

DATA ANALYSIS

Both MARK IV and DART/OMNITAB are used to run a number of year-end programs against our accident data base. These programs provide a number of outputs, including a municipal accident priority rating, which ranks each of Pennsylvania's 2564 municipalities; wet-weather accident location clusters under which our skid-testing program is directed (this program recently won praise from the National Transportation Safety Board based on our skidding accident rates); intersection rankings within municipalities; and fixed-object-hit clusters within engineering districts. Our programming capabilities have been expanded to the degree that, for some years now, Pennsylvania has not had to employ Fatal Accident Reporting System (FARS) analysts. The FARS information is programmatically retrieved from the various data bases, converted to FARS format, and submitted by tape each month.

With the output side relatively secure, our analyses are now constrained only by the limitations of input data. Data inadequacies are a result of the latitude of interpretations made by those reporting accidents and the lack of understanding in the field concerning how these data are used. By meeting with investigating agencies and by addressing problems in a bimonthly newsletter, we have significantly improved the data input to our system.

PROBLEM IDENTIFICATION: THE GAO PERSPECTIVE Dennis J. Parker, U.S. General Accounting Office

Why did the U.S. General Accounting Office (GAO) decide to review the highway safety grant program of NHTSA? Once every two years, the GAO auditing groups are required to develop a list of federal programs that should be reviewed for economy, efficiency, and effectiveness. Taking into consideration such factors as the amount of federal money involved and congressional interest, they then list by priority the programs they hope to review within a given time period.

In the June 1978 program plan for the transportation systems and policies issue area, the Highway Safety Audit Group (HSAG) identified as a priority assignment the evaluation of the management and effectiveness of federal highway safety grants to states and local communities. This program covers about two-thirds of NHTSA's annual budget and is of considerable interest to Congress.

SCOPE OF HIGHWAY SAFETY GRANT PROGRAM REVIEW

In May 1979, HSAG began a review of the highway safety grant program and, on October 15, 1980, the group issued a report to the Congress, Highway Safety Grant Program Achieves Limited Success (CED-81-16). This review focused on the activities of state highway safety agencies and summarized the overall accomplishments of the program. The administrative responsibilities and duties of NHTSA's and the Federal Highway Administration's (FHWA's) headquarters, regional, and division offices were also reviewed.

Nine states were included in the review: Maryland, Pennsylvania, Illinois, Ohio, Texas, New Mexico, Colorado, South Dakota, and Utah. These states were chosen because they represent the following variances:

1. Four of the states are in the West, where motor vehicle fatalities increased 25 percent from 1975 to 1978.
2. Three of the states are in the Midwest, where fatalities increased 11 percent from 1975 to 1978.

3. Two of the states are in the Northeast, where fatalities increased only 3 percent from 1975 to 1978.

About 25 percent of the total \$1.3 billion in grant funds allocated through FY 1979 were provided to those nine states. Allocations by state ranged from \$6 million to about \$50 million. About 25 percent of the recent motor vehicle fatalities occurred within those nine states. Fatalities by state ranged from 200 to 3600 annually.

As many highway safety officials as possible were interviewed within the nine states, NHTSA, and FHWA. A number of aspects of the highway safety grant program were discussed, including (a) the ability of federal and state governments to perform adequate safety planning through data analysis and problem identification techniques and (b) the requirements that affect how the safety grant program is carried out, including mandating (earmarking) grant funds to specific safety areas.

WEAKNESS OF THE PROBLEM IDENTIFICATION PROCESS

Inadequate Data

State and NHTSA officials were concerned primarily about the lack of adequate data. The specific problems included lack of trained staff to gather and analyze data; cost of maintaining and updating data; lack of an adequate collection system to ensure uniform, complete, and accurate data; and NHTSA's inability to fill in where state systems are weak.

NHTSA and FHWA recognized many of these weaknesses during a joint task force effort to improve the content and quality of state accident data. The following conclusions were outlined in a draft executive summary issued in July 1981, Accident Data Improvement Plan:

1. Accident data are not collected uniformly within all states.
2. Accident statistics compiled from state-furnished information are incomplete.
3. Data elements available for accident analysis vary significantly among states.
4. Routine feedback needed to improve report accuracy is missing in the majority of the states.
5. Adequate accident investigation training is not provided for state and local police officers.

Other groups outside of government are concerned with the accuracy and completeness of state accident data. The American Motorcyclist Association, for example, recently issued a second report on the accuracy of current motorcycle statistics. It concluded that uniform and representative data, as well as credible exposure data, must be maintained before properly founded motorcycle safety programs can be developed.

Lack of Problem Identification Criteria

NHTSA's problem identification manual calls for states to generate a large number of reports from their traffic records. However, there are no specific criteria for states to determine how significant a problem must be before grant funds can be used to resolve it. As a result, state officials also complained that time and money were being wasted on data analyses that would probably not affect how the funds were spent.

The GAO report recommended that the U.S. Secretary of Transportation establish criteria for the level of analysis necessary to address safety problems and evaluate results and to work with state highway safety agencies to ensure that the criteria are followed.

State Versus Federal Priorities

NHTSA and FHWA have been encouraging states to identify their most pressing highway safety problems before selecting projects to correct them. In some states, such as Maryland and South Dakota, officials told GAO investigators that they found the problem identification process to be a good way to manage grant funds. Other state officials, however, complained that the process does not work; the breakdown occurs, they said, because less than one-third of the grant funds is available to solve different state-identified problems than those already identified by the federal government.

Although federal earmarking of funds is likely to continue even when state problem identification analyses indicate that funds could be better spent elsewhere, the situation should improve. Congress is concerned with the ability of the states to identify and address their highway safety problems. A recent U.S. Senate bill (S. 1377, June 17, 1981) proposes to amend section 402(a) of the Highway Safety Act to read:

"Each State shall have a highway safety program designed to reduce traffic deaths and injuries by identifying its highway safety problems, by adopting measures to reduce its highway safety problems, and by evaluating the effectiveness of such measures."

If the bill is adopted by Congress and subsequently becomes a part of the Highway Safety Act, the requirement for states to identify their highway safety problems will then be firmly recognized.

GOAL-SETTING PROBLEMS

B. J. Campbell, University of North Carolina

About a year ago there was much discussion—and some confusion—about setting quantified or numerical goals for programs. Some states saw quantified goals as something NHTSA wanted for them, whereas NHTSA felt that it was responding to a need expressed by the states.

Basically, goal quantification is an advance statement of how well the planner hopes a program will succeed. The problem is that in many cases there is no objective data to indicate the benefits of a particular program. Frequently, past evaluations and analyses have not been done, and numbers are pulled out of the air. For instance, 30 percent improvement sounds good, but it is unrealistic and unattainable. To bring about such a large improvement would require a higher level of funding than is usually available. Even if the project were funded, the evaluation data might not be sensitive enough to show a definite improvement.

Actually, the best number to pick for a goal is close to zero. Then, if the data suggest that the impact is somewhere around zero—it may not be zero, but it is probably not 60 or 70 percent either—the improvement is probably fairly modest.

Goals made in advance often have no basis. Program planners do not necessarily know how their countermeasures will work. In one project in North Carolina, a pilot project was set up to teach students a few rudimentary emergency maneuvers as part of their driver education. The standard 30 classroom h and 6 h behind the wheel were augmented with additional time behind the wheel during which the students were taught recovery maneuvers on the range—i.e.,

off the street and under safe circumstances. There was no basis for forecasting a percentage improvement that the program was to effect. In fact, when the project was evaluated, no improvement was found. If there were a benefit, it could not be measured in terms of subsequent accidents within the size population analyzed.

It is easier to set and meet administrative goals than impact goals. A goal of distributing 100 000 posters or of making 50 speeches to an average audience of 30 each is realistic, and the success of the project can be measured.

If impact goals must be set, however, several rules of thumb may help in setting them realistically. When a project planner starts with a program, he or she generally knows how much money can be spent. The planner also has the capability to estimate the cost of an accident. A 1974-1975 NHTSA estimate was \$4000 per accident. Fatalities, injuries, and property damage were factored into this figure. Adjusted for inflation, this figure may be about \$6000. By dividing the project amount by the accident cost, the planner gets a number of accidents that represents the project break-even point. For example, for a \$60 000 project, the break-even point (the goal) would be to prevent 10 accidents.

Another way to set realistic goals is to determine the size of change that can be detected with some statistical significance. Where there is no such basis, setting quantitative goals should be avoided.

MANAGEMENT USE OF ACCIDENT STATISTICS: ADMINISTRATIVE AND ORGANIZATIONAL PROBLEMS Cordell Smith, Colorado Division of Highway Safety

One of the most difficult problems faced by state highway safety managers is the lack of integrated and consistent traffic records. As the national highway safety effort was being developed, the need for systematic records was recognized, but not emphasized. As policy has shifted toward improved planning and evaluation, the seriousness of this oversight has become apparent.

In Colorado, available traffic records are used (a) to identify problems and set priorities, (b) to evaluate project or program impact, (c) to determine program cost/benefit, (d) to set goals within the departmental management-by-objective program, and (e) to justify programs to state legislators. But, like most states and NHTSA, Colorado is not doing the job that it could in these areas. The data are inadequate, and there are insufficient resources to upgrade our traffic records system.

The Colorado records system is used to address these specific questions:

- Which municipality or county has the worst accident problem based on vehicle miles of travel, population, miles of road, etc.? Would increased enforcement affect this problem?
- Which emergency medical service (EMS) district has the slowest response time or the best on-scene medical care? Why?
- Who are the people involved in alcohol-related crashes? If we develop a profile, could we intervene at some point before the individual is involved in a serious crash?
- What is the contribution of the roadway environment to the crash situation?
- What is the contribution of the motor vehicle inspection program?