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SAFETY EFFECTIVENESS EVALUATION

REPORT TO CONGRESS

SAFETY EFFECTIVENESS EVALUATION
OF THE
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION'S
NATIONAL ACCIDENT SAMPLING SYSTEM

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16. Abstract The report includes an evaluation of the National Accident Sampling System (NASS) being administered by the National Highway Traffic Safety Administration. NASS, as proposed, is a nationwide system of investigative teams whose goal is to collect nationally representative highway accident data. The major findings of the evaluation are: <ol style="list-style-type: none"> 1. Nationally representative highway accident data are needed. 2. If attained, NASS' publicly stated objectives will provide valuable information to the nation's highway safety program. 3. The NASS' plan for the near future emphasizes motor vehicle crashworthiness and primarily supports NHTSA's mission. 4. The NASS program alone will provide limited capability for evaluating many countermeasures. 5. The implementation of NASS has proceeded beyond the level of planning. 6. Through improved planning and broader perspective NASS could become an important part of the national highway safety program. 			
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Abbreviations

CSS	Continuous Sampling Subsystem
DOT	Department of Transportation
FARS	Fatal Accident Reporting System
FHWA	Federal Highway Administration
GSA	General Services Administration
HSRI	Highway Safety Research Institute
MDAI	Multi-Disciplinary Accident Investigation
NASS	National Accident Sampling System
NCSS	National Crash Severity Study
NHTSA	National Highway Traffic Safety Administration
PSU	Primary Sampling Unit

SAFETY EFFECTIVENESS EVALUATION OF THE
NATIONAL ACCIDENT SAMPLING SYSTEM

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INTRODUCTION

On March 3, 1977, the Subcommittee on Transportation and Related Agencies of the Senate Appropriations Committee asked the National Transportation Safety Board to study the National Accident Sampling System (NASS), which was being developed by the National Highway Traffic Safety Administration (NHTSA). Specifically, they urged the Safety Board to evaluate NASS to determine if a sufficient amount of reliable data will be collected in order to accurately determine accident trends and to assess the impact of vehicle safety standards.

Under the authority of the Independent Safety Board Act of 1974, the Safety Board initiated a safety evaluation of NASS in October 1977, which coincided with the formal implementation of the NASS pilot program. The future of NASS depends on the experience obtained in the pilot program, the results of numerous supportive studies, and any subsequent program revision. Consequently, this safety effectiveness evaluation is based on the NASS program as of January 25, 1978; the Board intends to monitor the NASS development and evaluate it further if deemed necessary.

In performing this safety evaluation, the Safety Board examined the adequacy of the NASS objectives and the potential of NHTSA to fulfill them. This was accomplished by a literature search and technical review of all available reports and other relevant documentation. Interviews were held with key NHTSA staff, NASS contractors, members of the NASS National Review Panel, and other prominent researchers and officials. In addition, an informal survey, which was approved by OMB, solicited voluntary input from each State Governor's representative for highway safety, department of highways, department of motor vehicles, police or highway patrol, and from numerous highway safety organizations.

BACKGROUND FOR EVALUATION

Highway Safety's Accident Data Needs

In general, there are two fundamental purposes for any safety program--first and most important, prevent accidents; second, reduce the consequences of accidents to the greatest extent possible. In highway safety these are commonly translated into programs for collision avoidance (preventing accidents) and crashworthiness (reducing the number and seriousness of resultant injuries).

To achieve these ends in a problem area as complex and as widespread as motor vehicle accidents, a substantial amount of reliable accident data are required. Obtaining the necessary data for all purposes has been an elusive goal because of the diverse authorities and associated program development costs.

Accident data are needed (1) to identify the causes of highway accidents and resultant injuries and fatalities, which would permit safety problems or hazards to be properly identified; (2) to identify possible countermeasures; (3) to establish the relative effectiveness of the countermeasures; (4) to direct the thrust of traffic law enforcement; and (5) to support the effective management of highway safety programs.

These needs will vary depending on the particular user group. At the Federal level most safety programs have national impact and require nationally derived data or estimates representative of the entire United States.

In other cases, the Federal program authorities need certain "area specific" information. Administration of many of the Federal highway safety program standards, for instance, require data on a State by State basis. Likewise, demonstration projects which would apply to a given geographic area would need only data from that region. Selective information is needed for use in overseeing the management of safety programs at various levels of government and industry.

At the State level, "area specific" (local jurisdiction) data are needed to properly determine statewide problems, assign priorities, and facilitate the proper allocation of resources to correct the problems. National estimates would assist State programs only by providing a perspective and basis for comparison.

At the local level, "site specific" data are needed to identify specific locations or sections of streets and highways which have high or potentially high accident experience. This provides a basis for establishing priorities for safety improvements and other operational practices designed to eliminate or reduce the hazards. Similarly, "accident specific" data is needed to aid in the administration and enforcement of traffic laws and determine responsibility when appropriate.

Evolution OF NASS

The National Highway Traffic Safety Administration's (NHTSA) primary mission is to reduce the number of fatalities, injuries, and economic losses from motor vehicle accidents. NHTSA has approached this mission by developing and implementing Federal safety programs and standards. Two broad types of programs currently in operation are Motor Vehicle Safety Standards and Highway Safety Program Standards.

The Motor Vehicle Safety Standards involve hardware changes to motor vehicles such as restraint systems, energy absorbing steering columns, brakes, and tires.

Highway Safety Program Standards are Federally assisted programs which are implemented by various States. There are currently 18 such standards, including such areas as Motorcycle Safety, Alcohol in Relation to Highway Safety, Highway Design, and Construction and Maintenance. NHTSA has primary responsibility for administering 14 of the standards, FHWA administers 3, and 1 is administered jointly.

The authority for NHTSA's data collection program is principally derived from the National Traffic and Motor Vehicle Safety Act (PL 89-563). It authorizes NHTSA to:

"Conduct research, testing, development and training necessary to carry out the purpose of this title including but not limited to (1) collecting data from any source for the purpose of determining the relationship between motor vehicles and motor vehicle equipment performance characteristics and (A) accidents involving motor vehicles, or (B) the occurrence of death, or personal injury resulting from such accidents."

The NHTSA, in determining what type of accident data were necessary to support their programs, established the concept of the tri-level system of data collection. Level 1 was composed of State and local police investigations. Level 2 was an intermediate level involving teams of technicians and sometimes included police investigations. Level 3 included multidisciplinary teams of professional accident investigators.

Particular emphasis has been placed on the use of the multidisciplinary teams. In fact, over the past 10 years approximately 6000 accidents have been investigated by some 20 teams. Typically, such an investigation was an on-scene, in-depth analysis of the accident, and produced detailed information on the collision phenomena, crash dynamics, and resultant injuries. Unfortunately, these efforts have typically had several shortcomings:

- (1) They have been very expensive which limited the total number of accidents that could be investigated and the breadth of various problems that could be covered.
- (2) They have not been centrally controlled at the national level to insure that results were truly representative of the nation.^{1/} Instead, the accident selection process or sampling plan was usually developed individually by each team within assigned subject areas such as School buses, Passive Restraints and Utility Poles. Consequently, the results obtained were very

^{1/} James O'Day, et al, Statistical Inference from Multidisciplinary Accident Investigation, National Highway Traffic Safety Administration, August 1974, pages 16, 17.

often biased toward the particular specialty of the contracting organization or its team leadership. For example, one team may have placed more emphasis on the medical aspects while another team concentrated on vehicle mechanical defects. Also, the results were only representative of the localized area where the team operated and could not be generalized into national estimates.

State and local investigation, performed primarily by police and highway patrols, also underwent change and improvement. NHTSA's Highway Safety Program Standard "Accident Investigation and Reporting" establishes minimum requirements for these areas. Nevertheless, certain limitations have always hampered the collection and utility of these data at the national level.

Specifically, there is considerable variation from locale to locale in authority, reporting criteria and the type and quality of investigation performed. Definitions vary, report formats differ, and reporting is inconsistent, all of which make it difficult to integrate State data into reliable national statistics. Furthermore, since the police have many additional responsibilities beyond accident investigation, there is a constraint on how detailed a police investigation can or should be. Consequently, police reports are not detailed enough to support much of the necessary highway safety research and analysis.

In June of 1973, the Highway Safety Research Institute at Ann Arbor, Michigan, published "Statistical Inference from Multidisciplinary Accident Investigation (MDAI)." This report recommended that the MDAI program be modified to enable development of valid national estimates. Subsequently, a follow-on contract was awarded to develop acceptable modification. The results of that effort were published August 1975 in a report entitled "Design for NASS: A National Accident Sampling System". In February 1976, NHTSA introduced the NASS plans to a 14-member expert panel for review. In November of 1976, the NHTSA established the National Center for Statistics and Analysis (NCSA), whose goal was "to establish a nationally representative data base which would portray the national accident picture." NCSA adopted the National Accident Sampling System (NASS) as its major program. In October 1977, a pilot program for NASS was initiated and contracts were awarded to establish 10 NASS teams.

NASS, as introduced, will utilize a system of trained technicians organized in teams of 3 to 5 members. Each team will investigate a probability sample of highway accidents in accordance with a predetermined sampling plan at geographically distributed sites throughout the country. Eventually, 35 to 50 teams will be established and 17,000 to 25,000 accidents will be investigated annually on a continuing basis. In addition, special studies of accident problems of particular concern and ancillary studies to gather data such as exposure information, will be performed.

On October 20, 1977, Ms. Joan Claybrook, the Administrator of NHTSA, said that NASS "will produce nationally representative accident data with sufficient accuracy and detail to provide an objective means of setting and evaluating many motor vehicle and highway safety standards. It also will enable us to conduct special studies on pressing safety problems in a timely and cost-effective manner."

Expanding on this general statement, a recent paper by key NHTSA NASS staff listed the following specific objectives for NASS 2/:

1. "Estimate and disseminate annual national totals and rates of accidents and exposure, accident causes and consequences at a level of detail not currently available.
2. Evaluate existing countermeasures, motor vehicle safety standards, and highway safety program standards.
3. Provide data during the field test or demonstration phase of proposed standards and countermeasures to assist in evaluating their likely accident and injury reducing benefit.
4. Provide a current and detailed accident and injury causation data base suitable for establishing priorities for and assisting in the design of future countermeasures.
5. Monitor changes and trends in the highway safety environment."

EVALUATION OF THE NASS PROGRAM

Its Subsystems

The NASS program is comprised of three subsystems--the continuous sampling subsystem (CSS), a special study subsystem, and an ancillary study subsystem.

CSS will involve the investigation of some 20,000 cases per year on a continuing basis. The investigations will not be in-depth and according to NHTSA, each should be completed in 16 man-hours.

The Special Study Subsystem will include the conduct of one-time data collection efforts to supplement the CSS. It will involve either collecting more detailed data on accidents already sampled or oversampling and collecting data on special kinds of accidents.

2/ Charles Kahane, et al., The National Accident Sampling System - A Status Report, Proceedings of the 21st Conference of the American Association for Automotive Medicine, September 15-17, 1977, page 417.

Ancillary Studies will involve the collection of data outside the normal sampling frame of CSS for such purposes as exposure information.

Continuous Sampling System

The Sampling Plan--the key to the NASS program is to investigate a sample of accidents which will produce nationally representative statistics. This means the pattern of accidents investigated must correspond to the national pattern of accidents and therefore represent the nation. It is extremely important, therefore, that the accident case selection be based on a scientifically designed sampling plan.

The original sampling plan for NASS was developed by the Highway Safety Research Institute at Ann Arbor, Michigan. It was subsequently revised by the NASS staff.

The sampling plan essentially involved dividing up the continental United States into regions and subsequently into smaller geographic areas called primary sampling units (PSU's). A PSU generally would be defined as a county or group of counties with a minimum population of 50,000. Each PSU becomes a potential site for locating a NASS site and conducting investigations. Most importantly, the plan allows one to select a minimal number of PSU's that would represent the nation in terms of such factors as population size, degree of urbanization, and per capita retail gasoline sales. Obviously, the proper selection of these factors or selection criteria is critical since they define how representative the final results will be.

The current plan calls for at least 50 sites to be established. To implement the pilot program, 10 sites have already been designated (see figure 1). As the size of the program expands, there is no guarantee that these original sites will remain in the sample because of the statistical selection process. The number of sites will however be increased using a statistical technique that maximizes the likelihood of retaining the original sites in the new larger sample.

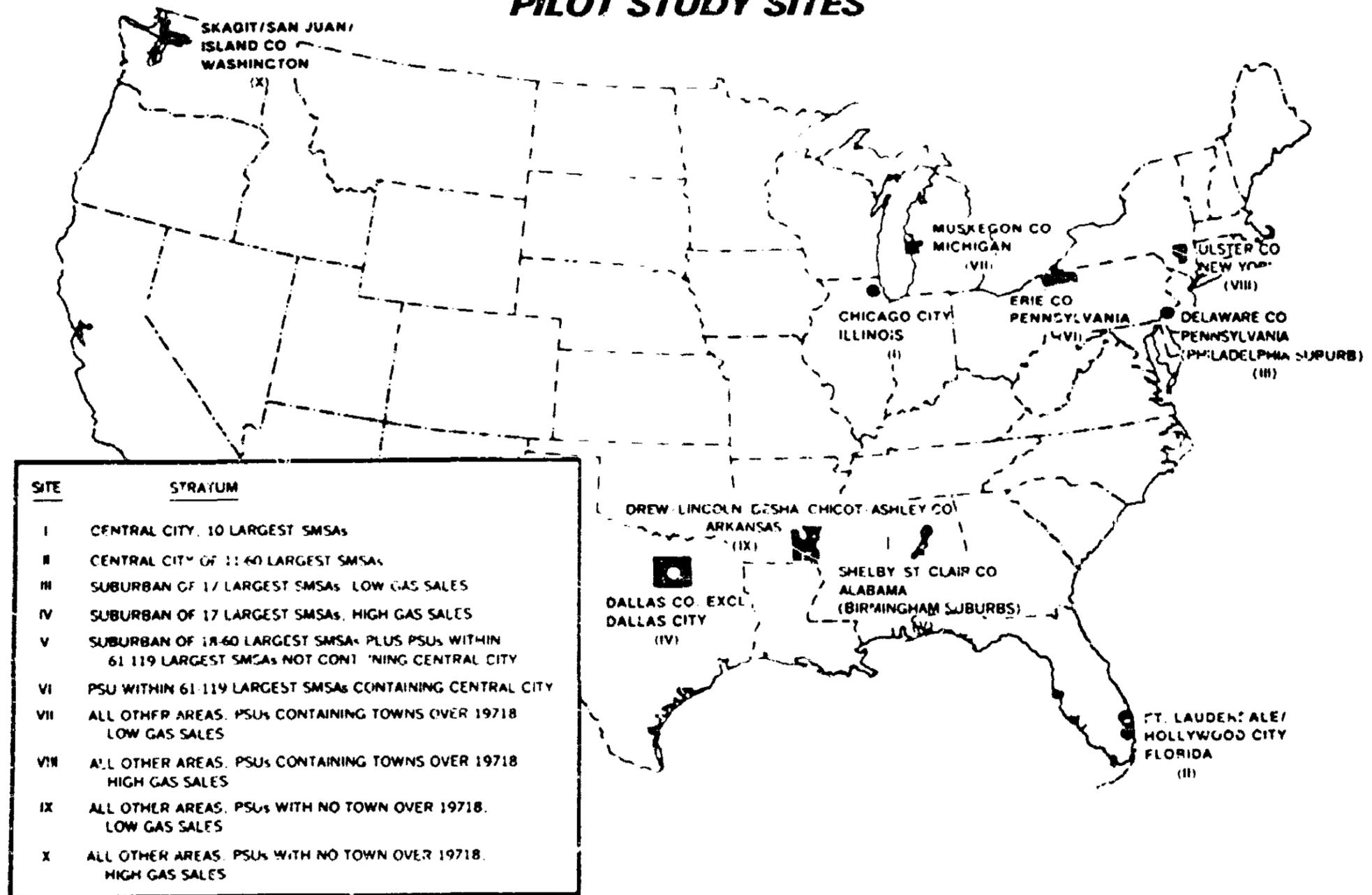
In the context of the NASS effort, a good sampling plan would help insure two things. First, the accidents investigated at each site would produce data which could easily be combined into nationally representative statistics. Second, the data collection effort would be efficient since the investigators would spend their time in proportion to the priority of the needed data. For example, more emphasis might be placed on fatalities and less emphasis on accidents involving just property damage. The sampling plan would minimize the statistical variability of results for high priority items.

Unfortunately, as is often the case for the original design of any large survey, sufficient data did not exist to support an optimal design.

NATIONAL ACCIDENT SAMPLING SYSTEM (NASS)

PILOT STUDY SITES

FIGURE 1



Analysis of the expected variance in the results and design optimization was based on police reports from only two States. The actual selection factors chosen were based on the 1970 census data adjusted to 1973, and 1972 retail gasoline sales.

Although original NASS plan would establish 35 sites, NHTSA stated in June 1976 that "the reason for selection of 35 PSUs was based on a number of factors involving subjective judgement of cost and accuracy." ^{3/} Subsequent analysis has indicated that 35 sites will not be sufficient to produce valid national estimates.

The optimal number of sites is determined by the desired degree of confidence in the results and the cost to collect the data. Reliable cost estimates, however, will not be available until well into the pilot program. One of the main objectives of the pilot program is to determine whether 3 or 5 member teams should be used. In addition, some of the data items, such as the medical/injury information, may be difficult to obtain in certain sites and thus impact cost and reliability significantly.

WESTAT RESEARCH, INC., of Rockville, Maryland, is currently under contract to NHTSA to study the sampling design. They have been asked to develop an "optimal design" which will include recommendations for:

(1) The number of PSU's or sites; (2) the size of the team; (3) selection factors or criteria; and (4) expected sampling errors.

This study will complement the pilot program and provide additional information essential to the future development of NASS.

It will be important to closely monitor statistical errors inherent within the NASS data collected and consequently the variance in any results. Over the long run, the makeup of a site might change significantly because of population shifts. Similar changes may be the result of feedback from the long-term presence of the NASS teams themselves. The sites may no longer be truly representative of the nation and thus require modification.

Quality Control--Since high standards of quality control will be essential to the ultimate success of NASS, zone centers with a mandate to insure quality control have been established to oversee the NASS sites.

Quality control in this context includes all efforts to insure that the data collected are representative and reliable. The accidents which are investigated in any site must be in strict conformance with the

^{3/} NASS Notes, National Highway Traffic Safety Administration, June 1976, page 3.

selection scheme. Apparently in the past, some NDAI teams would simply drop a case if certain data were unavailable. This practice cannot be tolerated in NASS or else the concept of a probability sample will be violated.

For the zone centers to monitor this selection process they must have some method to monitor and adequately check team performance. Ideally, the zone centers should establish an independent procedure to collect some limited data on all accidents which occur within each site--perhaps by working directly with the police. They could then actually check those cases selected by the teams against their own data. The original HSRI study addressed this concern by proposing an on-line computer selection procedure. The teams would submit general accident data via a computer terminal to a central location and a sample selection program would then direct appropriate team action.

Procedures must also be established to insure the data collected and coded for each case is accurate and reliable. Definitions for data elements must be consistently and uniformly interpreted. This must be given high priority throughout the full course of the program.

Zone center personnel must regularly spot check selected cases. This would involve a variety of procedures but at a minimum should include the actual independent follow-up (reinvestigation) of certain cases or portions of cases.

Before the data are entered, they should also be analyzed manually. An independent analyst should scrutinize all material available on the case--the investigator's records, data forms, and other supporting documents. The importance of this evaluation cannot be overstated since once the NASS data are placed in the computer, it will be considered completely correct by most users.

Interactive data entry and editing should be used to reduce paperwork, simplify coding, reduce coding errors, and reduce the turnaround required to clear up inconsistencies in the data. This latter point is significant since the longer one waits after an accident occurs, the harder it is to collect data on the accident. Thus, any errors or inconsistencies in the data must be found as soon as possible in order to properly correct them.

Proper storage of the data collection forms, accident reports, photographs and other records associated with each case is also very important. NHTSA indicated that these records would be maintained, but it is unclear exactly how accessible they might be. Good records which could be easily located and analyzed would allow researchers to obtain additional information beyond that which had already been coded.

Since the NASS teams are made up of personnel from outside contractors, additional constraints are placed on the system. Uniform procedures must be established between teams, the zone centers, and the NHTSA contract technical monitors to identify problems and, as necessary, take timely corrective action.

Since zone center personnel are also contractors, the ultimate responsibility for quality control rests with the permanent NHTSA/NASS staff. NHTSA is currently planning to use one or two in-house staff personnel for every five NASS teams. As the NASS program expands, the NHTSA staff responsible for NASS must expand proportionately.

Operational Factors--Each NASS team will be composed of 3 to 5 "trained technicians" and according to NHTSA will be responsible for the investigation of some 300 to 500 cases annually. On the average, each three-member team will complete more than one investigation per available work day which appears to be an overly optimistic estimate. With this workload, all activities of the team must be effectively coordinated. Trips to regular data collection points, such as police stations, tow yards, hospital emergency rooms and other locations, must be carefully planned to reduce travel time.

The data collected are intended to be restricted to objective information only. The present data collection forms provide for approximately 260 data items. NHTSA indicates that another 10 to 20 data items will probably be added after an "Accident Causation Methodology" study is completed. The currently proposed form is basically a modification of that being used in the ongoing National Crash Severity Study (NCSS). (See Appendix A.)

The data elements to be recorded on the form are not complex and generally should require little effort to gain the needed information. For instance, the type of information needed about the vehicle would include such items as measurement of vehicle's deformation and its relationship to a pre-determined scale. Observing and recording damage to the vehicle interior that could relate to occupant injury is required. This type of information is to be acquired in about 2 hours. In-depth analysis of such items as defective brakes or similar items requiring dismantling will not be accomplished. Examining braking systems on automobiles and particularly on large trucks and trailers requires more time and skill than that planned for NASS.

Information collected at the accident scene with regard to marks left by the involved vehicles on the roadway and the involvement of the various elements of the highway is likewise limited in scope and depth of effort.

The NHTSA indicates that they now estimate it will require about 16 hours of the field investigators time to perform all activities as necessary to complete the form. The NCSS results to date indicate about 15 hours on the average for 7 teams. The 16 hours is a low estimate since a wider variety of accident types will be investigated under NASS and a larger number of data elements per case recorded.

Cooperation with and from local organizations and officials will be of paramount importance. NASS will be severely handicapped without strong support and assistance from the police, hospitals, doctors, and vehicle salvage personnel, since these are the sources of much of the required information. NHTSA has very appropriately included this factor as an element of the NASS philosophy. They have also recognized that the initial contact and rapport established with these groups will set the standard for the months and years to follow. The professional conduct of the team members is critical. If a team alienates the various officials and professionals with whom they must work, it will lose its effectiveness, possibly to the extent that the site might have to close down.

Contracts must be carefully written to provide adjustment or replacement of contractors if team performance is inadequate. It will become even more important as more NASS sites are established since there are not many contractors with adequate highway accident investigation experience to fill the needs of the projected number of sites.

One of the most critical areas will be the collection of medical data to link injury severity with their cause. If these data cannot be collected adequately, the program will be severely affected.

Trained technicians will not be able to collect good quality medical information without assistance from coroners, doctors, and hospital emergency room personnel. Many potential problems exist:

- (1) Most States have confidentiality laws which prohibit the release of the information by the hospital or doctor unless specific consent is given by the patient.
- (2) Autopsies are sometimes not performed because of religious constraints, costs, or local policy. Those that are performed can vary in quality. Thus, valid information on internal and fatal injuries will be difficult to obtain.
- (3) A large percentage of injured victims, especially those with more minor problems, may choose to be treated by private physicians in their offices rather than at emergency room facilities. A recent Health Interview Survey by the National Center for Health

Statistics indicated that only 46% of the injuries from motor vehicles were ever treated in hospitals. ^{4/} Should this fact be repeated in the NASS program PSU's, the job of locating all the doctors and then obtaining necessary support may be overwhelming due to the doctor's lack of time or administrative help and concerns for confidentiality and medical malpractice liability.

NHTSA staff have indicated they do not believe the collection of necessary medical information will be a major problem. Nevertheless, preliminary results from the ongoing National Crash Severity Study seem to indicate otherwise. On the average, the trained technicians for that study could only adequately rate the severity of injuries (using the standard abbreviated injury scale) in 81% of the cases investigated.

The following summarizes similar results for several key data elements:

Percent of Cases Where Data Element was known

<u>Data Element</u>	<u>Best Team</u>	<u>Worst Team</u>	<u>Average</u>
Work Days Lost	91%	57%	76%
Damage Description	94%	70%	84%
Restraint Use	91%	61%	79%
Crash Reconstruction	72%	43%	63%
Impact Type	100%	95%	97%

Goals should be established to ensure a "high response rate" for all key data elements. The NASS National Review Panel recommended in March 1976, a response rate of greater than 90 percent and that plans be developed to attain this goal.

The Safety Board is concerned about the retention of team members and thus the long-term stability of the NASS teams. Given the basic nature of the NASS workload--somewhat routine and quite busy--and the rather low annual salaries (\$10,000 to \$15,000) it may be difficult to hire and keep quality team members for any length of time. NHTSA anticipates a 25% personnel turnover rate. Experienced and well-motivated team members are vital to the program. Unfortunately, NASS will not offer a team member much opportunity for advancement within its program. Every effort should be made to keep the teams motivated. Future budget increases to support salary increases may be needed to address this problem.

The contract for the Muskegon County, Michigan site, was awarded to the State of Michigan. They in turn have subcontracted the effort to the Highway Safety Research Institute. The State, however, intends to

^{4/} Advanced data from 1975 Health Interview Survey, National Center for Health Statistics.

consider making the team members full-time State employees provided the site remains in operation. Similar arrangements with other States, could be explored further since this would provide more long term stability.

Likewise, the possibility exists for NHTSA to use State and local investigators through a cooperative effort to supplement the NASS data. In certain instances special programs might be established in which the States would agree to collect additional data on an agreed number of key data elements. With adequate coordination and quality control the data could then be integrated with that collected by the NASS investigators, and thus increase the capability for analysis due to the larger sample.

The Safety Board is also concerned about the effects if NASS investigators become involved in private litigation. Currently, they are not protected from subpoenas to appear as court witnesses or for depositions, both of which would interfere with their investigatory functions, cause delays, and increased costs. It could also affect their accident investigation, and the relationship with those involved in service groups from which they collect data.

The NASS National Review Panel recommended a "limited shield" be sought from Congress to protect the investigators from this potential involvement. Apparently, a legislative initiative to seek such protection is not currently being supported by NHTSA. NHTSA does not believe this is a serious problem based on their experience. They pointed out that the NASS data will be sanitized almost immediately after collection to remove identifying factors, such as names and addresses of persons involved in the accident, thereby making the report anonymous. It is not clear, however, that this will guarantee that the NASS investigators won't become involved.

By regulation, the Safety Board shields its investigators from appearing in court without the Board's consent. It does, however, permit its investigators to be deposed at locations and times convenient to the Board. Annually, about 300 requests for depositions are received of which about 150 are actually given. These usually require about 2 man-days per deposition. If court appearances were required, the number of man-days would be significantly increased.

The Wyoming State Highway Department has ceased in-depth investigations within Wyoming because of legal problems gaining access to damaged vehicles, interviewing witnesses, and having the investigators and investigative material subpoenaed.

Consequently, the Board believes that this potential problem requires further study since it could seriously affect the cost and quality of data collected.

NHTSA revealed to the Safety Board that there are no multidisciplinary accident investigations (MDAI) planned as a part of the NASS program. However, they did indicate that the zone centers would have MDAI capability and could be called on to investigate catastrophic accidents with high public visibility and interest. The investigation of catastrophic accidents and the holding of public hearings is mandated to the Safety Board by statute. This activity should not be duplicated by NHTSA.

Special Studies

Special studies are planned to collect data in cases where continuous long-term collection of the data is either unfeasible or unnecessary. Generally it will involve collecting additional data on accidents already sampled or collecting data on special kinds of accidents.

The special study concept as proposed has evolved from what the original NASS design called the "quick-response system". Under the existing NHTSA data collection program, if a problem arose which demanded study, it could not be addressed in a timely fashion. This is because each such study required a separate procurement process to define the needed work, identify potential contractors and award the necessary contracts.

Under the proposed concept, the NASS investigators would be an available resource which could be called on to gather data to support the conduct of studies on pressing safety problems in a much more timely fashion. In some instances, the data collection efforts might be limited to several months. In others, the special study data collection might extend for as long as 3 years.

Plans for special studies have lagged behind those for the continuous data collection activities. Actual data collection for any special study will not be initiated until January 1979. Therefore, a complete list of anticipated special studies does not exist. NHTSA supplied the Safety Board with the following list, which they indicated was based only on current plans and subject to change in response to future NHTSA priorities:

- . Fuel and fuel leakage in accidents.
- . Intrusion in side impact for passenger car and light truck accidents.
- . Heavy truck underride protection.
- . Passenger car--light truck rollovers.
- . Distribution of impact speeds.
- . Child restraints.
- . Roadside and environmental objects.
- . Contribution of braking to passenger car and light truck accidents.
- . Identification of motor vehicle safety defects in accidents.

Once implemented, the special studies will encompass approximately one-third of the NASS data collection activities. For the most part, they will be performed by the regular NASS investigators (trained technicians). Undoubtedly, those teams affected will need to be supplemented with additional personnel so that their normal continuous data collection will not be adversely affected. It will also require special training for the investigators so that they understand the particular study objectives and are capable of collecting the desired data. Both of these needs will require careful planning before the study and meticulous administration and management of the program during the study.

Special study data collection will most certainly be an integral part of the NASS program, and will have to fulfill most of the accident data needs which cannot effectively be addressed in the continuous sampling effort. Several potential NASS data users have indicated to the Board that NHTSA has already indicated to them "that their particular concern will be covered by a special study." The Safety Board believes that as NASS grows the requests to NHTSA for additional data and studies will likewise grow beyond current projections. It is important, therefore, that input from the many segments of the highway safety community be sought and that NHTSA plans reflect a balance of those needs.

Ancillary Studies

Two ancillary studies are presently envisioned. The first of these is a study of accidents which are not reported to police so that the number of unreported accidents within each site can be estimated. This problem is particularly complex since reporting criteria vary from jurisdiction to jurisdiction. In addition, the reporting rates invariably are a function of the accident site, the type of accident, and the severity of the accident. The National Review Panel pointed out the problem was especially significant for single vehicle, bicycle, and motorcycle accidents and cited a study where 57 percent of the seriously injured motorcyclists were not identified in police reports.^{5/}

NHTSA has not yet finalized the work statement for the study; therefore, evaluation of it is not possible. The Safety Board believes this study will be extremely difficult because of the scope of the problem. However, the study is essential since it will enable the necessary adjustments to the sampling plan or subsequent analysis so that results are representative of all accidents and not just those reported to the police.

The other ancillary study will examine methods for collecting valid exposure data so that NASS accident data can be converted to population at risk information such as accident rates.

^{5/} National NASS Review Panel Report to NHTSA, March 31, 1976, page 6.

Valid exposure data should be an integral component of the NASS program because, without it problem identification and countermeasure design and evaluation will be severely limited. Good exposure data are essential for evaluating countermeasures in relation to the risks and transportation provided. This is especially true for any countermeasures concerned with accident prevention.

The Highway Safety Research Institute at Ann Arbor, Michigan, is currently under contract to the NHTSA to determine the type of exposure data to collect, and how to collect it to insure sufficient reliability. Since this study is just beginning, its the scope, effects, and costs of this element of NASS cannot be evaluated.

The Safety Board believes that both studies are extremely important and crucial to the ultimate usefulness of NASS. Final plans to expand the NASS program should not be made until both of these studies are complete and their results incorporated into the appropriate plans.

Implementation

The pilot program for NASS was initiated in October 1977 when the NHTSA awarded contracts to establish ten NASS sites. Contracts for two zone centers had been awarded in June. Since that time, the investigators have received 2 weeks of classroom instruction on accident investigation and two 1-week sessions of on the job training. The rest of their time has been spent establishing site facilities, establishing community relations, documenting the site, and making other preparations to begin data collection. Actual data collection is scheduled to begin in April 1978. For the first 8 months, the principle objective of the data collection will be to compare the performance of a three person versus five person team.

The following table summarizes NASS' main objectives from now until fiscal year 1981:

1978

- | | | |
|---------|----|--|
| April | -- | Begin CSS data collection pilot program |
| | -- | Assign priorities to special studies and initiate their design. |
| July | -- | Initiate ancillary study of unreported and nontowaway accidents. |
| October | -- | Complete accident causation methodology study |
| | -- | Initiate pilot test of exposure data collection |

1979

- | | | |
|----------|----|---|
| January | -- | Initiate special study data collection |
| | -- | Implement results of accident causation methodology study |
| February | -- | Complete evaluation of CSS data collection pilot program |

- June -- Complete pilot test of exposure data collection
- June -- Complete sample design for expanding number of sites.
- June -- Complete ancillary study of unreported, nontowaway accidents.
- October -- Initiate exposure data collection
- October -- Expand number of sites to 30
- 1980
- January -- Prepare first statistical report
- 1981
- October -- Expand number of sites to 50

In fiscal year 1977 the NHTSA expended \$2,230,000 on NASS and has budgeted \$3,090,000 for 1978. With 50 sites in operation the following annual budget for the NASS program is anticipated:

Continuous Sampling Subsystem Data Collection	\$9,700,000
Special Study Data Collection and Design	5,300,000
Exposure Data Collection	500,000
Training	400,000
Methodology Development	600,000
Computer Support	<u>1,200,000</u>
	\$17,700,000

The Safety Board has found instances where the implementation of NASS has proceeded before necessary planning was completed. For example:

- . The existing sampling plan and selection of sites were finalized before the significance of unreported and nontowaway accidents was thoroughly understood.
- . Plans for the CSS accident data collection pilot program were finalized before the accident causation methodology study was completed.
- . The current NASS teams were established and trained before the data collection forms were finalized. The final forms and associated coding definitions are not yet complete as of January 25, 1978.

Likewise, the Safety Board is concerned over some problems in NHTSA's current plans for the future implementation of NASS:

- . The ancillary study on unreported and nontowaway accidents is scheduled for completion the same time the sampling plan for expanding the number of sites is to be completed. The results of this study are important as to how representative the national estimates will be and thus should be thoroughly analyzed before the program expands.

- . The CSS data collection pilot program is to be evaluated only 1 month after the teams will have begun collecting special study data. Since teams will eventually be spending about one-third of their time on special studies, this activity will have a significant affect on field operation. Therefore, more than 1 month's experience in this activity should be allowed before the program is evaluated.
- . The CSS data collection pilot program is to be evaluated less than a year after the teams will have begun collecting accident data. One year is not sufficient time to study the operation of the teams and solve unexpected problems which might arise. Because the time required for other elements of the program to come into operation and the probability of change during the pilot program, the Safety Board believes that a longer period of operation and evaluation will be necessary.
- . The Accident Causation Methodology Study appears to be behind schedule.

In general, the Safety Board believes NHTSA is attempting to speed implementation before adequate planning and is not allowing sufficient time to integrate the results of various studies and the results from field experience. NASS must be developed in an orderly fashion and expand in size only when sufficient planning and evaluation has been completed.

NASS Advisory Committee

Inherent within the stated NASS philosophy is the importance of maintaining frequent communication with the data users both inside and outside NHTSA. "The cost-effectiveness of NASS, in the long run, is measured by the extent to which it satisfies user needs."6/

In February 1976, a 14-member expert panel, the National Review Panel, was established to review the plans for development and implementation of NASS. Their report in March of that year provided numerous recommendations relating to the establishment, maintenance, review, and use of NASS data, and highlighted portions of the NASS plans where special attention was deemed necessary to insure the ultimate success, usefulness, and credibility of NASS.7/

One recommendation called for the establishment of an advisory panel of experts to review the results of the pilot studies and proposed modifications in the plans for NASS before full-scale implementation.

6/ Kahane, page 428.

7/ NASS National Review Panel Report to NHTSA, March 31, 1976.

In November 1976, a permanent user's committee was formed within the Department of Transportation to advise the NASS staff. It is composed of 12 members from NHTSA and 2 from FHWA. An external user's committee has been proposed by NHTSA, but has not been established.

The Safety Board believes that a national program with the stated scope of NASS must provide a balance of services to all elements of the highway safety community which have a supportable need for the type of data that can be collected. It further believes that such a broad purpose can easily be jeopardized if the program is administered without the input of knowledgeable individuals from outside the Department of Transportation. If the administering agency has major data needs without external input, the agency's needs are likely to receive top priority.

An advisory body to NHTSA would provide a beneficial medium to insure that adequate dialogue between user groups and NHTSA is maintained. It would further increase the chance of NASS' ultimate success by providing an independent body of experts capable of providing recommendations to NHTSA at key points in NASS's development. Such a body should be similar to the National Review Panel for NASS, but unlike that panel should have representatives from police organizations, highway departments, highway user groups, and Governor's highway safety offices.

EVALUATION OF THE NASS OBJECTIVES

The NHTSA has publicly stated these specific objectives for NASS:

- (1) "Estimate and disseminate annual national totals and rates of accidents and exposure, accident causes and consequences at a level of detail not currently available.
- (2) Monitor changes and trends in the design of future countermeasures.
- (3) Evaluate existing countermeasures, motor vehicle standards, and highway safety program standards.
- (4) Provide data during the field test or demonstration phase of proposed standards and countermeasures to assist in evaluating their likely accident and injury reducing benefit.
- (5) Provide a current and detailed accident and injury causation data base suitable for establishing priorities for and assisting in the design of future countermeasures."

The Safety Board believes that the above objectives are excellent and if fulfilled, will have a beneficial impact on highway safety. In fact, the lack of definitive, reliable, nationally representative data in the highway mode is certainly one of the most critical problems that exists today in transportation safety. The following is the Safety Board's evaluation of NHTSA's ability to fulfill each of these objectives.

Estimating National Statistics

NHTSA has stated that one of the most useful products from NASS will be an annual report of national totals and rates of accidents, accident causes and consequences.

Since NASS will be a probability sample of the nation's accidents, nationally representative estimates can be easily derived. In general, reliability of any estimate for any event's occurrence will, however, vary depending on the frequency of its occurrence. The more frequent an event, the more datapoints that will be included in the sample and the more valid the results. For less frequent events, the data becomes sparse and the reliability is lower.

As proposed, a fully implemented NASS program would provide some 17,500 to 20,000 cases per year, which would appear sufficient. Nevertheless, even with this size sample, it is easy to identify certain key data elements which would not be adequately represented. For example, as designed, NASS will not permit meaningful analysis with respect to

vehicle year, make, and model. In fact, "to test for the significant difference in a towaway involverent rate of 1973 Chevy Novas and 1973 Ford Mavericks would require a ten-fold increase in the NASS sample size."8/

Reliability can be improved by modifying the sampling scheme to adjust the proportions of data collected. This concept, of course, is inherent to the basic NASS sampling plan. Unfortunately, optimizing the sampling plan in this manner really involves making a compromise or trade-off. Increasing reliability for one parameter will undoubtedly decrease it for another.

Reliability can also be improved by simply increasing the total sample size, which could be accomplished by either collecting more data over a given period of time or lengthening the time between analyses. For data elements, it might be necessary to wait several years until enough data points are gathered. Unfortunately, accident parameters are dynamic because of changes to vehicles, applicable regulations, and driving patterns. This instability means that one year is the maximum time period for collecting a given sample for most general statistics.9/

Determining the optimal sample size is extremely difficult since in addition to all of the above factors, one must be willing to decide how much one is willing to spend to collect data. Considering this problem, in 1975 an Office of Technology Assessment's report indicated "that approximately 500,000 to 1,000,000 reports per year are needed..." 10/

Nevertheless, even limited to 20,000 cases per year, the NASS program still should produce the largest, most reliable accident data file available. The MDAI files will be more in-depth and police data files will be more numerous, but considering both attributes, none would be better for research and statistical analysis. If realized, the collection of data to link factors contributing to the accident and resultant injury, and exposure data to measure the population at risk will be especially significant.

The selection of data elements collected will have a major and direct impact on the utility of the NASS data. To be the most useful, the NASS program should collect data with a "system's perspective", i.e. without emphasizing any one particular problem area or element of concern. Specifically, the data collection scheme should place equal weight on all phases of an accident (precrash, crash, and postcrash) and all

8/ NHTSA response to NASS National Review Panel Report, July 6, 1976, page 4.

9/ Automobile Collision Data - An Assessment of Needs and Methods of Acquisition, Office of Technology Assessment, Washington, D.C., February 17, 1975, page 27.

10/ Ibid, page 31.

factors (human, vehicle/equipment, environment) of an accident. The proposed NASS data collection form does not fulfill these criteria. It is oriented strongly toward vehicle factors and the crash phase of the accident.

Consequently, the usefulness of the data base to "provide nationally representative statistics" is limited as now structured.

Monitoring Changes and Trends

One of the advantages of NASS is that data will be collected continuously over long periods of time. This will allow certain key statistics to be monitored and the appearance of certain trends identified. The exposure data will be particularly valuable.

Once again, the size of the sample will, however, limit the analysis. NHTSA has stated that "only fairly substantial (5 percent or more in a year) or fairly persistent (2 percent a year for 5 years) changes can be reliably detected." 11/

To analyze "why a change occurred" would require even more data since you would have to study the possible interaction between many variables. Most likely, any analysis of this sort would require some type of special study to oversample certain key data elements.

Continuous collection of data to monitor long term trends also inherently places an additional constraint on NASS. Specifically, it will fix certain data elements being collected and thus limit the number of revisions or additions to the data collection effort.

Evaluating Existing Countermeasures

NASS will assist in the evaluation of certain existing countermeasures especially if special studies are designed and conducted with this specific purpose in mind.

Motor vehicle and highway safety program standards are inherently different in many respects and thus pose different problems from the standpoint of evaluation.

Many of the highway standards do not lend themselves to evaluation by accident data because they cannot be directly linked to accident consequences. These would include such standards as Traffic Records and Traffic Courts.

11/ Kahane, page 427.

Highway standards are also implemented on a State by State basis. Since NASS will not produce estimates for each State, comparisons between States will be impossible. "To represent the States individually would require nearly 400 sampling units, and that is considered an unreasonable extension of a system aimed primarily at national statistics." 12/

Also, since proposed NASS data collection will emphasize motor vehicle crashworthiness programs, evaluation of highway standards is inherently limited.

For these reasons, the Safety Board believes that NASS's capability, as now planned to evaluate highway standards, is extremely limited. NHTSA admitted NASS alone does not have the potential for validating any highway safety standards, and indicated that separate research projects would be needed to handle any such evaluations. 13/

Evaluating existing motor vehicle standards presents similar problems. Most significant is the inherent difficulty associated with evaluating a standard already in existence. Such an evaluation requires one to identify some category of accidents not affected by the standard and another category that was affected.

For some standards, for example those requiring seatbelts, such categories could easily be found since many people use belts and an even greater number do not. Nevertheless, in analyzing the data, it is extremely important to make sure that other outside factors (other than the standard) are not influencing the results. This requires the analyst to control factors which might have an effect which places definite requirements on the amount of data needed, usually expanding it.

For example, if one wished to examine the benefits of seatbelts in recent subcompact cars compared to full-sized cars, there would be for a one year period, 18,000 automobile accidents involving 30,000 vehicles. 14/ Of these, one would probably end up with around 1,250 recent subcompact cars and 17,000 full-sized cars after other irrelevant vehicles were eliminated. If we categorized those into belted versus unbelted the following would result:

12/ James O'Day et al, Design for NASS, National Highway Traffic Safety Administration, May 1976, pages 22, 23.

13/ Comptroller General of the U.S., Effectiveness of Vehicle Safety Inspections Neither Proven nor Unproven, December 20, 1977, pages 18, 19.

14/ B. J. Campbell, 8/17/77 Draft of paper on NASS forwarded to NTSB, pages 8, 9.

	<u>Subcompact</u>	<u>Full-Size</u>
Belted	250 (20%)	2,550 (15%)
Unbelted	1,000 (80%)	14,450 (85%)
Total	1,250	17,000

If we further controlled for 5 levels of crash severity and 5 levels of crash type, the above frequencies would have to be divided into 25 cells. This would yield a frequency count of only 10 per cell on the average for the subcompacts and thus limit the confidence in any results observed.

Typically, the motor vehicle safety standards have been implemented so that they are applicable to all cars after some date and none before that date. Therefore, the cars with the standards are generally newer and differ from the older ones in many respects. This consequently compounds the problems of identifying the proper categories of accident data and then finding a sufficient sample to control for all of the necessary factors.

Therefore, the Safety Board believes that NASS will assist in the evaluation of many existing motor vehicle safety standards, especially if special studies for that purpose are specifically designed. However, additional studies or research projects still seem necessary to supplement the NASS program.

Evaluating Proposed Countermeasures

The NASS program has potential for evaluating certain proposed safety standards. Such evaluations would of course be subject to many of the same limitations as evaluating existing standards. NHTSA has proposed field-testing the proposed standard on a random sample of the population to obtain this objective. This would enable researchers to study and compare cars with the new standard against those without it.

The Safety Board believes that a program to randomly introduce a proposed standard would be virtually impossible because of the practical problems associated with it. As an alternative, the Safety Board believes new standards could be field-tested on vehicles purchased by the Federal Government. In a 1970 study, "The Roles of GSA and DOT in Motor Vehicle Safety Standard," the Safety Board proposed a system whereby GSA and DOT would jointly develop and promulgate advanced safety standards. Such a system would allow a proposed safety standard to be field-tested, studies of its effectiveness to be made, and any associated implementation problems to be identified before the standard was mandated on all new vehicles.

DOT and GSA have not adequately considered this proposal. The Safety Board believes, therefore, that the NHTSA should reconsider this proposal in light of their current NASS objectives, and needs for evaluating proposed safety standards.

Providing a Data Base

As proposed, the NASS data base will primarily support motor vehicle crashworthiness programs. This support stems from two factors. First, the Congressional mandate to the NHTSA includes responsibility for evaluating automobile crashworthiness and for the promulgation of Federal motor vehicle safety standards.

Second, the state of the art for accident causation research is far behind that for crashworthiness. It is generally agreed that an accident is the result of the imbalance between many factors associated with the driver, the vehicle, and the highway environment. Unfortunately, there are no universally accepted methods for "objectively" identifying all of the causal factors which contributed to an accident, let alone which of them was the primary cause. Even the NHTSA multidisciplinary teams staffed with highly trained professionals had difficulty determining cause with only objective data.

The NHTSA is currently sponsoring an Accident Causation Methodology study which they feel will provide many of the answers needed for determining precrash, crash, and postcrash causal factors. They hope to develop techniques for obtaining good causation data which could then be introduced into the NASS program. As mentioned earlier, this study is currently behind schedule. NHTSA's objective in this regard is commendable and the research should continue although such research should have been completed before the pilot program was implemented.

Discussion with NHTSA indicates that they expect 10 to 20 data elements to be added to the data collection form for causal factors for precrash events. This small number certainly raises concerns as to the value of such an approach on such complex and widely varied events as traffic accidents. These few elements can only indicate involvement of the few predetermined causal factors among a potentially large group that could be suggested from causes related to the human, vehicle, and highway environment.

The overall usefulness of NASS will be limited unless data needs are balanced. Of course, a new program cannot be all things to all groups; however, NHTSA is not new to data collection activities and should have been able to design a more balanced approach without significantly increasing cost.

The lack of data on important problem areas in the highway environment is conspicuous. The FHWA has representatives on NASS's users committee who provided a list of problem issues for which they desired data. It is not evident from a review of NASS' proposed data collection form that FHWA's requests were accepted.

The CSS data accident investigation form contains questions relating to 19 highway elements. A majority of these elements are of little value without further supporting data. For example, determining if the road is curved is of little value without information regarding degree of curvature, cross-slope, surface friction and lane width. Ascertaining the presence of a shoulder is of little value without knowledge of shoulder width, cross-slope and surface condition. Similar information about the lanes adjacent to the shoulder would also be necessary.

The need for highway-related data was illustrated in 1977. The FHWA proposed new regulation for the adoption of changes to geometric design elements of highways that would have, in the Safety Board's opinion, lowered safety margins on roadways where the lower standards would be applied. The FHWA, in proposing the lower standards, noted that they did not have sufficient data to know how the proposed standards would affect safety.

With the multiple billions of Federal dollars that are annually provided to support our nation's highways, highway engineers should have sufficient data to scientifically support changes for design and operational standards. To allow this to continue can only be described as false economy. The highway engineering efforts will require both continuous sampling and special study efforts.

The Board believes that FHWA must also do more to identify problems for which data are needed. Each problem must be sufficiently defined to indicate what elements must be collected. A comprehensive program is needed immediately to address the subject.

CONCLUSIONS

1. Reliable and representative national data are needed to support funding allocations, countermeasure design and evaluation.
2. Creating a system to fulfill national data needs is both complex and difficult.
3. NHTSA will not be able to fulfill all needs implicit in the broad title--National Accident Sampling System.

4. The absence of reliable data on precrash, crash, and postcrash factors and the effects of the human, the motor vehicle, and the highway in crashes has been a major obstacle to reducing accidents and their consequences.
5. The publicly stated objectives of NASS, if attained, will provide valuable information for those charged with highway safety improvement.
6. The NASS program, as planned for the next 5 or more years, falls short of its publicly stated objectives.
7. The lack of adequate input to NHTSA from the many groups of the highway safety community has contributed to the narrowly conceived program.
8. The program emphasizes vehicle crashworthiness and excludes for the most part data that would contribute to accident prevention research and countermeasure development.
9. The FHWA does not have a comprehensive list of highway safety data to support changes for design and operational standards.
10. The NASS program alone will provide a limited capability for evaluating most countermeasures considering budgeted resources.
11. The NHTSA is attempting to speed implementation of NASS before adequate planning is complete and is not allowing sufficient time to integrate the results of various studies and the results from field experience.
12. Several NASS studies, including the exposure data system design study, sampling design study, accident causation methodology development study, and a study of unreported accidents, are extremely important and crucial to the ultimate usefulness of NASS.
13. Litigation could involve NASS investigators to the detriment of quality and cost of the data.
14. Potential problems with collecting key data, such as injury information, could jeopardize the effectiveness of NASS.
15. NASS data will be more useful in the future if the field investigation files are centrally located, contain all associated documentation including photographs, and are easily retrievable.
16. Since NASS is still in the planning phase and constantly evolving, it is not feasible to complete an effective final evaluation of the program at this time.

17. Through improved planning and broader perspectives, the NASS program could become an important part of the national highway safety effort and should be supported through sustained funding.

RECOMMENDATIONS

Based on this evaluation, the National Transportation Safety Board recommends that the NHTSA:

1. Establish a NASS Advisory Committee to provide NHTSA with a broader perspective of types of data that should be collected and methods of data storage and retrieval. The committee membership should be balanced and include persons from automobile manufacturers, highway user groups, the insurance industry, governors' highway safety representatives, highway engineering agencies, medical and legal professions, statistical and economic professions, and the private and governmental highway safety research community.
2. Study the practical problems associated with collecting key data, such as injury data, to determine the magnitude of any problems and to assess the impact on the effectiveness of the NASS program before selecting the number and location of future NASS investigation sites.
3. Study the potential effects from liability litigation between parties to individual motor accidents which could involve testimony from NASS investigators on the cost and quality of data collection. The study should consider the need, advisability, and obtainability of a limited shield for NASS investigators.
4. Assure that the number of NASS accident investigation sites will not be expanded beyond the original 10 until after experience with field data collection and processing is evaluated; the exposure data system design, sample design, accident causation methodology, and other NASS studies are completed; and a comprehensive plan for further implementation of NASS is developed and made public.
5. Ensure that copies of the sanitized accident reports and case files including photographs completed by each team are retained and systematically filed at a central location for easy retrieval for future use by persons interested in further in-depth research.
6. Revise the currently proposed data collection forms to include substantially increased emphasis on the highway environment. The recommendations and counsel of the Federal Highway Administration should be sought and utilized.

Similarly, the National Transportation Safety Board recommends that the FHWA:

1. Conduct a comprehensive study to identify highway safety accident problem factors for which data must be collected to identify the problem magnitude, and support research and countermeasure formulation. Such problem factors should include elements such as geometric design factors, roadway surface skid resistance qualities, traffic control devices, traffic barrier systems, roadside hazards, and other factors related to highway operational safety. This study should be designed to support both the NHTSA NASS program as well as the activities of FHWA and State and local agencies involved in highway safety.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

/s/ KAY BAILEY
Acting Chairman

/s/ FRANCIS H. McADAMS
Member

/s/ PHILIP A. HOGUE
Member

/s/ JAMES B. KING
Member

March 2, 1978

APPENDIX A

INTERFACES WITH OTHER NHTSA PROGRAMS

Special In-Depth Accident Investigations - The special in-depth investigations of the past will be gradually phased out. NHTSA has indicated multidisciplinary capability will be maintained at the NASS zone centers, and that personnel from the zone center, if called on, could respond to catastrophic accidents of high public visibility and public interest.

National Crash Severity Study (NCSS) - This is a national multi-team effort quite analagous to NASS begun in 1976. It uses trained technicians at sites to collect data very similar to that which NASS will initially collect. The investigation sites were not randomly selected, but rather were established in areas where contractors with investigation experience already existed. Nevertheless, NHTSA feels that although the accidents investigated will not fit a strict probability sample, they should provide a reasonable national sample of the crash phenomena. The data collection forms and team operation being used in the NCSS will also be quite similar to the early NASS efforts.

In addition to providing the data on the crash phase, NCSS also provides a resource for field testing new data collection techniques, forms, and methodologies. Eventually, the NCSS will be phased out as NASS becomes operational.

The Fatal Accident Reporting System (FARS) - The Fatal Accident Reporting System (FARS) is a long term program of NHTSA designed to complement NASS. It essentially is a census of fatal motor vehicle accidents occurring throughout the nation. The information is assembled and standardized from police accident reports and other State/local records. Some 120 data elements have been continuously collected and analyzed since its inception in 1975.

NHTSA plans for a parallel effort involving a representative sample of non-fatal police reports (NARS - The National Accident Reporting System) have recently been dropped due to budgetary constraints.

APPENDIX B

INFORMAL STATE SURVEY RESULTS

As part of the Board's evaluation a letter soliciting comments on NASS was sent to each State Governor's Representative for Highway Safety, the State Department of Highway Safety, the State Department of Motor Vehicles, the State Police or Highway Patrol and to several highway safety organizations. Specific input was requested on four questions:

1. What types of Federal, State and local accident data do you need to effectively manage your highway safety programs?
2. What specific areas of accident data do you believe are unavailable to you now?
3. Could you suggest any improvements, added details, or alternative data collection programs which would be useful to you beyond the program outlined in the attached paper?
4. Have you had experience with programs having elements similar to NASS that would provide insight to any potential problems in NASS?

A total of 212 letters were mailed - 4 to agencies in each State, 1 to the District of Columbia and 11 to various highway safety organizations.

A total of 92 responses were received as a result of the survey. This included responses from 47 of the States and from 6 of the miscellaneous organizations.

The input received was quite varied, both in terms of substance and the scope of the reply. It seems that many of the respondents were unfamiliar with the NASS program before receiving the Board's letter. Consequently, many of the comments appeared to be based primarily on a recent NHTSA paper describing the program which was enclosed with the Board's letter.

Due to the nature of the responses, tabulations of specific points common to respondents was not feasible. The following summary contains the major points presented:

- . Most respondents appreciated the opportunity to provide input into the Board's evaluation.
- . Many States felt the major problem with existing accident data was the incompatibility between different States' records.

- . Most States felt they generally had sufficient accident data to manage their own programs.
- . There was general support for the NASS program. Nevertheless, the States highlighted that the NASS data would be of limited use to them since it generally would only allow them to compare their identified State problems with a national sample.
- . Respondents felt more data were needed on alcohol and drug involvement, exposure information, accident causation, human factors and roadway design elements.
- . Several States expressed dissatisfaction with NHTSA's FARS program in that it was not providing timely, useful feedback to the user.

APPENDIX C

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