity, identify the variety of local, situational circumstances that might dictate unique local laws to optimize traffic safety.

—Continue exploration of alternatives to the criminal justice system for adjudication and sanctioning of low-risk violation cases.

—Determine the range of circumstances in which enforcement and sanctions can exercise beneficial influence on *normative* behavior, rather than simply focusing on containing normative behavior.

—Improve mechanisms for periodic review of driver and vehicle codes for emphasis of good and purging of bad laws.

—Augment the traditional inquiries into the etiology of risky behavior and accidents with special surveys of drivers to determine causes and circumstances of intentional unsafe behavior.

—Study means for greater publicity of transient enforcement and sanction crack-downs as enforcement extenders to the known benefits to safe driving performance of actual or expected police presence.

### On Risk Identification

—Prepare a better taxonomy of unsafe driver behavior than currently reflected by traffic law, using social and behavioral science study techniques.

### On Enforcement

—Attempt to determine which laws or characteristics of laws are associated with high voluntary compliance.

—Given low police enthusiasm for traffic duties, develop incentives to improve professional rewards for traffic law enforcement.

—With respect to police operations, consider the following potential effectiveness improvers:

- Goal, rather than activity, objectives.
- Tradition notwithstanding, adopt improved procedures.
- Better deployment practices and enforcement level guidelines.
- Develop guidelines on what tactics work with what driver groups.
- Accelerate development and acceptance of physical improvements.
- Bolster traffic training programs and include segments on societal benefits of traffic duties.
- Develop risky-driver profiles.
- Improve reporting procedures.

### On Adjudication

—Prior to widespread implementation of administrative adjudication, determine compatibility of police interaction and any necessary changes in police functioning.

—Study means for positive reinforcement to good drivers by the legal system.

—Explore alternatives to mandatory court appearance for serious traffic offenses.

### On Sanctioning

—Continue study of sanction effectiveness, with particular emphasis on exploitation of indirect social influences.

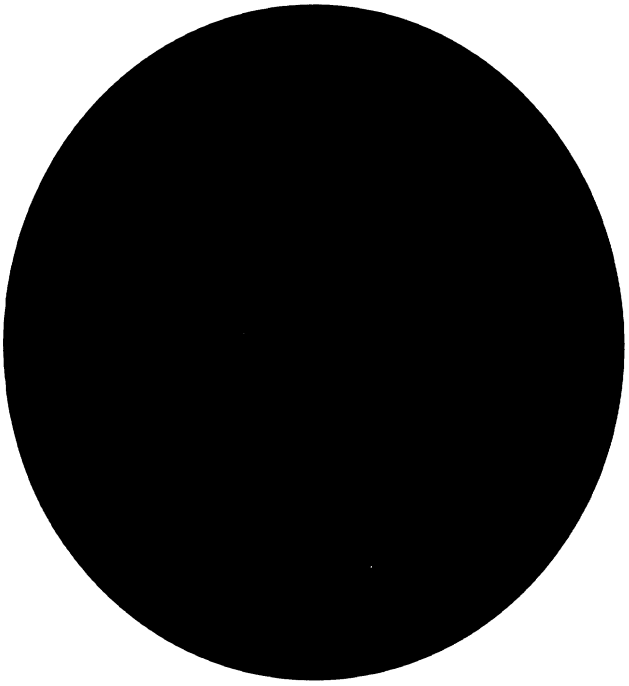
—Explore techniques to extend the range of sanctions, with attention to relating the sanction to the violating behavior.

—For occasional violators, develop sanctions more diagnostic, less punitive in nature.

### On Records

—Study use of longer *active* driver records for improving bad driver predictability.

—Determine data parameters to augment driver record files for operational and prediction improvement.



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# Synopsis of Social Influences Group Discussions

## Focus

Despite all the apparent anonymity of people who use the traffic system as vehicle operators, passengers, or pedestrians, their participation does not take place in a social vacuum. We know, mainly from experience because few research findings are available, that how we behave as road users is largely determined by a myriad of *informal* influences from people before, while, and after (as expectations) we drive. The wife's smile or frown as you leave for work—your passenger's friendly banter or the obscene gesture from that other driver on the way—those thoughts of pleasant colleagues or an impatient boss waiting—these and endless combinations of *social* influences serve in complex ways to determine the variable quality of our driving behavior.

Our Social Influences group bravely tackled that complexity, looking for ways in which good influences could be identified and exploited, and bad influences suppressed. Confounding the subject complexity is the paucity of research data on, or even a catalog or listing of, influences on driver behavior through social interaction.

## Discussion Emphases

Given such an unorganized area, the discussions were understandably diverse in subject and detail. Concentration on *driver communication* was evident, and included review and speculation of influential inputs to a driver from other drivers, passengers, and whoever. Considerable interest was shown in documenting *social norms* for driver risk evaluation and acceptance, and particularly in how public information and influence figures and groups might modify those norms. Recognizing that driving is but a thread in our social fabric, lively debates on influences on driving spilling over from employment, recreational, and general maturation problems were spawned, along with related arguments on the feasibility of *modifying life styles* to effect driver performance improvement.

## Salient Points

*Area Definition:* Given that the topic, social influences on driver behavior, has not been systematically explored, our discussants spent considerable

effort in attempting definition of just what should be covered by such a topic.

Starting small, the Group suggested the topic to cover social influences occasioned by interaction of a driver, and his personal characteristics, with other road users. But quickly recognized was the fact that such *immediate* interactions were not truly reflective of driver social influences. For example, what the driver expects or assumes another as-yet-unseen driver will do serves to influence his behavior, as when he cautiously approaches a blind corner.

In addition to those implicit or expected social interactions, the Group expanded their definitional considerations to include *antecedent* events that could persist and influence driver performance. The popular example here is the domestic spat before trip-start and its effects on subsequent driving performance.

So a broad spectrum of real or expected interpersonal contacts before and during driving was included for the topic of social influences on driving behavior.

While not specifically “interpersonal,” social norms, particularly with respect to risk evaluation and risk acceptance, were also drafted as pertinent to the Group discussion. Subsumed under social norms are the variety of personal life styles—styles with identifiable characteristics that may facilitate or suppress high-quality driver performance.

With that wide-ranging variety of *informal* social influence sources to review, what specific observations and recommendations were generated by the Social Influences Group?

*Communications:* The Group recognized three general types of driver-influencing communications—(1) driver to driver, (2) driver to authority, and (3) authority to driver. While considerable personal and anecdotal information was exchanged, realization was quick in coming that we just do not know much about any one of the communication types. Conclusions were few, questions were many.

Who influences whom, based on what perceptions through what medium? That extremely broad, multivariate question condenses what we need to know to exploit communications for driver improvement, and concomitantly, with no answers available, underscores our ignorance in this potentially high-payoff area.

Bits and pieces of appetizing observations and minor research were mentioned. The assumed cautionary influence on other drivers of American

“Driver Education” car-roof signs and British “L” (for learner) plates was mulled over. Studies of conflict resolution by competing drivers at unmarked urban versus rural intersections were mentioned. Imitative behavior of drivers in signalling turns and changing lanes was discussed. And so on, confirming that we know little in driver-to-driver communication about what is, could be, and should be done to exploit this mechanism for traffic conflict resolution.

A somewhat special case of communications is that between a driver and his passenger. Accident statistics, for example, suggest that a young driver with a young passenger is an elevated accident risk. What mechanism of social interaction is operating? How might it be changed to a safety-favorable influence to include, for example, active passenger participation in threat detection, navigation, etc.?

On a different communications tack, the discussants speculated about ad hoc authority-to-driver communications as represented, for example, by traffic advisory information offered by some AM radio stations. Do such inputs to drivers affect traffic flow? Could they be similarly used to input safety advice?

With respect to information flow in the reverse direction, i.e., driver-to-authority, little is known. Many instances of organized citizen-band radio buffs reporting traffic hazards are known. Some locales have emergency motorist aid call boxes. But we do not know what if any success lies with these communications possibilities. Study is needed. Applause was given the recent sponsoring by NHTSA of research on citizen participation in hazard reporting and of authority acceptance and use of such reports.

In general summary of informal driver communications, research is required, starting with systematic description of what current practices exist as a foundation for exploratory development of acceptable, effective influences.

*Risk Considerations:* Deliberately exceeding the bounds of prudent driving behavior was identified by the discussants as a probable major cause of accidents. While the Group believed some drivers to be chronic risk-takers, consensus seemed to favor the notion that most risk-taking reflects more of a personal, transient state. We occasionally accept elevated risk as an expedient or as a sign of inexperience.

With respect to “inexperience” and risk, the demonstrably poor performance of beginning drivers was recognized as a complex case. Is that poor performance indeed low appreciation of risk, though vehicle control skills are adequate? Or are skills inadequate to cope with high risk appreciation? Does the beginning driver command effective risk knowledge *and* response skill, but insufficient practice in integrating information clues to a developing risk situation?

These and other questions require answers before risky behavior of entry-level drivers can be inhibited.

With the problem of “convenience” risk of experienced drivers, similar fundamental questions surfaced. Is there indeed a hard core of drivers who consistently elect dangerous driving practices? What are their personal and demographic characteristics? Some discussants asserted that generally low achievers are of that chronic class. Individuals with low success in school, employment, marriage, etc., seek self and social esteem in risky driving and in other potentially dangerous pursuits such as motorcycling, snowmobiling, hang-gliding, surfing, etc.

Given such assertions, research is needed in the general area of risk *perception* and *acceptance* as a function of personal and demographic variables. We need much better definitions of situations in which normally “good” drivers show increased tolerance to risk. Are some driver types more susceptible to those situational influences than others?

Concomitantly, does the overt behavior of risk-takers offer clues to other road users so that these other users might alter their risk expectancies?

In a different vein, the Group voiced some concern with recent trends in accident avoidance training. The hypothesis was advanced that training in accident-avoidance maneuvers increases risk-taking and, thus, accidents. Conversely, training in risk *perception* should lower risk-taking and, thus, accidents. These hypotheses need testing.

*Life Styles:* Much discussion involved the “we drive as we live” contention and its ramifications. There is little question that our socialization processes encourage general aggressiveness, and that some or all of that encouragement is expressed in risky driving.

Some discussants argued that, particularly, errant driving, being symptomatic of some social adaptation problem, must be studied and corrected in a larger social context. Debate raged on the cost-effectiveness of treating the immediate manifestations, i.e., risky driving, versus the general social motivating condition. The stand-off consensus recommended study in both directions—research on the global precipitators of errant driving to include job dissatisfaction, economic unrest, school problems, etc., as well as continued study of symptom relievers.

How to increase the social utility of safe driving, and the dis-utility of risky driving, was another consuming topic.

Rewards for safe driving, other than possibly accident avoidance, are few. Insurance incentives are considered inadequate. Programs for facilitating safe drivers through license renewal systems seem to have marginal incentive effects. How can safe driving be made more socially rewarding?

Conversely, how can unsafe driving be made more socially undesirable? Some examples of risk utility



were offered. Paid-by-the-trip drivers, e.g., taxi, truck, and bus, have high expected utility for risky behavior. While such high-exposure driver groups generally have relatively low accident rates, it is suspected that they set bad examples for less capable drivers. Their imitation is risky. How, with economic fairness, can the utility of risky behavior by such example-setters be removed?

Recreational driving by youths, considered generally risky by the Group, received attention. Study is needed to determine alternatives to the car as a social-life focal point.

Still on youths, conviction was expressed that risky driving has become a maturation phenomenon. Young males in particular seem compelled to experience the vicarious thrill of risk and to maintain peer status. Suggestions were offered to substitute socially less damaging activities such as supervised drag racing, expanded athletics, and surfing for this maturation use of risky driving. This area needs study.

In passing, the Group noted that possible changes in life styles and residency due to the energy shortage may have long-term effects on highway safety. Exploitation for safety of this trend was recommended, for example, by expedited development of telecommunications, close-in recreational land use planning, directed consumer education in schools, etc.

*General:* In their sweeping discussions, the Social Influences Group touched on several considerations beyond their group charter but worthy of reporting.

The discussants expressed dissatisfaction with the form of the U.S. Department of Transportation Highway Safety Program Standards proclaimed to the states. Performance or output standards should be set rather than activity specifications. For example, "...each state shall have drivers who know the rules of the road..." rather than "...each state shall have a licensing test on rules of the road...." Latitude should be left for alternative, innovative approaches by the states.

On a general communications note, the discussants suggested the need for a bulletin of summary information on highway safety research. Pitched to state administrators and legislators, the bulletin purpose would be to acquaint decision- and policy-makers with available data on safety activities. Problems arise. Who would be accepted as a creditable, unbiased source of such information? Can researchers agree on the merit and validity of specific research? Is not the plethora of research information so diffuse as to defy summary? How much of the available information is too transitory or too constrained to specific locales to be of general use? These are indeed tough questions, but the need for information exchange remains. Study is needed.

Still in the communications domain, the discussants felt that news media treatment of traffic crashes could be improved from the beneficial influence

standpoint. Perhaps, in addition to the facts and figures generally reported, more information on probable causal risks and losses associated with specific crashes might be reported.

In the area of general education, the Group proposed working with authority figures and policy makers to inculcate concepts of and needs for social *experiments*. Too often operational experiments are solely for the purpose of selecting an alternative activity for implementation. Needed in addition is research for information and understanding of social processes, without the press for immediate problem solution.

## *Recommendations*

Recommended study areas from the Social Influences Group discussions are as follows:

### *On Communications*

—Identify and classify the variety of informal communications currently observed between drivers.

—Use that classification for study of means for enhancing "good" communications and suppressing "bad."

—Explore driver imitative behavior with respect to who imitates whom under what situational circumstances.

—Determine means for greater participatory involvement of passengers in driver support tasks such as threat detection and navigation.

—Support and continue the NHTSA-initiated research on organized reporting to authorities of traffic hazards by drivers.

—Consider techniques for exploiting AM radio traffic advisory services for broadcast of *safety* advisories.

### *On Risk Considerations*

—Investigate the relative contributions of low risk-perception skills and low vehicle-control skills in low performance of beginning drivers.

—Continue attempts to determine if chronic risk-takers constitute a social class identifiable by patterns of personal and demographic characteristics.

—Given occasional excessive risk-taking by otherwise "good" drivers, determine if there are consistent situational patterns that induce that transient lowering of risk acceptance threshold.

—Identify overt traffic behavior clues given by consistent high-risk-takers as avoidance information for other drivers.

—Evaluate the hypothesis that training in accident avoidance maneuvers results in increased risk-taking.

—Evaluate the hypothesis that risk-perception training lowers risky behavior.

### *On Life Style*

—Expand efforts to relate signs of increased risk-taking to indicators of general and personal socio-economic problems.

—Study means for deliberate, explicit social rewards for good driving performance.

—Identify alternate economic reward schemes for taxi, bus, and truck drivers who presently see high utility to risky behavior.

—Explore alternatives to intense recreational driving by youths.

—Study the potential of substituting less socially damaging activities like surfing, controlled racing, etc., for maturation motivated risky driving by young males.

—Evolve public information and education programs to exploit energy shortage considerations to minimize exposure to high-risk driving situations.

### *On Other General Matters*

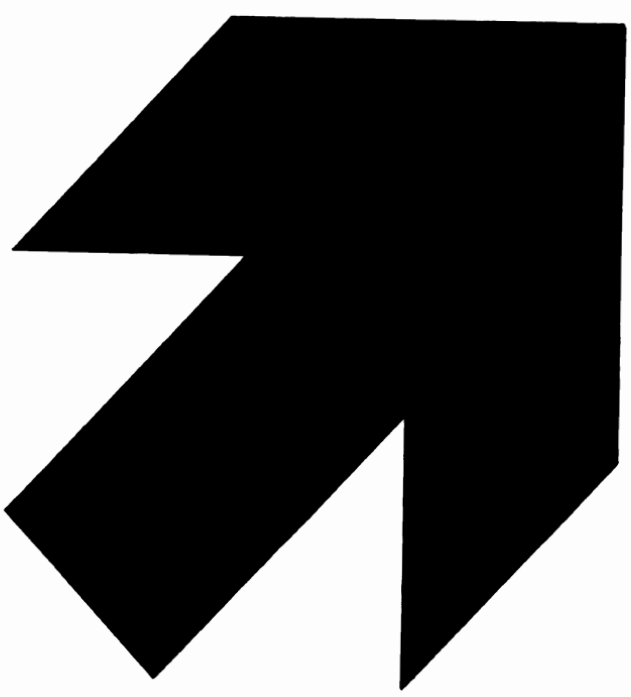
—Encourage NHTSA to continue its effort to reshape the Highway Safety Program Standards to emphasize state and local government safety program performance and output rather than cook-booked activities.

—Consider the feasibility of a bulletin of research information on safety programs as an input to operational program decision makers.

—Explore means for injecting more risk perception and acceptance information in media reports of crashes.

—Encourage policy and decision makers' tolerance to social experiments for insight to augment operational experiments for selection of alternative program implementations.

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# Synopsis of Economic Influences

## Group Discussions

### Focus

Economists assert that persons operating as vehicle owners and drivers behave with economic rationality—consumers try to minimize the cost of highway transportation necessary to their personal mobility goals. But beyond that general statement, the literature is extremely meager on what economic factors operate on the individual driver and how these factors might be manipulated to improve driver performance.

Obviously the costs of driving are manifold. Some are direct and explicit, such as fuel, license fees, fines, and insurance. Others are more hidden, such as general taxes used to maintain police and highway services and wage losses during traffic court appearances. We all, even non-drivers, bear these costs, but how these economic considerations influence our behavior as individual highway users just has not been rigorously studied.

The *Economic Influences Group* broached this complex, unexplored area, searching for initial approaches to defining what we currently know about economic influences on driver behavior and what we need to know for inducing improved driver performance.

### Discussion Emphases

Given the unstructured nature of “driver economics,” the discussions in this Group were understandably varied in subject and detail. True to the Colloquium theme, the Group labored to identify current economic factors operable as *individual driver incentives*. Given the idea that some actual accident costs are largely absorbed by non-accident drivers, our discussants considered approaches to *accident cost re-distribution* as an economic incentive to safe driving. While not directly related to driver economics, the Group looked critically at current practices of federal funding to state and local highway safety agencies with the belief that improved *safety agency incentives* would produce more effective driver influence and control programs.

### Salient Points

*Individual Driver Incentives:* In thrashing about for handles to the problem of influencing drivers

through economic approaches, our Group identified the following economic incentives to good driving, or, more properly, disincentives to bad driving.

- Avoidance of traffic violation fines
- Avoidance of increased insurance premiums
- Minimize vehicle operating costs, e.g., less repair and maintenance due to vehicle abuse
- Avoidance of wage losses in court and driver improvement appearances
- Avoidance of general increase in taxes for increased enforcement
- Avoidance of license loss and associated increased transportation costs
- Avoidance of the direct cost of accident damage
- Avoidance of income loss from injury and death

This is only a partial list of cost cuts associated with good driving. But frustrating to the discussants is the fact that we know little about the precise effects of any one or all on driver behavior. Or even that many drivers consciously consider these economic possibilities.

These gloomy conclusions about data availability in the cost versus driving area triggered discussion on some fundamental questions. Is the assumption that prices have a big effect on driver behavior true? Do drivers really respond to mobility costs? Are costs really a factor in determining driver behavior in today’s highway system?

Economists in the group were appalled at the suggestion that drivers are insensitive of costs. Their more researchable questions were accepted by the Group — Are the full costs apparent to the average motorist? At what increased levels do costs begin to affect driver behavior? What is the elasticity, or responsiveness, of driver behavior to cost?

In considering those general questions with respect to accident-inducing behavior, discussion centered on the low legal penalty in the form of fines associated with accidents. Coupled with the low probability of accidents, drivers understandably have little concern for that small, low-probability cost risk. What would happen to driver behavior if the legal economic penalty for accident involvement was greatly increased?

With respect to general accident costs, the uncertainty of those costs due to accident rarity must be

delusory for most drivers, particularly compared to the certainty of some operating costs (fuel, insurance, maintenance, etc.). Thus, can the relatively hollow threat of massively increased costs with accidents be expected to change driver behavior?

Perhaps the economics of traffic law violation behavior is more tractable. Probabilities of being detected in violation of some traffic ordinance certainly exceed those for accidents. Research is required on the effects both of increased detection probabilities and of increased economic penalty for violation behavior.

But left hanging, and recognized, is the questionable relation between violations and accidents. Given that the end game here is accident loss reduction through economic sanction of accident-associated behavior, we need much better data on how violations and accidents are related. Indeed, perhaps redefinitions of violations are required. Fines must reflect real or potential societal cost of undesired behavior. Much research is required here. As emphasized in the Legal System Influences Group discussions, better codification of accident-risk behavior is required. Subsequently, study is required to establish the societal cost of various unsafe behaviors and the levels of economic sanction required for influencing that undesired behavior.

With respect to fines per se, the Group mulled over the problem of constant-amount fine impact on divergent socio-economic groups. A given fine is less penalty and less of a behavior-change inducer to an executive than to a laborer. What more equitable and effective fine schedules might be developed? Some countries reportedly set fines proportional to personal income. Study is needed to determine economic penalty schemes with equal and desired impact across the broad range of income groups.

In looking at the area of driver licensing, the Group was disenchanted with license revocation and suspension of "bad" drivers. If observed by the individual so treated, license removal offers no rehabilitation possibility. Consistent with their economic perspective, our discussants suggested study of alternative restricted license schemes. How about, for example, having such drivers pay graduated amounts for special licenses based on risk potential? So much for a daytime commuting license, an additional cost for a daytime recreational license, more for nighttime business, etc.

In the same licensing vein, with perhaps both penalty and reward features, consider in simplification a system in which the original license fee is actually an annuity of some nominal principal value, say \$2,000. Without citations or accidents, the driver would collect some annual return. With citations and accidents, the annuity payment would be reduced on some schedule. With a very bad record, a driver would have his annuity finally reduced to zero, with purchase of a new annuity (license) necessary. Study

of some such type of economic reward/penalty scheme for licensing is recommended.

While not directly pertinent to driver performance improvement, the discussants enthused over schemes to induce drivers to cut down on the amount of their driving. As shown in recent analyses and by the accident reduction experience with the recent energy crisis and attendant mileage reduction, reduced exposure, i.e., less driving, is associated with fewer accidents. The Group considered several schemes that might persuade individual drivers to cut down on their mileage. Full payment of the actual cost per mile, both personal and social, of private car operation might dissuade some motorists. Recognize that those actual costs per unit of driving should include incremental costs for wear and tear of the highways, costs associated with traffic congestion, accident cost, incremental costs of environmental degradation, and a host of other actual costs that study is needed to identify. Differential fuel costs for necessary versus recreational driving might deter others. Hearty endorsement was given the trend toward improved public transportation systems, with strong recommendations for increased "selling" of these modes to the motorist, using economic arguments.

*Accident Cost Redistribution:* The group dug deep into what they felt was the large discrepancy between the real and the apparent costs to the driver of accidents. They agreed that a hidden subsidy of accidents exists in the form of enforcement, medical, highway, insurance, and other services and facilities that are paid for by all, but used only by accident involvees. In one sense, drivers are encouraged to "consume" risky behavior.

Much discussion focused on the social philosophy of direct charge of all, hidden and direct, accident and violation costs to the individuals having the accident or incurring the citation. Research on these points was recommended, first through economic analysis to determine the social cost of accident and violation types, and second to develop procedures for levying the full costs of transgressions to the guilty. Such a direct payment might be assessed, for example, in the form of driver license fees scaled to driver record point accumulation.

In this same discussion, the Group recommended study of the regulations under which car insurers operate to determine if more equitable, cost-incentive schemes might be developed. Contentions that accident-free drivers actually subsidize accident drivers, that many young drivers are unfairly penalized, etc., were voiced.

Still on insurance and increasing its potential for behavior modification, the discussants wondered about several questions. Is the deductible option with collision coverage an incentive to safe driving? Would group auto policies, with attendant group

pressure, be associated with improved individual driver safety habits? Can insurance policies, in addition to influencing type of car purchased, influence other driver behaviors associated with safety? These questions need exploration.

As a cautionary note, the Group emphasized that rewards for good driving as an economic incentive must be carefully approached. Such rewards could encourage increased driving and end up being counter-productive to safety.

*Safety Agency Incentives:* With occasional fervor, the discussants debated the merits of federal grants to states for highway safety programs under the Highway Safety Act of 1966 and subsequent continuing Acts. While not direct economic incentives to drivers, these incentive funds were believed by the Group to be potentially valuable in fostering state and local programs for effective modification of driver behavior. Group consensus favored the notion that the potential of these economic incentives was not being realized.

On the one hand, the federal funds to the states, under Section 402 of the federal acts, is pitifully small, something like 2-3% of what the typical state spends on safety from its own coffers. On the other, the requirement of state and local governments to match the federal dollars creates problems. Would funded program effectiveness be increased with fewer programs and 100% federal funding?

Augmenting the annual federal grant system are several in-being or planned federal incentive programs. In one of these, states showing greatest reductions in highway fatality rates (deaths per 100-million miles of travel) are granted various sums as rewards. The intent of the awards is to foster increased use of local funds for more and better safety programs. But critics argue that the funding levels are too meager to influence legislative and other budget bodies.

The federal funds to states are earmarked for implementation of the federal highway safety program standards. Our Group, and other critics, argue that the program standards are too oriented toward administrative procedures rather than performance. Perhaps states would be more enthusiastic and effective in their conduct of highway safety programs if *performance* criteria determined the level of incoming federal dollars.

An added consideration is that states have gained considerable experience and sophistication in safety program design and implementation since 1966. Flexibility in use of federal funding should permit full exploitation of that experience.

In general conclusion of the federal grant-in-aid and incentive programs discussion, our Group tended toward consensus favoring relaxation of federal standards to permit more individual state initiative in improving driver performance. Only in program instances where uniformity per se is desirable, for example in traffic control devices, licensing re-

quirements, accident reporting, and associated data systems, should tight activity and specification standards be promulgated. States need flexibility in programming federal grant and incentive dollars, and could benefit from federal technical assistance rather than program mandates. Concomitantly, most states would have to bolster their technical expertise with available talent.

## *Recommendations*

The several study areas felt to need research by the Economic Influences Group are as follows:

### *On Individual Driver Incentives*

—Develop a taxonomy of “driver economics,” to include normal operating costs as well as those incurred through transient or chronic aberrant behavior.

—Determine those economic factors which influence the quality and quantity of driver behavior, and quantify those relationships, probably, as a function of driver types.

—Evaluate the potential of radically increased economic penalties for accident involvement as an accident behavior deterrent.

—Consider the feasibility of public education of accident costs as a means to induce public support of accident prevention programs.

—Study the relative deterrent values of increased violation detection versus increased violation conviction penalties.

—In concert with legal system studies, determine violation fine schedules reflecting societal costs of violation behaviors as they are related to accident frequency and severity.

—Consider graduated fine schedules to equalize economic impact on violators with differing economic status.

—Study driver license alternatives to revocation and suspension involving graduated costs for restricted licenses keyed from low- to high-risk driving situations.

—Develop for trial implementation concepts of a driver license annuity with financial incentives for good and dis-incentives for bad driving.

—Develop economic arguments for public education intended both to deter unnecessary driving and to encourage greater use of public transportation facilities.

### *On Accident Cost Redistribution*

—Study the feasibility of more direct assessment of full accident costs to those drivers involved in accidents.

—With respect to automobile insurance,

- Consider schemes for more equitable distribution of costs than the driver class rate schedules now used.

- Determine if the deductible option with collision coverage is an incentive to safe driving.
- Evaluate the hypothesis that group pressure with group policies might be associated with improved individual driver safety habits.

—Evaluate the hypothesis that reward for good driving leads to increased driving and risk-taking.

#### *On Safety Agency Incentives*

—Consider the relaxation of the Federal Highway Safety Program Standards to permit more state flexibility in the design and conduct of driver control programs.

—Explore federal periodic and incentive funding to states based on “bottom-line” performance measures, e.g., reduced injury and fatality *totals*.

—Consider more federal technical assistance to state programs and less insistence on administrative procedure compliance.