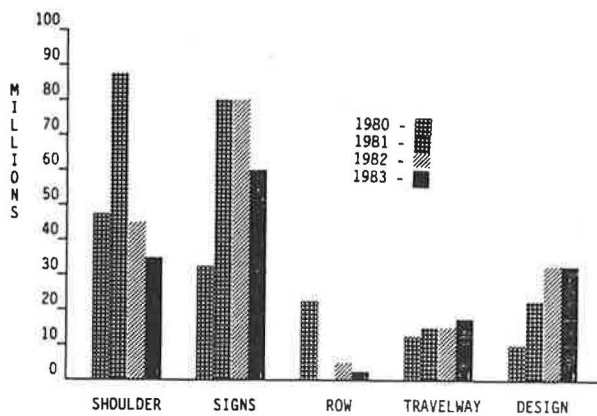


TABLE 2. ACCIDENT AND CLAIMS TREND

1980 - 1983



A Highway Safety Research
Engineer's Perspective
Don Ivey

There are two objectives of this talk. First, to describe three problems that either are, or should be, the purview of conscientious engineers and researchers to correct. Second, to describe three recent research developments that MAY, and I emphasize MAY, result in improvements in some aspects of highway safety and in the ability of states to defend their construction and maintenance policies.

First, there are the three perceived problems:

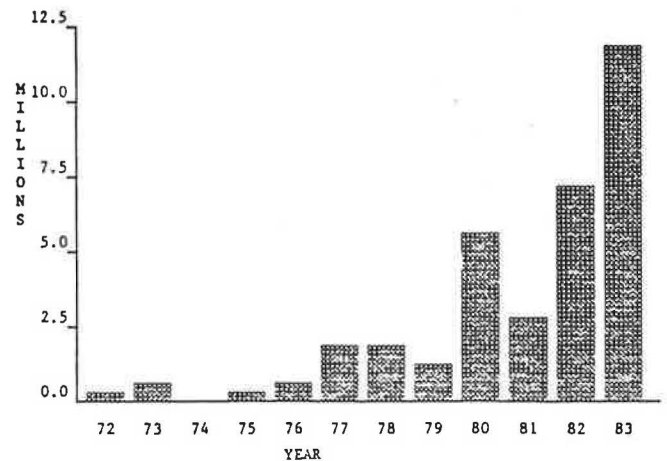
1. Over-publication of marginally valuable research.
2. Representation of transportation system resistance to change as a major drawback to achieving appropriate levels of safety.
3. The ability of untrained, uneducated and non-objective individuals to qualify as expert witnesses in our courts.

"Even as we speak," an insulated, academically-oriented, idealistic, university professor, part-time highway safety researcher, and self-acknowledged societal philosopher is writing a report on some aspect of highway safety. This philosopher is making recommendations for immediate implementation of his "findings" with little understanding of how his particular recommendations might fit into an overall plan for safety improvement by a state department of transportation, and no concern for the economic feasibility of the proposed "improvements." Indeed it is not always beyond

TABLE 3. LEGISLATIVE APPROPRIATIONS FOR DOTD

JUDGEMENTS IN TORT CASES

(Amounts do not include interest paid)



debate that particular recommendations will have a positive influence on safety. Whether or not the research is credible or the recommendations feasible, once published, such a report will become part of the arsenal for plaintiff attorneys seeking financial gain at the public's expense.

Almost everything published by researchers relative to highway safety has the potential for use in Tort Claims, either for or against the states, and in my view, much more is published than should be. The reasons for over-publication of marginally valuable documents are understood. The incentive to publish to advance in the academic community, the justification of research expenditures, the desire for personal recognition and many other more subtle influences on both individuals and organizations combine to produce an avalanche of published documents, in a field where fewer well-done and well-considered treatises, subjected to stringent peer review would be more productive. As we are called on as members of TRB, SAE, ITE, FHWA, ASCE, ASTM and other organizations, to review and recommend whether these papers should be published, we can exert a major and even immediate influence on this problem.

By "transportation system inertia," I mean the well-measured pace at which research ideas, innovations and designs are implemented by state DOT's. The idealistic researcher described before is extremely frustrated that it takes so much time to get good ideas implemented and converted to "standard procedure" on our highway system. It has been estimated that new ideas and designs take approximately ten years to achieve general acceptance and implementation in the field. This position has usually been stated as a complaint against the inertia of state DOT's. Considering

the massive investment in transportation networks, and the correspondingly high levels of funding required to make even small physical changes, it is not clear to me that this inertia is entirely inappropriate. It is possible, if one takes an evolutionary viewpoint toward the development of our transportation systems, to argue that this inertia, or lag time in implementation of new technology, is entirely appropriate for our society at this time. If it is not in the best interest of society (note this is possibly a somewhat different interest than the maximization of highway safety), then evolutionary theory dictates either it will change, or the society will change.

In the meantime, I plan never to apologize to an attorney or a court for the inertia in the system when we have all seen that inertia guard against the quick implementation of ideas and designs that appear excellent in the early development stages but are later determined to have some dominant flaw. A noted exception to this personal policy on apology is when a state DOT CONTINUES TO CONSTRUCT facilities using old concepts and designs when there are better and proven cost effective approaches that have been provided by engineers and researchers.

The final problem is by far the most embarrassing of the three because it reflects so badly on the professionalism of conscientious engineers and scientists. It is the ability of untrained, uneducated and totally non-objective individuals to qualify as experts in our courts.

Figure 1 gives my highly pretentious, oversimplified and irreverent representation of the categories into which many self-proclaimed experts may be divided. I have tried to describe caricatures in our society which might fit the specific combination of knowledgeability and objectivity.

- | | |
|--------------|---|
| Category 1 - | The Professional Teacher - traditionally considered to be both knowledgeable and objective, someone a pupil, individual (or court) could trust. |
| Category 2 - | The Used Car Salesman - He may be quite knowledgeable in his field but is not likely to give you the full benefit of that knowledge. |
| Category 3 - | The Tent Service Evangelist - Knowledge and objectivity are not even in his vocabulary. |

- | | |
|--------------|---|
| Category 4 - | The Second Lieutenant - Trying hard, extremely conscientious, but without the experience or training to get the job done. |
|--------------|---|

Table 1 gives some of the characteristics I suspect you have all observed during your careers. Although this may seem a problem to you associated primarily with the defense side of Tort Claims, I assure you it is an absolute delight to plaintiff attorneys.

The degree of hazard, defined as the ability of individuals in these categories to help a jury or judge reach the wrong decision, is given on the lower line of Table 1. It seems apparent to me that the most hazardous individuals in the courtroom are those in Categories II and III, the non-objective, whether they be knowledgeable or uninformed. By far, the most hazardous is the individual who is both knowledgeable and non-objective. He is a scientist or engineer acting as an advocate, and one who has the technical capabilities to appear creditable.

The obvious question is, how can a court be guarded against the influence of non-expert and/or non-objective individuals who represent themselves otherwise? There do not seem to be easy answers but there are some possibilities. As a precedent, society guards itself by requiring registration by qualified engineers. Although this is certainly an imperfect tool, it has resulted in considerable benefit in preventing many unqualified individuals from calling themselves engineers.

Self-regulation by engineering societies through devices similar to university accreditation committees are cumbersome but somewhat effective measures that could be applied to individuals seeking accreditation of their expertise in specific fields. Perhaps a more feasible approach would be to provide courts with information on specific subject areas which would be useful in examining proposed experts. This information could be provided through the auspices of reputable engineering or scientific societies if they chose to undertake the task.

Finally, the factors that influence a judge to accept many unqualified individuals as experts, with admonitions such as "his experience (or lack of experience) goes to the weight of the testimony," might be critically considered by the legal community. Once an individual is accepted, the weight of his testimony may be primarily a function of personality, charisma or whether he has taken a course on "How to Win Friends and Influence People."

In my view, this is the most serious problem faced in Tort Claims and one which should justify detailed consideration by the engineering, scientific and legal communities.

FIGURE 1. OVERSIMPLIFIED AND HIGHLY IRREVERENT REPRESENTATION OF EXPERT WITNESS CATEGORIES

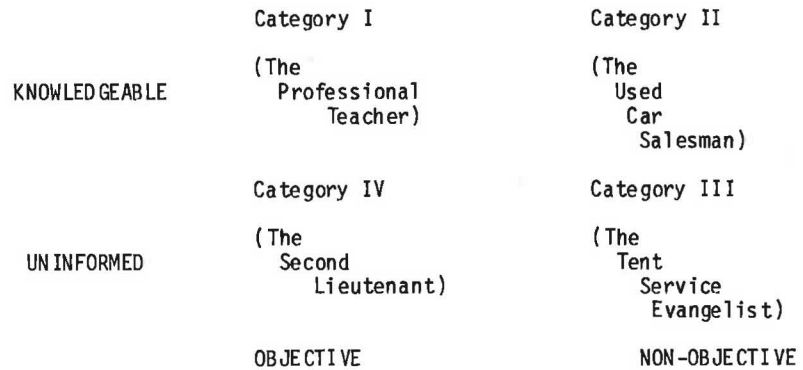


TABLE 1. CHARACTERISTICS OF EXPERT CATEGORIES

CATEGORY	I KNOWLEDGEABLE OBJECTIVE	II KNOWLEDGEABLE NON-OBJECTIVE	III UNINFORMED NON-OBJECTIVE	IV UNINFORMED OBJECTIVE
EDUCATION	Basic educational training. Continuing education to acquire new techniques and knowledge.	Same as I	a. Unrelated basic education b. No effort toward continuing education	Same as III
EXPERIENCE	Use and/or development of appropriate engineering and scientific information and analytical tools in field of proposed qualifications.	Same as I	No experience related to use or development of scientific information and analytical tools in field of proposed qualification. May cite investigation of thousands of accidents.	Same as III
OPERATIONAL MODE	Analyzes facts. Uses best analytical tools to define specific situations and events. Develops opinions based soundly on these facts and appropriate analyses of same. Represents situation accurately to attorneys and courts.	Determines most advantageous opinions. Forces the facts and/or analyses to fit those predetermined opinions. Disregards information not helpful to advantageous opinions.	Unconcerned by facts or purposely uses them inappropriately. Does not look for information related to the situation. May misuse analytical procedures in support of opinions.	Uses "common sense" and layman's experience to deduce causes, influences, and characteristics of accidents. May be an excellent "investigator". May misuse analytical procedures in honest efforts to develop opinions.
DEGREE OF HAZARD	Minimal	Extreme	Significant	Minimal