

A Future for Highway Safety Research

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ABRIDGMENT

•THE MAGNITUDE of losses from highway accidents demands systematic, carefully planned research studies. Fortunately, the scope and numbers of such efforts are reaching unprecedented levels. Major thrusts in highway safety research have developed in a number of programs, and more widely diversified disciplines and skills are now being directed toward accident research than ever before:

1. Pharmacologists and pathologists are beginning to study complex blood-alcohol-drug effects on driving;
2. Social psychologists are tracing demographic and other sociological relationships to accidents;
3. Experimental psychologists are studying signs, markings and other visual displays in highly sophisticated laboratories;
4. High-speed computers are enabling statisticians to apply the most complex factorial models to mass accident data analyses;

In the engineering disciplines, broad-scale studies are in progress on such aspects as the mechanism of vehicle failure in crashes, dynamic stability of truck-trailer combinations, and relationships of geometric design alternatives to accident likelihood.

Likelihood of Research Payoff

Along with the result-producing projects, others undoubtedly will come up empty-handed or provide only partial answers or hints of new avenues for study. It is unrealistic to expect any single major breakthrough in highway safety. Instead, individual projects and observations will produce facts and partial facts that gradually will come to be related to each other over a period of time. Early findings may be proved or disproved, and working theories will evolve out of diverse contributions. This almost piecemeal process of accumulating real facts and discarding false ones characterizes virtually all scientific progress. To expect otherwise of safety research would be unrealistic, if not completely naive.

Need for On-Going Programs

The need for on-going programs characterizes virtually all research, and is almost self-evident for a number of reasons: personnel have to be hired on a sustained basis with job security, not on a project-to-project basis; laboratory facilities must be obtained, maintained, and replaced as new tools evolve; investigators cannot do the research itself if they are spending substantial amounts of time writing proposals, progress reports, interim reports, financial reports, and final reports. There are many other reasons as well.

In safety research, an additional, unique aspect demands a programmatic approach. The criterion measure can only be accidents. And no matter how great the accident losses are on a national basis, they are very rare events within the framework of any single, closely controlled study. A certain amount of manipulation of data with modern statistical methods helps to overcome this difficulty, but the only substantial recourse is to have the study continue over a sufficiently long period of time to give the accidents

that normally would happen a chance to happen, or, stated positively, to assure the researcher that accidents are no longer occurring at the same rate. When we ask for the study to continue for an extended period of time, literally to wait for accidents, we are asking for safety research programs—not projects.

Involvement of Operational Personnel

The second dominant need in highway safety research is a greater involvement of operational personnel in programmatic research. This refers not only to the need for sustained activity but also to the nature of the problem under study. Most operational personnel in highway safety research seem to be concerned with what may be called "putting out fires" types of problems. This is understandable. Somebody must do this and lives are undoubtedly saved as a result.

Typically, the broad gaged problems, those problems not likely to produce immediate results, are thought of as being in the province of universities and non-operational research centers. But the experience and skills of operational personnel are also badly needed for these problems. Here I am not referring to support assistance, such as in making field measurements, and I am not deprecating the importance of such support. Any university researcher who has ever attempted to instrument an 8-lane freeway can corroborate my comfort in having the support of California Division of Highways engineers during these phases of a recent joint research effort. Nor am I referring to the equally important supportive role of helping to identify the significant basic problems for programmatic type of support; nothing will discredit research more quickly than spending large sums of money on small problems.

My reference is to more involvement by operational personnel in their own broad gaged highway safety research programs, such as the comparatively recent build-up of the U. S. Bureau of Public Roads Office of Highway Safety and the recently initiated continuing five-year Highway Safety Research Program of the California Highway Transportation Agency. As a part of the latter program, the Agency recently sponsored a two-day seminar attended by engineers of the California Division of Highways, the Department of Motor Vehicles, the Highway Patrol, and the ITTE staff. All participants had charge of one or more safety research projects in California's five-year program. The purpose was simply to communicate to one another the plans and problems in conducting the separate research projects. The men from the operating agencies found that our work was not completely impractical, and we, in turn, gained a better appreciation for the kinds of answers urgently needed by the operating agencies.

Conclusion

At the 1964 meeting of the Highway Research Board Committee on Highway Safety, Ed Ricker described a very simple finding that undoubtedly could save many lives on the highways—a 5-cent washer inserted behind the head of bolts and nuts used to hold guardrails in place. He used this example to highlight the need for systematic procedures for implementing such findings.

I am unfamiliar with the facts leading up to the discovery of this simple design improvement. Possibly it was the culmination of a systematic research program of some sort. Possibly some bright mathematician generated a series of simultaneous equations, solved them on a high-speed digital computer, and found the answer—use the 5-cent washer. More likely, however, the discovery had large elements of luck in it. This is not a derogatory statement; to the contrary, such discoveries—radioactivity, penicillin, and others of equal importance to mankind—also were largely lucky. But these discoveries were made by people who had the skill and experience to understand a problem and recognize a solution, even when it appeared by chance.

Such discoveries will continue; everything should be done to encourage more, to create a climate of understanding of the accident, and hence, the capability of recognizing remedial measures when they occur, both with regard to prevention of accidents and mitigation of injuries, and then implementing the findings. The future of highway safety research rests with diverting at least a part of the skill, experience and judgment implicit in making such discoveries to full-time programmatic research problems.