# TG-3 PROJECT EVALUATION

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## I Evaluation in Highway Traffic Safety Administration - The Role of Traffic Records Systems

### Defined

Evaluation has been defined as a careful, systematic, detailed study, and investigation to establish the success or failure of a program, project or some tasks or specific function. This is a very broad definition of evaluation in relation to traffic safety programs. Perhaps, we could more closely define evaluation as: "A measure of effectiveness of a program, project, task or function, in relation to its stated objective." If this is an acceptable definition, then, the stated objective must be stated in achievable terms. As an example, it would be unrealistic for a county school district to evaluate its driver education program in terms of saving lives or cost-benefit analysis. A lesser level of evaluation would be more appropriate and far easier to achieve.

In traffic safety programs, now, more than ever, we must depend on evaluation. If we do not, opinion, rather than scientifically derived information will and does become the principal basis for decision and/or change. New programs based on opinions, not supported by good sound traffic records data, may do more harm than no change.

### Who Should Conduct Evaluation

Evaluation is a very complex and costly procedure requiring highly qualified professionals, trained and experienced in methods and techniques of analysis and statistics. Evaluation must also be well used in highway traffic safety programs and be cognizant of the political structure of national, state and local organizations that impact on the success or failure of such programs.

At the national and state level and perhaps at larger city and municipal governments, a staff of evaluators, data analysts, researchers and systems analysts should be employed to carry on most of the evaluation. Evaluation conducted from within a government organization may not truely portray the real situation resulting from their deeply involved status with their organization. Many times outside consultants or subject matter specialists are more appropriate to give an independent evaluation. The outside trained evaluator brings many very important qualities. The first of these is professional objectively. He is in a position to make an important contribution. An organization's desire to see a program succeed will many times cause traffic records data to be manipulated to gleen the most favorable aspects of the project or program. This is not to say that good evaluation cannot be conducted from within. Many times personnel from witin an agency are better qualified to conduct the analysis

and evaluation than consulting organizations.

The Traffic Records Systems Role

Traffic Records Systems have been a phenominal growth in the past few years primarily through the emphasis placed on this subject by the "Highway Safety Act of 1966." Development has centered principally around the creation of data bases for operational programs such as determining driver and motor vehicle status, issuance and renewal of driver licenses and the registration of motor vehicle status,issuance and renewal of driver licenses and the registration of motor vehicles. Whereas, four critical systems features of traffic records have not as yet received sufficient attention. These are the directly relatable functions to program evaluation:

A. Identify primary causations factors of highway collisions.
B. Identify significant trends in highway collisions and their causes.
C. Evaluate new programs or techniques for the prevention of highway collisions.
D. Determine those areas where further emphasis, research and development are required to reduce highway fatalities, injuries and damages.

The statewide traffic records system should be so constructed to produce the above stated objectives in an efficient and economical manner. Certain basic data bases must be created and maintained on a continuing basis, i.e., driver, motor vehicle, roadway accident, traffic law enforcement and adjudication, emergency medical services, educational services, and safety program management data base. Other data may be gathered on a sampling or on occasion, such as driving exposure, driving habits, vehicles miles by make, models, etc. Bi-level reporting, multi-disciplinary accident investigation teams and other similar techniques may be employed to supplement the basic traffic records data for evaluation. Program, project and task descriptive information will also be necessary to clearly define that element to be evaluated.

The Problem

At this point in time, there most certainly are sufficient traffic records data to perform basic evaluations of program accomplishments. At a minimum we should be implementing evaluation programs that will identify significant trends, indicate the magnitude of the problem , and at the very lowest level - a descriptive analysis of our programs and some correlations of program to traffic safety trends. It would appear that we are afraid to take a hard, fast look at our programs in terms of success or failure. Instead, we just say we don't have the data or that the data is inaccurate, unreliable, untimely or just plain no good.

## II Type of Evaluations

Three types of evaluation will be described in this section. They are in order of increasing level of sophistication, (1) administrative, (2) descriptive, and (3) special studies. Each type will be described along with examples.

Administrative - This type of evaluation does not require major use of data from the traffic record system (TRS). It does require an accounting for the level of activity and how well the previously defined goals have been achieved. For example, consider a project for evaluation of emergency medical services. An administrative evaluation might invlude: number of units (vehicles) meeting minimal standards, number and level of training of EMS personnel, average response time counts of DOA (dead on arrival.) All of this information can be obtained at the operational level, forwarded and summarized for the region covered by the project.

Another example in which an administrative evaluation would be appropriate is a statewide driver education program. In this case it would be desireable to monitor the program cost, number and level of training of the instructors in driver education, number of students in the training program, hours of instruction, etc.

Descriptive and Comparative Analysis - This type of evaluation requires some analysis of administrative type data and/or data which, can be obtained from a traffic records system. As an example, consider an evaluation of a highway intersection improvement project. In addition to an administrative summary of the type and extent of improvements, it is usually desirable to analyze data on intersection accidents collected before and after improvement. To do this many states can interrogate the accident data such as type of accident (single vehicle, approximate angle of impact), number and severity of injuries, etc. By a comparison of these data for at least three years before the highway intersection improvements and at least one year (preferably more) after the improvements the mean increase (or decrease) in the number and severity of the accidents can be obtained. There are some cautions which should be considered in such an analysis. Some of these are: (1) the level of exposure (volume of vehicles passing through the intersection in one day) usually changes during the course of the evaluation project and this dictates the need for using accident rates rather than the number of accidents, (2) the selection of the intersection for design improvement is often made on the basis of accident data for the year(s) preceding the time of improvement, hence there is the high likelihood of a lower number to be observed after the improvement even if no safety improvements have been made. This is referred to as "regression to the mean." (3) A third and very important consideration is that other changing factors can influence the results. For example, vehicle safety features are constantly changing and these changes can alter the severity of injuries in a given type of accident. It is important to continually remind oneself

in the evaluation process, that the analysis of accident data collected before and after the implementation of any project or safety program yields an overall assessment of the many changing factors, all of which may alter the improvement in safety resulting from the specific program of interest. Thus, unless one can correct for the effects of these other changes all such evaluations should not be stated as a positive achievement without recognizing the limitations of these analysis.

Another example in which comparative analysis is made of administrative information is to compare the driving /violation accident experience of students receiving driver training in various school districts within a state. For example, the driving experience for one year might be correlated with socio-economic data and driver education training methods in order to determine if certain school districts are providing a better quality driver education program. Some attempt should then be made to determine why the driver education program is of better quality in some areas than in others, assuming the difference is not due to socio-economic factors or other pertinent factors. Such an analysis may yield further improvement in the driver education program on a statewide basis. Certain use of the results should be made in all cases.

Special Studies - The third type of evaluation which involves a thorough planning, implementation, analysis and interpretation of the results is referred to as a special study. This is typically performed at the state or federal level in order to evaluate a specific program. The studies are usually conducted by universities, profit and not-for-profit research oriented organizations closely monitored by the organization having the responsibility for the overall program.

In order for such studies to be useful, that is, generate a product for the intended user, they must be initiated with clearly stated goals or objectives. The problem statement will be followed by an investigation of related research. In some cases the problem may be solved at this point. Assuming that further investigation is necessary, a plan of action must be developed. This plan incorporates the means of collecting new data or analyzing existing data in a traffic records system, the analytical techniques to be employed, and a measure of the likelihood of achieving the stated objectives. In statistical terms this measure might be phased in terms of the "power of the test" and the associated experiment. The determination of this measure usually requires estimates of the potential range of results with appropriate measures of variation of these statistics. Clearly what has been described so far is somewhat ideal in scope and not all special studies are planned in this detail.

After the planning phase has been completed and the interested parties /agencies are clearly satisfied with the approach or work plan, implementation can begin. The appropriate analyses are employed as planned and the results obtained. At this point, the evaluation needs to be reported or documented in order that the results can be understood by the intended users. This is a very important phase of the evaluation and is often

hurried or cut short due to the funding being short at the end of such projects, particularly in contract research. Follow-up and re-evaluation is often necessary before launching large and exotic programs.

The above description intentionally omitted the description of a particular type of program. For example, the study might be an extensive trend analysis of accident data from a traffic records system, or it may be a carefully designed experiment for studying the potential improvement in injury/fatality reduction resulting from an improved emergency medical service system. The same general approach can be employed in each program area.

III Program Elements of Evaluations

Three program elements of evaluation are (1) task, (2) project, and (3) program in increasing order of level, complexity or area of implementation. For example, a task evaluation might relate to a specific purchase of EMS equipment, a training course for Emergency Medical Service Driver Education personnel, or to install a specific traffic control signal. A project might be to evaluate Emergency Medical Service activities to be implemented over several counties or regions.

A program might be any one of the major NHTSA and FHWA safety programs, e.g. (PMVI) periodic motor vehicle inspection it is important to recognize that different types of evaluations are applicable to the different program elements. This is not to say that there is a one-to-one correspondence between the program elements and types of evaluation but that one or two types will typically apply.

At the task level an administrative type of evaluation will usually be appropriate and in most cases the only type that can reasonably be expected from the individual responsible for the task implementation. At the project end, both administrative, descriptive and comparative analyses will be used and less often the special study approach. At the program level the special study will be frequently employed with supportive administrative evaluation information.

IV Organizational Responsibilities

A. Private, commercial, universities - these organizations can provide an important and vital area in evaluative research. Primary emphasis would be in controlled studies to determine overall program effectiveness. The organizations can bring unbiased judgment which will give creditability to their findings.

B. Municipal/county/city agencies should place primary emphasis on administrative evaluation and in some larger programs and projects engage in some form of descriptive and comparative analysis to indicate change and trends in programs. In other words, evaluation at this level would produce success indicators or indicators of lack of success.

C. State traffic safety agencies and Highway Safety Coordinators should place most of their support to evaluate programs utilizing techniques and procedures of administrative and descriptive and comparative analysis. It is our opinion that state agencies should engage in very few scientific or controlled studies to determine the effectiveness of individual projects and programs in terms of lives saved. Special interest should be directed to monitoring programs and performing evaluations to determine change and trend indicators.

D. Federal government agencies have need for all levels of evaluation information to assess the impact of national traffic safety programs. The major thrust of federal agencies' evaluation should be in the area of controlled studies/scientific research to prove or disprove the life saving and injury reduction value of traffic safety programs.

E. In a broad sense, the ultimate users of data from traffic records system are congressional and legislative groups. It is the evaluation information furnished to Congress that impacts on programs to be funded.