

DATA PREPARATION OF NHTSA
MULTIDISCIPLINARY INVESTIGATION REPORTS

1976-1977 Interim Report

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16. Abstract <p>Since 1969, in-depth accident reports generated by Multidisciplinary Accident Investigation (MDAI) teams have been edited and processed by the Highway Safety Research Institute for computer storage and retrieval. This report details the work on this program between April, 1976, and June, 1977. During this period, accident investigation case studies were edited and formatted into the HSRI-maintained CPIR Revision 3 data sets.</p> <p>The report briefly summarizes the program, describes accomplishments during the past year, and presents recommendations for future efforts.</p>			
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1. SUMMARY

Since 1968 the National Highway Traffic Safety Administration (NHTSA) has conducted a program of in-depth or multidisciplinary accident investigations (MDAI) in contract with various universities and other research organizations. The Canadian Department of Transportation also sponsors a series of MDAI teams throughout Canada, while the Motor Vehicle Manufacturers Association sponsors clinical investigations of traffic accident crash and injury factors.

Since 1969 HSRI has been engaged in editing the case reports that result from these investigations, formatting the information into digital form, and making this information accessible for retrieval or statistical analysis by computer techniques. Case reports from all sources are processed into a common data set that is subsequently made available for direct analysis by each sponsor through use of the Institute's Automated Data Access and Analysis System (ADAAS) (1).*

The NHTSA contract for computerizing MDAI reports (DOT-HS-5-01134) provides for the processing of MDAI cases sponsored by NHTSA into a common format, using procedures that assure the quality and consistency of the data. NHTSA is provided remote-terminal access to the common data set of Level-III cases obtained from all sponsors as well as to more than 100 other Level-I or police-accident-data files obtained through other contractual agreements.

Data collected in the field for each motor vehicle crash investigated by an MDAI team are recorded by the team, using the "Annotated CPIR and Supplements," and forwarded to HSRI for processing. At HSRI, the coded data forms are carefully edited for accuracy and consistency and are keypunched for entry into the University of Michigan computer in Ann Arbor. After keypunching, the data are

*Numbers in parentheses designate references at the end of the report.

processed by computerized validation and restructuring programs that perform a substantial amount of automatic error checking, create many new items of information from the field-derived information, and restructure the data into a format compatible with ADAAS. These data are subsequently made available to NHTSA users through remote terminals linked to the University computer.

2. CASE PROCESSING PROCEDURES

As cases arrive at HSRI from NHTSA, a form is filled out for each applicable case vehicle (traffic unit) for inventory purposes. This form is subsequently keypunched and computerized, and the formatted data all made available as the "TRAFFIC UNIT COMPENDIUM" (or TUC) data-set. The TUC data-set is intended to be a catalog of in-depth accident investigation reports received at HSRI and is not designed for analytical purposes. Not all case-vehicle in-depth studies that arrive at HSRI are subsequently computerized in detail. For example, data recorded on the CPIR Version A Bus Form or on the Motorcycle form are not currently edited. The TUC data-set may thus be the only available digital record for some reports.

Each case vehicle study (documenting crash-related information for a selected vehicle in an accident) may consist of up to four field-completed accident report forms:

- 1) The CPIR Revision 3 and its supplement
- 2) The Occupant Supplement (OS)
- 3) The Damage Analysis Supplement (DAS)
- 4) The Air Cushion Restraint System (ACRS) Supplement

The annotated CPIR and supplements are processed by the data editors, who review all case documentation to ensure the validity and consistency of data to be keypunched. Over 45 pages of forms are manually verified. Missing pages of supplementary forms are also coded from the original documentation.

After keypunching and verification, the cards are entered into the computer for checking and formatting. Periodically, the compiled cases are added to the applicable data-sets and may then be accessed by NHTSA users. Table 1 shows the list of data-sets that are regularly updated as part of this contract, together with the ADAAS data base keywords used to access them. A summary of the characteristics of each data-set may be found in the 1975 Final Report (2).

TABLE 1
CPIR Data-Sets Regularly Updated

<u>Data-Set</u>	<u>ADAAS Keyword</u>
ACRS Vehicles	ACRSVEH
ACRS Occupants	ACRSOCC
CPIR Rev. 3 Vehicles	CPIR3VEH
CPIR Rev. 3 Occupants	CPIR3OCC
CPIR Rev. 3 Injuries	CPIR3INJ
DAS Vehicles	DASVEH
OS Occupants	OSOCC
OS OIC's	OSOIC
TUC	TUC

3. PROGRAM ACCOMPLISHMENTS

A brief review of tasks performed during the fourteen-month period April 18, 1976, through June 30, 1977, is presented below.

3.1 Task 1: Accident Report Editing

Prior to editing, a case is entered into the Traffic Unit Compendium file (TUC). Crashes involving only large trucks, motorcycles, or pedestrians are not candidates for the CPIR Revision 3 file, but do become part of this inventory.

On April 18, 1976, there was a balance of 142 NHTSA-MDAI cases remaining to be processed at HSRI from the previous year. All 142 were received in February of 1976 after file-building had begun for the end-of-year update. Through the fourteen-month contract period, 222 cases were received from NHTSA at HSRI and 349 were completely processed and returned. This left a balance on June 30, 1977, of 15 cases (see Table 2). Large-truck cases (Version B), while not added to the CPIR file, were added to the large-truck file maintained under auspices of the Motor Vehicle Manufacturer's Association. It is anticipated that a bus file (Version A) will be created in the near future.

Critiques of cases were created by the editing staff and submitted in duplicate to NHTSA for the purpose of informing contract technical managers and investigating teams of changes and/or corrections made by editors to original case CPIR documentation. These changes are part of a quality-control effort to assure consistency of data being merged into existing files. Often changes are needed to correct for errors, but more frequently to correct for clerical inconsistencies (e.g., right side designated as damaged when left side is intended, incorrect make-model codes, incorrect numbering of occupants in vehicles, incorrect initial vehicle dimensions).

During the initial inventory process (the establishing of the

Traffic Unit Compendium variables) it is sometimes necessary for an editor to assign a new case number to a crash report. This is necessitated by the fact that several teams often assign the same case number to more than one investigation (i.e., Cal 75-9). To differentiate between these investigations, HSRI will assign new identifiers, retaining the original case number at variable 16 in the CPIR data-set.

3.2 Task 2 Data Conversion and File Updates

All edited field data forms and relevant supplements were key-punched, verified, and placed on magnetic tape prior to file build. All cases completed under Task 1 were added to the applicable data files.

TABLE 2
NHTSA Case Flow

<u>Month of Activity</u>	Received			Returned		
	<u>Regular Case</u>	<u>TUC Only</u>	<u>Air Bag</u>	<u>Regular Case</u>	<u>TUC Only</u>	<u>Air Bag</u>
4/18/76 (Bal)	82	60	0	0	0	0
5/76	57	10	8	14	0	0
6/76	0	0	10	0	49	0
7/76	6	0	0	34	10	0
8/76	0	0	0	40	0	0
9/76	0	66	0	0	40	0
10/76	0	0	0	40	36	0
11/76	0	0	0	17	1	18
12/76	14	11	21	0	0	0
1/77	0	0	0	0	0	0
2/77	0	0	0	0	0	0
3/77	1	1	3	1	11	0
4/77	1	0	5	0	0	0
5/77	0	0	0	7	0	7
6/77	0	1	7	4	0	20
Totals	161	149	54	157	147	45
Balance 6/30/77	4	2	9	= 15 Total Cases		

4. RECOMMENDATIONS

At present, there is a certain amount of confusion concerning the future of the MDAI program, particularly in light of developments on NASS. However, it seems clear to the authors that in-depth investigation and report automation will remain viable for some years to come. Major reasons for this conclusion are:

- 1) There will be a continuing need for clinical-type studies of accidents that cannot be carried out in the framework of a NASS-type methodology.
- 2) Many NHTSA contracted efforts or programs now in the proposal stage rely upon MDAI data to answer critical questions.
- 3) NHTSA's direct usage of the MDAI data-sets averages over 1.5 accesses per day.
- 4) The backlog of case studies from currently funded teams will require automation activities for some years to come.

The basic recommendation, therefore, is to continue the processing of all in-depth MDAI cases, using the existing protocol and file-handling procedures (except for changes outlined below).

4.1 Specific Program Recommendations

To provide a more cost-effective approach to MDAI report automation the following specific modifications to the file-build protocol are recommended:

- 1) Since the TUC data is intended primarily as an inventory control tool, it is suggested that the number of variables included in the TUC be greatly reduced and that a direct data entry protocol be developed.

- 2) Due to limited use of the ACRS, DAS, and OS data-sets at present, it is suggested that their utility be investigated in terms of cost-effectiveness.
- 3) To eliminate redundant injury coding, it is recommended that the CPIR Revision 3 and OS forms be merged to provide a single report form.

4.2 CPIR Maintenance Recommendations

In addition to the specific file-build protocol recommendations, there is a broader question of general MDAI data support that is of present concern to HSRI. If the data-sets developed under this contract are to be of maximum utility to users, it is necessary that adequate documentation be provided, especially in light of the investment of time and money in each case study. Consequently, it is recommended that a CPIR maintenance program be developed to carry out the following tasks:

- 1) Print and distribute codebooks for each data-set.
- 2) Maintain an up-to-date editing manual.
- 3) Maintain an up-to-date catalog of reference information.
- 4) Supply MDAI teams with current field reporting forms.
- 5) Maintain computer files to provide on-line documentation of code value names.
- 6) Provide consultation services to system users.
- 7) Continue to maintain a cross-index catalog of DOT-HS publication numbers and team-case numbers followed by MDAI summary publication volumes.

REFERENCES

1. Multidisciplinary Accident Investigation Report Automation and Utilization Data Users Operating Manual, John A. Green and Barbara C. Brown. Highway Safety Research Institute, December 1973.
2. Multidisciplinary Accident Investigation Data File, 1975 Final Report, Joseph C. Marsh IV, Marion J. Compton, John A. Green, DOT-HS-802-291. Highway Safety Research Institute, March 1977.