

## B. COLLECTIONS OF INFORMATION EMPLOYING STATISTICAL METHODS

### 1. Describe the potential respondent universe and any sampling or other respondent selection methods to be used.

The NASS universe, or sample frame, is the set of all police traffic crash reports in the United States. There are about 6,000,000 such police reported crashes each year. NASS samples this basic frame through a stratified cluster scheme whose stages are as follows:

- Divide the country into geographic units called Primary Sampling Units (PSUs). There are about 1,195 PSUs total.
- Group PSUs into one of 12 strata based on the PSU's geographic location (Northwest, South, Mid-west, or West) and degree of urbanization (city, large county, or a group of counties).
- For the NASS Crashworthiness Data System (CDS), a subsample of 24 PSUs was selected from the 1,195; two from each of the 12 PSU strata. The CDS is concerned with motor vehicle traffic crashes involving at least one passenger vehicle (passenger cars, pickup trucks, vans, and sport utility vehicles) that was towed due to damage from the crash.
- Within each PSU, select a sample of the police jurisdictions to which motor vehicle traffic crashes are reported. There is an average of seven police jurisdictions per PSU.
- Visit each selected jurisdiction on a regular basis (once or twice a week). List all crashes recorded at that jurisdiction since the last visit.
- Crashes which are investigated in the CDS are selected from crashes which involve a towed light vehicle.
- Stratify each listed crash involving a towed light vehicle first by the severity of the outcome of the crash (injury to victim of towed light vehicle) and then by model year. Model year classification is by late model year (last four years) or not-late model years.
- Add crashes listed on current visit to those previously listed.
- Select a random sample from all strata such that a weekly workload of 1.75 cases per researcher is achieved.
- Strata weights are established so that a higher proportion of more serious injury crashes are selected than the less serious injury crashes.
- Sampling procedure produce a fixed workload.

NASS randomly samples police reports at 24 sites. Each site or PSU has multiple police departments or jurisdictions. Not all police jurisdictions in a PSU are in the sample. If the police jurisdiction is not in the sample then it is considered a nonsample jurisdiction. Some individual police jurisdictions (cities) produce too many crashes and must be treated as a subsample. There are nearly 171 police jurisdictions that are sampled and 340 that are nonsample. NHTSA uses nonsample counts to improve the accuracy of the national estimates.

The following table shows the number of police-reported crashes listed and selected at the 24 CDS PSUs for calendar year 2008. The “National Police-Reported Crashes” is an estimate of the total number of crashes that occur across the United States as reported by the General Estimates System.

National Police-Reported Crashes	5,801,228
Police-Reported Crashes in 24 NASS CDS PSUs	97,799
Police-Reported Crashes in Sampled CDS Police Jurisdictions	66,387
Crashes Selected for NASS CDS Investigation	5,189

Once a crash is selected for the NASS sample it remains in the sample. Since the crash was identified by a police report, the information on the report itself provides some of the data needed for each component of the NASS investigation. Completion rates for the additional investigation stages are scene inspection 98%; vehicle inspection 85%; occupant interview 83%; and, occupant injury 88%.

2. Describe collection of information procedures.

Once a crash has been selected for investigation, several activities are initiated by the NASS team. Researchers locate, visit, measure, and photograph the crash scene; locate, inspect, and photograph all involved vehicles; conduct a telephone or personal interview with each involved person or surrogate; and, record injury information from hospitals or emergency rooms for all injured victims. During each activity the researchers record information on the NASS crash, vehicle, and occupant forms as appropriate.

Each sampled crash is weighted by the inverse of its probability of selection at each of the three stages of the sample design. That is, the national estimates equal the inverse of the product of the probability of the PSUs being selected, the probability of the police agencies being selected, and the probability of the crash being selected for that day. Since the number of crashes in the sample is pre-determined, the national estimate for each crash within a category is different. To account for this bias, a ratio weight was developed. The ratio weight is the national estimate multiplied by a ratio factor. For each category, this ratio factor is equal to the number of crashes listed in all of the police agencies (sampled and non-sampled) divided by the number of crashes selected. There are instances where very few or no crashes are listed. To account for this, the similar PSUs were grouped together, based on the category from which they were originally selected.

NASS is designed to give the most accurate estimates available for key statistics within

budgetary constraints. Variance estimates can be calculated using different available methods such as balanced repeated replication, SUDAAN or WESVAR. NASS CDS currently uses the Proc Survey portion of the SAS programming language to produce the standard errors. Due to the nature of the analysis performed and the detailed data provided, the standard errors should be produced for each analysis conducted. The CDS does not provide generalized variances for any data collection year.

NASS has the capacity to conduct special studies of particular problem areas outside of its regular sample. If a study should require a larger sample than would be available through the normal procedures, NASS CDS will oversample crashes of interest. Oversampling was used in a study of truck underride crashes (where a passenger vehicle strikes the side or rear of a heavy truck) in 1979-1980 and in a study of crashes involving various roadside equipment such as guard rails, poles, and crash cushions. In 1989, oversampling was used to increase the number of crashes involving light passenger vehicles with automatic occupant restraint systems. In these oversamples, crashes satisfying the appropriate criteria were identified from police crash reports within the regular NASS CDS sampling procedures.

NASS CDS will use an annual data collection cycle since NASS seeks to collect continuous data.

3. Describe methods to maximize response rates and to deal with issues of non-response.

The NASS Crashworthiness Data System quality control system is designed to produce the most accurate, reliable, and complete database possible within the limits of available resources. All data are automated and edited by a complex algorithm which checks for inconsistencies and questionable items. A sample of all crashes is given a thorough review by an experienced researcher at a NASS Zone Center. Zone Center personnel visit each PSU regularly to observe the team's investigation activities and to discuss systematic problems revealed in edit and Zone Center reviews of the team's cases.

Since the interview is vital to a complete case, NASS teams make special efforts to complete an interview when at all possible. Occupants are contacted by telephone. NASS researchers call at varying hours (often in evenings or on weekends) until they have located the person sought. When the person is unavailable, other passengers or witnesses are contacted. If the person sought cannot be located by telephone, researchers use personal visits or mail questionnaires. Each NASS researcher is given special training in interviewing. This increases the possibility that persons will cooperate once they have been located and contacted. As a result of these procedures, NASS teams have completed interviews with more than three-quarters of all occupants throughout the years.

As a final check on NASS data, approximately 5% of those interviewed are recontacted

by Zone Center personnel to establish that they had in fact been interviewed and to verify some of their responses. This type of interview takes approximately 5 minutes.

4. Describe any tests of procedures or methods to be undertaken.

NHTSA tested the original NASS forms and protocol in an OMB-approved pilot test in 1978, the year before regular NASS data collection began. Between 1978 and 1987, NHTSA had made only incremental changes (additions and deletions) to both forms and protocol. In 1988, the NASS data collection effort was redirected by focusing on crashes involving towed passenger vehicles. These changes were tested as part of the continuing data collection effort, since they grew out of the experience developed in NASS crash investigations and interviews. Changes are reviewed extensively by design, analysis, and field staff for their necessity and practicality.

5. Provide the name and telephone number of individuals consulted on statistical aspects of the design and the name of the agency unit, contractor(s), grantee(s), or other person(s) who will actually collect and/or analyze the information for the agency.

Ms. Nancy Bondy, National Center for Statistics and Analysis, NHTSA, 202-366-5353 is responsible for NASS survey design and estimation. Ms. Chou-Lin Chen, National Center for Statistics and Analysis, NHTSA, 202-366-1048 is responsible for NASS data analysis.

The design for NASS was begun by the University of Michigan Transportation Research Institute (contract DOT-HS-4-00890) and was further developed by Westat, Inc. (contracts DTNH22-80-C-07561 and DTNH22-83-C-07281). The current sample was developed and selected by NHTSA staff. The 1986 NASS Annual Report was produced by COMSIS, Inc. (contract DTNH22-83-C-07247). An annual report was not produced for 1987 because it was a program transition year. Beginning with 1988 NASS CDS data, the NASS CDS annual reports were published using data from three-year averages. The last report published contained data from 1995 through 1997. Since 1995, Capital Consulting Corporation has been producing the NASS CDS reports (contract DTNH22-99-D-07009). Twenty-four (24) research teams collect crash data at the selected PSUs for NASS. Two Zone Centers quality control the data and are technically and administratively responsible for these 24 PSUs. The Zone Center contractors are Calspan Corporation (contract DTNH22-06-C-00022) and KLD Associates, Inc. (contract DTNH22-06-C-00024).